SHIELD
ENVIRONMENTAL ASSOCIATES, INC.

April 23, 2024

Mr. Zachary Bittner
KY Dept. for Environmental Protection
Division for Air Quality
Permit Review Branch
300 Sower Blvd. 2nd Floor
Frankfort, KY 40601

Subject: Initial Application for a Conditional Major Permit
Pittsburgh Glass Works, LLC dba Vitro Automotive Glass
Berea, (Madison County), Kentucky
AI #2846, Facility ID #21-151-00048

Project No. 122-1220

Dear Mr. Bittner:

Pittsburgh Glass Works, LLC dba Vitro Automotive Glass (Vitro) is submitting an initial application for a Conditional Major Permit. Vitro currently operates under State-Origin Permit (S-15-052 R4). Due to market and operational conditions, Vitro is transitioning operations from the O'Fallon, Missouri facility. This will result in the plant closure in O'Fallon and the addition of six lines to the Berea site.

The new lines are noted as EP 22, EP 23, EP 24, EP 25, EP 26, and IA 9 in the attached application. Due to increased capacity, EP 11, EP 12, and EP 20 have included forms. EP 14 now includes both BL2 and BL1, where previously BL1 was captured as an insignificant activity. Lastly, EP 21 was listed in S-15-052 R4 as an insignificant activity, however, due to the changes with this line the potential emissions of hazardous air pollutants (HAPs) exceed 1000 lbs/year, therefore, forms have been submitted to move it to Section B in the permit. These additional lines and changes to existing lines result in the potential to emit for toluene being more than 10 tons per year (TPY). Due to this, Vitro requests to take a federally enforceable limit for toluene. In addition, due to anticipated changes in the future, Vitro is also requesting a limit for volatile organic compounds (VOCs) and total HAPs.

Should there be any questions, please do not hesitate to contact Nicole Galavotti at (859) 294-5155. Thank you.
Sincerely,

SHIELD ENVIRONMENTAL ASSOCIATES, INC.

Nicole Galavotti, P.E.
Principal, Sr. Environmental Engineer

Daniel Porter, PhD, P.E.
Environmental Engineer

cc: Tony Kloss – Vitro Automotive Glass

Attachments
Appendix A DEP7007 Forms
Appendix B Process Flow Diagram
Appendix C Potential to Emit Calculations
Appendix D Permit Markup
Appendix E Safety Data Sheets (SDSs)

Lexington
948 Floyd Drive
Lexington, KY 40505
Telephone 859.294.5155
Fax 859.294.5255
www.shieldenv.com

Louisville, KY

APPENDIX A

DEP7007 Forms

Division for Air Quality

300 Sower Boulevard

Frankfort, KY 40601

(502) 564-3999

DEP7007AI

Administrative Information

_✓__ Section AI.1: Source Information

_✓__ Section AI.2: Applicant Information

_✓__ Section AI.3: Owner Information

_✓__ Section AI.4: Type of Application

_✓__ Section AI.5: Other Required Information

_✓__ Section AI.6: Signature Block

___ Section AI.7: Notes, Comments, and Explanations

Additional Documentation

_✓__ Additional Documentation attached

Source Name: **Pittsburgh Glass Works, LLC dba Vitro Automotive Glass**

KY EIS (AFS) #: **21- 151-00048**

Permit #: **S-15-052 R4**

Agency Interest (AI) ID: **2846**

Date: **4/22/2024**

Section AI.1: Source Information

Physical Location Address:	**Street:**	2290 Menelaus Rd				
	City:	Berea	**County:**	Madison	**Zip Code:**	**40403**
Mailing Address:	**Street or P.O. Box:**	2290 Menelaus Rd				
	City:	Berea	**County:**	Madison	**Zip Code:**	**40403**

Standard Coordinates for Source Physical Location

Longitude: 37.59595 (decimal degrees) **Latitude:** -84.3017 (decimal degrees)

Primary (NAICS) Category: Glass Product Manufacturing Made of Purchased Glass **Primary NAICS #:** 327215

Classification (SIC) Category: Glass Products, Made of Purchased Glass **Primary SIC #:** 3231

Briefly discuss the type of business conducted at this site: PWG/Vitro is an automotive glass products and service provider. Various primers and adhesives are applied to glass products for the automotive industry.

Description of Area Surrounding Source: ☐ Rural Area ☐ Industrial Park ☐ Residential Area ☐ Urban Area ☑ Industrial Area ☐ Commercial Area

Is any part of the source located on federal land? ☐ Yes ☑ No

Number of Employees: 350

Approximate distance to nearest residence or commercial property: *150-200 ft*

Property Area: **16.8 acres**

Is this source portable? ☐ Yes ☑ No

What other environmental permits or registrations does this source currently hold or need to obtain in Kentucky?

NPDES/KPDES:	☑ Currently Hold	☐ Need	☐ N/A
Solid Waste:	☐ Currently Hold	☐ Need	☑ N/A
RCRA:	☑ Currently Hold	☐ Need	☐ N/A
UST:	☐ Currently Hold	☐ Need	☑ N/A

Type of Regulated Waste Activity: ☐ Mixed Waste Generator ☑ Generator ☐ Recycler ☐ Other: _____ ☐ U.S. Importer of Hazardous Waste ☐ Transporter ☐ Treatment/Storage/Disposal Facility ☐ N/A

Section AI.2: Applicant Information

Applicant Name: Pittsburgh Glass Works, LLC dba Vitro Automotive Glass

Title: (if individual)

Mailing Address:
Street or P.O. Box: 2290 Menelaus Rd
City: Berea **State:** KY **Zip Code:** 40403

Email: (if individual)

Phone: 895-986-5080

Technical Contact

Name: Edson Aldape

Title: Plant Manager

Mailing Address:
Street or P.O. Box: 2290 Menelaus Rd
City: Berea **State:** KY **Zip Code:** 40403

Email: ealdapem@vitro.com

Phone: 895-986-5080

Air Permit Contact for Source

Name: Nicole Galavotti

Title: Sr. Environmental Engineer

Mailing Address:
Street or P.O. Box: 948 Floyd Drive
City: Lexington **State:** KY **Zip Code:** 40505

Email: nicole_galavotti@shieldmw.com

Phone: 859-294-5155

Section AI.3: Owner Information

☑ **Owner same as applicant**

Name: Pittsburgh Glass Works, LLC

Title:

Mailing Address:
Street or P.O. Box: 323 North Shore Dr, 6th Floor
City: Pittsburgh **State:** Pennsylvania **Zip Code:** 15212

Email:

Phone: 412-995-6500

List names of owners and officers of the company who have an interest in the company of 5% or more.

Name	Position

Section AI.4: Type of Application

Current Status: ☐ Title V ☐ Conditional Major ☑ State-Origin ☐ General Permit ☐ Registration ☐ None

Requested Action: *(check all that apply)*

☐ Name Change	☐ Initial Registration	☐ Significant Revision	☐ Administrative Permit Amendment
☐ Renewal Permit	☐ Revised Registration	☐ Minor Revision	☐ Initial Source-wide Operating Permit
☐ 502(b)(10)Change	☐ Extension Request	☑ Addition of New Facility	☐ Portable Plant Relocation Notice
☐ Revision	☐ Off Permit Change	☐ Landfill Alternate Compliance Submittal	☑ Modification of Existing Facilities
☐ Ownership Change	☐ Closure		

Requested Status: ☐ Title V ☑ Conditional Major ☐ State-Origin ☐ PSD ☐ NSR ☐ Other: _____

Is the source requesting a limitation of potential emissions? ☐ Yes ☐ No

Pollutant:	Requested Limit:	Pollutant:	Requested Limit:
☐ Particulate Matter		☑ Single HAP	< 10 tpy (Toluene)
☑ Volatile Organic Compounds (VOC)	< 90 tpy	☑ Combined HAPs	< 25 tpy
☐ Carbon Monoxide		☐ Air Toxics (40 CFR 68, Subpart F)	
☐ Nitrogen Oxides		☐ Carbon Dioxide	
☐ Sulfur Dioxide		☐ Greenhouse Gases (GHG)	
☐ Lead		☐ Other	

For New Construction:

Proposed Start Date of Construction: *(MM/YYYY)* _____

Proposed Operation Start-Up Date: *(MM/YYYY)* _____

For Modifications:

Proposed Start Date of Modification: *(MM/YYYY)* 07/2024

Proposed Operation Start-Up Date: *(MM/YYYY)* 07/2024

Applicant is seeking coverage under a permit shield. ☐ **Yes** ☑ **No**

Identify any non-applicable requirements for which permit shield is sought on a separate attachment to the application.

Section AI.5 Other Required Information

Indicate the documents attached as part of this application:

- ☐ DEP7007A Indirect Heat Exchangers and Turbines
- ☐ DEP7007B Manufacturing or Processing Operations
- ☐ DEP7007C Incinerators and Waste Burners
- ☐ DEP7007F Episode Standby Plan
- ☐ DEP7007J Volatile Liquid Storage
- ☑ DEP7007K Surface Coating or Printing Operations
- ☐ DEP7007L Mineral Processes
- ☐ DEP7007M Metal Cleaning Degreasers
- ☑ DEP7007N Source Emissions Profile
- ☐ DEP7007P Perchloroethylene Dry Cleaning Systems
- ☐ DEP7007R Emission Offset Credit
- ☐ DEP7007S Service Stations
- ☐ DEP7007T Metal Plating and Surface Treatment Operations
- ☑ DEP7007V Applicable Requirements and Compliance Activities
- ☐ DEP7007Y Good Engineering Practice and Stack Height Determination
- ☐ DEP7007AA Compliance Schedule for Non-complying Emission Units
- ☐ DEP7007BB Certified Progress Report
- ☐ DEP7007CC Compliance Certification
- ☑ DEP7007DD Insignificant Activities
- ☐ DEP7007EE Internal Combustion Engines
- ☐ DEP7007FF Secondary Aluminum Processing
- ☐ DEP7007GG Control Equipment
- ☐ DEP7007HH Haul Roads
- ☐ Confidentiality Claim
- ☐ Ownership Change Form
- ☐ Secretary of State Certificate
- ☑ Flowcharts or diagrams depicting process
- ☐ Digital Line Graphs (DLG) files of buildings, roads, etc.
- ☐ Site Map
- ☐ Map or drawing depicting location of facility
- ☑ Safety Data Sheet (SDS)
- ☐ Emergency Response Plan
- ☑ Other: PTE Calculations, Permit Markup

Section AI.6: Signature Block

I, the undersigned, hereby certify under penalty of law, that I am a responsible official*, and that I have personally examined, and am familiar with, the information submitted in this document and all its attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the information is on knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false or incomplete information, including the possibility of fine or imprisonment.

Authorized Signature	4/23/24 **Date**
Edson Aldape **Type or Printed Name of Signatory**	Plant Manager **Title of Signatory**

*Responsible official as defined by 401 KAR 52:001.

Division for Air Quality
300 Sower Boulevard
Frankfort, KY 40601
(502) 564-3999

DEP7007DD

Insignificant Activities

_✓__ Section DD.1: Table of Insignificant Activities
_✓__ Section DD.2: Signature Block
_✓__ Section DD.3: Notes, Comments, and Explanations

Source Name: Pittsburgh Glass Works, LLC dba Vitro Automotive Glass
KY EIS (AFS) #: 21- 151-00048
Permit #: S-15-052 R4
Agency Interest (AI) ID: 2846
Date: 4/22/2024

Section DD.1: Table of Insignificant Activities

*Identify each activity with a unique Insignificant Activity number (IA #); for example: 1, 2, 3… etc.

Insignificant Activity #	Description of Activity including Rated Capacity	Serial Number or Other Unique Identifier	Applicable Regulation(s)	Calculated Emissions
1	Space Heaters, 28 units, NG, 4.87 MMBtu/hr total	N/A	None	See Appendix B
2	Line 1 (Sidelite and Backlite)	Line 1	None	See Appendix B
3	Sidelite Bonding Line (2014) (SL1)	SL1	None	See Appendix B
4	Quarter Window Bonding Line (2015) (QW1)	QW1	None	See Appendix B
5	Westward Cold Cleaner, 20 gallon	N/A	None	See Appendix B
6	Diesel Fuel Storage Tank, 280 gallon	N/A	None	See Appendix B
7	MIG Welding Table	N/A	None	See Appendix B
8	Sequoia Sidelite (SL7)	SL7	None	See Appendix B
9	Line 6/6A Backlite w/ soldering	Line 6/6A	401 KAR 59:010	See Appendix B

Section DD.2: Signature Block

I, THE UNDERSIGNED, HEREBY CERTIFY UNDER PENALTY OF LAW, THAT I AM A RESPONSIBLE OFFICIAL, AND THAT I HAVE PERSONALLY EXAMINED, AND AM FAMILIAR WITH, THE INFORMATION SUBMITTED IN THIS DOCUMENT AND ALL ITS ATTACHMENTS. BASED ON MY INQUIRY OF THOSE INDIVIDUALS WITH PRIMARY RESPONSIBILITY FOR OBTAINING THE INFORMATION, I CERTIFY THAT THE INFORMATION IS ON KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE OR INCOMPLETE INFORMATION, INCLUDING THE POSSIBILITY OF FINE OR IMPRISONMENT.

By:

Authorized Signature	Date
Edson Aldape	Plant Manager
Type/Print Name of Signatory	Title of Signatory

Section DD.3: Notes, Comments, and Explanations

Sidelite Bonding Line (2015), (previously IA #4) will be operating at a rate that increases the potential emissions above 1,000 lb/year HAPs. Therefore, this unit has been moved to the front of the permit and is now EP 21. Backling Bonding line w/ soldering (previously IA #5) will be combined with existing EP 14 Backlite Bonding Line (BL2).

DEP7007K

Surface Coating or Printing Operations

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_✓_ Section K.1: Process Information

_✓_ Section K.2: Coating Operations

_✓_ Section K.3: Other Operations

_✓_ Section K.4: Coatings/Printing Materials as Applied

_✓_ Section K.5: HAP-containing Coatings/Printing Materials

_✓_ Section K.6: Notes, Comments, and Explanations

Additional Documentation

_✓__ Complete DEP7007AI, DEP7007N, DEP7007V, and DEP7007GG.

_✓__ Attach SDS or Technical Sheets for all Coating/Printing Materials

____ Attach a flow diagram

Source Name: **Pittsburgh Glass Works, LLC dba Vitro Automotive Glass**

KY EIS (AFS) #: **21- 151-00048**

Permit #: **S-15-052 R4**

Agency Interest (AI) ID: **2846**

Date: **4/22/2024**

Section K.1: Process Information

Emission Unit #: EP 10

Emission Unit Name: Sidelite Assembly Line A (SL3)

Coating/Printing Line Name: Sidelite Assembly Line A (SL3)

Proposed/Actual Date of Construction: *(MM/YYYY)* 09/2019

List Applicable Regulations:

401 KAR 52:030
401 KAR 63:020

Describe Overall Process:

Bottom portions of door sidelite (side window) glass are manually or semi-automatically primed with an adhesion promoter (glass primer). A two-component adhesive is mixed together and dispensed into the channel of the door window clip.

Describe Coatings/Printing Materials:

Clear Glass Primer, Urethane Adhesive and Urethane Curative

Identify the Material that is Coated/Printed: ☐ Metal ☐ Vinyl ☐ Plastics ☐ Wood ☐ Foil ☐ Paper ☑ Other Substrate

Provide detailed description of material coated/printed: Automotive glass

Provide approximate dimensions and range of sizes of parts being coated or printed: Varies

Identify the Type of Operation: ☐ Continuous ☑ Batch ☐ Other:

Describe Surface Preparation/Pretreatment Steps:

For Coating Operations: ☐ Spray ☐ Flow ☐ Dip tank ☐ Electrodeposition ☑ Brush ☐ Powder ☐ Roller Coat ☐ Other:

For Printing Operations: *(Select all that apply)* ☐ Web ☐ Rotogravure ☐ Heatset ☐ Lithographic ☐ Sheetfed ☐ Letterpress ☐ Non-heatset ☐ Flexographic ☐ Other:

Describe Final Product: Automotive glass

Check the category that most closely describes this unit:

☐ Large Appliance Coating
☐ Auto or Light-Duty Truck Coating
☐ Metal Furniture Coating
☐ Metal Coil Coating
☐ Beverage Can Coating
☐ Miscellaneious Metal Parts Coating
☐ Magnet Wire Insulation Coating
☐ Flat Wood Panel Coating
☐ Fabric, Vinyl, or Paper Coating
☐ Boat Manufacturing/ Ship Repair
☐ Pressure Sensitive Tape and Label Coating
☐ Magnet Tape Coating
☐ Publication Rotogravure Printing
☐ Coating of Plastic Parts for Business Machines
☐ Flexible Vinyl and Urethane Coating and Printing
☐ Graphic Arts using Rotogravure and Flexographic Printing
☑ Other: Automotive Glass Coating

Section K.2: Coating Operations

K.2A: For Spray Coating

Gun/Booth ID	Describe Function	Type	Mode	Maximum Design Application Rate *(gal/hr or lb/hr)*		Describe how maximum rate was determined
		☐ Conventional Air Gun ☐ Airless ☐ HVLP ☐ Electrostatic ☐ LVLP ☐ Aerosol Spray Can ☐ Other	☐ Manual ☐ Automatic			☐ Testing ☐ Equipment Specification Sheet ☐ Estimation
		☐ Conventional Air Gun ☐ Airless ☐ HVLP ☐ Electrostatic ☐ LVLP ☐ Aerosol Spray Can ☐ Other	☐ Manual ☐ Automatic			☐ Testing ☐ Equipment Specification Sheet ☐ Estimation
		☐ Conventional Air Gun ☐ Airless ☐ HVLP ☐ Electrostatic ☐ LVLP ☐ Aerosol Spray Can ☐ Other	☐ Manual ☐ Automatic			☐ Testing ☐ Equipment Specification Sheet ☐ Estimation

If spray guns are used simultaneously, describe:	

K.2B: For Brush Coating

Describe Function:	A brush is used to add primer and adhesive to the edges of the glass
Maximum Coating Application Rate: *(gal/hr)*	1.34 gal/hr (gal/part for all coatings x parts/hr)

Section K.3: Other Operations

K.3A: For Finishing

Describe Finishing Processes: *Complete Form DEP7007B as applicable*	

K.3B: For Curing/Drying

Describe Curing/Drying Processes:	**Description**	**Rated Capacity** *(MMBtu/hr)*	**Fuel**	**Control Device/Stack ID**

K.3C: For Purge

Type: _____

Daily Usage: _____ gal/day

K.3D: For Clean-up

Type: ☑ Manual ☐ Automatic

Daily Usage: ~ 1 gal/day hrs/day

Operating Hours: 16 hrs/day

K.3E: For Other Equipment

Describe Processes:	

Section K.4: Coatings/Printing Materials As Applied

Include SDS or Technical Sheets for all coating/printing materials used.

Trade Name of Material	Description *(Identify as coating, ink, fountain solution, blanket wash, cleaning solvent, thinning solvent, auto wash, manual wash, etc.)*	Emission Unit/Coating ID where material is used	SCC Code	SCC Code Units	Density *(lb/gal)*	Solid Content *(lb/gal)*	VOC Content *(lb/gal)*	Emission Factor for PM* *(lb/SCC)*	Transfer Efficiency *(%)*	Emission Factor for VOC *(lb/SCC)*	Capture Efficiency *(%)*	Control Device/ Stack ID
43518 Clear Glass Primer	Primer	EP 10	39999995	Gallons	6.97	N/A	6.94	N/A	N/A	6.94	0%	11
WS-292FK Urethane Adhesive	Adhesive	EP 10	39999995	Gallons	10.48	N/A	0.01	N/A	N/A	0.01	0%	11
B-1M Urethane Curative	Curative	EP 10	39999995	Gallons	10.66	N/A	0.14	N/A	N/A	0.14	0%	11

**Emission factor for particulate matter (PM) should not include transfer efficiency.*

Section K.5: Hazardous Air Pollutant-containing Coatings/Printing Materials

List each individual hazardous air pollutant (HAP) contained in each material.

Trade Name of Material	HAP Name	HAP CAS #	Identify Solid (*S*) or Volatile (*V*)	HAP % by weight	HAP Emission Factor *(lb/SCC)*	Control Device/ Stack ID
Clear Glass Primer 43518	Methanol	67-56-1	V	48.75	3.40	11
Clear Glass Primer 43518	Toluene	108-88-3	V	48.75	3.40	11

Section K.6: Notes, Comments, and Explanations

This line remains the same as described in the July 2019 application, apart from the removal of Isopropanol and new stack information (stack 11).

DEP7007K

Surface Coating or Printing Operations

Division for Air Quality

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_✓_ Section K.1: Process Information

_✓_ Section K.2: Coating Operations

_✓_ Section K.3: Other Operations

_✓_ Section K.4: Coatings/Printing Materials as Applied

_✓_ Section K.5: HAP-containing Coatings/Printing Materials

_✓_ Section K.6: Notes, Comments, and Explanations

Additional Documentation

_✓__ Complete DEP7007AI, DEP7007N, DEP7007V, and DEP7007GG.

_✓__ Attach SDS or Technical Sheets for all Coating/Printing Materials

____ Attach a flow diagram

Source Name: **Pittsburgh Glass Works, LLC dba Vitro Automotive Glass**

KY EIS (AFS) #: **21- 151-00048**

Permit #: **S-15-052 R4**

Agency Interest (AI) ID: **2846**

Date: **4/22/2024**

Section K.1: Process Information

Emission Unit #: EP 11

Emission Unit Name: Sidelite Assembly Line B (SL4)

Coating/Printing Line Name: Sidelite Assembly Line B (SL4)

Proposed/Actual Date of Construction: *(MM/YYYY)* 09/2019

List Applicable Regulations:

401 KAR 52:030
401 KAR 63:020

Describe Overall Process:

Bottom portions of door sidelite (side window) glass are manually or semi-automatically primed with an adhesion promoter (glass primer). A two-component adhesive is mixed together and dispensed into the channel of the door window clip.

Describe Coatings/Printing Materials:

Clear Glass Primer, Urethane Adhesive, Urethane Curative, and Glass Cleaner

Identify the Material that is Coated/Printed: ☐ Metal ☐ Vinyl ☐ Plastics ☐ Wood ☐ Foil ☐ Paper ☑ Other Substrate

Provide detailed description of material coated/printed: Automotive glass

Provide approximate dimensions and range of sizes of parts being coated or printed: Varies

Identify the Type of Operation: ☐ Continuous ☑ Batch ☐ Other:

Describe Surface Preparation/Pretreatment Steps: Glass is cleaned with isopropanol prior to coating

For Coating Operations: ☐ Spray ☐ Flow ☐ Dip tank ☐ Electrodeposition ☑ Brush ☐ Powder ☐ Roller Coat ☐ Other:

For Printing Operations: *(Select all that apply)* ☐ Web ☐ Rotogravure ☐ Heatset ☐ Lithographic ☐ Sheetfed ☐ Letterpress ☐ Non-heatset ☐ Flexographic ☐ Other:

Describe Final Product: Automotive glass

Check the category that most closely describes this unit:

☐ Large Appliance Coating
☐ Auto or Light-Duty Truck Coating
☐ Metal Furniture Coating
☐ Metal Coil Coating
☐ Beverage Can Coating
☐ Miscellaneious Metal Parts Coating
☐ Magnet Wire Insulation Coating
☐ Flat Wood Panel Coating
☐ Fabric, Vinyl, or Paper Coating
☐ Boat Manufacturing/ Ship Repair
☐ Pressure Sensitive Tape and Label Coating
☐ Magnet Tape Coating
☐ Publication Rotogravure Printing
☐ Coating of Plastic Parts for Business Machines
☐ Flexible Vinyl and Urethane Coating and Printing
☐ Graphic Arts using Rotogravure and Flexographic Printing
☑ Other: Automotive Glass Coating

Section K.2: Coating Operations

K.2A: For Spray Coating

Gun/Booth ID	Describe Function	Type	Mode	Maximum Design Application Rate *(gal/hr or lb/hr)*		Describe how maximum rate was determined
		☐ Conventional Air Gun ☐ Airless ☐ HVLP ☐ Electrostatic ☐ LVLP ☐ Aerosol Spray Can ☐ Other	☐ Manual ☐ Automatic			☐ Testing ☐ Equipment Specification Sheet ☐ Estimation
		☐ Conventional Air Gun ☐ Airless ☐ HVLP ☐ Electrostatic ☐ LVLP ☐ Aerosol Spray Can ☐ Other	☐ Manual ☐ Automatic			☐ Testing ☐ Equipment Specification Sheet ☐ Estimation
		☐ Conventional Air Gun ☐ Airless ☐ HVLP ☐ Electrostatic ☐ LVLP ☐ Aerosol Spray Can ☐ Other	☐ Manual ☐ Automatic			☐ Testing ☐ Equipment Specification Sheet ☐ Estimation

If spray guns are used simultaneously, describe:

K.2B: For Brush Coating

Describe Function:	A brush is used to add primer and adhesive to the edges of the glass
Maximum Coating Application Rate: *(gal/hr)*	1.79 gal/hr (gal/part for all coatings x parts/hr)

Section K.3: Other Operations

K.3A: For Finishing

Describe Finishing Processes: *Complete Form DEP7007B as applicable*	

K.3B: For Curing/Drying

Describe Curing/Drying Processes:	**Description**	**Rated Capacity** *(MMBtu/hr)*	**Fuel**	**Control Device/Stack ID**

K.3C: For Purge

Type: _____

Daily Usage: _____ gal/day

K.3D: For Clean-up

Type: ☑ Manual ☐ Automatic

Daily Usage: ~ 1 gal/day hrs/day

Operating Hours: 16 hrs/day

K.3E: For Other Equipment

Describe Processes:	

Section K.4: Coatings/Printing Materials As Applied

Include SDS or Technical Sheets for all coating/printing materials used.

Trade Name of Material	Description *(Identify as coating, ink, fountain solution, blanket wash, cleaning solvent, thinning solvent, auto wash, manual wash, etc.)*	Emission Unit/Coating ID where material is used	SCC Code	SCC Code Units	Density *(lb/gal)*	Solid Content *(lb/gal)*	VOC Content *(lb/gal)*	Emission Factor for PM* *(lb/SCC)*	Transfer Efficiency *(%)*	Emission Factor for VOC *(lb/SCC)*	Capture Efficiency *(%)*	Control Device/ Stack ID
43518 Clear Glass Primer	Primer	EP 11	39999995	Gallons	6.97	N/A	6.94	N/A	N/A	6.94	0%	11
WS-292FK Urethane Adhesive	Adhesive	EP 11	39999995	Gallons	10.48	N/A	0.01	N/A	N/A	0.01	0%	11
B-1M Urethane Curative	Curative	EP 11	39999995	Gallons	10.66	N/A	0.14	N/A	N/A	0.14	0%	11
Isopropanol	Glass Cleaner	EP 11	39999995	Gallons	6.65	N/A	6.65	N/A	N/A	6.65	0%	11

**Emission factor for particulate matter (PM) should not include transfer efficiency.*

Section K.5: Hazardous Air Pollutant-containing Coatings/Printing Materials

List each individual hazardous air pollutant (HAP) contained in each material.

Trade Name of Material	HAP Name	HAP CAS #	Identify Solid (*S*) or Volatile (*V*)	HAP % by weight	HAP Emission Factor *(lb/SCC)*	Control Device/ Stack ID
Clear Glass Primer 43518	Methanol	67-56-1	V	48.75	3.40	11
Clear Glass Primer 43518	Toluene	108-88-3	V	48.75	3.40	11

Section K.6: Notes, Comments, and Explanations

This line remains the same as described in the July 2019 application, apart for an increase in throughput (300 parts/hr) and stack information (stack 11).

DEP7007K

Surface Coating or Printing Operations

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300 Sower Boulevard

Frankfort, KY 40601

(502) 564-3999

_✓_ Section K.1: Process Information

_✓_ Section K.2: Coating Operations

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_✓_ Section K.5: HAP-containing Coatings/Printing Materials

_✓_ Section K.6: Notes, Comments, and Explanations

Additional Documentation

_✓__ Complete DEP7007AI, DEP7007N, DEP7007V, and DEP7007GG.

_✓__ Attach SDS or Technical Sheets for all Coating/Printing Materials

____ Attach a flow diagram

Source Name: **Pittsburgh Glass Works, LLC dba Vitro Automotive Glass**

KY EIS (AFS) #: **21- 151-00048**

Permit #: **S-15-052 R4**

Agency Interest (AI) ID: **2846**

Date: **4/22/2024**

Section K.1: Process Information

Emission Unit #: EP 12

Emission Unit Name: Sidelite Door Cell (SL6)

Coating/Printing Line Name: Sidelite Door Cell (SL6)

Proposed/Actual Date of Construction: *(MM/YYYY)* 08/2020

List Applicable Regulations:

401 KAR 52:030
401 KAR 63:020

Describe Overall Process:

Bottom portions of door sidelite (side window) glass are manually or semi-automatically primed with an adhesion promoter (glass primer). A two-component adhesive is mixed together and dispensed into the channel of the door window clip.

Describe Coatings/Printing Materials:

Clear Glass Primer, Urethane Adhesive, Urethane Curative

Identify the Material that is Coated/Printed: ☐ Metal ☐ Vinyl ☐ Plastics ☐ Wood ☐ Foil ☐ Paper ☑ Other Substrate

Provide detailed description of material coated/printed: Automotive glass

Provide approximate dimensions and range of sizes of parts being coated or printed: Varies

Identify the Type of Operation: ☐ Continuous ☑ Batch ☐ Other:

Describe Surface Preparation/Pretreatment Steps:

For Coating Operations: ☐ Spray ☐ Flow ☐ Dip tank ☐ Electrodeposition ☑ Brush ☐ Powder ☐ Roller Coat ☐ Other:

For Printing Operations: *(Select all that apply)* ☐ Web ☐ Rotogravure ☐ Heatset ☐ Lithographic ☐ Sheetfed ☐ Letterpress ☐ Non-heatset ☐ Flexographic ☐ Other:

Describe Final Product: Automotive glass

Check the category that most closely describes this unit:

☐ Large Appliance Coating
☐ Auto or Light-Duty Truck Coating
☐ Metal Furniture Coating
☐ Metal Coil Coating
☐ Beverage Can Coating
☐ Miscellaneious Metal Parts Coating
☐ Magnet Wire Insulation Coating
☐ Flat Wood Panel Coating
☐ Fabric, Vinyl, or Paper Coating
☐ Boat Manufacturing/ Ship Repair
☐ Pressure Sensitive Tape and Label Coating
☐ Magnet Tape Coating
☐ Publication Rotogravure Printing
☐ Coating of Plastic Parts for Business Machines
☐ Flexible Vinyl and Urethane Coating and Printing
☐ Graphic Arts using Rotogravure and Flexographic Printing
☑ Other: Automotive Glass Coating

Section K.2: Coating Operations

K.2A: For Spray Coating

Gun/Booth ID	Describe Function	Type	Mode	Maximum Design Application Rate *(gal/hr or lb/hr)*		Describe how maximum rate was determined
		☐ Conventional Air Gun ☐ Airless ☐ HVLP ☐ Electrostatic ☐ LVLP ☐ Aerosol Spray Can ☐ Other	☐ Manual ☐ Automatic			☐ Testing ☐ Equipment Specification Sheet ☐ Estimation
		☐ Conventional Air Gun ☐ Airless ☐ HVLP ☐ Electrostatic ☐ LVLP ☐ Aerosol Spray Can ☐ Other	☐ Manual ☐ Automatic			☐ Testing ☐ Equipment Specification Sheet ☐ Estimation
		☐ Conventional Air Gun ☐ Airless ☐ HVLP ☐ Electrostatic ☐ LVLP ☐ Aerosol Spray Can ☐ Other	☐ Manual ☐ Automatic			☐ Testing ☐ Equipment Specification Sheet ☐ Estimation

If spray guns are used simultaneously, describe:

K.2B: For Brush Coating

Describe Function:	A brush is used to add primer and adhesive to the edges of the glass
Maximum Coating Application Rate: *(gal/hr)*	2.38 gal/hr (gal/part for all coatings x parts/hr) reflective of the usage from YH America AN-1M Option scenerio (See table 3 for additonal information)

Section K.3: Other Operations

K.3A: For Finishing

Describe Finishing Processes: *Complete Form DEP7007B as applicable*	

K.3B: For Curing/Drying

Describe Curing/Drying Processes:	Description	Rated Capacity *(MMBtu/hr)*	Fuel	Control Device/Stack ID

K.3C: For Purge

Type: _____

Daily Usage: _____ gal/day

K.3D: For Clean-up

Type: ☑ Manual ☐ Automatic

Daily Usage: ~1 gal/day hrs/day

Operating Hours: 16 hrs/day

K.3E: For Other Equipment

Describe Processes:	

Section K.4: Coatings/Printing Materials As Applied

Include SDS or Technical Sheets for all coating/printing materials used.

Trade Name of Material	Description *(Identify as coating, ink, fountain solution, blanket wash, cleaning solvent, thinning solvent, auto wash, manual wash, etc.)*	Emission Unit/Coating ID where material is used	SCC Code	SCC Code Units	Density *(lb/gal)*	Solid Content *(lb/gal)*	VOC Content *(lb/gal)*	Emission Factor for PM* *(lb/SCC)*	Transfer Efficiency *(%)*	Emission Factor for VOC *(lb/SCC)*	Capture Efficiency *(%)*	Control Device/ Stack ID
43518 Clear Glass Primer	Primer	EP 12	39999995	Gallons	6.97	N/A	6.94	N/A	N/A	6.94	0%	11
WS-242FK Urethane Adhesive	Adhesive	EP 12	39999995	Gallons	10.60	N/A	0.04	N/A	N/A	0.04	0%	11
AN-1M Urethane Curative	Curative	EP 12	39999995	Gallons	10.60	N/A	0.53	N/A	N/A	0.53	0%	11
43518 Clear Glass Primer	Primer	EP 12 (alternative option)	39999995	Gallons	6.97	N/A	6.94	N/A	N/A	6.94	0%	11
WS-292FK Urethane Adhesive	Adhesive	EP 12 (alternative option)	39999995	Gallons	10.48	N/A	0.01	N/A	N/A	0.01	0%	11
B-1M Urethane Curative	Curative	EP 12 (alternative option)	39999995	Gallons	10.66	N/A	0.14	N/A	N/A	0.14	0%	11

**Emission factor for particulate matter (PM) should not include transfer efficiency.*

Section K.5: Hazardous Air Pollutant-containing Coatings/Printing Materials

List each individual hazardous air pollutant (HAP) contained in each material.

Trade Name of Material	HAP Name	HAP CAS #	Identify Solid (*S*) or Volatile (*V*)	HAP % by weight	HAP Emission Factor *(lb/SCC)*	Control Device/ Stack ID
Clear Glass Primer 43518	Methanol	67-56-1	V	48.75	3.40	11
Clear Glass Primer 43518	Toluene	108-88-3	V	48.75	3.40	11

Section K.6: Notes, Comments, and Explanations

This line remains the same as described in the May 2020 application, apart for an increase in throughput (225 parts/hrs) and stack information (11).

DEP7007K

Surface Coating or Printing Operations

Division for Air Quality

300 Sower Boulevard

Frankfort, KY 40601

(502) 564-3999

_✓_ Section K.1: Process Information

_✓_ Section K.2: Coating Operations

_✓_ Section K.3: Other Operations

_✓_ Section K.4: Coatings/Printing Materials as Applied

_✓_ Section K.5: HAP-containing Coatings/Printing Materials

_✓_ Section K.6: Notes, Comments, and Explanations

Additional Documentation

_✓__ Complete DEP7007AI, DEP7007N, DEP7007V, and DEP7007GG.

_✓__ Attach SDS or Technical Sheets for all Coating/Printing Materials

____ Attach a flow diagram

Source Name: **Pittsburgh Glass Works, LLC dba Vitro Automotive Glass**

KY EIS (AFS) #: **21- 151-00048**

Permit #: **S-15-052 R4**

Agency Interest (AI) ID: **2846**

Date: **4/22/2024**

Section K.1: Process Information

Emission Unit #: EP 14

Emission Unit Name: Backlite Assembly Line (BL2/BL1)

Coating/Printing Line Name: Backlite Assembly Line (BL2/BL1)

Proposed/Actual Date of Construction: *(MM/YYYY)* 09/2019

List Applicable Regulations:
401 KAR 52:030
401 KAR 63:020

Describe Overall Process:
Portions of the backlite (back window glass) glass are manually or semi-automatically primed with an adhesion promoter, or promoters (glass primer or primers). The silver grid on the backlite is abraded where a heater connector (or connectors) will be solder to the silver grid. The heat connector (or connectors) are soldered to the silver grid using automated resistance soldering.

Describe Coatings/Printing Materials:
Clear Glass Primer, Black Glass Primer and Glass Cleaner

Identify the Material that is Coated/Printed: ☐ Metal ☐ Vinyl ☐ Plastics ☐ Wood ☐ Foil ☐ Paper ☑ Other Substrate

Provide detailed description of material coated/printed: Automotive glass

Provide approximate dimensions and range of sizes of parts being coated or printed: Varies

Identify the Type of Operation: ☐ Continuous ☑ Batch ☐ Other:

Describe Surface Preparation/Pretreatment Steps: Glass is cleaned with isopropanol prior to coating

For Coating Operations: ☐ Spray ☐ Flow ☐ Dip tank ☐ Electrodeposition ☑ Brush ☐ Powder ☐ Roller Coat ☐ Other:

For Printing Operations: *(Select all that apply)* ☐ Web ☐ Rotogravure ☐ Heatset ☐ Lithographic ☐ Sheetfed ☐ Letterpress ☐ Non-heatset ☐ Flexographic ☐ Other:

Describe Final Product: Automotive glass

Check the category that most closely describes this unit:

☐ Large Appliance Coating
☐ Auto or Light-Duty Truck Coating
☐ Metal Furniture Coating
☐ Metal Coil Coating
☐ Beverage Can Coating
☐ Miscellaneious Metal Parts Coating
☐ Magnet Wire Insulation Coating
☐ Flat Wood Panel Coating
☐ Fabric, Vinyl, or Paper Coating
☐ Boat Manufacturing/ Ship Repair
☐ Pressure Sensitive Tape and Label Coating
☐ Magnet Tape Coating
☐ Publication Rotogravure Printing
☐ Coating of Plastic Parts for Business Machines
☐ Flexible Vinyl and Urethane Coating and Printing
☐ Graphic Arts using Rotogravure and Flexographic Printing
☑ Other: Automotive Glass Coating

Section K.2: Coating Operations

K.2A: For Spray Coating

Gun/Booth ID	Describe Function	Type	Mode	Maximum Design Application Rate *(gal/hr or lb/hr)*		Describe how maximum rate was determined
		☐ Conventional Air Gun ☐ Airless ☐ HVLP ☐ Electrostatic ☐ LVLP ☐ Aerosol Spray Can ☐ Other	☐ Manual ☐ Automatic			☐ Testing ☐ Equipment Specification Sheet ☐ Estimation
		☐ Conventional Air Gun ☐ Airless ☐ HVLP ☐ Electrostatic ☐ LVLP ☐ Aerosol Spray Can ☐ Other	☐ Manual ☐ Automatic			☐ Testing ☐ Equipment Specification Sheet ☐ Estimation
		☐ Conventional Air Gun ☐ Airless ☐ HVLP ☐ Electrostatic ☐ LVLP ☐ Aerosol Spray Can ☐ Other	☐ Manual ☐ Automatic			☐ Testing ☐ Equipment Specification Sheet ☐ Estimation

If spray guns are used simultaneously, describe:

K.2B: For Brush Coating

Describe Function:	A brush is used to add primer and adhesive to the edges of the glass
Maximum Coating Application Rate: *(gal/hr)*	0.18 gal/hr (gal/part for all coatings x parts/hr) reflective of the usage from BL2 option scenerio (See table 3 for additonal information)

Section K.3: Other Operations

K.3A: For Finishing

Describe Finishing Processes: *Complete Form DEP7007B as applicable*	

K.3B: For Curing/Drying

Describe Curing/Drying Processes:	**Description**	**Rated Capacity** *(MMBtu/hr)*	**Fuel**	**Control Device/Stack ID**

K.3C: For Purge

Type: _____

Daily Usage: _____ gal/day

K.3D: For Clean-up

Type: ☑ Manual ☐ Automatic

Daily Usage: ~ 1 gal/day hrs/day

Operating Hours: 16 hrs/day

K.3E: For Other Equipment

Describe Processes:	

Section K.4: Coatings/Printing Materials As Applied

Include SDS or Technical Sheets for all coating/printing materials used.

Trade Name of Material	Description *(Identify as coating, ink, fountain solution, blanket wash, cleaning solvent, thinning solvent, auto wash, manual wash, etc.)*	Emission Unit/Coating ID where material is used	SCC Code	SCC Code Units	Density *(lb/gal)*	Solid Content *(lb/gal)*	VOC Content *(lb/gal)*	Emission Factor for PM* *(lb/SCC)*	Transfer Efficiency *(%)*	Emission Factor for VOC *(lb/SCC)*	Capture Efficiency *(%)*	Control Device/ Stack ID
43518 Clear Glass Primer	Primer	EP 14 (BL2 & BL1)	39999995	Gallons	6.97	N/A	6.94	N/A	N/A	6.94	0%	11
43520A Black Glass Primer	Primer	EP 14 (BL2 & BL1)	39999995	Gallons	8.26	N/A	4.82	N/A	N/A	4.82	0%	11
Isopropanol	Glass Cleaner	EP 14 (BL2 & BL1)	39999995	Gallons	6.65	N/A	6.65	N/A	N/A	6.65	0%	11
Betaprime 5500 Black Glass Primer	Primer	EP 14 (IPA & 5500 Option)	39999995	Gallons	7.93	N/A	4.95	N/A	N/A	4.95	0%	11
Isopropanol	Glass Cleaner	EP 14 (BL1, IPA & 5500 Option)	39999995	Gallons	6.65	N/A	6.65	N/A	N/A	6.65	0%	11

**Emission factor for particulate matter (PM) should not include transfer efficiency.*

Section K.5: Hazardous Air Pollutant-containing Coatings/Printing Materials

List each individual hazardous air pollutant (HAP) contained in each material.

Trade Name of Material	HAP Name	HAP CAS #	Identify Solid (*S*) or Volatile (*V*)	HAP % by weight	HAP Emission Factor *(lb/SCC)*	Control Device/ Stack ID
Clear Glass Primer 43518	Methanol	67-56-1	V	48.75	3.40	11
Clear Glass Primer 43518	Toluene	108-88-3	V	48.75	3.40	11
Black Glass Primer 43520A	Toluene	108-88-3	V	15	1.24	11
Black Glass Primer 43520A	Xylene	1330-20-7	V	<1	0.0826	11
Black Glass Primer 43520A	HDI	822-06-0	V	<1	0.0826	11
Black Glass Primer 43520A	TDI	584-84-9	V	<1	0.0826	11
Betaprime 5500 Black Glass Primer	MDI	101-68-8	V	<1	0.08	11

Section K.6: Notes, Comments, and Explanations

This line (EP 14) previously just had BL2 but insignificant activity BL1 is now combined with this line.

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Surface Coating or Printing Operations

Division for Air Quality

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_✓_ Section K.1: Process Information

_✓_ Section K.2: Coating Operations

_✓_ Section K.3: Other Operations

_✓_ Section K.4: Coatings/Printing Materials as Applied

_✓_ Section K.5: HAP-containing Coatings/Printing Materials

_✓_ Section K.6: Notes, Comments, and Explanations

Additional Documentation

_✓__ Complete DEP7007AI, DEP7007N, DEP7007V, and DEP7007GG.

_✓__ Attach SDS or Technical Sheets for all Coating/Printing Materials

____ Attach a flow diagram

Source Name: **Pittsburgh Glass Works, LLC dba Vitro Automotive Glass**

KY EIS (AFS) #: **21- 151-00048**

Permit #: **S-15-052 R4**

Agency Interest (AI) ID: **2846**

Date: **4/22/2024**

Section K.1: Process Information

Emission Unit #: EP 20

Emission Unit Name: Sidelite Door Line (SL4B/SL8)

Coating/Printing Line Name: Sidelite Door Line (SL4B/SL8)

Proposed/Actual Date of Construction: *(MM/YYYY)* 11/2020

List Applicable Regulations:
401 KAR 52:030
401 KAR 63:020

Describe Overall Process:
Bottom portions of door sidelite (side window) glass are manually or semi-automatically primed with an adhesion promoter (glass primer). A two-component adhesive is mixed together and dispensed into the channel of the door window clip.

Describe Coatings/Printing Materials:
Clear Glass Primer, Urethane Adhesive, Urethane Curative, and Glass Cleaner

Identify the Material that is Coated/Printed: ☐ Metal ☐ Vinyl ☐ Plastics ☐ Wood ☐ Foil ☐ Paper ☑ Other Substrate

Provide detailed description of material coated/printed: Automotive glass

Provide approximate dimensions and range of sizes of parts being coated or printed: Varies

Identify the Type of Operation: ☐ Continuous ☑ Batch ☐ Other:

Describe Surface Preparation/Pretreatment Steps: Glass is cleaned with isopropanol prior to coating

For Coating Operations: ☐ Spray ☐ Flow ☐ Dip tank ☐ Electrodeposition ☑ Brush ☐ Powder ☐ Roller Coat ☐ Other:

For Printing Operations: *(Select all that apply)* ☐ Web ☐ Rotogravure ☐ Heatset ☐ Lithographic ☐ Sheetfed ☐ Letterpress ☐ Non-heatset ☐ Flexographic ☐ Other:

Describe Final Product: Automotive glass

Check the category that most closely describes this unit:

☐ Large Appliance Coating
☐ Auto or Light-Duty Truck Coating
☐ Metal Furniture Coating
☐ Metal Coil Coating
☐ Beverage Can Coating
☐ Miscellaneious Metal Parts Coating
☐ Magnet Wire Insulation Coating
☐ Flat Wood Panel Coating
☐ Fabric, Vinyl, or Paper Coating
☐ Boat Manufacturing/ Ship Repair
☐ Pressure Sensitive Tape and Label Coating
☐ Magnet Tape Coating
☐ Publication Rotogravure Printing
☐ Coating of Plastic Parts for Business Machines
☐ Flexible Vinyl and Urethane Coating and Printing
☐ Graphic Arts using Rotogravure and Flexographic Printing
☑ Other: Automotive Glass Coating

Section K.2: Coating Operations

K.2A: For Spray Coating

Gun/Booth ID	Describe Function	Type	Mode	Maximum Design Application Rate *(gal/hr or lb/hr)*		Describe how maximum rate was determined
		☐ Conventional Air Gun ☐ Airless ☐ HVLP ☐ Electrostatic ☐ LVLP ☐ Aerosol Spray Can ☐ Other	☐ Manual ☐ Automatic			☐ Testing ☐ Equipment Specification Sheet ☐ Estimation
		☐ Conventional Air Gun ☐ Airless ☐ HVLP ☐ Electrostatic ☐ LVLP ☐ Aerosol Spray Can ☐ Other	☐ Manual ☐ Automatic			☐ Testing ☐ Equipment Specification Sheet ☐ Estimation
		☐ Conventional Air Gun ☐ Airless ☐ HVLP ☐ Electrostatic ☐ LVLP ☐ Aerosol Spray Can ☐ Other	☐ Manual ☐ Automatic			☐ Testing ☐ Equipment Specification Sheet ☐ Estimation

If spray guns are used simultaneously, describe:

K.2B: For Brush Coating

Describe Function:	A brush is used to add primer and adhesive to the edges of the glass
Maximum Coating Application Rate: *(gal/hr)*	1.49 gal/hr (gal/part for all coatings x parts/hr)

Section K.3: Other Operations

K.3A: For Finishing

Describe Finishing Processes: *Complete Form DEP7007B as applicable*	

K.3B: For Curing/Drying

Describe Curing/Drying Processes:	**Description**	**Rated Capacity** *(MMBtu/hr)*	**Fuel**	**Control Device/Stack ID**

K.3C: For Purge

Type: _____

Daily Usage: _____ gal/day

K.3D: For Clean-up

Type: ☑ Manual ☐ Automatic

Daily Usage: ~ 1 gal/day hrs/day

Operating Hours: 16 hrs/day

K.3E: For Other Equipment

Describe Processes:	

Section K.4: Coatings/Printing Materials As Applied

Include SDS or Technical Sheets for all coating/printing materials used.

Trade Name of Material	Description *(Identify as coating, ink, fountain solution, blanket wash, cleaning solvent, thinning solvent, auto wash, manual wash, etc.)*	Emission Unit/Coating ID where material is used	SCC Code	SCC Code Units	Density *(lb/gal)*	Solid Content *(lb/gal)*	VOC Content *(lb/gal)*	Emission Factor for PM* *(lb/SCC)*	Transfer Efficiency *(%)*	Emission Factor for VOC *(lb/SCC)*	Capture Efficiency *(%)*	Control Device/ Stack ID
43518 Clear Glass Primer	Primer	EP 20	39999995	Gallons	6.97	N/A	6.94	N/A	N/A	6.94	0%	11
WS-292FK Urethane Adhesive	Adhesive	EP 20	39999995	Gallons	10.48	N/A	0.01	N/A	N/A	0.01	0%	11
Urethane Curative B-1M	Curative	EP 20	39999995	Gallons	10.66	N/A	0.14	N/A	N/A	0.14	0%	11
Isopropanol	Glass Cleaner	EP 20	39999995	Gallons	6.65	N/A	6.65	N/A	N/A	6.65	0%	11

**Emission factor for particulate matter (PM) should not include transfer efficiency.*

Section K.5: Hazardous Air Pollutant-containing Coatings/Printing Materials

List each individual hazardous air pollutant (HAP) contained in each material.

Trade Name of Material	HAP Name	HAP CAS #	Identify Solid (*S*) or Volatile (*V*)	HAP % by weight	HAP Emission Factor *(lb/SCC)*	Control Device/ Stack ID
Clear Glass Primer 43518	Methanol	67-56-1	V	48.75	3.40	11
Clear Glass Primer 43518	Toluene	108-88-3	V	48.75	3.40	11

Section K.6: Notes, Comments, and Explanations

This line remains the same as described in the 2020 application, apart for an increase in throughput (250 parts/hr) and stack information (stack 11).

DEP7007K

Surface Coating or Printing Operations

Division for Air Quality

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_✓_ Section K.1: Process Information

_✓_ Section K.2: Coating Operations

_✓_ Section K.3: Other Operations

_✓_ Section K.4: Coatings/Printing Materials as Applied

_✓_ Section K.5: HAP-containing Coatings/Printing Materials

_✓_ Section K.6: Notes, Comments, and Explanations

Additional Documentation

_✓__ Complete DEP7007AI, DEP7007N, DEP7007V, and DEP7007GG.

_✓__ Attach SDS or Technical Sheets for all Coating/Printing Materials

____ Attach a flow diagram

Source Name: **Pittsburgh Glass Works, LLC dba Vitro Automotive Glass**

KY EIS (AFS) #: **21- 151-00048**

Permit #: **S-15-052 R4**

Agency Interest (AI) ID: **2846**

Date: **4/22/2024**

Section K.1: Process Information

Emission Unit #: EP 21

Emission Unit Name: Sidelite Bonding Line (SL2)

Coating/Printing Line Name: Sidelite Bonding Line (SL2)

Proposed/Actual Date of Construction: *(MM/YYYY)* 07/2015

List Applicable Regulations:
401 KAR 52:030
401 KAR 63:020

Describe Overall Process:
Bottom portions of door sidelite (side window) glass are manually or semi-automatically primed with an adhesion promoter (glass primer). A two-component adhesive is mixed together and dispensed into the channel of the door window clip.

Describe Coatings/Printing Materials:
Clear Glass Primer, Black Glass Primer, Urethane Adhesive, Urethane Curative, and Glass Cleaner

Identify the Material that is Coated/Printed: ☐ Metal ☐ Vinyl ☐ Plastics ☐ Wood ☐ Foil ☐ Paper ☑ Other Substrate

Provide detailed description of material coated/printed: Automotive glass

Provide approximate dimensions and range of sizes of parts being coated or printed: Varies

Identify the Type of Operation: ☐ Continuous ☑ Batch ☐ Other:

Describe Surface Preparation/Pretreatment Steps: Glass is cleaned with isopropanol prior to coating

For Coating Operations: ☐ Spray ☐ Flow ☐ Dip tank ☐ Electrodeposition ☑ Brush ☐ Powder ☐ Roller Coat ☐ Other:

For Printing Operations: *(Select all that apply)* ☐ Web ☐ Rotogravure ☐ Heatset ☐ Lithographic ☐ Sheetfed ☐ Letterpress ☐ Non-heatset ☐ Flexographic ☐ Other:

Describe Final Product: Automotive glass

Check the category that most closely describes this unit:

☐ Large Appliance Coating
☐ Auto or Light-Duty Truck Coating
☐ Metal Furniture Coating
☐ Metal Coil Coating
☐ Beverage Can Coating
☐ Miscellaneious Metal Parts Coating
☐ Magnet Wire Insulation Coating
☐ Flat Wood Panel Coating
☐ Fabric, Vinyl, or Paper Coating
☐ Boat Manufacturing/ Ship Repair
☐ Pressure Sensitive Tape and Label Coating
☐ Magnet Tape Coating
☐ Publication Rotogravure Printing
☐ Coating of Plastic Parts for Business Machines
☐ Flexible Vinyl and Urethane Coating and Printing
☐ Graphic Arts using Rotogravure and Flexographic Printing
☑ Other: Automotive Glass Coating

Section K.2: Coating Operations

K.2A: For Spray Coating

Gun/Booth ID	Describe Function	Type	Mode	Maximum Design Application Rate *(gal/hr or lb/hr)*		Describe how maximum rate was determined
		☐ Conventional Air Gun ☐ Airless ☐ HVLP ☐ Electrostatic ☐ LVLP ☐ Aerosol Spray Can ☐ Other	☐ Manual ☐ Automatic			☐ Testing ☐ Equipment Specification Sheet ☐ Estimation
		☐ Conventional Air Gun ☐ Airless ☐ HVLP ☐ Electrostatic ☐ LVLP ☐ Aerosol Spray Can ☐ Other	☐ Manual ☐ Automatic			☐ Testing ☐ Equipment Specification Sheet ☐ Estimation
		☐ Conventional Air Gun ☐ Airless ☐ HVLP ☐ Electrostatic ☐ LVLP ☐ Aerosol Spray Can ☐ Other	☐ Manual ☐ Automatic			☐ Testing ☐ Equipment Specification Sheet ☐ Estimation

If spray guns are used simultaneously, describe:	

K.2B: For Brush Coating

Describe Function:	A brush is used to add primer and adhesive to the edges of the glass
Maximum Coating Application Rate: *(gal/hr)*	0.38 gal/hr (gal/part for all coatings x parts/hr) reflective of the usage from 43518 & 43520A Option scenerio (See table 3 for additonal information)

Section K.3: Other Operations

K.3A: For Finishing

Describe Finishing Processes: *Complete Form DEP7007B as applicable*	

K.3B: For Curing/Drying

Describe Curing/Drying Processes:	**Description**	**Rated Capacity** *(MMBtu/hr)*	**Fuel**	**Control Device/Stack ID**

K.3C: For Purge

Type: _____

Daily Usage: _____ gal/day

K.3D: For Clean-up

Type: ☑ Manual ☐ Automatic

Daily Usage: ~ 1 gal/day hrs/day

Operating Hours: 16 hrs/day

K.3E: For Other Equipment

Describe Processes:	

Section K.4: Coatings/Printing Materials As Applied

Include SDS or Technical Sheets for all coating/printing materials used.

Trade Name of Material	Description *(Identify as coating, ink, fountain solution, blanket wash, cleaning solvent, thinning solvent, auto wash, manual wash, etc.)*	Emission Unit/Coating ID where material is used	SCC Code	SCC Code Units	Density *(lb/gal)*	Solid Content *(lb/gal)*	VOC Content *(lb/gal)*	Emission Factor for PM* *(lb/SCC)*	Transfer Efficiency *(%)*	Emission Factor for VOC *(lb/SCC)*	Capture Efficiency *(%)*	Control Device/ Stack ID
43518 Clear Glass Primer	Primer	EP 21 (43518 & 43520A Option)	39999995	Gallons	6.97	N/A	6.94	N/A	N/A	6.94	0%	11
43520A Black Glass Primer	Primer	EP 21 (43518 & 43520A Option)	39999995	Gallons	8.26	N/A	4.82	N/A	N/A	4.82	0%	11
X2500 A Plus Urethane Adhesive	Adhesive	EP 21 (43518 & 43520A Option)	39999995	Gallons	10.68	N/A	0.05	N/A	N/A	0.05	0%	11
X2500 B Plus Urethane Curative	Curative	EP 21 (43518 & 43520A Option)	39999995	Gallons	10.01	N/A	0.006	N/A	N/A	0.006	0%	11
Isopropanol	Glass Cleaner	EP 21 (43518 & 43520A Option)	39999995	Gallons	6.65	N/A	6.65	N/A	N/A	6.65	0%	11
Isopropanol	Pre-Wipe, Glass Cleaner	EP 21 (IPA & 5500 Option)	39999995	Gallons	6.65	N/A	6.65	N/A	N/A	6.65	0%	11
Betaprime 5500 Black Glass Primer	Primer	EP 21 (IPA & 5500 Option)	39999995	Gallons	7.93	N/A	4.95	N/A	N/A	4.95	0%	11
X2500 A Plus Urethane Adhesive	Adhesive	EP 21 (IPA & 5500 Option)	39999995	Gallons	10.68	N/A	0.05	N/A	N/A	0.05	0%	11
X2500 B Plus Urethane Curative	Curative	EP 21 (IPA & 5500 Option)	39999995	Gallons	10.01	N/A	0.006	N/A	N/A	0.006	0%	11
Isopropanol	Glass Cleaner	EP 21 (43518 & 43520A Option)	39999995	Gallons	6.65	N/A	6.65	N/A	N/A	6.65	0%	11

**Emission factor for particulate matter (PM) should not include transfer efficiency.*

Section K.4: Coatings/Printing Materials As Applied

Include SDS or Technical Sheets for all coating/printing materials used.

Trade Name of Material	Description *(Identify as coating, ink, fountain solution, blanket wash, cleaning solvent, thinning solvent, auto wash, manual wash, etc.)*	Emission Unit/Coating ID where material is used	SCC Code	SCC Code Units	Density *(lb/gal)*	Solid Content *(lb/gal)*	VOC Content *(lb/gal)*	Emission Factor for PM* *(lb/SCC)*	Transfer Efficiency *(%)*	Emission Factor for VOC *(lb/SCC)*	Capture Efficiency *(%)*	Control Device/ Stack ID
Isopropanol	Glass Cleaner	EP 21 (IPA & WS-292FK Option)	39999995	Gallons	6.65	N/A	6.65	N/A	N/A	6.65	0%	11
WS-292FK Urethane Adhesive	Adhesive	EP 21 (IPA & WS-292FK Option)	39999995	Gallons	10.48	N/A	0.01	N/A	N/A	0.01	0%	11
Urethane Curative B-1M	Curative	EP 21 (IPA & WS-292FK Option)	39999995	Gallons	10.66	N/A	0.14	N/A	N/A	0.14	0%	11
Isopropanol	Glass Cleaner	EP 21 (IPA & WS-292FK Option)	39999995	Gallons	6.65	N/A	6.65	N/A	N/A	6.65	0%	11
Isopropanol	Pre-Wipe, Glass Cleaner	EP 21 (IPA & 5500 Option 2)	39999995	Gallons	6.65	N/A	6.65	N/A	N/A	6.65	0%	11
Betaprime 5500 Black Glass Primer	Primer	EP 21 (IPA & 5500 Option 2)	39999995	Gallons	7.93	N/A	4.95	N/A	N/A	4.95	0%	11
X2500 A Plus Urethane Adhesive	Adhesive	EP 21 (IPA & 5500 Option 2)	39999995	Gallons	10.68	N/A	0.05	N/A	N/A	0.05	0%	11
X2500 B Plus Urethane Curative	Curative	EP 21 (IPA & 5500 Option 2)	39999995	Gallons	10.01	N/A	0.006	N/A	N/A	0.006	0%	11

**Emission factor for particulate matter (PM) should not include transfer efficiency.*

Section K.5: Hazardous Air Pollutant-containing Coatings/Printing Materials

List each individual hazardous air pollutant (HAP) contained in each material.

Trade Name of Material	HAP Name	HAP CAS #	Identify Solid (*S*) or Volatile (*V*)	HAP % by weight	HAP Emission Factor *(lb/SCC)*	Control Device/ Stack ID
Clear Glass Primer 43518	Methanol	67-56-1	V	48.75	3.40	11
Clear Glass Primer 43518	Toluene	108-88-3	V	48.75	3.40	11
Black Glass Primer 43520A	Toluene	108-88-3	V	15	1.24	11
Black Glass Primer 43520A	Xylene	1330-20-7	V	<1	0.0826	11
Black Glass Primer 43520A	HDI	822-06-0	V	<1	0.0826	11
Black Glass Primer 43520A	TDI	584-84-9	V	<1	0.0826	11
Urethane Adhesive X2500 A Plus	MDI	101-68-8	V	<5	0.05	11
Betaprime 5500 Black Glass Primer	MDI	101-68-8	V	<1	0.05	11

Section K.6: Notes, Comments, and Explanations
This line was previously an insignificant activity. Updated chemical information results in a PTE over 1,000 lb/yr of HAPs.

DEP7007K

Surface Coating or Printing Operations

Division for Air Quality

300 Sower Boulevard

Frankfort, KY 40601

(502) 564-3999

_✓_ Section K.1: Process Information

_✓_ Section K.2: Coating Operations

_✓_ Section K.3: Other Operations

_✓_ Section K.4: Coatings/Printing Materials as Applied

_✓_ Section K.5: HAP-containing Coatings/Printing Materials

_✓_ Section K.6: Notes, Comments, and Explanations

Additional Documentation

_✓__ Complete DEP7007AI, DEP7007N, DEP7007V, and DEP7007GG.

_✓__ Attach SDS or Technical Sheets for all Coating/Printing Materials

____ Attach a flow diagram

Source Name: **Pittsburgh Glass Works, LLC dba Vitro Automotive Glass**

KY EIS (AFS) #: **21- 151-00048**

Permit #: **S-15-052 R4**

Agency Interest (AI) ID: **2846**

Date: **4/22/2024**

Section K.1: Process Information

Emission Unit #: EP 22

Emission Unit Name: Line 2A Sidelite

Coating/Printing Line Name: Line 2A Sidelite

Proposed/Actual Date of Construction: *(MM/YYYY)* 07/2024

List Applicable Regulations:
401 KAR 52:030
401 KAR 63:020

Describe Overall Process:
Door sidelite and window glass is manually or semi-automatically primed with an adhesion promoter (glass primer). A two-component adhesive is mixed together and dispensed onto locator pins. The door clips and glass are manually loaded into an assembly machine where they are assembled.

Describe Coatings/Printing Materials:
Adhesive, Clear Glass Primer, Black Glass Primer and Glass Cleaner

Identify the Material that is Coated/Printed: ☐ Metal ☐ Vinyl ☐ Plastics ☐ Wood ☐ Foil ☐ Paper ☑ Other Substrate

Provide detailed description of material coated/printed: Automotive glass

Provide approximate dimensions and range of sizes of parts being coated or printed: Varies

Identify the Type of Operation: ☐ Continuous ☑ Batch ☐ Other:

Describe Surface Preparation/Pretreatment Steps: Glass is cleaned with isopropanol as needed.

For Coating Operations: ☐ Spray ☐ Flow ☐ Dip tank ☐ Electrodeposition ☑ Brush ☐ Powder ☐ Roller Coat ☐ Other:

For Printing Operations: *(Select all that apply)* ☐ Web ☐ Rotogravure ☐ Heatset ☐ Lithographic ☐ Sheetfed ☐ Letterpress ☐ Non-heatset ☐ Flexographic ☐ Other:

Describe Final Product: Automotive glass

Check the category that most closely describes this unit:

☐ Large Appliance Coating
☐ Auto or Light-Duty Truck Coating
☐ Metal Furniture Coating
☐ Metal Coil Coating
☐ Beverage Can Coating
☐ Miscellaneious Metal Parts Coating
☐ Magnet Wire Insulation Coating
☐ Flat Wood Panel Coating
☐ Fabric, Vinyl, or Paper Coating
☐ Boat Manufacturing/ Ship Repair
☐ Pressure Sensitive Tape and Label Coating
☐ Magnet Tape Coating
☐ Publication Rotogravure Printing
☐ Coating of Plastic Parts for Business Machines
☐ Flexible Vinyl and Urethane Coating and Printing
☐ Graphic Arts using Rotogravure and Flexographic Printing
☑ Other: Automotive Glass Coating

Section K.2: Coating Operations

K.2A: For Spray Coating

Gun/Booth ID	Describe Function	Type	Mode	Maximum Design Application Rate (gal/hr or lb/hr)		Describe how maximum rate was determined
		☐ Conventional Air Gun ☐ Airless ☐ HVLP ☐ Electrostatic ☐ LVLP ☐ Aerosol Spray Can ☐ Other	☐ Manual ☐ Automatic			☐ Testing ☐ Equipment Specification Sheet ☐ Estimation
		☐ Conventional Air Gun ☐ Airless ☐ HVLP ☐ Electrostatic ☐ LVLP ☐ Aerosol Spray Can ☐ Other	☐ Manual ☐ Automatic			☐ Testing ☐ Equipment Specification Sheet ☐ Estimation
		☐ Conventional Air Gun ☐ Airless ☐ HVLP ☐ Electrostatic ☐ LVLP ☐ Aerosol Spray Can ☐ Other	☐ Manual ☐ Automatic			☐ Testing ☐ Equipment Specification Sheet ☐ Estimation

If spray guns are used simultaneously, describe:	

K.2B: For Brush Coating

Describe Function:	A brush is used to add primer and adhesive to the edges of the glass
Maximum Coating Application Rate: *(gal/hr)*	0.161 gal/hr (gal/part for all coatings x parts/hr) reflective of the usage from Large SL option scenerio (See table 3 for additonal information)

Section K.3: Other Operations

K.3A: For Finishing

Describe Finishing Processes: *Complete Form DEP7007B as applicable*	

K.3B: For Curing/Drying

Describe Curing/Drying Processes:	Description	Rated Capacity *(MMBtu/hr)*	Fuel	Control Device/Stack ID

K.3C: For Purge

Type: _____

Daily Usage: _____ gal/day

K.3D: For Clean-up

Type: ☑ Manual ☐ Automatic

Daily Usage: ~1 gal/day

Operating Hours: 16 hr/day

K.3E: For Other Equipment

Describe Processes:	

Section K.4: Coatings/Printing Materials As Applied

Include SDS or Technical Sheets for all coating/printing materials used.

Trade Name of Material	Description *(Identify as coating, ink, fountain solution, blanket wash, cleaning solvent, thinning solvent, auto wash, manual wash, etc.)*	Emission Unit/Coating ID where material is used	SCC Code	SCC Code Units	Density *(lb/gal)*	Solid Content *(lb/gal)*	VOC Content *(lb/gal)*	Emission Factor for PM* *(lb/SCC)*	Transfer Efficiency *(%)*	Emission Factor for VOC *(lb/SCC)*	Capture Efficiency *(%)*	Control Device/ Stack ID
43518 Clear Glass Primer	Primer	EP 22 (For all three options)	39999995	Gallons	6.97	N/A	6.94	N/A	N/A	6.94	0%	10
43520A Black Glass Primer	Primer	EP 22 (For all three options)	39999995	Gallons	8.26	N/A	4.82	N/A	N/A	4.82	0%	10
Pliogrip 7655 Adhesive	Adhesive	EP 22 (For all three options)	39999995	Gallons	10.51	N/A	0.007	N/A	N/A	0.007	0%	10
Pliogrip 7400 Adhesive	Adhesive	EP 22 (For all three options)	39999995	Gallons	10.75	N/A	0.007	N/A	N/A	0.007	0%	10
Isopropanol	Glass Cleaner	EP 22 (For all three options)	39999995	Gallons	6.65	N/A	6.65	N/A	N/A	6.65	0%	10

**Emission factor for particulate matter (PM) should not include transfer efficiency.*

Section K.5: Hazardous Air Pollutant-containing Coatings/Printing Materials

List each individual hazardous air pollutant (HAP) contained in each material.

Trade Name of Material	HAP Name	HAP CAS #	Identify Solid (*S*) or Volatile (*V*)	HAP % by weight	HAP Emission Factor *(lb/SCC)*	Control Device/ Stack ID
Clear Glass Primer 43518	Methanol	67-56-1	V	48.75	3.40	10
Clear Glass Primer 43518	Toluene	108-88-3	V	48.75	3.40	10
Black Glass Primer 43520A	Toluene	108-88-3	V	15	1.24	10
Black Glass Primer 43520A	Xylene	1330-20-7	V	<1	0.0826	10
Black Glass Primer 43520A	HDI	822-06-0	V	<1	0.0826	10
Black Glass Primer 43520A	TDI	584-84-9	V	<1	0.0826	10
Pliogrip 7655 Adhesive	MDI	101-68-8	V	<0.1	0.07	10
Pliogrip 7400 Adhesive	MDI	101-68-8	V	<0.1	0.07	10

Section K.6: Notes, Comments, and Explanations

This line is being relocated from the Vitro facility in O'Fallon, MO.

DEP7007K

Surface Coating or Printing Operations

Division for Air Quality

300 Sower Boulevard

Frankfort, KY 40601

(502) 564-3999

_✓_ Section K.1: Process Information

_✓_ Section K.2: Coating Operations

_✓_ Section K.3: Other Operations

_✓_ Section K.4: Coatings/Printing Materials as Applied

_✓_ Section K.5: HAP-containing Coatings/Printing Materials

_✓_ Section K.6: Notes, Comments, and Explanations

Additional Documentation

_✓__ Complete DEP7007AI, DEP7007N, DEP7007V, and DEP7007GG.

_✓__ Attach SDS or Technical Sheets for all Coating/Printing Materials

____ Attach a flow diagram

Source Name: **Pittsburgh Glass Works, LLC dba Vitro Automotive Glass**

KY EIS (AFS) #: **21- 151-00048**

Permit #: **S-15-052 R4**

Agency Interest (AI) ID: **2846**

Date: **4/22/2024**

Section K.1: Process Information

Emission Unit #: EP 23

Emission Unit Name: Line 2B Quarter

Coating/Printing Line Name: Line 2B Quarter

Proposed/Actual Date of Construction: *(MM/YYYY)* 07/2024

List Applicable Regulations:
401 KAR 52:030
401 KAR 63:020

Describe Overall Process:
Door sidelite and window glass is manually or semi-automatically primed with an adhesion promoter (glass primer). A two-component adhesive is mixed together and dispensed onto locator pins. The door clips and glass are manually loaded into an assembly machine where they are assembled.

Describe Coatings/Printing Materials:
Adhesive, Clear Glass Primer, Black Glass Primer and Glass Cleaner

Identify the Material that is Coated/Printed: ☐ Metal ☐ Vinyl ☐ Plastics ☐ Wood ☐ Foil ☐ Paper ☑ Other Substrate

Provide detailed description of material coated/printed: Automotive glass

Provide approximate dimensions and range of sizes of parts being coated or printed: Varies

Identify the Type of Operation: ☑ Continuous ☐ Batch ☐ Other:

Describe Surface Preparation/Pretreatment Steps: Glass is cleaned with isopropanol as needed.

For Coating Operations: ☐ Spray ☐ Flow ☐ Dip tank ☐ Electrodeposition ☑ Brush ☐ Powder ☐ Roller Coat ☐ Other:

For Printing Operations: *(Select all that apply)* ☐ Web ☐ Rotogravure ☐ Heatset ☐ Lithographic ☐ Sheetfed ☐ Letterpress ☐ Non-heatset ☐ Flexographic ☐ Other:

Describe Final Product: Automotive glass

Check the category that most closely describes this unit:

☐ Large Appliance Coating
☐ Auto or Light-Duty Truck Coating
☐ Metal Furniture Coating
☐ Metal Coil Coating
☐ Beverage Can Coating
☐ Miscellaneious Metal Parts Coating
☐ Magnet Wire Insulation Coating
☐ Flat Wood Panel Coating
☐ Fabric, Vinyl, or Paper Coating
☐ Boat Manufacturing/ Ship Repair
☐ Pressure Sensitive Tape and Label Coating
☐ Magnet Tape Coating
☐ Publication Rotogravure Printing
☐ Coating of Plastic Parts for Business Machines
☐ Flexible Vinyl and Urethane Coating and Printing
☐ Graphic Arts using Rotogravure and Flexographic Printing
☑ Other: Automotive Glass Coating

Section K.2: Coating Operations

K.2A: For Spray Coating

Gun/Booth ID	Describe Function	Type	Mode	Maximum Design Application Rate *(gal/hr or lb/hr)*		Describe how maximum rate was determined
		☐ Conventional Air Gun ☐ Airless ☐ HVLP ☐ Electrostatic ☐ LVLP ☐ Aerosol Spray Can ☐ Other	☐ Manual ☐ Automatic			☐ Testing ☐ Equipment Specification Sheet ☐ Estimation
		☐ Conventional Air Gun ☐ Airless ☐ HVLP ☐ Electrostatic ☐ LVLP ☐ Aerosol Spray Can ☐ Other	☐ Manual ☐ Automatic			☐ Testing ☐ Equipment Specification Sheet ☐ Estimation
		☐ Conventional Air Gun ☐ Airless ☐ HVLP ☐ Electrostatic ☐ LVLP ☐ Aerosol Spray Can ☐ Other	☐ Manual ☐ Automatic			☐ Testing ☐ Equipment Specification Sheet ☐ Estimation

If spray guns are used simultaneously, describe:

K.2B: For Brush Coating

Describe Function:	A brush is used to add primer and adhesive to the edges of the glass
Maximum Coating Application Rate: *(gal/hr)*	0.09 gal/hr (gal/part for all coatings x parts/hr)

Section K.3: Other Operations

K.3A: For Finishing

Describe Finishing Processes: *Complete Form DEP7007B as applicable*	

K.3B: For Curing/Drying

Describe Curing/Drying Processes:	Description	Rated Capacity *(MMBtu/hr)*	Fuel	Control Device/Stack ID

K.3C: For Purge

Type: _____

Daily Usage: _____ gal/day

K.3D: For Clean-up

Type: ☑ Manual ☐ Automatic

Daily Usage: ~1 gal/day

Operating Hours: 16 hr/day

K.3E: For Other Equipment

Describe Processes:	

Section K.4: Coatings/Printing Materials As Applied

Include SDS or Technical Sheets for all coating/printing materials used.

Trade Name of Material	Description *(Identify as coating, ink, fountain solution, blanket wash, cleaning solvent, thinning solvent, auto wash, manual wash, etc.)*	Emission Unit/Coating ID where material is used	SCC Code	SCC Code Units	Density *(lb/gal)*	Solid Content *(lb/gal)*	VOC Content *(lb/gal)*	Emission Factor for PM* *(lb/SCC)*	Transfer Efficiency *(%)*	Emission Factor for VOC *(lb/SCC)*	Capture Efficiency *(%)*	Control Device/ Stack ID
43518 Clear Glass Primer	Primer	EP 23	39999995	Gallons	6.97	N/A	6.94	N/A	N/A	6.94	0%	10
43520A Black Glass Primer	Primer	EP 23	39999995	Gallons	8.26	N/A	4.82	N/A	N/A	4.82	0%	10
Pliogrip 7655 Adhesive	Adhesive	EP 23	39999995	Gallons	10.51	N/A	0.007	N/A	N/A	0.007	0%	10
Pliogrip 7400 Adhesive	Adhesive	EP 23	39999995	Gallons	10.75	N/A	0.007	N/A	N/A	0.007	0%	10
Isopropanol	Glass Cleaner	EP 23	39999995	Gallons	6.65	N/A	6.65	N/A	N/A	6.65	0%	10

**Emission factor for particulate matter (PM) should not include transfer efficiency.*

Section K.5: Hazardous Air Pollutant-containing Coatings/Printing Materials

List each individual hazardous air pollutant (HAP) contained in each material.

Trade Name of Material	HAP Name	HAP CAS #	Identify Solid (*S*) or Volatile (*V*)	HAP % by weight	HAP Emission Factor *(lb/SCC)*	Control Device/ Stack ID
Clear Glass Primer 43518	Methanol	67-56-1	V	48.75	3.40	10
Clear Glass Primer 43518	Toluene	108-88-3	V	48.75	3.40	10
Black Glass Primer 43520A	Toluene	108-88-3	V	15	1.24	10
Black Glass Primer 43520A	Xylene	1330-20-7	V	<1	0.0826	10
Black Glass Primer 43520A	HDI	822-06-0	V	<1	0.0826	10
Black Glass Primer 43520A	TDI	584-84-9	V	<1	0.0826	10
Pliogrip 7655 Adhesive	MDI	101-68-8	V	<0.1	0.007	10
Pliogrip 7400 Adhesive	MDI	101-68-8	V	<0.1	0.007	10

Section K.6: Notes, Comments, and Explanations

This line is being relocated from the Vitro facility in O'Fallon, MO.

DEP7007K

Surface Coating or Printing Operations

Division for Air Quality

300 Sower Boulevard

Frankfort, KY 40601

(502) 564-3999

_✓_ Section K.1: Process Information

_✓_ Section K.2: Coating Operations

_✓_ Section K.3: Other Operations

_✓_ Section K.4: Coatings/Printing Materials as Applied

_✓_ Section K.5: HAP-containing Coatings/Printing Materials

_✓_ Section K.6: Notes, Comments, and Explanations

Additional Documentation

_✓__ Complete DEP7007AI, DEP7007N, DEP7007V, and DEP7007GG.

_✓__ Attach SDS or Technical Sheets for all Coating/Printing Materials

____ Attach a flow diagram

Source Name: **Pittsburgh Glass Works, LLC dba Vitro Automotive Glass**

KY EIS (AFS) #: **21- 151-00048**

Permit #: **S-15-052 R4**

Agency Interest (AI) ID: **2846**

Date: **4/22/2024**

Section K.1: Process Information

Emission Unit #: EP 24

Emission Unit Name: Line 7 Backlite

Coating/Printing Line Name: Line 7 Backlite

Proposed/Actual Date of Construction: *(MM/YYYY)* 07/2024

List Applicable Regulations:
401 KAR 52:030
401 KAR 63:020

Describe Overall Process:
Glass is manually or semi-automatically primed with an adhesion promoter (glass primer). A one component adhesive is dispensed into the bottom profile of the glass. The components, solder tabs, connector, and glass are manually loaded into an assembly machine where they are assembled. The solder tab is applied using automated resistance soldering.

Describe Coatings/Printing Materials:
Urethane Adhesive, Clear Glass Primer, Black Glass Primer, Solder, Flux and Glass Cleaner

Identify the Material that is Coated/Printed: ☐ Metal ☐ Vinyl ☐ Plastics ☐ Wood ☐ Foil ☐ Paper ☑ Other Substrate

Provide detailed description of material coated/printed: Automotive glass

Provide approximate dimensions and range of sizes of parts being coated or printed: Varies

Identify the Type of Operation: ☐ Continuous ☑ Batch ☐ Other:

Describe Surface Preparation/Pretreatment Steps: Glass is cleaned with isopropanol as needed.

For Coating Operations: ☐ Spray ☐ Flow ☐ Dip tank ☐ Electrodeposition ☑ Brush ☐ Powder ☐ Roller Coat ☐ Other:

For Printing Operations: *(Select all that apply)* ☐ Web ☐ Rotogravure ☐ Heatset ☐ Lithographic ☐ Sheetfed ☐ Letterpress ☐ Non-heatset ☐ Flexographic ☐ Other:

Describe Final Product: Automotive glass

Check the category that most closely describes this unit:

☐ Large Appliance Coating
☐ Auto or Light-Duty Truck Coating
☐ Metal Furniture Coating
☐ Metal Coil Coating
☐ Beverage Can Coating
☐ Miscellaneious Metal Parts Coating
☐ Magnet Wire Insulation Coating
☐ Flat Wood Panel Coating
☐ Fabric, Vinyl, or Paper Coating
☐ Boat Manufacturing/ Ship Repair
☐ Pressure Sensitive Tape and Label Coating
☐ Magnet Tape Coating
☐ Publication Rotogravure Printing
☐ Coating of Plastic Parts for Business Machines
☐ Flexible Vinyl and Urethane Coating and Printing
☐ Graphic Arts using Rotogravure and Flexographic Printing
☑ Other: Automotive Glass Coating

Section K.2: Coating Operations

K.2A: For Spray Coating

Gun/Booth ID	Describe Function	Type	Mode	Maximum Design Application Rate *(gal/hr or lb/hr)*		Describe how maximum rate was determined
		☐ Conventional Air Gun ☐ Airless ☐ HVLP ☐ Electrostatic ☐ LVLP ☐ Aerosol Spray Can ☐ Other	☐ Manual ☐ Automatic			☐ Testing ☐ Equipment Specification Sheet ☐ Estimation
		☐ Conventional Air Gun ☐ Airless ☐ HVLP ☐ Electrostatic ☐ LVLP ☐ Aerosol Spray Can ☐ Other	☐ Manual ☐ Automatic			☐ Testing ☐ Equipment Specification Sheet ☐ Estimation
		☐ Conventional Air Gun ☐ Airless ☐ HVLP ☐ Electrostatic ☐ LVLP ☐ Aerosol Spray Can ☐ Other	☐ Manual ☐ Automatic			☐ Testing ☐ Equipment Specification Sheet ☐ Estimation

If spray guns are used simultaneously, describe:

K.2B: For Brush Coating

Describe Function:	A brush is used to add primer and adhesive to the edges of the glass
Maximum Coating Application Rate: *(gal/hr)*	0.06 gal/hr (gal/part for all coatings x parts/hr)

Section K.3: Other Operations

K.3A: For Finishing

Describe Finishing Processes: *Complete Form DEP7007B as applicable*	

K.3B: For Curing/Drying

Describe Curing/Drying Processes:	Description	Rated Capacity *(MMBtu/hr)*	Fuel	Control Device/Stack ID

K.3C: For Purge

Type: _____

Daily Usage: _____ gal/day

K.3D: For Clean-up

Type: ☑ Manual ☐ Automatic

Daily Usage: ~1 gal/day

Operating Hours: 16 hr/day

K.3E: For Other Equipment

Describe Processes:	

Section K.4: Coatings/Printing Materials As Applied

Include SDS or Technical Sheets for all coating/printing materials used.

Trade Name of Material	Description *(Identify as coating, ink, fountain solution, blanket wash, cleaning solvent, thinning solvent, auto wash, manual wash, etc.)*	Emission Unit/Coating ID where material is used	SCC Code	SCC Code Units	Density *(lb/gal)*	Solid Content *(lb/gal)*	VOC Content *(lb/gal)*	Emission Factor for PM* *(lb/SCC)*	Transfer Efficiency *(%)*	Emission Factor for VOC *(lb/SCC)*	Capture Efficiency *(%)*	Control Device/ Stack ID
Betaseal 58702SFHN Urethane Adhesive	Adhesive	EP 24	39999995	Gallons	9.85	N/A	6.94	N/A	N/A	0.07	0%	10
43518 Clear Glass Primer	Primer	EP 24	39999995	Gallons	6.97	N/A	6.94	N/A	N/A	6.94	0%	10
43520A Black Glass Primer	Primer	EP 24	39999995	Gallons	8.26	N/A	4.82	N/A	N/A	4.82	0%	10
Flux	Flux	EP 24	39999995	Gallons	7.43	N/A	5.659	N/A	N/A	5.66	0%	10
Isopropanol	Glass Cleaner	EP 24	39999995	Gallons	6.65	N/A	6.65	N/A	N/A	6.65	0%	10

**Emission factor for particulate matter (PM) should not include transfer efficiency.*

Section K.5: Hazardous Air Pollutant-containing Coatings/Printing Materials

List each individual hazardous air pollutant (HAP) contained in each material.

Trade Name of Material	HAP Name	HAP CAS #	Identify Solid (*S*) or Volatile (*V*)	HAP % by weight	HAP Emission Factor *(lb/SCC)*	Control Device/ Stack ID
Clear Glass Primer 43518	Methanol	67-56-1	V	48.75	3.40	10
Clear Glass Primer 43518	Toluene	108-88-3	V	48.75	3.40	10
Black Glass Primer 43520A	Toluene	108-88-3	V	15	1.24	10
Black Glass Primer 43520A	Xylene	1330-20-7	V	<1	0.0826	10
Black Glass Primer 43520A	HDI	822-06-0	V	<1	0.0826	10
Black Glass Primer 43520A	TDI	584-84-9	V	<1	0.0826	10
Flux	Methyl Isobutyl Ketone	108-10-1	V	5	0.371	10

Section K.6: Notes, Comments, and Explanations

This line is being relocated from the Vitro facility in O'Fallon, MO.

DEP7007K

Surface Coating or Printing Operations

Division for Air Quality

300 Sower Boulevard

Frankfort, KY 40601

(502) 564-3999

_✓_ Section K.1: Process Information

_✓_ Section K.2: Coating Operations

_✓_ Section K.3: Other Operations

_✓_ Section K.4: Coatings/Printing Materials as Applied

_✓_ Section K.5: HAP-containing Coatings/Printing Materials

_✓_ Section K.6: Notes, Comments, and Explanations

Additional Documentation

_✓__ Complete DEP7007AI, DEP7007N, DEP7007V, and DEP7007GG.

_✓__ Attach SDS or Technical Sheets for all Coating/Printing Materials

____ Attach a flow diagram

Source Name: **Pittsburgh Glass Works, LLC dba Vitro Automotive Glass**

KY EIS (AFS) #: **21- 151-00048**

Permit #: **S-15-052 R4**

Agency Interest (AI) ID: **2846**

Date: **4/22/2024**

Section K.1: Process Information

Emission Unit #: EP 25

Emission Unit Name: Line 17 Windshield

Coating/Printing Line Name: Line 17 Windshield

Proposed/Actual Date of Construction: *(MM/YYYY)* 07/2024

List Applicable Regulations:
401 KAR 52:030
401 KAR 63:020

Describe Overall Process:
Windshield glass is manually or semi-automatically primed with an adhesion promoter (glass primer). A one component adhesive is dispensed into the lace molding. The parts and glass are manually assembled.

Describe Coatings/Printing Materials:
Urethane Adhesive, Clear Glass Primer, Black Glass Primer and Glass Cleaner

Identify the Material that is Coated/Printed: ☐ Metal ☐ Vinyl ☐ Plastics ☐ Wood ☐ Foil ☐ Paper ☑ Other Substrate

Provide detailed description of material coated/printed: Automotive glass

Provide approximate dimensions and range of sizes of parts being coated or printed: Varies

Identify the Type of Operation: ☐ Continuous ☑ Batch ☐ Other:

Describe Surface Preparation/Pretreatment Steps: Glass is cleaned with isopropanol as needed.

For Coating Operations: ☐ Spray ☐ Flow ☐ Dip tank ☐ Electrodeposition ☑ Brush ☐ Powder ☐ Roller Coat ☐ Other:

For Printing Operations: *(Select all that apply)* ☐ Web ☐ Rotogravure ☐ Heatset ☐ Lithographic ☐ Sheetfed ☐ Letterpress ☐ Non-heatset ☐ Flexographic ☐ Other:

Describe Final Product: Automotive glass

Check the category that most closely describes this unit:

☐ Large Appliance Coating
☐ Auto or Light-Duty Truck Coating
☐ Metal Furniture Coating
☐ Metal Coil Coating
☐ Beverage Can Coating
☐ Miscellaneious Metal Parts Coating
☐ Magnet Wire Insulation Coating
☐ Flat Wood Panel Coating
☐ Fabric, Vinyl, or Paper Coating
☐ Boat Manufacturing/ Ship Repair
☐ Pressure Sensitive Tape and Label Coating
☐ Magnet Tape Coating
☐ Publication Rotogravure Printing
☐ Coating of Plastic Parts for Business Machines
☐ Flexible Vinyl and Urethane Coating and Printing
☐ Graphic Arts using Rotogravure and Flexographic Printing
☑ Other: Automotive Glass Coating

Section K.2: Coating Operations

K.2A: For Spray Coating

Gun/Booth ID	Describe Function	Type	Mode	Maximum Design Application Rate *(gal/hr or lb/hr)*		Describe how maximum rate was determined
		☐ Conventional Air Gun ☐ Airless ☐ HVLP ☐ Electrostatic ☐ LVLP ☐ Aerosol Spray Can ☐ Other	☐ Manual ☐ Automatic			☐ Testing ☐ Equipment Specification Sheet ☐ Estimation
		☐ Conventional Air Gun ☐ Airless ☐ HVLP ☐ Electrostatic ☐ LVLP ☐ Aerosol Spray Can ☐ Other	☐ Manual ☐ Automatic			☐ Testing ☐ Equipment Specification Sheet ☐ Estimation
		☐ Conventional Air Gun ☐ Airless ☐ HVLP ☐ Electrostatic ☐ LVLP ☐ Aerosol Spray Can ☐ Other	☐ Manual ☐ Automatic			☐ Testing ☐ Equipment Specification Sheet ☐ Estimation

If spray guns are used simultaneously, describe:

K.2B: For Brush Coating

Describe Function:	A brush is used to add primer and adhesive to the edges of the glass
Maximum Coating Application Rate: *(gal/hr)*	0.176 gal/hr (gal/part for all coatings x parts/hr)

Section K.3: Other Operations

K.3A: For Finishing

Describe Finishing Processes: *Complete Form DEP7007B as applicable*	

K.3B: For Curing/Drying

Describe Curing/Drying Processes:	Description	Rated Capacity *(MMBtu/hr)*	Fuel	Control Device/Stack ID

K.3C: For Purge

Type: _____

Daily Usage: _____ gal/day

K.3D: For Clean-up

Type: ☑ Manual ☐ Automatic

Daily Usage: ~1 gal/day

Operating Hours: 16 hr/day

K.3E: For Other Equipment

Describe Processes:	

Section K.4: Coatings/Printing Materials As Applied

Include SDS or Technical Sheets for all coating/printing materials used.

Trade Name of Material	Description *(Identify as coating, ink, fountain solution, blanket wash, cleaning solvent, thinning solvent, auto wash, manual wash, etc.)*	Emission Unit/Coating ID where material is used	SCC Code	SCC Code Units	Density *(lb/gal)*	Solid Content *(lb/gal)*	VOC Content *(lb/gal)*	Emission Factor for PM* *(lb/SCC)*	Transfer Efficiency *(%)*	Emission Factor for VOC *(lb/SCC)*	Capture Efficiency *(%)*	Control Device/ Stack ID
43518 Clear Glass Primer	Primer	EP 25	39999995	Gallons	6.97	N/A	6.94	N/A	N/A	6.94	0%	10
43520A Black Glass Primer	Primer	EP 25	39999995	Gallons	8.26	N/A	4.82	N/A	N/A	4.82	0%	10
Betaseal 58702SFHN Urethane Adhesive	Urethane Adhesive	EP 25	39999995	Gallons	9.8470	N/A	0.070	N/A	N/A	0.07	0%	10
Isopropanol	Glass Cleaner	EP 25	39999995	Gallons	6.65	N/A	6.65	N/A	N/A	6.65	0%	10

**Emission factor for particulate matter (PM) should not include transfer efficiency.*

Section K.5: Hazardous Air Pollutant-containing Coatings/Printing Materials

List each individual hazardous air pollutant (HAP) contained in each material.

Trade Name of Material	HAP Name	HAP CAS #	Identify Solid (*S*) or Volatile (*V*)	HAP % by weight	HAP Emission Factor *(lb/SCC)*	Control Device/ Stack ID
Clear Glass Primer 43518	Methanol	67-56-1	V	48.75	3.40	10
Clear Glass Primer 43518	Toluene	108-88-3	V	48.75	3.40	10
Black Glass Primer 43520A	Toluene	108-88-3	V	15	1.24	10
Black Glass Primer 43520A	Xylene	1330-20-7	V	<1	0.0826	10
Black Glass Primer 43520A	HDI	822-06-0	V	<1	0.0826	10
Black Glass Primer 43520A	TDI	584-84-9	V	<1	0.0826	10
Betaseal 58702SFHN Urethane Adhesive	MDI	101-68-8	V	<0.7	0.070	10

Section K.6: Notes, Comments, and Explanations

This line is being relocated from the Vitro facility in O'Fallon, MO.

DEP7007K

Surface Coating or Printing Operations

Division for Air Quality

300 Sower Boulevard

Frankfort, KY 40601

(502) 564-3999

_✓_ Section K.1: Process Information

_✓_ Section K.2: Coating Operations

_✓_ Section K.3: Other Operations

_✓_ Section K.4: Coatings/Printing Materials as Applied

_✓_ Section K.5: HAP-containing Coatings/Printing Materials

_✓_ Section K.6: Notes, Comments, and Explanations

Additional Documentation

_✓__ Complete DEP7007AI, DEP7007N, DEP7007V, and DEP7007GG.

_✓__ Attach SDS or Technical Sheets for all Coating/Printing Materials

____ Attach a flow diagram

Source Name: **Pittsburgh Glass Works, LLC dba Vitro Automotive Glass**

KY EIS (AFS) #: **21- 151-00048**

Permit #: **S-15-052 R4**

Agency Interest (AI) ID: **2846**

Date: **4/22/2024**

Section K.1: Process Information

Emission Unit #: EP 26

Emission Unit Name: Line 18 Windshield

Coating/Printing Line Name: Line 18 Windshield

Proposed/Actual Date of Construction: *(MM/YYYY)* 07/2024

List Applicable Regulations:
401 KAR 52:030
401 KAR 63:020

Describe Overall Process:
Windshield glass is manually or semi-automatically primed with an adhesion promoter (glass primer). A two-component adhesive is mixed together and dispensed onto component parts. The parts and glass are manually loaded into an assembly machine where they are assembled.

Describe Coatings/Printing Materials:
Urethane Adhesive, Urethane Curative, Clear Glass Primer, Black Glass Primer and Glass Cleaner

Identify the Material that is Coated/Printed: ☐ Metal ☐ Vinyl ☐ Plastics ☐ Wood ☐ Foil ☐ Paper ☑ Other Substrate

Provide detailed description of material coated/printed: Automotive glass

Provide approximate dimensions and range of sizes of parts being coated or printed: Varies

Identify the Type of Operation: ☐ Continuous ☑ Batch ☐ Other:

Describe Surface Preparation/Pretreatment Steps: Glass is cleaned with isopropanol as needed.

For Coating Operations: ☐ Spray ☐ Flow ☐ Dip tank ☐ Electrodeposition ☑ Brush ☐ Powder ☐ Roller Coat ☐ Other:

For Printing Operations: *(Select all that apply)* ☐ Web ☐ Rotogravure ☐ Heatset ☐ Lithographic ☐ Sheetfed ☐ Letterpress ☐ Non-heatset ☐ Flexographic ☐ Other:

Describe Final Product: Automotive glass

Check the category that most closely describes this unit:

☐ Large Appliance Coating
☐ Auto or Light-Duty Truck Coating
☐ Metal Furniture Coating
☐ Metal Coil Coating
☐ Beverage Can Coating
☐ Miscellaneious Metal Parts Coating
☐ Magnet Wire Insulation Coating
☐ Flat Wood Panel Coating
☐ Fabric, Vinyl, or Paper Coating
☐ Boat Manufacturing/ Ship Repair
☐ Pressure Sensitive Tape and Label Coating
☐ Magnet Tape Coating
☐ Publication Rotogravure Printing
☐ Coating of Plastic Parts for Business Machines
☐ Flexible Vinyl and Urethane Coating and Printing
☐ Graphic Arts using Rotogravure and Flexographic Printing
☑ Other: Automotive Glass Coating

Section K.2: Coating Operations

K.2A: For Spray Coating

Gun/Booth ID	Describe Function	Type	Mode	Maximum Design Application Rate *(gal/hr or lb/hr)*		Describe how maximum rate was determined
		☐ Conventional Air Gun ☐ Airless ☐ HVLP ☐ Electrostatic ☐ LVLP ☐ Aerosol Spray Can ☐ Other	☐ Manual ☐ Automatic			☐ Testing ☐ Equipment Specification Sheet ☐ Estimation
		☐ Conventional Air Gun ☐ Airless ☐ HVLP ☐ Electrostatic ☐ LVLP ☐ Aerosol Spray Can ☐ Other	☐ Manual ☐ Automatic			☐ Testing ☐ Equipment Specification Sheet ☐ Estimation
		☐ Conventional Air Gun ☐ Airless ☐ HVLP ☐ Electrostatic ☐ LVLP ☐ Aerosol Spray Can ☐ Other	☐ Manual ☐ Automatic			☐ Testing ☐ Equipment Specification Sheet ☐ Estimation

If spray guns are used simultaneously, describe:	

K.2B: For Brush Coating

Describe Function:	A brush is used to add primer and adhesive to the edges of the glass
Maximum Coating Application Rate: *(gal/hr)*	0.131 gal/hr (gal/part for all coatings x parts/hr)

Section K.3: Other Operations

K.3A: For Finishing

Describe Finishing Processes: *Complete Form DEP7007B as applicable*	

K.3B: For Curing/Drying

Describe Curing/Drying Processes:	Description	Rated Capacity *(MMBtu/hr)*	Fuel	Control Device/Stack ID

K.3C: For Purge

Type: _____

Daily Usage: _____ gal/day

K.3D: For Clean-up

Type: ☑ Manual ☐ Automatic

Daily Usage: ~1 gal/day

Operating Hours: 16 hr/day

K.3E: For Other Equipment

Describe Processes:	

Section K.4: Coatings/Printing Materials As Applied

Include SDS or Technical Sheets for all coating/printing materials used.

Trade Name of Material	Description *(Identify as coating, ink, fountain solution, blanket wash, cleaning solvent, thinning solvent, auto wash, manual wash, etc.)*	Emission Unit/Coating ID where material is used	SCC Code	SCC Code Units	Density *(lb/gal)*	Solid Content *(lb/gal)*	VOC Content *(lb/gal)*	Emission Factor for PM* *(lb/SCC)*	Transfer Efficiency *(%)*	Emission Factor for VOC *(lb/SCC)*	Capture Efficiency *(%)*	Control Device/ Stack ID
X2500 A Plus Urethane Adhesive	Adhesive	EP 26	39999995	Gallons	10.68	N/A	0.05	N/A	N/A	0.05	0%	12
X2500 B Plus Urethane Curative	Curative	EP 26	39999995	Gallons	10.01	N/A	0.006	N/A	N/A	0.006	0%	12
43518 Clear Glass Primer	Primer	EP 26	39999995	Gallons	6.97	N/A	6.94	N/A	N/A	6.94	0%	12
43520A Black Glass Primer	Primer	EP 26	39999995	Gallons	8.26	N/A	4.82	N/A	N/A	4.82	0%	12
Isopropanol	Glass Cleaner	EP 26	39999995	Gallons	6.65	N/A	6.65	N/A	N/A	6.65	0%	12

**Emission factor for particulate matter (PM) should not include transfer efficiency.*

Section K.5: Hazardous Air Pollutant-containing Coatings/Printing Materials

List each individual hazardous air pollutant (HAP) contained in each material.

Trade Name of Material	HAP Name	HAP CAS #	Identify Solid (*S*) or Volatile (*V*)	HAP % by weight	HAP Emission Factor *(lb/SCC)*	Control Device/ Stack ID
Clear Glass Primer 43518	Methanol	67-56-1	V	48.75	3.40	12
Clear Glass Primer 43518	Toluene	108-88-3	V	48.75	3.40	12
Black Glass Primer 43520A	Toluene	108-88-3	V	15	1.24	12
Black Glass Primer 43520A	Xylene	1330-20-7	V	<1	0.0826	12
Black Glass Primer 43520A	HDI	822-06-0	V	<1	0.0826	12
Black Glass Primer 43520A	TDI	584-84-9	V	<1	0.0826	12
Urethane Adhesive X2500 A Plus	MDI	101-68-8	V	<5	0.05	12

Section K.6: Notes, Comments, and Explanations

This line is being relocated from the Vitro facility in O'Fallon, MO.

Division for Air Quality

300 Sower Boulevard
Frankfort, KY 40601
(502) 564-3999

DEP7007N

Source Emissions Profile

_✓_ Section N.1: Emission Summar
_✓_ Section N.2: Stack Information
___ Section N.3: Fugitive Information
_✓_ Section N.4: Notes, Comments, and Explanations

Additional Documentation

_✓__ Complete DEP7007AI

Source Name: **Pittsburgh Glass Works, LLC dba Vitro Automotive Glass**
KY EIS (AFS) #: **21- 151-00048**
Permit #: **S-15-052 R4**
Agency Interest (AI) ID: **2846**
Date: **4/22/2024**

N.1: Emission Summary

Emission Unit #	Emission Unit Name	Process ID	Process Name	Control Device Name	Control Device ID	Stack ID	Maximum Design Capacity *(SCC Units/hour)*	Pollutant	Uncontrolled Emission Factor *(lb/SCC Units)*	Emission Factor Source (e.g. AP-42, Stack Test, Mass Balance)	Capture Efficiency *(%)*	Control Efficiency *(%)*	Hourly Emissions		Annual Emissions	
													Uncontrolled Potential *(lb/hr)*	Controlled Potential *(lb/hr)*	Uncontrolled Potential *(tons/yr)*	Controlled Potential *(tons/yr)*
10	Sidelite Assembly Line A (SL3)	1	Clear Glass Primer 43518	N/A	N/A	11	0.031	VOC	6.94	Mass Balance	0.00%	0.00%	0.217	0.217	0.951	0.951
							0.031	Methanol	3.40	Mass Balance	0.00%	0.00%	0.106	0.106	0.466	0.466
							0.031	Toluene	3.40	Mass Balance	0.00%	0.00%	0.106	0.106	0.466	0.466
							0.031	Total HAPs	6.80	Mass Balance	0.00%	0.00%	0.213	0.213	0.932	0.932
		2	Urethane Adhesive WS-292FK	N/A	N/A		0.664	VOC	0.01	Mass Balance	0.00%	0.00%	0.007	0.007	0.029	0.029
		3	Urethane Curative B-1M	N/A	N/A		0.646	VOC	0.14	Mass Balance	0.00%	0.00%	0.090	0.090	0.396	0.396
11	Sidelite Assembly Line B (SL4)	1	Clear Glass Primer 43518	N/A	N/A	11	0.042	VOC	6.94	Mass Balance	0.00%	0.00%	0.290	0.290	1.271	1.271
							0.042	Methanol	3.40	Mass Balance	0.00%	0.00%	0.142	0.142	0.622	0.622
							0.042	Toluene	3.40	Mass Balance	0.00%	0.00%	0.142	0.142	0.622	0.622
							0.042	Total HAPs	6.80	Mass Balance	0.00%	0.00%	0.284	0.284	1.245	1.245
		2	Urethane Adhesive WS-292FK	N/A	N/A		0.885	VOC	0.01	Mass Balance	0.00%	0.00%	0.009	0.009	0.039	0.039
		3	Urethane Curative B-1M	N/A	N/A		0.862	VOC	0.14	Mass Balance	0.00%	0.00%	0.121	0.121	0.529	0.529
		4	Isopropanol	N/A	N/A		0.05	VOC	6.65	Mass Balance	0.00%	0.00%	0.333	0.333	1.456	1.456

N.1: Emission Summary

Emission Unit #	Emission Unit Name	Process ID	Process Name	Control Device Name	Control Device ID	Stack ID	Maximum Design Capacity *(SCC Units/hour)*	Pollutant	Uncontrolled Emission Factor *(lb/SCC Units)*	Emission Factor Source (e.g. AP-42, Stack Test, Mass Balance)	Capture Efficiency *(%)*	Control Efficiency *(%)*	Hourly Emissions		Annual Emissions	
													Uncontrolled Potential *(lb/hr)*	Controlled Potential *(lb/hr)*	Uncontrolled Potential *(tons/yr)*	Controlled Potential *(tons/yr)*
12	Sidelite Door Cell (SL6)	1	Clear Glass Primer 43518	N/A	N/A	11	0.047	VOC	6.94	Mass Balance	0.00%	0.00%	0.326	0.326	1.429	1.429
							0.047	Methanol	3.40	Mass Balance	0.00%	0.00%	0.160	0.160	0.700	0.700
							0.047	Toluene	3.40	Mass Balance	0.00%	0.00%	0.160	0.160	0.700	0.700
							0.047	Total HAPs	6.80	Mass Balance	0.00%	0.00%	0.320	0.320	1.400	1.400
		2	Urethane Adhesive WS-242FK	N/A	N/A		1.31	VOC	0.04	Mass Balance	0.00%	0.00%	0.053	0.053	0.230	0.230
		3	Urethane Curative AN-1M	N/A	N/A		1.016	VOC	0.53	Mass Balance	0.00%	0.00%	0.538	0.538	2.359	2.359
14	Backlite Assembly Line (BL2/BL1)	1	Clear Glass Primer 43518	N/A	N/A	11	0.051	VOC	6.94	Mass Balance	0.00%	0.00%	0.357	0.357	1.562	1.562
							0.051	Methanol	3.40	Mass Balance	0.00%	0.00%	0.175	0.175	0.765	0.765
							0.051	Toluene	3.40	Mass Balance	0.00%	0.00%	0.175	0.175	0.765	0.765
							0.051	Total HAPs	6.80	Mass Balance	0.00%	0.00%	0.350	0.350	1.531	1.531
		2	Black Glass Primer 43520A	N/A	N/A		0.13	VOC	4.82	Mass Balance	0.00%	0.00%	0.627	0.627	2.745	2.745
							0.13	Toluene	1.24	Mass Balance	0.00%	0.00%	0.161	0.161	0.705	0.705
							0.13	Xylene	0.083	Mass Balance	0.00%	0.00%	0.011	0.011	0.047	0.047
							0.13	HDI	0.083	Mass Balance	0.00%	0.00%	0.011	0.011	0.047	0.047
							0.13	TDI	0.083	Mass Balance	0.00%	0.00%	0.011	0.011	0.047	0.047
							0.13	Total HAPs	1.49	Mass Balance	0.00%	0.00%	0.193	0.193	0.847	0.847
		3	Electrical Connector	N/A	N/A		0.029	PM/PM10	0.0002	Process Knowledge. See Appendix B.	0.00%	0.00%	0.000	0.000	0.000	0.000

N.1: Emission Summary

Emission Unit #	Emission Unit Name	Process ID	Process Name	Control Device Name	Control Device ID	Stack ID	Maximum Design Capacity *(SCC Units/hour)*	Pollutant	Uncontrolled Emission Factor *(lb/SCC Units)*	Emission Factor Source (e.g. AP-42, Stack Test, Mass Balance)	Capture Efficiency *(%)*	Control Efficiency *(%)*	Hourly Emissions		Annual Emissions	
													Uncontrolled Potential *(lb/hr)*	Controlled Potential *(lb/hr)*	Uncontrolled Potential *(tons/yr)*	Controlled Potential *(tons/yr)*
20	Sidelite Door Line (SL4B/SL8)	1	Clear Glass Primer 43518	N/A	N/A	11	0.035	VOC	6.94	Mass Balance	0.00%	0.00%	0.243	0.243	1.064	1.064
							0.035	Methanol	3.40	Mass Balance	0.00%	0.00%	0.119	0.119	0.521	0.521
							0.035	Toluene	3.40	Mass Balance	0.00%	0.00%	0.119	0.119	0.521	0.521
							0.035	Total HAPs	6.80	Mass Balance	0.00%	0.00%	0.238	0.238	1.042	1.042
		2	Urethane Adhesive WS-292FK	N/A	N/A		0.74	VOC	0.01	Mass Balance	0.00%	0.00%	0.007	0.007	0.032	0.032
		3	Urethane Curative B-1M	N/A	N/A		0.72	VOC	0.14	Mass Balance	0.00%	0.00%	0.101	0.101	0.440	0.440
		4	Isopropanol	N/A	N/A		0.041	VOC	6.65	Mass Balance	0.00%	0.00%	0.273	0.273	1.194	1.194
21	Sidelite Bonding Line (2015) (SL2)	1	Clear Glass Primer 43518	N/A	N/A	11	0.013	VOC	6.94	Mass Balance	0.00%	0.00%	0.088	0.088	0.386	0.386
							0.013	Methanol	3.40	Mass Balance	0.00%	0.00%	0.043	0.043	0.189	0.189
							0.013	Toluene	3.40	Mass Balance	0.00%	0.00%	0.043	0.043	0.189	0.189
							0.013	Total HAPs	6.80	Mass Balance	0.00%	0.00%	0.086	0.086	0.378	0.378
		2	Black Glass Primer 43520A	N/A	N/A		0.021	VOC	4.82	Mass Balance	0.00%	0.00%	0.103	0.103	0.450	0.450
							0.021	Toluene	1.24	Mass Balance	0.00%	0.00%	0.026	0.026	0.116	0.116
							0.021	Xylene	0.083	Mass Balance	0.00%	0.00%	0.002	0.002	0.008	0.008
							0.021	HDI	0.083	Mass Balance	0.00%	0.00%	0.002	0.002	0.008	0.008
							0.021	TDI	0.083	Mass Balance	0.00%	0.00%	0.002	0.002	0.008	0.008
							0.021	Total HAPs	1.49	Mass Balance	0.00%	0.00%	0.032	0.032	0.139	0.139
		3	Urethane Adhesive x2500 A Plus	N/A	N/A		0.165	VOC	0.05	Mass Balance	0.00%	0.00%	0.008	0.008	0.036	0.036
				N/A	N/A		0.165	MDI	0.05	Mass Balance	0.00%	0.00%	0.008	0.008	0.036	0.036
				N/A	N/A		0.165	Total HAPs	0.05	Mass Balance	0.00%	0.00%	0.008	0.008	0.036	0.036
		4	Urethane Curative x2500 B Plus	N/A	N/A		0.176	VOC	0.01	Mass Balance	0.00%	0.00%	0.001	0.001	0.005	0.005
		5	Isopropanol	N/A	N/A		0.007	VOC	6.65	Mass Balance	0.00%	0.00%	0.047	0.047	0.204	0.204

N.1: Emission Summary

Emission Unit #	Emission Unit Name	Process ID	Process Name	Control Device Name	Control Device ID	Stack ID	Maximum Design Capacity *(SCC Units/hour)*	Pollutant	Uncontrolled Emission Factor *(lb/SCC Units)*	Emission Factor Source (e.g. AP-42, Stack Test, Mass Balance)	Capture Efficiency *(%)*	Control Efficiency *(%)*	Hourly Emissions		Annual Emissions	
													Uncontrolled Potential *(lb/hr)*	Controlled Potential *(lb/hr)*	Uncontrolled Potential *(tons/yr)*	Controlled Potential *(tons/yr)*
22	Line 2A (Sidelite)	1	Pliogrip 7655 Adhesive	N/A	N/A	10	0.007	VOC	0.007	Mass Balance	0.00%	0.00%	5.0E-05	5.0E-05	2.2E-04	2.2E-04
							0.007	MDI	0.007	Mass Balance	0.00%	0.00%	5.0E-05	5.0E-05	2.2E-04	2.2E-04
							0.007	Total HAPs	0.007	Mass Balance	0.00%	0.00%	5.0E-05	5.0E-05	2.2E-04	2.2E-04
		2	Pliogrip 7400 Adhesive	N/A	N/A		0.007	VOC	0.007	Mass Balance	0.00%	0.00%	5.0E-05	5.0E-05	2.2E-04	2.2E-04
							0.007	MDI	0.007	Mass Balance	0.00%	0.00%	5.0E-05	5.0E-05	2.2E-04	2.2E-04
							0.007	Total HAPs	0.007	Mass Balance	0.00%	0.00%	5.0E-05	5.0E-05	2.2E-04	2.2E-04
		3	Clear Glass Primer 43518	N/A	N/A		0.024	VOC	6.94	Mass Balance	0.00%	0.00%	0.167	0.167	0.730	0.730
							0.024	Methanol	3.40	Mass Balance	0.00%	0.00%	0.082	0.082	0.357	0.357
							0.024	Toluene	3.40	Mass Balance	0.00%	0.00%	0.082	0.082	0.357	0.357
							0.024	Total HAPs	6.80	Mass Balance	0.00%	0.00%	0.163	0.163	0.715	0.715
		4	Black Glass Primer 43520A	N/A	N/A		0.122	VOC	4.82	Mass Balance	0.00%	0.00%	0.588	0.588	2.576	2.576
							0.122	Toluene	1.24	Mass Balance	0.00%	0.00%	0.151	0.151	0.662	0.662
							0.122	Xylene	0.083	Mass Balance	0.00%	0.00%	0.010	0.010	0.044	0.044
							0.122	HDI	0.083	Mass Balance	0.00%	0.00%	0.010	0.010	0.044	0.044
							0.122	TDI	0.083	Mass Balance	0.00%	0.00%	0.010	0.010	0.044	0.044
							0.122	Total HAPs	1.49	Mass Balance	0.00%	0.00%	0.181	0.181	0.794	0.794
		5	Isopropanol	N/A	N/A		0.007	VOC	6.65	Mass Balance	0.00%	0.00%	0.047	0.047	0.204	0.204

N.1: Emission Summary

Emission Unit #	Emission Unit Name	Process ID	Process Name	Control Device Name	Control Device ID	Stack ID	Maximum Design Capacity *(SCC Units/hour)*	Pollutant	Uncontrolled Emission Factor *(lb/SCC Units)*	Emission Factor Source (e.g. AP-42, Stack Test, Mass Balance)	Capture Efficiency *(%)*	Control Efficiency *(%)*	Hourly Emissions		Annual Emissions	
													Uncontrolled Potential *(lb/hr)*	Controlled Potential *(lb/hr)*	Uncontrolled Potential *(tons/yr)*	Controlled Potential *(tons/yr)*
23	Line 2B (Qtr)	1	Pliogrip 7655 Adhesive	N/A	N/A	10	0.007	VOC	0.007	Mass Balance	0.00%	0.00%	5.0E-05	5.0E-05	2.2E-04	2.2E-04
							0.007	MDI	0.007	Mass Balance	0.00%	0.00%	5.0E-05	5.0E-05	2.2E-04	2.2E-04
							0.007	Total HAPs	0.007	Mass Balance	0.00%	0.00%	5.0E-05	5.0E-05	2.2E-04	2.2E-04
		2	Pliogrip 7400 Adhesive	N/A	N/A		0.007	VOC	0.007	Mass Balance	0.00%	0.00%	5.0E-05	5.0E-05	2.2E-04	2.2E-04
							0.007	MDI	0.007	Mass Balance	0.00%	0.00%	5.0E-05	5.0E-05	2.2E-04	2.2E-04
							0.007	Total HAPs	0.007	Mass Balance	0.00%	0.00%	5.0E-05	5.0E-05	2.2E-04	2.2E-04
		3	Clear Glass Primer 43518	N/A	N/A		0.013	VOC	6.94	Mass Balance	0.00%	0.00%	0.093	0.093	0.407	0.407
							0.013	Methanol	3.40	Mass Balance	0.00%	0.00%	0.046	0.046	0.200	0.200
							0.013	Toluene	3.40	Mass Balance	0.00%	0.00%	0.046	0.046	0.200	0.200
							0.013	Total HAPs	6.80	Mass Balance	0.00%	0.00%	0.091	0.091	0.399	0.399
		4	Black Glass Primer 43520A	N/A	N/A		0.066	VOC	4.82	Mass Balance	0.00%	0.00%	0.318	0.318	1.393	1.393
							0.066	Toluene	1.24	Mass Balance	0.00%	0.00%	0.082	0.082	0.358	0.358
							0.066	Xylene	0.083	Mass Balance	0.00%	0.00%	0.005	0.005	0.024	0.024
							0.066	HDI	0.083	Mass Balance	0.00%	0.00%	0.005	0.005	0.024	0.024
							0.066	TDI	0.083	Mass Balance	0.00%	0.00%	0.005	0.005	0.024	0.024
							0.066	Total HAPs	1.49	Mass Balance	0.00%	0.00%	0.098	0.098	0.430	0.430
		5	Isopropanol	N/A	N/A		0.007	VOC	6.65	Mass Balance	0.00%	0.00%	0.047	0.047	0.204	0.204

N.1: Emission Summary

Emission Unit #	Emission Unit Name	Process ID	Process Name	Control Device Name	Control Device ID	Stack ID	Maximum Design Capacity *(SCC Units/hour)*	Pollutant	Uncontrolled Emission Factor *(lb/SCC Units)*	Emission Factor Source (e.g. AP-42, Stack Test, Mass Balance)	Capture Efficiency *(%)*	Control Efficiency *(%)*	Hourly Emissions		Annual Emissions	
													Uncontrolled Potential *(lb/hr)*	Controlled Potential *(lb/hr)*	Uncontrolled Potential *(tons/yr)*	Controlled Potential *(tons/yr)*
24	Line 7 (BL)	1	Betaseal 58702SFHN	N/A	N/A	12	0.020	VOC	0.07	Mass Balance	0.00%	0.00%	0.0014	0.0014	0.0061	0.0061
							0.020	MDI	0.07	Mass Balance	0.00%	0.00%	0.0014	0.0014	0.0061	0.0061
							0.020	Total HAPs	0.07	Mass Balance	0.00%	0.00%	0.0014	0.0014	0.0061	0.0061
		2	Clear Glass Primer 43518	N/A	N/A		0.012	VOC	6.94	Mass Balance	0.00%	0.00%	0.083	0.083	0.365	0.365
							0.012	Methanol	3.40	Mass Balance	0.00%	0.00%	0.041	0.041	0.179	0.179
							0.012	Toluene	3.40	Mass Balance	0.00%	0.00%	0.041	0.041	0.179	0.179
							0.012	Total HAPs	6.80	Mass Balance	0.00%	0.00%	0.082	0.082	0.357	0.357
		3	Black Glass Primer 43520A	N/A	N/A		0.028	VOC	4.82	Mass Balance	0.00%	0.00%	0.135	0.135	0.591	0.591
							0.028	Toluene	1.24	Mass Balance	0.00%	0.00%	0.035	0.035	0.152	0.152
							0.028	Xylene	0.083	Mass Balance	0.00%	0.00%	0.002	0.002	0.010	0.010
							0.028	HDI	0.083	Mass Balance	0.00%	0.00%	0.002	0.002	0.010	0.010
							0.028	TDI	0.083	Mass Balance	0.00%	0.00%	0.002	0.002	0.010	0.010
							0.028	Total HAPs	1.49	Mass Balance	0.00%	0.00%	0.042	0.042	0.182	0.182
		4	Solder	N/A	N/A		4.30E-05	PM/PM10	2.42	AP 42 Table 12.7-2	0.00%	0.00%	1.04E-04	1.04E-04	4.56E-04	4.56E-04
							4.30E-05	Lead	1.50	AP 42 Table 12.7-3	0.00%	0.00%	6.45E-05	6.45E-05	2.82E-04	2.82E-04
							4.30E-05	Total HAPs	1.50	AP 42 Table 12.7-4	0.00%	0.00%	6.45E-05	6.45E-05	2.82E-04	2.82E-04
		5	Flux	N/A	N/A		0.005	VOC	5.66	Mass Balance	0.00%	0.00%	0.027	0.027	0.120	0.120
							0.005	Methyl Isobutyl Ketone	0.37	Mass Balance	0.00%	0.00%	0.002	0.002	0.008	0.008
							0.005	Total HAPs	0.37	Mass Balance	0.00%	0.00%	0.002	0.002	0.008	0.008
		6	Isopropanol	N/A	N/A		0.005	VOC	6.65	Mass Balance	0.00%	0.00%	0.032	0.032	0.140	0.140

N.1: Emission Summary

Emission Unit #	Emission Unit Name	Process ID	Process Name	Control Device Name	Control Device ID	Stack ID	Maximum Design Capacity *(SCC Units/hour)*	Pollutant	Uncontrolled Emission Factor *(lb/SCC Units)*	Emission Factor Source (e.g. AP-42, Stack Test, Mass Balance)	Capture Efficiency *(%)*	Control Efficiency *(%)*	Hourly Emissions		Annual Emissions	
													Uncontrolled Potential *(lb/hr)*	Controlled Potential *(lb/hr)*	Uncontrolled Potential *(tons/yr)*	Controlled Potential *(tons/yr)*
25	Line 17 (WS)	1	Betaseal 58702SFHN	N/A	N/A	10	0.073	VOC	0.07	Mass Balance	0.00%	0.00%	0.0051	0.0051	0.0223	0.0223
							0.073	MDI	0.07	Mass Balance	0.00%	0.00%	0.0051	0.0051	0.0223	0.0223
							0.073	Total HAPs	0.07	Mass Balance	0.00%	0.00%	0.0051	0.0051	0.0223	0.0223
		2	Clear Glass Primer 43518	N/A	N/A		0.016	VOC	6.94	Mass Balance	0.00%	0.00%	0.114	0.114	0.500	0.500
							0.016	Methanol	3.40	Mass Balance	0.00%	0.00%	0.056	0.056	0.245	0.245
							0.016	Toluene	3.40	Mass Balance	0.00%	0.00%	0.056	0.056	0.245	0.245
							0.016	Total HAPs	6.80	Mass Balance	0.00%	0.00%	0.112	0.112	0.490	0.490
		3	Black Glass Primer 43520A	N/A	N/A		0.087	VOC	4.82	Mass Balance	0.00%	0.00%	0.418	0.418	1.831	1.831
							0.087	Toluene	1.24	Mass Balance	0.00%	0.00%	0.107	0.107	0.471	0.471
							0.087	Xylene	0.083	Mass Balance	0.00%	0.00%	0.007	0.007	0.031	0.031
							0.087	HDI	0.083	Mass Balance	0.00%	0.00%	0.007	0.007	0.031	0.031
							0.087	TDI	0.083	Mass Balance	0.00%	0.00%	0.007	0.007	0.031	0.031
							0.087	Total HAPs	1.49	Mass Balance	0.00%	0.00%	0.129	0.129	0.565	0.565
		4	Isopropanol	N/A	N/A		0.005	VOC	6.65	Mass Balance	0.00%	0.00%	0.036	0.036	0.157	0.157

N.1: Emission Summary

Emission Unit #	Emission Unit Name	Process ID	Process Name	Control Device Name	Control Device ID	Stack ID	Maximum Design Capacity *(SCC Units/hour)*	Pollutant	Uncontrolled Emission Factor *(lb/SCC Units)*	Emission Factor Source (e.g. AP-42, Stack Test, Mass Balance)	Capture Efficiency *(%)*	Control Efficiency *(%)*	Hourly Emissions		Annual Emissions	
													Uncontrolled Potential *(lb/hr)*	Controlled Potential *(lb/hr)*	Uncontrolled Potential *(tons/yr)*	Controlled Potential *(tons/yr)*
26	Line 18 (WS)	1	Urethane Adhesive x2500 A Plus	N/A	N/A	12	0.018	VOC	0.05	Mass Balance	0.00%	0.00%	0.001	0.001	0.004	0.004
				N/A	N/A		0.018	MDI	0.05	Mass Balance	0.00%	0.00%	0.001	0.001	0.004	0.004
				N/A	N/A		0.018	Total HAPs	0.05	Mass Balance	0.00%	0.00%	0.001	0.001	0.004	0.004
		2	Urethane Curative x2500 B Plus	N/A	N/A		0.019	VOC	0.01	Mass Balance	0.00%	0.00%	0.000	0.000	0.001	0.001
		3	Clear Glass Primer 43518	N/A	N/A		0.021	VOC	6.94	Mass Balance	0.00%	0.00%	0.143	0.143	0.625	0.625
							0.021	Methanol	3.40	Mass Balance	0.00%	0.00%	0.070	0.070	0.306	0.306
							0.021	Toluene	3.40	Mass Balance	0.00%	0.00%	0.070	0.070	0.306	0.306
							0.021	Total HAPs	6.80	Mass Balance	0.00%	0.00%	0.140	0.140	0.612	0.612
		4	Black Glass Primer 43520A	N/A	N/A		0.073	VOC	4.82	Mass Balance	0.00%	0.00%	0.351	0.351	1.538	1.538
							0.073	Toluene	1.24	Mass Balance	0.00%	0.00%	0.090	0.090	0.395	0.395
							0.073	Xylene	0.083	Mass Balance	0.00%	0.00%	0.006	0.006	0.026	0.026
							0.073	HDI	0.083	Mass Balance	0.00%	0.00%	0.006	0.006	0.026	0.026
							0.073	TDI	0.083	Mass Balance	0.00%	0.00%	0.006	0.006	0.026	0.026
							0.073	Total HAPs	1.49	Mass Balance	0.00%	0.00%	0.108	0.108	0.474	0.474
		5	Isopropanol	N/A	N/A		0.005	VOC	6.65	Mass Balance	0.00%	0.00%	0.036	0.036	0.157	0.157

Section N.2: Stack Information

UTM Zone:

Stack ID	Identify all Emission Units (with Process ID) and Control Devices that Feed to Stack	Stack Physical Data			Stack UTM Coordinates		Stack Gas Stream Data		
		Equivalent Diameter *(ft)*	Height *(ft)*	Base Elevation *(ft)*	Northing *(m)*	Easting *(m)*	Flowrate *(acfm)*	Temperature *(° F)*	Exit Velocity *(ft/sec)*
10	EP25 Line 17 (WS), EP22 Line 2A (SL), EP23 Line 2B (Qtr)	3.33	32	~1000			19,950	70	38.1
11	EP10 Sidelite Assembly Line A (SL3), EP11 Sidelite Assembly Line B (SL4), EP12 Sidelite Door Cell (SL6), EP21 Sidelite Bonding Line (2015) (SL2), EP20 Sidelite Door line (SL4B/SL8), EP14 Backlite Assembly Line (BL2/BL1)	3.33	36	~1000			19,950	70	38.1
12	EP24 Line 7 (BL), EP26 Line 18 (WS)	3.33	32	~1000			19,950	70	38.1

Section N.4: Notes, Comments, and Explanations

See attached flow diagram for stack changes. The facility is rerouting existing emission points to new stacks and adding new lines with new stacks.

Division for Air Quality

300 Sower Boulevard
Frankfort, KY 40601
(502) 564-3999

DEP7007V

Applicable Requirements and Compliance Activities

_✓__ Section V.1: Emission and Operating Limitation(s)
_✓__ Section V.2: Monitoring Requirements
_✓__ Section V.3: Recordkeeping Requirements
_✓__ Section V.4: Reporting Requirements
_✓__ Section V.5: Testing Requirements
___ Section V.6: Notes, Comments, and Explanations

Additional Documentation

_✓__ Complete DEP7007AI

Source Name **Pittsburgh Glass Works, LLC dba Vitro Automotive Glass**
KY EIS (AFS 21- **151-00048**
Permit #: **S-15-052 R4**
Agency Interest (AI) I **2846**
Date: **4/22/2024**

Section V.1: Emission and Operating Limitation(s)

Emission Unit #	Emission Unit Description	Applicable Regulation or Requirement	Pollutant	Emission Limit (if applicable)	Voluntary Emission Limit or Exemption (if applicable)	Operating Requirement or Limitation (if applicable)	Method of Determining Compliance with the Emission and Operating Requirement(s)
EP 01	Emergency Generator	40 CFR 63.6603(a) 40 CFR 63.6625(h) 40 CFR 63.6625(e) 40 CFR 63.6640(f) 40 CFR 63.6605(a) 40 CFR 63.6605(b) 40 CFR 63.6640(a)	HAPs			Change oil and filter every 500 hours of operation or annually, whichever comes first; Inspect air cleaner every 1,000 hours of operation or annually, whichever comes first; Inspect all hoses and belts every 500 hours of operation or annually, whichever comes first, and replace as necessary. Minimize the engine's time spent at idle and minimize the engine's startup time at startup to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the non-start emission limitations apply. Operate and maintain the stationary RICE according to the manufacturer's emission-related written instructions or develop your own maintenance plan which must provide, to the extent practicable, for the maintenance and operation of the engine in a manner consistent with good air pollution control practice for minimizing emissions. No more than 100 hours of maintenance and readiness checks. No more than 50 hours non-emergency use. Be in compliance with all emission limitations and operating limitations that apply to you at all time and must operate and maintain any affected source, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions.	Recordkeeping

Section V.1: Emission and Operating Limitation(s)

Emission Unit #	Emission Unit Description	Applicable Regulation or Requirement	Pollutant	Emission Limit (if applicable)	Voluntary Emission Limit or Exemption (if applicable)	Operating Requirement or Limitation (if applicable)	Method of Determining Compliance with the Emission and Operating Requirement(s)
EP 04, EP 10 EP 11, EP 12 EP 13, EP 14 EP 15, EP 16 EP 18, EP 20 EP 21, EP 22 EP 23, EP 24 EP 25, EP 26	Various Assembly Lines	401 KAR 63:020	Toxics	The permittee shall not allow any affected facility to emit potentially hazardous matter or toxic substances in such quantities or duration as to be harmful to the health and welfare of humans, animals and plants.			Source in compliance based on the rates of emissions of airborne toxics provided in the application submitted by the source.
Source-Wide	Source-Wide	401 KAR 52:030	VOC Total HAPs Individual HAPs (Toluene)		Facility emissions < 90 tons/yr. Facility emissions < 22.5 tons/yr. Facility emissions < 9 tons/yr.		Recordkeeping of material usage and percent VOC/HAP content.

Section V.2: Monitoring Requirements

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Monitored	Description of Monitoring
EP 01	Emergency Generator	HAPs	40 CFR 63.6625(f) 40 CFR 63.6625(i)	Hours	The permittee shall install a non-resettable hour meter if one is not already installed. As an alternative to the requirement to change the oil every 500 hours of operation or annually, the permittee has the option of utilizing an oil analysis program, according to the methods and requirements in 40 CFR 63.6625(i), in order to extend the specified oil change requirements.
Source-Wide	Source-Wide	VOC Total HAPs Individual HAPs (Toluene)	401 KAR 52:030	Fuel Usage Raw material usage	Monitor the amount of diesel fuel usage (gallons), natural gas (MMscf), welding wire (lbs) and raw materials that contains VOC or HAPs on a monthly basis.

Section V.3: Recordkeeping Requirements

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Recorded	Description of Recordkeeping
EP 01	Emergency Generator	HAPs	40 CFR 63.6655(e) 40 CFR 63.6655(f) 40 CFR 63.6655(d)	Hours Maintenance	The permittee shall maintain records of the maintenance conducted on the engine in order to demonstrate that the engine was operated and maintained, including any after-treatment control device, according to the maintenance plan for the engine. If an engine is not certified to the standards applicable to nonemergency engines (see Table 2d to 40 CFR 63 Subpart ZZZZ), then the permittee must keep records of the hours of operation of the engine that is recorded through the non-resettable hour meter. The owner or operator must document how many hours are spent for emergency operation; including, what classified the operation as emergency and how many hours are spent for nonemergency operation.
			40 CFR 63.6655(a)	Malfunctions, Performance Tests, Maintenance, Actions taken during malfunctions	The permittee shall maintain records of all occurrences and durations of malfunctions, any performance tests and evaluations, maintenance performed on air pollution control and monitoring equipment, and actions taken during periods of malfunction
Source-Wide	Source-Wide	VOC Total HAPs Individual HAPs (Toluene)	401 KAR 52:030	Fuel Usage Raw material usage	Record the amount of diesel fuel usage (gallons), natural gas (MMscf), welding wire (lbs) and raw materials that contains VOC or HAPs on a monthly basis.

Section V.4: Reporting Requirements

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Reported	Description of Reporting
EP 01	Emergency Generator	HAPs	40 CFR 63.6640(b)	Deviations from Emissions	Report each instance in which the permittee did not meet the operating limitations. These instances are deviations from the emission and operating limitations in this subpart. These deviations shall be reported according to the requirements in 40 CFR 63.6650.
			40 CFR 63 Subpart ZZZZ Table 2d	Report Maintenance Delays	If an emergency engine is operating during an emergency and it is not possible to shut down the engine in order to perform the management practice requirements on the schedule required in Table 2d of this subpart, or if performing the management practice on the required schedule would otherwise pose an unacceptable risk under Federal, State, or local law, the management practice can be delayed until the emergency is over or the unacceptable risk under Federal, State, or local law has abated. The management practice should be performed as soon as practicable after the emergency has ended or the unacceptable risk under Federal, State, or local law has abated. Sources shall report any failure to perform the management practice on the schedule required and the Federal, State or local law under which the risk was deemed unacceptable.
Source-Wide	Source-Wide	VOC Total HAPs Individual HAPs (Toluene)	401 KAR 52:030	Fuel Usage Raw material usage	Keep calendar month records of the fuel usage (gallons), natural gas (MMscf), welding wire (lbs) and raw materials that contains VOC or HAPs. At the end of each month, monthly emissions and 12 month rolling totals for VOC, total HAPS and Individual HAPs (Toluene) are calculated and recorded. These records shall be reported for each semi-annual period.

Section V.5: Testing Requirements

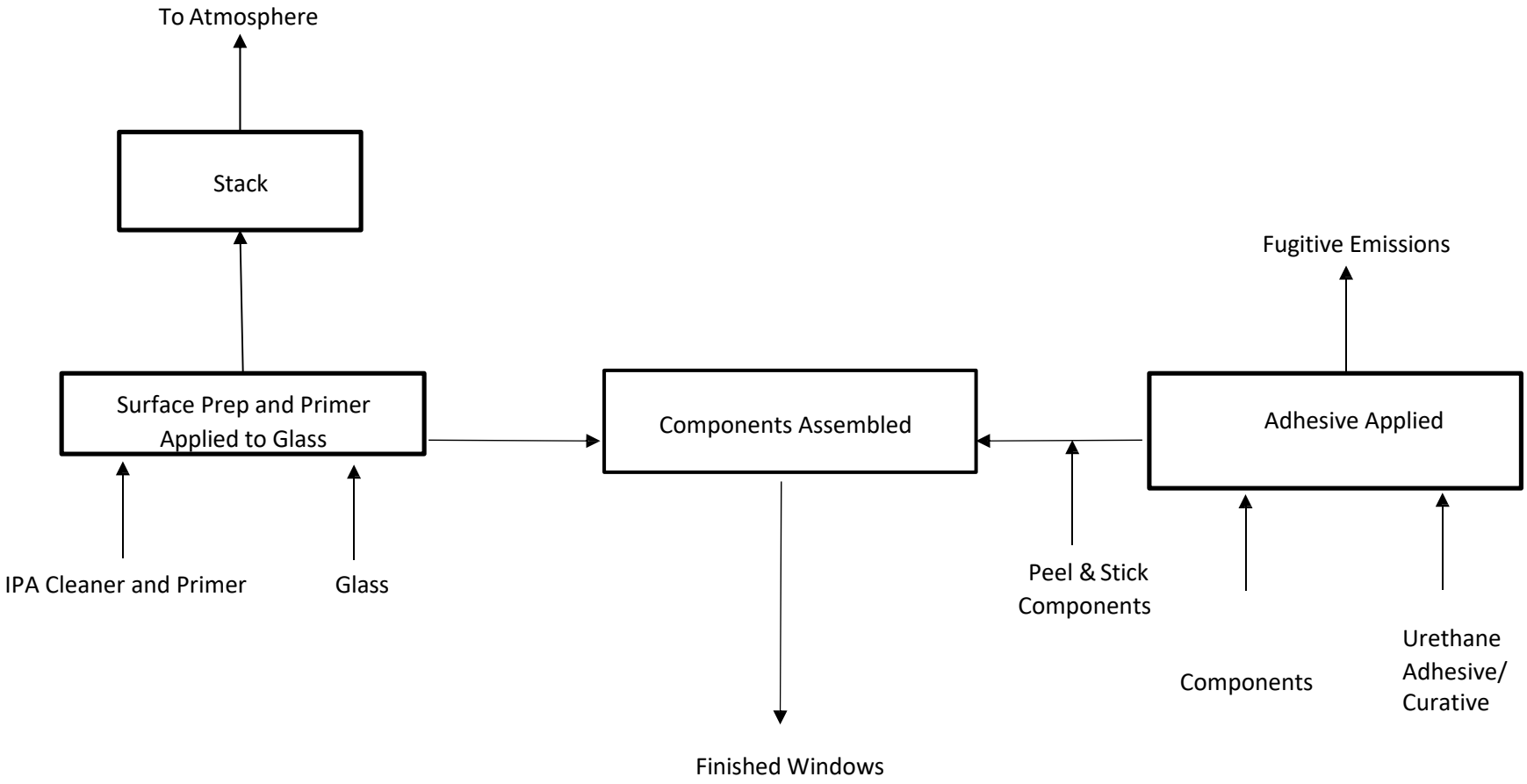
Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Tested	Description of Testing
EP 01	Emergency Generator	HAPs PM VOC HC CO Nox	401 KAR 59:005 401 KAR 50:045	N/A	Pursuant to 401 KAR 59:005, Section 2(2) and 401 KAR 50:045, Section 1, performance testing using the Reference Methods specified in 401 KAR 50:015 shall be conducted if required by the Division.
EP 04, EP 10 EP 11, EP 12 EP 13, EP 14 EP 15, EP 16 EP 18, EP 20 EP 21, EP 22 EP 23, EP 24 EP 25, EP 26	Various Assembly Lines	VOC Total HAPs Individual HAPs (Toluene)			

APPENDIX B

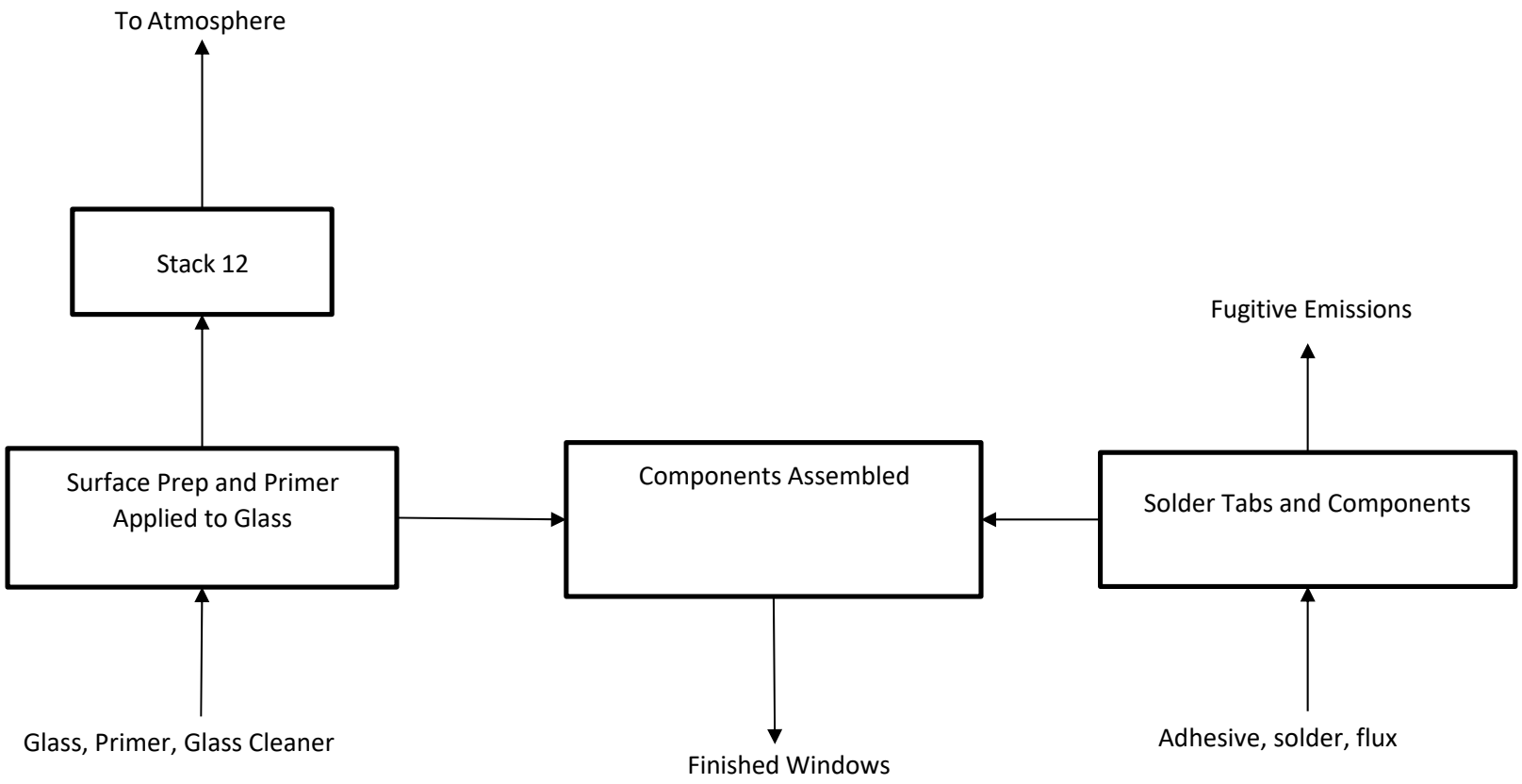
Process Flow Diagrams

Pittsburgh Glass Works, LLC dba Vitro Automotive Glass (Vitro)
Berea, KY

General - Process Flow Diagram (EP 10, 11, 12, 14, 20, 21, 22, 23, 25 & 26)



Pittsburgh Glass Works, LLC dba Vitro Automotive Glass (Vitro)
Berea, KY
General - Process Flow Diagram EP 24



APPENDIX C

Potential to Emit (PTE) Calculations

Table 1
Vitro Automotive Glass AI #2846
Berea, Kentucky
Potential to Emit TPY

EP#	Process ID	Stack	EP Description	Process Description	CO_2	CO	NO_2	SO_2	VOC	MDI	Methanol	Toluene	Xylene	HDI	TDI	Methyl Isobutyl Ketone	Lead	HAP	PM/ PM10
1	1	EG 1	Emergency Generator	Diesel Usage	49.654	0.288	1.335	1.335	0.106	-	-	-	-	-	-	-	-	-	0.094
4	1	EP 4	Clip Priming (2 Stations) - 43533	Body Primer 43533	-	-	-	-	5.261	0.435	-	-	-	-	-	-	-	0.435	-
10	1	11	Sidelite Assembly Line A (SL3)	Clear Glass Primer 43518	-	-	-	-	0.952	-	0.466	0.466	-	-	-	-	-	0.932	-
10	2	11	Sidelite Assembly Line A (SL3)	Urethane Adhesive WS-292FK	-	-	-	-	0.029	-	-	-	-	-	-	-	-	-	-
10	3	11	Sidelite Assembly Line A (SL3)	Urethane Curative B-1M	-	-	-	-	0.396	-	-	-	-	-	-	-	-	-	-
11	1	11	Sidelite Assembly Line B (SL4)	Clear Glass Primer 43518	-	-	-	-	1.269	-	0.621	0.621	-	-	-	-	-	1.243	-
11	2	11	Sidelite Assembly Line B (SL4)	Urethane Adhesive WS-292FK	-	-	-	-	0.039	-	-	-	-	-	-	-	-	-	-
11	3	11	Sidelite Assembly Line B (SL4)	Urethane Curative B-1M	-	-	-	-	0.528	-	-	-	-	-	-	-	-	-	-
11	4	11	Sidelite Assembly Line B (SL4)	Isopropanol	-	-	-	-	1.448	-	-	-	-	-	-	-	-	-	-
12	1	11	Sidelite Door Cell (SL6) - YH America AN-1M Option	Clear Glass Primer 43518	-	-	-	-	1.423	-	0.697	0.697	-	-	-	-	-	1.393	-
12	2	11	Sidelite Door Cell (SL6) - YH America AN-1M Option	Urethane Adhesive WS-242FK	-	-	-	-	0.230	-	-	-	-	-	-	-	-	-	-
12	3	11	Sidelite Door Cell (SL6) - YH America AN-1M Option	Urethane Curative AN-1M	-	-	-	-	2.358	-	-	-	-	-	-	-	-	-	-
13	1	6	Clip Priming Station - 43533	Body Primer 43533	-	-	-	-	7.201	0.595	-	-	-	-	-	-	-	0.595	-
14	1	11	Backlite Assembly Line (BL2)	Clear Glass Primer 43518	-	-	-	-	1.562	-	0.765	0.765	-	-	-	-	-	1.530	-
14	2	11	Backlite Assembly Line (BL2)	Black Glass Primer 43520A	-	-	-	-	2.746	-	-	0.706	0.047	0.047	0.047	-	-	0.847	-
14	3	11	Backlite Assembly Line (BL2)	Electrical Connector	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000
15	1	8	Quarter Assembly Line (SL5)	Clear Glass Primer 43518	-	-	-	-	1.010	-	0.494	0.494	-	-	-	-	-	0.989	-
15	2	8	Quarter Assembly Line (SL5)	Black Glass Primer 43520A	-	-	-	-	1.972	-	-	0.507	0.034	0.034	0.034	-	-	0.608	-
15	3	8	Quarter Assembly Line (SL5)	Electrical Connector	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000
16	1	6	Windshield Assembly Line 1 (WS2)	Clear Glass Primer 43518	-	-	-	-	1.803	-	0.883	0.883	-	-	-	-	-	1.765	-
16	2	6	Windshield Assembly Line 1 (WS2)	Black Glass Primer 43520A	-	-	-	-	3.169	-	-	0.815	0.054	0.054	0.054	-	-	0.978	-
16	3	6	Windshield Assembly Line 1 (WS2)	Body Primer 43533	-	-	-	-	0.376	0.031	-	-	-	-	-	-	-	0.031	-
16	4	6	Windshield Assembly Line 1 (WS2)	Urethane Adhesive x2500 A Plus	-	-	-	-	0.046	0.046	-	-	-	-	-	-	-	0.046	-
16	5	6	Windshield Assembly Line 1 (WS2)	Urethane Curative x2500 B Plus	-	-	-	-	0.006	-	-	-	-	-	-	-	-	-	-
16	6	6	Windshield Assembly Line 1 (WS2)	Isopropanol	-	-	-	-	0.362	-	-	-	-	-	-	-	-	-	-
18	1	7	Windshield Assembly Line 2 (WS1) - 500B Option	Clear Glass Primer 43518	-	-	-	-	1.803	-	0.883	0.883	-	-	-	-	-	1.765	-
18	2	7	Windshield Assembly Line 2 (WS1) - 500B Option	Black Glass Primer 43520A	-	-	-	-	3.169	-	-	0.815	0.054	0.054	0.054	-	-	0.978	-
18	3	7	Windshield Assembly Line 2 (WS1) - 500B Option	Body Primer 43533	-	-	-	-	0.439	0.036	-	-	-	-	-	-	-	0.036	-
18	4	7	Windshield Assembly Line 2 (WS1) - 500B Option	Aron Mighty	-	-	-	-	0.170	-	0.018	-	-	-	-	-	-	0.018	-
18	5	7	Windshield Assembly Line 2 (WS1) - 500B Option	Urethane Adhesive x2500 A Plus	-	-	-	-	0.046	0.046	-	-	-	-	-	-	-	0.046	-
18	6	7	Windshield Assembly Line 2 (WS1) - 500B Option	Urethane Curative x2500 B Plus	-	-	-	-	0.006	-	-	-	-	-	-	-	-	-	-
18	7	7	Windshield Assembly Line 2 (WS1) - 500B Option	Isopropanol	-	-	-	-	0.362	-	-	-	-	-	-	-	-	-	-
20	1	11	Sidelite Door Line (SL4B / SL8)	Clear Glass Primer 43518	-	-	-	-	1.058	-	0.518	0.518	-	-	-	-	-	1.036	-
20	2	11	Sidelite Door Line (SL4B / SL8)	Urethane Adhesive WS-292FK	-	-	-	-	0.032	-	-	-	-	-	-	-	-	-	-
20	3	11	Sidelite Door Line (SL4B / SL8)	Urethane Curative B-1M	-	-	-	-	0.440	-	-	-	-	-	-	-	-	-	-
20	4	11	Sidelite Door Line (SL4B / SL8)	Isopropanol	-	-	-	-	1.207	-	-	-	-	-	-	-	-	-	-
21	1	11	Sidelite Bonding Line (2015) (SL2)	Clear Glass Primer 43518	-	-	-	-	0.385	-	0.188	0.188	-	-	-	-	-	0.377	-
21	2	11	Sidelite Bonding Line (2015) (SL2)	Black Glass Primer 43520A	-	-	-	-	0.451	-	-	0.116	0.008	0.008	0.008	-	-	0.139	-
21	3	11	Sidelite Bonding Line (2015) (SL2)	Urethane Adhesive x2500 A Plus	-	-	-	-	0.036	0.036	-	-	-	-	-	-	-	0.036	-
21	4	11	Sidelite Bonding Line (2015) (SL2)	Urethane Curative x2500 B Plus	-	-	-	-	0.005	-	-	-	-	-	-	-	-	-	-
21	5	11	Sidelite Bonding Line (2015) (SL2)	Glass Cleaner, Isopropanol	-	-	-	-	0.193	-	-	-	-	-	-	-	-	-	-
22	1	10	Line 2A - Large SL option (previously 2AL)	Pliogrip 7655 Adhesive	-	-	-	-	0.000	0.000	-	-	-	-	-	-	-	0.000	-
22	2	10	Line 2A - Large SL option (previously 2AL)	Pliogrip 7400 Adhesive	-	-	-	-	0.000	0.000	-	-	-	-	-	-	-	0.000	-
22	3	10	Line 2A - Large SL option (previously 2AL)	Clear Glass Primer 43518	-	-	-	-	0.736	-	0.360	0.360	-	-	-	-	-	0.720	-
22	4	10	Line 2A - Large SL option (previously 2AL)	Black Glass Primer 43520A	-	-	-	-	2.586	-	-	0.665	0.044	0.044	0.044	-	-	0.798	-
22	5	10	Line 2A - Large SL option (previously 2AL)	Glass Cleaner, Isopropanol	-	-	-	-	0.205	-	-	-	-	-	-	-	-	-	-
23	1	10	Line 2B (Qtr)	Pliogrip 7655 Adhesive	-	-	-	-	0.000	0.000	-	-	-	-	-	-	-	0.000	-
23	2	10	Line 2B (Qtr)	Pliogrip 7400 Adhesive	-	-	-	-	0.000	0.000	-	-	-	-	-	-	-	0.000	-
23	3	10	Line 2B (Qtr)	Clear Glass Primer 43518	-	-	-	-	0.409	-	0.200	0.200	-	-	-	-	-	0.400	-
23	4	10	Line 2B (Qtr)	Black Glass Primer 43520A	-	-	-	-	1.389	-	-	0.357	0.024	0.024	0.024	-	-	0.428	-
23	5	10	Line 2B (Qtr)	Glass Cleaner, Isopropanol	-	-	-	-	0.205	-	-	-	-	-	-	-	-	-	-
24	1	12	Line 7 (BL)	Betaseal 58702SFHN	-	-	-	-	0.006	0.006	-	-	-	-	-	-	-	0.006	-
24	2	12	Line 7 (BL)	Clear Glass Primer 43518	-	-	-	-	0.375	-	0.184	0.184	-	-	-	-	-	0.367	-
24	3	12	Line 7 (BL)	Black Glass Primer 43520A	-	-	-	-	0.586	-	-	0.151	0.010	0.010	0.010	-	-	0.181	-
24	4	12	Line 7 (BL)	Solder	-	-	-	-	-	-	-	-	-	-	-	-	2.824E-04	2.824E-04	4.555E-04
24	5	12	Line 7 (BL)	Flux	-	-	-	-	0.120	-	-	-	-	-	-	0.008	-	0.008	-
24	6	12	Line 7 (BL)	Glass Cleaner, Isopropanol	-	-	-	-	0.157	-	-	-	-	-	-	-	-	-	-
25	1	10	Line 17 (WS)	Betaseal 58702SFHN	-	-	-	-	0.022	0.022	-	-	-	-	-	-	-	0.022	-
25	2	10	Line 17 (WS)	Clear Glass Primer 43518	-	-	-	-	0.500	-	0.245	0.245	-	-	-	-	-	0.490	-
25	3	10	Line 17 (WS)	Black Glass Primer 43520A	-	-	-	-	1.831	-	-	0.471	0.031	0.031	0.031	-	-	0.565	-
25	4	10	Line 17 (WS)	Glass Cleaner, Isopropanol	-	-	-	-	0.157	-	-	-	-	-	-	-	-	-	-
26	1	12	Line 18 (WS)	Urethane Adhesive x2500 A Plus	-	-	-	-	0.004	0.004	-	-	-	-	-	-	-	0.004	-
26	2	12	Line 18 (WS)	Urethane Curative x2500 B Plus	-	-	-	-	0.001	-	-	-	-	-	-	-	-	-	-
26	3	12	Line 18 (WS)	Clear Glass Primer 43518	-	-	-	-	0.625	-	0.306	0.306	-	-	-	-	-	0.612	-
26	4	12	Line 18 (WS)	Black Glass Primer 43520A	-	-	-	-	1.538	-	-	0.395	0.026	0.026	0.026	-	-	0.474	-
26	5	12	Line 18 (WS)	Glass Cleaner, Isopropanol	-	-	-	-	0.157	-	-	-	-	-	-	-	-	-	-
IA 3	1	IA	Sidelite Bonding Line (2014) (SL1) - 43518 & 43520A Option	Clear Glass Primer 43518	-	-	-	-	0.385	-	0.187	0.187	-	-	-	-	-	0.375	-
IA 3	2	IA	Sidelite Bonding Line (2014) (SL1) - 43518 & 43520A Option	Black Glass Primer 43520A	-	-	-	-	0.451	-	-	0.068	0.005	0.005	0.005	-	-	0.081	-

Table 1
Vitro Automotive Glass AI #2846
Berea, Kentucky
Potential to Emit TPY

EP#	Process ID	Stack	EP Description	Process Description	CO_2	CO	NO_2	SO_2	VOC	MDI	Methanol	Toluene	Xylene	HDI	TDI	Methyl Isobutyl Ketone	Lead	HAP	PM/ PM10
IA 3	3	IA	Sidelite Bonding Line (2014) (SL1) - 43518 & 43520A Option	Urethane Adhesive x2500 A Plus	-	-	-	-	0.036	0.000	-	-	-	-	-	-	-	0.000	-
IA 3	4	IA	Sidelite Bonding Line (2014) (SL1) - 43518 & 43520A Option	Urethane Curative x2500 B Plus	-	-	-	-	0.005	-	-	-	-	-	-	-	-	-	-
IA 3	5	IA	Sidelite Bonding Line (2014) (SL1) - 43518 & 43520A Option	Glass Cleaner, Isopropanol	-	-	-	-	0.193	-	-	-	-	-	-	-	-	-	-
IA 1	1	IA	Space heaters (28 units) 4.87 MMBtu/hr total	Natural Gas Usage	2,509.482	1.757	2.091	2.091	0.115	-	-	-	-	-	-	-	-	-	0.159
IA 2	1	IA	Line 1 - 31XXN option	Clear Glass Primer 43518	-	-	-	-	0.125	-	0.061	0.061	-	-	-	-	-	0.122	-
IA 2	2	IA	Line 1 - 31XXN option	Black Glass Primer 43520A	-	-	-	-	0.769	-	-	0.198	0.013	0.013	0.013	-	-	0.237	-
IA 2	3	IA	Line 1 - 31XXN option	Glass Cleaner, Isopropanol	-	-	-	-	0.063	-	-	-	-	-	-	-	-	-	-
IA 4	2	IA	Quarter Window Bonding Line (2015) (QW1)	Clear Glass Primer 43518	-	-	-	-	0.096	-	0.047	0.047	-	-	-	-	-	0.094	-
IA 5	1	IA	Westward Cold Cleaner	N/A	-	-	-	-	0.065	-	-	-	-	-	-	-	-	-	-
IA 6	1	IA	Diesel Storage Tank, 280 gallon	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IA 7	1	IA	MIG Welding Table	Electrode	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.205
IA 8	1	IA	Sequoia Sidelite (SL7)	Urethane Adhesive x2500 A Plus	-	-	-	-	0.044	0.044	-	-	-	-	-	-	-	0.044	-
IA 8	2	IA	Sequoia Sidelite (SL7)	Urethane Curative x2500 B Plus	-	-	-	-	0.006	-	-	-	-	-	-	-	-	-	-
IA 8	3	IA	Sequoia Sidelite (SL7)	Glass Cleaner, Isopropanol	-	-	-	-	1.117	-	-	-	-	-	-	-	-	-	-
IA 8	5	IA	Sequoia Sidelite (SL7)	Electrical Connector	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000
IA 8	6	IA	Sequoia Sidelite (SL7)	Black Glass Primer, Betaprime 5500	-	-	-	-	1.137	0.018	-	-	-	-	-	-	-	0.018	-
IA 9	1	IA	Line 6/6A BL w/ soldering	Solder	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-	0.000
Source-wide	1		Isopropanol for Cleaning	Isopropanol	-	-	-	-	1.663	-	-	-	-	-	-	-	-	-	-
				Maximum HAP Scenario Source-wide Emissions (Tons)	2559.137	2.044	3.426	3.426	61.971	1.320	7.123	12.367	0.351	0.351	0.351	0.008	0.001	21.871	4.459

Table 2
Vitro Automotive Glass AI #2846
Berea, Kentucky
Hourly Emissions (lb/hr)

EP#	Process ID	Stack	EP Description	Process Description	CO_2	CO	NO_2	SO_2	VOC	MDI	Methanol	Toluene	Xylene	HDI	TDI	Methyl Isobutyl Ketone	Lead	HAP	PM/ PM10
1	1	EG 1	Emergency Generator	Diesel Usage	198.617	1.151	5.341	5.341	0.424	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.375
4	1	EP 4	Clip Priming (2 Stations) - 43533	Body Primer 43533	0.000	0.000	0.000	0.000	1.201	0.099	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.099	0.000
10	1	11	Sidelite Assembly Line A (SL3)	Clear Glass Primer 43518	0.000	0.000	0.000	0.000	0.217	0.000	0.106	0.106	0.000	0.000	0.000	0.000	0.000	0.213	0.000
10	2	11	Sidelite Assembly Line A (SL3)	Urethane Adhesive WS-292FK	0.000	0.000	0.000	0.000	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10	3	11	Sidelite Assembly Line A (SL3)	Urethane Curative B-1M	0.000	0.000	0.000	0.000	0.090	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
11	1	11	Sidelite Assembly Line B (SL4)	Clear Glass Primer 43518	0.000	0.000	0.000	0.000	0.290	0.000	0.142	0.142	0.000	0.000	0.000	0.000	0.000	0.284	0.000
11	2	11	Sidelite Assembly Line B (SL4)	Urethane Adhesive WS-292FK	0.000	0.000	0.000	0.000	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
11	3	11	Sidelite Assembly Line B (SL4)	Urethane Curative B-1M	0.000	0.000	0.000	0.000	0.121	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
11	4	11	Sidelite Assembly Line B (SL4)	Isopropanol	0.000	0.000	0.000	0.000	0.331	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
12	1	11	Sidelite Door Cell (SL6) - YH America AN-1M Option	Clear Glass Primer 43518	0.000	0.000	0.000	0.000	0.325	0.000	0.159	0.159	0.000	0.000	0.000	0.000	0.000	0.318	0.000
12	2	11	Sidelite Door Cell (SL6) - YH America AN-1M Option	Urethane Adhesive WS-242FK	0.000	0.000	0.000	0.000	0.053	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
12	3	11	Sidelite Door Cell (SL6) - YH America AN-1M Option	Urethane Curative AN-1M	0.000	0.000	0.000	0.000	0.538	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
13	1	6	Clip Priming Station - 43533	Body Primer 43533	0.000	0.000	0.000	0.000	1.644	0.136	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.136	0.000
14	1	11	Backlite Assembly Line (BL2)	Clear Glass Primer 43518	0.000	0.000	0.000	0.000	0.357	0.000	0.175	0.175	0.000	0.000	0.000	0.000	0.000	0.349	0.000
14	2	11	Backlite Assembly Line (BL2)	Black Glass Primer 43520A	0.000	0.000	0.000	0.000	0.627	0.000	0.000	0.161	0.011	0.011	0.011	0.000	0.000	0.193	0.000
14	3	11	Backlite Assembly Line (BL2)	Electrical Connector	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
15	1	8	Quarter Assembly Line (SL5)	Clear Glass Primer 43518	0.000	0.000	0.000	0.000	0.230	0.000	0.113	0.113	0.000	0.000	0.000	0.000	0.000	0.226	0.000
15	2	8	Quarter Assembly Line (SL5)	Black Glass Primer 43520A	0.000	0.000	0.000	0.000	0.450	0.000	0.000	0.116	0.008	0.008	0.008	0.000	0.000	0.139	0.000
15	3	8	Quarter Assembly Line (SL5)	Electrical Connector	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
16	1	6	Windshield Assembly Line 1 (WS2)	Clear Glass Primer 43518	0.000	0.000	0.000	0.000	0.412	0.000	0.202	0.202	0.000	0.000	0.000	0.000	0.000	0.403	0.000
16	2	6	Windshield Assembly Line 1 (WS2)	Black Glass Primer 43520A	0.000	0.000	0.000	0.000	0.723	0.000	0.000	0.186	0.012	0.012	0.012	0.000	0.000	0.223	0.000
16	3	6	Windshield Assembly Line 1 (WS2)	Body Primer 43533	0.000	0.000	0.000	0.000	0.086	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.000
16	4	6	Windshield Assembly Line 1 (WS2)	Urethane Adhesive x2500 A Plus	0.000	0.000	0.000	0.000	0.011	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.011	0.000
16	5	6	Windshield Assembly Line 1 (WS2)	Urethane Curative x2500 B Plus	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
16	6	6	Windshield Assembly Line 1 (WS2)	Isopropanol	0.000	0.000	0.000	0.000	0.083	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
18	1	7	Windshield Assembly Line 2 (WS1) - 500B Option	Clear Glass Primer 43518	0.000	0.000	0.000	0.000	0.412	0.000	0.202	0.202	0.000	0.000	0.000	0.000	0.000	0.403	0.000
18	2	7	Windshield Assembly Line 2 (WS1) - 500B Option	Black Glass Primer 43520A	0.000	0.000	0.000	0.000	0.723	0.000	0.000	0.186	0.012	0.012	0.012	0.000	0.000	0.223	0.000
18	3	7	Windshield Assembly Line 2 (WS1) - 500B Option	Body Primer 43533	0.000	0.000	0.000	0.000	0.100	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.000
18	4	7	Windshield Assembly Line 2 (WS1) - 500B Option	Aron Mighty	0.000	0.000	0.000	0.000	0.039	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.000
18	5	7	Windshield Assembly Line 2 (WS1) - 500B Option	Urethane Adhesive x2500 A Plus	0.000	0.000	0.000	0.000	0.011	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.011	0.000
18	6	7	Windshield Assembly Line 2 (WS1) - 500B Option	Urethane Curative x2500 B Plus	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
18	7	7	Windshield Assembly Line 2 (WS1) - 500B Option	Isopropanol	0.000	0.000	0.000	0.000	0.083	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
20	1	11	Sidelite Door Line (SL4B / SL8)	Clear Glass Primer 43518	0.000	0.000	0.000	0.000	0.241	0.000	0.118	0.118	0.000	0.000	0.000	0.000	0.000	0.236	0.000
20	2	11	Sidelite Door Line (SL4B / SL8)	Urethane Adhesive WS-292FK	0.000	0.000	0.000	0.000	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
20	3	11	Sidelite Door Line (SL4B / SL8)	Urethane Curative B-1M	0.000	0.000	0.000	0.000	0.101	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
20	4	11	Sidelite Door Line (SL4B / SL8)	Isopropanol	0.000	0.000	0.000	0.000	0.276	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
21	1	11	Sidelite Bonding Line (2015) (SL2)	Clear Glass Primer 43518	0.000	0.000	0.000	0.000	0.088	0.000	0.043	0.043	0.000	0.000	0.000	0.000	0.000	0.086	0.000
21	2	11	Sidelite Bonding Line (2015) (SL2)	Black Glass Primer 43520A	0.000	0.000	0.000	0.000	0.103	0.000	0.000	0.026	0.002	0.002	0.002	0.000	0.000	0.032	0.000
21	3	11	Sidelite Bonding Line (2015) (SL2)	Urethane Adhesive x2500 A Plus	0.000	0.000	0.000	0.000	0.008	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.000
21	4	11	Sidelite Bonding Line (2015) (SL2)	Urethane Curative x2500 B Plus	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
21	5	11	Sidelite Bonding Line (2015) (SL2)	Glass Cleaner, Isopropanol	0.000	0.000	0.000	0.000	0.044	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
22	1	10	Line 2A - Large SL option (previously 2AL)	Pliogrip 7655 Adhesive	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
22	2	10	Line 2A - Large SL option (previously 2AL)	Pliogrip 7400 Adhesive	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
22	3	10	Line 2A - Large SL option (previously 2AL)	Clear Glass Primer 43518	0.000	0.000	0.000	0.000	0.168	0.000	0.082	0.082	0.000	0.000	0.000	0.000	0.000	0.164	0.000
22	4	10	Line 2A - Large SL option (previously 2AL)	Black Glass Primer 43520A	0.000	0.000	0.000	0.000	0.590	0.000	0.000	0.152	0.010	0.010	0.010	0.000	0.000	0.182	0.000
22	5	10	Line 2A - Large SL option (previously 2AL)	Glass Cleaner, Isopropanol	0.000	0.000	0.000	0.000	0.047	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
23	1	10	Line 2B (Qtr)	Pliogrip 7655 Adhesive	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
23	2	10	Line 2B (Qtr)	Pliogrip 7400 Adhesive	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
23	3	10	Line 2B (Qtr)	Clear Glass Primer 43518	0.000	0.000	0.000	0.000	0.093	0.000	0.046	0.046	0.000	0.000	0.000	0.000	0.000	0.091	0.000
23	4	10	Line 2B (Qtr)	Black Glass Primer 43520A	0.000	0.000	0.000	0.000	0.317	0.000	0.000	0.082	0.005	0.005	0.005	0.000	0.000	0.098	0.000
23	5	10	Line 2B (Qtr)	Glass Cleaner, Isopropanol	0.000	0.000	0.000	0.000	0.047	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
24	1	12	Line 7 (BL)	Betaseal 58702SFHN	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000
24	2	12	Line 7 (BL)	Clear Glass Primer 43518	0.000	0.000	0.000	0.000	0.086	0.000	0.042	0.042	0.000	0.000	0.000	0.000	0.000	0.084	0.000
24	3	12	Line 7 (BL)	Black Glass Primer 43520A	0.000	0.000	0.000	0.000	0.134	0.000	0.000	0.034	0.002	0.002	0.002	0.000	0.000	0.041	0.000
24	4	12	Line 7 (BL)	Solder	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
24	5	12	Line 7 (BL)	Flux	0.000	0.000	0.000	0.000	0.027	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.002	0.000
24	6	12	Line 7 (BL)	Glass Cleaner, Isopropanol	0.000	0.000	0.000	0.000	0.036	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
25	1	10	Line 17 (WS)	Betaseal 58702SFHN	0.000	0.000	0.000	0.000	0.005	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.000
25	2	10	Line 17 (WS)	Clear Glass Primer 43518	0.000	0.000	0.000	0.000	0.114	0.000	0.056	0.056	0.000	0.000	0.000	0.000	0.000	0.112	0.000
25	3	10	Line 17 (WS)	Black Glass Primer 43520A	0.000	0.000	0.000	0.000	0.418	0.000	0.000	0.107	0.007	0.007	0.007	0.000	0.000	0.129	0.000

Table 2
Vitro Automotive Glass AI #2846
Berea, Kentucky
Hourly Emissions (lb/hr)

EP#	Process ID	Stack	EP Description	Process Description	CO_2	CO	NO_2	SO_2	VOC	MDI	Methanol	Toluene	Xylene	HDI	TDI	Methyl Isobutyl Ketone	Lead	HAP	PM/ PM10
25	4	10	Line 17 (WS)	Glass Cleaner, Isopropanol	0.000	0.000	0.000	0.000	0.036	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
26	1	12	Line 18 (WS)	Urethane Adhesive x2500 A Plus	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000
26	2	12	Line 18 (WS)	Urethane Curative x2500 B Plus	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
26	3	12	Line 18 (WS)	Clear Glass Primer 43518	0.000	0.000	0.000	0.000	0.143	0.000	0.070	0.070	0.000	0.000	0.000	0.000	0.000	0.140	0.000
26	4	12	Line 18 (WS)	Black Glass Primer 43520A	0.000	0.000	0.000	0.000	0.351	0.000	0.000	0.090	0.006	0.006	0.006	0.000	0.000	0.108	0.000
26	5	12	Line 18 (WS)	Glass Cleaner, Isopropanol	0.000	0.000	0.000	0.000	0.036	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
IA 3	1	10	Sidelite Bonding Line (2014) (SL1) - 43518 & 43520A Option	Clear Glass Primer 43518	0.000	0.000	0.000	0.000	0.088	0.000	0.043	0.043	0.000	0.000	0.000	0.000	0.000	0.086	0.000
IA 3	2	10	Sidelite Bonding Line (2014) (SL1) - 43518 & 43520A Option	Black Glass Primer 43520A	0.000	0.000	0.000	0.000	0.103	0.000	0.000	0.015	0.001	0.001	0.001	0.000	0.000	0.019	0.000
IA 3	3	10	Sidelite Bonding Line (2014) (SL1) - 43518 & 43520A Option	Urethane Adhesive x2500 A Plus	0.000	0.000	0.000	0.000	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
IA 3	4	10	Sidelite Bonding Line (2014) (SL1) - 43518 & 43520A Option	Urethane Curative x2500 B Plus	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
IA 3	5	10	Sidelite Bonding Line (2014) (SL1) - 43518 & 43520A Option	Glass Cleaner, Isopropanol	0.000	0.000	0.000	0.000	0.044	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
IA 1	1	IA	Space heaters (28 units) 4.87 MMBtu/hr total	Natural Gas Usage	572.941	0.401	0.477	0.477	0.026	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.036
IA 2	1	10	Line 1 - 31XXN option	Clear Glass Primer 43518	0.000	0.000	0.000	0.000	0.029	0.000	0.014	0.014	0.000	0.000	0.000	0.000	0.000	0.028	0.000
IA 2	2	10	Line 1 - 31XXN option	Black Glass Primer 43520A	0.000	0.000	0.000	0.000	0.176	0.000	0.000	0.045	0.003	0.003	0.003	0.000	0.000	0.054	0.000
IA 2	3	10	Line 1 - 31XXN option	Glass Cleaner, Isopropanol	0.000	0.000	0.000	0.000	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
IA 4	2	11	Quarter Window Bonding Line (2015) (QW1)	Clear Glass Primer 43518	0.000	0.000	0.000	0.000	0.022	0.000	0.011	0.011	0.000	0.000	0.000	0.000	0.000	0.021	0.000
IA 5	1	IA	Westward Cold Cleaner	N/A	0.000	0.000	0.000	0.000	0.015	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
IA 6	1	IA	Diesel Storage Tank, 280 gallon	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
IA 7	1	IA	MIG Welding Table	Electrode	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.960
IA 8	1	10	Sequoia Sidelite (SL7)	Urethane Adhesive x2500 A Plus	0.000	0.000	0.000	0.000	0.010	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.010	0.000
IA 8	2	10	Sequoia Sidelite (SL7)	Urethane Curative x2500 B Plus	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
IA 8	3	10	Sequoia Sidelite (SL7)	Glass Cleaner, Isopropanol	0.000	0.000	0.000	0.000	0.255	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
IA 8	5	10	Sequoia Sidelite (SL7)	Electrical Connector	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
IA 8	6	10	Sequoia Sidelite (SL7)	Black Glass Primer, Betaprime 5500	0.000	0.000	0.000	0.000	0.260	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.000
IA 9	1	10	Line 6/6A BL w/ soldering	Solder	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.46E-05	0.000	0.000
IA 9	2	10	Line 6/6A BL w/ soldering	Flux	0.000	0.000	0.000	0.000	0.172	0.000	0.000	0.000	0.000	0.000	0.000	0.011	0.000	0.011	0.000
Source-wide	1		Isopropanol for Cleaning	Isopropanol	0.000	0.000	0.000	0.000	0.380	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Table 3
Vitro Automotive Glass AI #2846
Berea, Kentucky
Emission Factors

EP#	Process ID	Stack	EP Description	Process Description	Emission Factor Units	Capacity (parts/hr)	Throughput (SCC unit/hr)	Usage per Part (gram/part)	Usage Per Part (gal/part)	Density (lb/gal)	CO_2	CO	NO_2	SO_2	VOC	MDI	Methanol	Toluene	Xylene	HDI	TDI	Methyl Isobutyl Ketone	Lead	HAP	PM/ PM10	Emission Factor Reference
1	1	EG 1	Emergency Generator	Diesel Usage	lb/1000 gal	-	0.00884	-	-	-	22,468.00	130.15	604.17	39.73	47.95	-	-	-	-	-	-	-	-	-	42.47	AP 42
4	1	EP 4	Clip Priming (2 Stations) - 43533	Body Primer 43533	lb/gal	1000	0.245	0.90	2.45E-04	8.09	-	-	-	-	4.90	0.40	-	-	-	-	-	-	-	0.40	-	SDS
4	1	EP 4	Clip Priming (2 Stations) - RC-50E	RC-50E Body Primer	lb/gal	1000	0.242	0.90	2.42E-04	8.20	-	-	-	-	6.40	0.07	-	-	-	-	-	-	-	0.07	-	SDS
10	1	11	Sidelite Assembly Line A (SL3)	Clear Glass Primer 43518	lb/gal	225	0.031	0.44	1.39E-04	6.97	-	-	-	-	6.94	-	3.40	3.40	-	-	-	-	-	6.80	-	SDS
10	2	11	Sidelite Assembly Line A (SL3)	Urethane Adhesive WS-292FK	lb/gal	225	0.664	14.03	2.95E-03	10.48	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	SDS
10	3	11	Sidelite Assembly Line A (SL3)	Urethane Curative B-1M	lb/gal	225	0.646	13.89	2.87E-03	10.66	-	-	-	-	0.14	-	-	-	-	-	-	-	-	-	-	SDS
11	1	11	Sidelite Assembly Line B (SL4)	Clear Glass Primer 43518	lb/gal	300	0.042	0.44	1.39E-04	6.97	-	-	-	-	6.94	-	3.40	3.40	-	-	-	-	-	6.80	-	SDS
11	2	11	Sidelite Assembly Line B (SL4)	Urethane Adhesive WS-292FK	lb/gal	300	0.885	14.03	2.95E-03	10.48	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	SDS
11	3	11	Sidelite Assembly Line B (SL4)	Urethane Curative B-1M	lb/gal	300	0.862	13.89	2.87E-03	10.66	-	-	-	-	0.14	-	-	-	-	-	-	-	-	-	-	SDS
11	4	11	Sidelite Assembly Line B (SL4)	Isopropanol	lb/gal	300	0.050	0.50	1.66E-04	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
12	1	11	Sidelite Door Cell (SL6) - YH America AN-1M Option	Clear Glass Primer 43518	lb/gal	225	0.047	0.66	2.08E-04	6.97	-	-	-	-	6.94	-	3.40	3.40	-	-	-	-	-	6.80	-	SDS
12	2	11	Sidelite Door Cell (SL6) - YH America AN-1M Option	Urethane Adhesive WS-242FK	lb/gal	225	1.313	28.05	5.83E-03	10.60	-	-	-	-	0.04	-	-	-	-	-	-	-	-	-	-	SDS
12	3	11	Sidelite Door Cell (SL6) - YH America AN-1M Option	Urethane Curative AN-1M	lb/gal	225	1.016	21.71	4.52E-03	10.60	-	-	-	-	0.53	-	-	-	-	-	-	-	-	-	-	SDS
12	1	11	Sidelite Door Cell (SL6) - YH America B-1M Option	Clear Glass Primer 43518	lb/gal	225	0.031	0.44	1.39E-04	6.97	-	-	-	-	6.94	-	3.40	3.40	-	-	-	-	-	6.80	-	SDS
12	2	11	Sidelite Door Cell (SL6) - YH America B-1M Option	Urethane Adhesive WS-292FK	lb/gal	225	0.664	14.03	2.95E-03	10.48	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	SDS
12	3	11	Sidelite Door Cell (SL6) - YH America B-1M Option	Urethane Curative B-1M	lb/gal	225	0.646	13.89	2.87E-03	10.66	-	-	-	-	0.14	-	-	-	-	-	-	-	-	-	-	SDS
13	1	6	Clip Priming Station - 43533	Body Primer 43533	lb/gal	800	0.336	1.54	4.19E-04	8.09	-	-	-	-	4.90	0.40	-	-	-	-	-	-	-	0.40	-	SDS
13	2	6	Clip Priming Station - RC-50E	RC-50E Body Primer	lb/gal	800	0.331	1.54	4.14E-04	8.20	-	-	-	-	6.40	0.07	-	-	-	-	-	-	-	0.07	-	SDS
14	1	11	Backlite Assembly Line (BL2)	Clear Glass Primer 43518	lb/gal	65	0.051	2.50	7.91E-04	6.97	-	-	-	-	6.94	-	3.40	3.40	-	-	-	-	-	6.80	-	SDS
14	2	11	Backlite Assembly Line (BL2)	Black Glass Primer 43520A	lb/gal	65	0.130	7.50	2.00E-03	8.26	-	-	-	-	4.82	-	-	1.24	0.08	0.08	0.08	-	-	1.49	-	SDS
14	3	11	Backlite Assembly Line (BL2)	Electrical Connector	lb/lb	260	0.029	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00	Process knowledge [1]
14	1	11	Backlite Bonding Line w/ Soldering (2015) (BL1)	Clear Glass Primer 43518	lb/gal	50	0.011	0.70	2.21E-04	6.97	-	-	-	-	6.94	-	3.40	3.40	-	-	-	-	-	6.80	-	SDS
14	2	11	Backlite Bonding Line w/ Soldering (2015) (BL1)	Black Glass Primer 43520A	lb/gal	50	0.053	4.00	1.07E-03	8.26	-	-	-	-	4.82	-	-	1.24	0.08	0.08	0.08	-	-	1.49	-	SDS
14	3	11	Backlite Bonding Line w/ Soldering (2015) (BL1)	Glass Cleaner, Isopropanol	lb/gal	50	0.002	0.10	3.32E-05	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
14	4	11	Backlite Bonding Line w/ Soldering (2015) (BL1)	Electrical Connector	lb/lb	100	0.022	0.10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00	Process knowledge [1]
14	1	11	Backlite Bonding Line w/ Soldering (2015) (BL1) - IPA & 550 Option	Isopropanol, Pre Wipe	lb/gal	50	0.012	0.70	2.32E-04	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
14	2	11	Backlite Bonding Line w/ Soldering (2015) (BL1) - IPA & 550 Option	Black Glass Primer, Betaprime 5500	lb/gal	50	0.056	4.00	1.11E-03	7.93	-	-	-	-	4.95	0.08	-	-	-	-	-	-	-	0.08	-	SDS
14	3	11	Backlite Bonding Line w/ Soldering (2015) (BL1) - IPA & 550 Option	Glass Cleaner, Isopropanol	lb/gal	50	0.002	0.10	3.32E-05	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
14	4	11	Backlite Bonding Line w/ Soldering (2015) (BL1) - IPA & 550 Option	Electrical Connector	lb/lb	100	0.022	0.10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00	Process knowledge [1]
15	1	8	Quarter Assembly Line (SL5)	Clear Glass Primer 43518	lb/gal	70	0.033	1.50	4.74E-04	6.97	-	-	-	-	6.94	-	3.40	3.40	-	-	-	-	-	6.80	-	SDS
15	2	8	Quarter Assembly Line (SL5)	Black Glass Primer 43520A	lb/gal	70	0.093	5.00	1.33E-03	8.26	-	-	-	-	4.82	-	-	1.24	0.08	0.08	0.08	-	-	1.49	-	SDS
15	3	8	Quarter Assembly Line (SL5)	Electrical Connector	lb/lb	280	0.031	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00	Process knowledge [1]
16	1	6	Windshield Assembly Line 1 (WS2)	Clear Glass Primer 43518	lb/gal	75	0.059	2.50	7.91E-04	6.97	-	-	-	-	6.94	-	3.40	3.40	-	-	-	-	-	6.80	-	SDS
16	2	6	Windshield Assembly Line 1 (WS2)	Black Glass Primer 43520A	lb/gal	75	0.150	7.50	2.00E-03	8.26	-	-	-	-	4.82	-	-	1.24	0.08	0.08	0.08	-	-	1.49	-	SDS
16	3	6	Windshield Assembly Line 1 (WS2)	Body Primer 43533	lb/gal	75	0.018	0.858	2.34E-04	8.09	-	-	-	-	4.90	0.40	-	-	-	-	-	-	-	0.40	-	SDS
16	4	6	Windshield Assembly Line 1 (WS2)	Urethane Adhesive x2500 A Plus	lb/gal	75	0.210	13.572	2.80E-03	10.68	-	-	-	-	0.05	0.05	-	-	-	-	-	-	-	0.05	-	SDS
16	5	6	Windshield Assembly Line 1 (WS2)	Urethane Curative x2500 B Plus	lb/gal	75	0.228	13.784	3.04E-03	10.01	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	SDS
16	6	6	Windshield Assembly Line 1 (WS2)	Isopropanol	lb/gal	75	0.012	0.5	1.66E-04	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
18	1	7	Windshield Assembly Line 2 (WS1) - 500B Option	Clear Glass Primer 43518	lb/gal	75	0.059	2.50	7.91E-04	6.97	-	-	-	-	6.94	-	3.40	3.40	-	-	-	-	-	6.80	-	SDS
18	2	7	Windshield Assembly Line 2 (WS1) - 500B Option	Black Glass Primer 43520A	lb/gal	75	0.150	7.50	2.00E-03	8.26	-	-	-	-	4.82	-	-	1.24	0.08	0.08	0.08	-	-	1.49	-	SDS
18	3	7	Windshield Assembly Line 2 (WS1) - 500B Option	Body Primer 43533	lb/gal	75	0.020	1.001	2.73E-04	8.09	-	-	-	-	4.90	0.40	-	-	-	-	-	-	-	0.40	-	SDS
18	4	7	Windshield Assembly Line 2 (WS1) - 500B Option	Aron Mighty	lb/gal	75	0.0078	0.315	1.04E-04	6.68	-	-	-	-	4.98	-	0.53	-	-	-	-	-	-	0.53	-	SDS
18	5	7	Windshield Assembly Line 2 (WS1) - 500B Option	Urethane Adhesive x2500 A Plus	lb/gal	75	0.210	13.572	2.80E-03	10.68	-	-	-	-	0.05	0.05	-	-	-	-	-	-	-	0.05	-	SDS
18	6	7	Windshield Assembly Line 2 (WS1) - 500B Option	Urethane Curative x2500 B Plus	lb/gal	75	0.228	13.784	3.04E-03	10.01	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	SDS
18	7	7	Windshield Assembly Line 2 (WS1) - 500B Option	Isopropanol	lb/gal	75	0.012	0.5	1.66E-04	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
18	1	7	Windshield Assembly Line 2 (WS1) - C1UG/C1UH Option	Clear Glass Primer 43518	lb/gal	75	0.059	2.5	7.91E-04	6.97	-	-	-	-	6.94	-	3.40	3.40	-	-	-	-	-	6.80	-	SDS
18	2	7	Windshield Assembly Line 2 (WS1) - C1UG/C1UH Option	Black Glass Primer 43520A	lb/gal	75	0.150	7.5	2.00E-03	8.26	-	-	-	-	4.82	-	-	1.24	0.08	0.08	0.08	-	-	1.49	-	SDS
18	3	7	Windshield Assembly Line 2 (WS1) - C1UG/C1UH Option	Body Primer 43533	lb/gal	75	0.002	0.095	2.59E-05	8.09	-	-	-	-	4.90	0.40	-	-	-	-	-	-	-	0.40	-	SDS
18	4	7	Windshield Assembly Line 2 (WS1) - C1UG/C1UH Option	Urethane Adhesive x2500 A Plus	lb/gal	75	0.210	13.572	2.80E-03	10.68	-	-	-	-	0.05	0.05	-	-	-	-	-	-	-	0.05	-	SDS
18	5	7	Windshield Assembly Line 2 (WS1) - C1UG/C1UH Option	Urethane Curative x2500 B Plus	lb/gal	75	0.228	13.784	3.04E-03	10.01	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	SDS
18	6	7	Windshield Assembly Line 2 (WS1) - C1UG/C1UH Option	Isopropanol	lb/gal	75	0.012	0.5	1.66E-04	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
20	1	11	Sidelite Door Line (SL4B / SL8)	Clear Glass Primer 43518	lb/gal	250	0.035	0.44	1.39E-04	6.97	-	-	-	-	6.94	-	3.40	3.40	-	-	-	-	-	6.80	-	SDS
20	2	11	Sidelite Door Line (SL4B / SL8)	Urethane Adhesive WS-292FK	lb/gal	250	0.738	14.03	2.95E-03	10.48	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	SDS
20	3	11	Sidelite Door Line (SL4B / SL8)	Urethane Curative B-1M	lb/gal	250	0.718	13.89	2.87E-03	10.66	-	-	-	-	0.14	-	-	-	-	-	-	-	-	-	-	SDS
20	4	11	Sidelite Door Line (SL4B / SL8)	Isopropanol	lb/gal	250	0.041	0.50	1.66E-04	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
21	1	11	Sidelite Bonding Line (2015) (SL2)	Clear Glass Primer 43518	lb/gal	200	0.013	0.2	6.33E-05	6.97	-	-	-	-	6.94	-	3.40	3.40	-	-	-	-	-	6.80	-	SDS
21	2	11	Sidelite Bonding Line (2015) (SL2)	Black Glass Primer 43520A	lb/gal	200	0.021	0.4	1.07E-04	8.26	-	-	-	-	4.82	-	-	1.24	0.08	0.08	0.08	-	-	1.49	-	SDS
21	3	11	Sidelite Bonding Line (2015) (SL2)	Urethane Adhesive x2500 A Plus	lb/gal	200	0.165	4	8.26E-04	10.68	-	-	-	-	0.05	0.05	-	-	-	-	-	-	-	0.05	-	SDS
21	4	11	Sidelite Bonding Line (2015) (SL2)	Urethane Curative x2500 B Plus	lb/gal	200	0.176	4	8.81E-04	10.01	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	SDS
21	5	11	Sidelite Bonding Line (2015) (SL2)	Glass Cleaner, Isopropanol	lb/gal	200	0.007	0.1	3.32E-05	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
21	1	11	Sidelite Bonding Line (2015) (SL2) - IPA & 5500 Option	Isopropanol, Pre Wipe	lb/gal	200	0.007	0.1	3.32E-05	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
21	2	11	Sidelite Bonding Line (2015) (SL2) - IPA & 5500 Option	Black Glass Primer, Betaprime 5500	lb/gal	200	0.022	0.4	1.11E-04	7.93	-	-	-	-	4.95	0.08	-	-	-	-	-	-	-	0.08	-	SDS
21	3	11	Sidelite Bonding Line (2015) (SL2) - IPA & 5500 Option	Urethane Adhesive x2500 A Plus	lb/gal	200	0.165	4	8.26E-04	10.68	-	-	-	-	0.05	0.05	-	-	-	-	-	-	-	0.05	-	SDS
21	4	11	Sidelite Bonding Line (2015) (SL2) - IPA & 5500 Option	Urethane Curative x2500 B Plus	lb/gal	200	0.176	4	8.81E-04	10.01	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	SDS
21	5	11	Sidelite Bonding Line (2015) (SL2) - IPA & 5500 Option	Glass Cleaner, Isopropanol	lb/gal	200	0.007	0.1	3.32E-05	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
21	1	11	Sidelite Bonding Line (2015) (SL2) - YH America Primerless WS-292-A Option	Isopropanol, Pre Wipe	lb/gal	200	0.007	0.1	3.32E-05	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
21	2	11	Sidelite Bonding Line (2015) (SL2) - YH America Primerless WS-292-A Option	Urethane Adhesive WS-292FK	lb/gal	200	0.151	3.6	7.57E-04	10.48	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	SDS
21	3	11	Sidelite Bonding Line (2015) (SL2) - YH America Primerless WS-292-A Option	Urethane Curative B-1M	lb/gal	200	0.015	0.36	7.45E-05	10.66	-	-	-	-	0.14	-	-	-	-	-	-	-	-	-	-	SDS
21	4	11	Sidelite Bonding Line (2015) (SL2) - YH America Primerless WS-292-A Option	Glass Cleaner, Isopropanol	lb/gal	200	0.007	0.1	3.32E-05	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
21	1	11	Sidelite Bonding Line (2015) (SL2) - IPA & 5500 Option 2	Isopropanol	lb/gal	200	0.020	0.3	9.95E-05	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
21	2	11	Sidelite Bonding Line (2015) (SL2) - IPA & 5500 Option 2	Black Glass Primer, Betaprime 5500	lb/gal	200	0.028	0.5	1.39E-04	7.93	-	-	-	-	4.95	0.08	-	-	-	-	-	-	-	0.08	-	SDS
21	3	11	Sidelite Bonding Line (2015) (SL2) - IPA & 5500 Option 2	Urethane Adhesive x2500 A Plus	lb/gal	200	0.155	3.75	7.74E-04	10.68	-	-	-	-	0.05	0.05	-	-	-	-	-	-	-	0.05	-	SDS
21	4	11	Sidelite Bonding Line (2015) (SL2) - IPA & 5500 Option 2	Urethane Curative x2500 B Plus	lb/gal	200	0.165	3.75	8.26E-04	10.01	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	SDS
22	1	10	Line 2A - Small SL option	Pliogrip 7655 Adhesive	lb/gal	85	0.007	0.4	8.39E-05	10.51	-	-	-	-	0.01	0.01	-	-	-	-	-	-	-	0.01	-	SDS
22	2	10	Line 2A - Small SL option	Pliogrip 7400 Adhesive	lb/gal	85	0.007	0.4	8.20E-05	10.75	-	-	-	-	0.01	0.01	-	-	-	-	-	-	-	0.01	-	SDS
22	3	10	Line 2A - Small SL option	Clear Glass Primer 43518	lb/gal	85	0.013	0.5	1.58E-04	6.97	-	-	-	-	6.94	-	3.40	3.40	-	-	-	-	-	6.80	-	SDS
22	4	10	Line 2A - Small SL option	Black Glass Primer 43520A	lb/gal	85	0.066	2.9	7.74E-04	8.26	-	-	-	-	4.82	-	-	1.24	0.08	0.08	0.08	-	-	1.49	-	SDS
22	5	10	Line 2A - Small SL option	Glass Cleaner, Isopropanol	lb/gal	85	0.007	0.25	8.29E-05	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
22	1	10	Line 2A - Medium SL option (previously 2AL)	Pliogrip 7655 Adhesive	lb/gal	85	0.007	0.4	8.39E-05	10.51	-	-	-	-	0.01	0.01	-	-	-	-	-	-	-	0.01	-	SDS
22	2	10	Line 2A - Medium SL option (previously 2AL)	Pliogrip 7400 Adhesive	lb/gal	85	0.007	0.4	8.20E-05	10.75	-	-	-	-	0.01	0.01	-	-	-	-	-	-	-	0.01	-	SDS
22	3	10	Line 2A - Medium SL option (previously 2AL)	Clear Glass Primer 43518	lb/gal	85	0.016	0.6	1.90E-04	6.97	-	-	-	-	6.94	-	3.40	3.40	-	-	-	-	-	6.80	-	SDS
22	4	10	Line 2A - Medium SL option (previously 2AL)	Black Glass Primer 43520A	lb/gal	85	0.109	4.8	1.28E-03	8.26	-	-	-	-	4.82	-	-	1.24	0.08	0.08	0.08	-	-	1.49	-	SDS
22	5	10	Line 2A - Medium SL option (previously 2AL)	Glass Cleaner, Isopropanol	lb/gal	85	0.007	0.25	8.29E-05	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
22	1	10	Line 2A - Large SL option (previously 2AL)	Pliogrip 7655 Adhesive	lb/gal	85	0.007	0.4	8.39E-05	10.51	-	-	-	-	0.01	0.01	-	-	-	-	-	-	-	0.01	-	SDS
22	2	10	Line 2A - Large SL option (previously 2AL)	Pliogrip 7400 Adhesive	lb/gal	85	0.007	0.4	8.20E-05	10.75	-	-	-	-	0.01	0.01	-	-	-	-	-	-	-	0.01	-	SDS
22	3	10	Line 2A - Large SL option (previously 2AL)	Clear Glass Primer 43518	lb/gal	85	0.024	0.9	2.85E-04	6.97	-	-	-	-	6.94	-	3.40	3.40	-	-	-	-	-	6.80	-	SDS
22	4	10	Line 2A - Large SL option (previously 2AL)	Black Glass Primer 43520A	lb/gal	85	0.122	5.4	1.44E-03	8.26	-	-	-	-	4.82	-	-	1.24	0.08	0.08	0.08	-	-	1.49	-	SDS
22	5	10	Line 2A - Large SL option (previously 2AL)	Glass Cleaner, Isopropanol	lb/gal	85	0.007	0.25	8.29E-05	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
23	1	10	Line 2B (Qtr)	Pliogrip 7655 Adhesive	lb/gal	85	0.007	0.4	8.39E-05	10.51	-	-	-	-	0.01	0.01	-	-	-	-	-	-	-	0.01	-	SDS
23	2	10	Line 2B (Qtr)	Pliogrip 7400 Adhesive	lb/gal	85	0.007	0.4	8.20E-05	10.75	-	-	-	-	0.01	0.01	-	-	-	-	-	-	-	0.01	-	SDS
23	3	10	Line 2B (Qtr)	Clear Glass Primer 43518	lb/gal	85	0.013	0.5	1.58E-04	6.97	-	-	-	-	6.94	-	3.40	3.40	-	-	-	-	-	6.80	-	SDS
23	4	10	Line 2B (Qtr)	Black Glass Primer 43520A	lb/gal	85	0.066	2.9	7.74E-04	8.26	-	-	-	-	4.82	-	-	1.24	0.08	0.08	0.08	-	-	1.49	-	SDS
23	5	10	Line 2B (Qtr)	Glass Cleaner, Isopropanol	lb/gal	85	0.007	0.25	8.29E-05	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
24	1	12	Line 7 (BL)	Betaseal 58702SFHN	lb/gal	65	0.020	1.4	3.13E-04	9.85	-	-	-	-	0.07	0.07	-	-	-	-	-	-	-	0.07	-	SDS
24	2	12	Line 7 (BL)	Clear Glass Primer 43518	lb/gal	65	0.012	0.6	1.90E-04	6.97	-	-	-	-	6.94	-	3.40	3.40	-	-	-	-	-	6.80	-	SDS
24	3	12	Line 7 (BL)	Black Glass Primer 43520A	lb/gal	65	0.028	1.6	4.27E-04	8.26	-	-	-	-	4.82	-	-	1.24	0.08	0.08	0.08	-	-	1.49	-	SDS
24	4	12	Line 7 (BL)	Solder	lb/ton	65	4.30E-05	0.6		N/A	-	-	-	-	-	-	-	-	-	-	-	-	1.50	-	2.42	SDS
24	5	12	Line 7 (BL)	Flux	lb/gal	65	0.005	0.25	7.42E-05	7.43	-	-	-	-	5.66	-	-	-	-	-	-	0.37	-	0.37	-	SDS
24	6	12	Line 7 (BL)	Glass Cleaner, Isopropanol	lb/gal	65	0.005	0.25	8.29E-05	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
25	1	10	Line 17 (WS)	Betaseal 58702SFHN	lb/gal	65	0.073	5	1.12E-03	9.85	-	-	-	-	0.07	0.07	-	-	-	-	-	-	-	0.07	-	SDS
25	2	10	Line 17 (WS)	Clear Glass Primer 43518	lb/gal	65	0.016	0.8	2.53E-04	6.97	-	-	-	-	6.94	-	3.40	3.40	-	-	-	-	-	6.80	-	SDS
25	3	10	Line 17 (WS)	Black Glass Primer 43520A	lb/gal	65	0.087	5	1.33E-03	8.26	-	-	-	-	4.82	-	-	1.24	0.08	0.08	0.08	-	-	1.49	-	SDS
25	4	10	Line 17 (WS)	Glass Cleaner, Isopropanol	lb/gal	65	0.005	0.25	8.29E-05	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
26	1	12	Line 18 (WS)	Urethane Adhesive x2500 A Plus	lb/gal	65	0.018	1.35	2.79E-04	10.68	-	-	-	-	0.05	0.05	-	-	-	-	-	-	-	0.05	-	SDS
26	2	12	Line 18 (WS)	Urethane Curative x2500 B Plus	lb/gal	65	0.019	1.35	2.97E-04	10.01	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	SDS
26	3	12	Line 18 (WS)	Clear Glass Primer 43518	lb/gal	65	0.021	1	3.16E-04	6.97	-	-	-	-	6.94	-	3.40	3.40	-	-	-	-	-	6.80	-	SDS
26	4	12	Line 18 (WS)	Black Glass Primer 43520A	lb/gal	65	0.073	4.2	1.12E-03	8.26	-	-	-	-	4.82	-	-	1.24	0.08	0.08	0.08	-	-	1.49	-	SDS
26	5	12	Line 18 (WS)	Glass Cleaner, Isopropanol	lb/gal	65	0.005	0.25	8.29E-05	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS

Table 3
Vitro Automotive Glass AI #2846
Berea, Kentucky
Emission Factors

EP#	Process ID	Stack	EP Description	Process Description	Emission Factor Units	Capacity (parts/hr)	Throughput (SCC unit/hr)	Usage per Part (gram/part)	Usage Per Part (gal/part)	Density (lb/gal)	CO_2	CO	NO_2	SO_2	VOC	MDI	Methanol	Toluene	Xylene	HDI	TDI	Methyl Isobutyl Ketone	Lead	HAP	PM/ PM10	Emission Factor Reference
IA 3	1		Sidelite Bonding Line (2014) (SL1) - 43518 & 43520A Option	Clear Glass Primer 43518	lb/gal	200	0.013	0.2	6.33E-05	6.97	-	-	-	-	6.94	-	3.40	3.40	-	-	-	-	-	6.80	-	SDS
IA 3	2		Sidelite Bonding Line (2014) (SL1) - 43518 & 43520A Option	Black Glass Primer 43520A	lb/gal	200	0.021	0.4	1.07E-04	8.26	-	-	-	-	4.82	-	-	1.24	0.08	0.08	0.08	-	-	1.49	-	SDS
IA 3	3		Sidelite Bonding Line (2014) (SL1) - 43518 & 43520A Option	Urethane Adhesive x2500 A Plus	lb/gal	200	0.165	4	8.26E-04	10.68	-	-	-	-	0.05	0.05	-	-	-	-	-	-	-	0.05	-	SDS
IA 3	4		Sidelite Bonding Line (2014) (SL1) - 43518 & 43520A Option	Urethane Curative x2500 B Plus	lb/gal	200	0.176	4	8.81E-04	10.01	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	SDS
IA 3	5		Sidelite Bonding Line (2014) (SL1) - 43518 & 43520A Option	Glass Cleaner, Isopropanol	lb/gal	200	0.007	0.1	3.32E-05	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
IA 3	1		Sidelite Bonding Line (2014) (SL1) - IPA & 5500 Option	Isopropanol, Pre Wipe	lb/gal	200	0.007	0.1	3.32E-05	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
IA 3	2		Sidelite Bonding Line (2014) (SL1) - IPA & 5500 Option	Black Glass Primer, Betaprime 5500	lb/gal	200	0.022	0.4	1.11E-04	7.93	-	-	-	-	4.95	0.08	-	-	-	-	-	-	-	0.08	-	SDS
IA 3	3		Sidelite Bonding Line (2014) (SL1) - IPA & 5500 Option	Urethane Adhesive x2500 A Plus	lb/gal	200	0.165	4	8.26E-04	10.68	-	-	-	-	0.05	0.05	-	-	-	-	-	-	-	0.05	-	SDS
IA 3	4		Sidelite Bonding Line (2014) (SL1) - IPA & 5500 Option	Urethane Curative x2500 B Plus	lb/gal	200	0.176	4	8.81E-04	10.01	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	SDS
IA 3	5		Sidelite Bonding Line (2014) (SL1) - IPA & 5500 Option	Glass Cleaner, Isopropanol	lb/gal	200	0.007	0.1	3.32E-05	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
IA 3	1		Sidelite Bonding Line (2014) (SL1) - YH America Primerless WS-292-A Option	Isopropanol, Pre Wipe	lb/gal	200	0.007	0.1	3.32E-05	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
IA 3	2		Sidelite Bonding Line (2014) (SL1) - YH America Primerless WS-292-A Option	Urethane Adhesive WS-292FK	lb/gal	200	0.151	3.6	7.57E-04	10.48	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	SDS
IA 3	3		Sidelite Bonding Line (2014) (SL1) - YH America Primerless WS-292-A Option	Urethane Curative B-1M	lb/gal	200	0.015	0.36	7.45E-05	10.66	-	-	-	-	0.14	-	-	-	-	-	-	-	-	-	-	SDS
IA 3	4		Sidelite Bonding Line (2014) (SL1) - YH America Primerless WS-292-A Option	Glass Cleaner, Isopropanol	lb/gal	200	0.007	0.1	3.32E-05	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
IA 1	1		Space heaters (28 units) 4.87 MMBtu/hr total	Natural Gas Usage	lb/MMSCF		4.77E-03	-	-	N/A	120,000	84	100	0.60	5.50	-	-	-	-	-	-	-	-	-	7.60	AP 42 Table 1.4-2
IA 2	1	10	Line 1 - GMT610 option	Glasgrip 7780 Primer	lb/gal	65	0.004	0.2	6.34E-05	6.96	-	-	-	-	6.82	-	3.41	3.41	-	-	-	-	-	6.82	-	SDS
IA 2	2	10	Line 1 - GMT610 option	Pliogrip 7655 Adhesive	lb/gal	65	0.031	2.25	4.72E-04	10.51	-	-	-	-	0.01	0.01	-	-	-	-	-	-	-	0.01	-	SDS
IA 2	3	10	Line 1 - GMT610 option	Pliogrip 7400 Adhesive	lb/gal	65	0.030	2.25	4.61E-04	10.75	-	-	-	-	0.01	0.01	-	-	-	-	-	-	-	0.01	-	SDS
IA 2	4	10	Line 1 - GMT610 option	Isopropanol	lb/gal	65	0.011	0.5	1.66E-04	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
IA 2	1	10	Line 1 - 31XXN option	Clear Glass Primer 43518	lb/gal	65	0.004	0.2	6.33E-05	6.97	-	-	-	-	6.94	-	3.40	3.40	-	-	-	-	-	6.80	-	SDS
IA 2	2	10	Line 1 - 31XXN option	Black Glass Primer 43520A	lb/gal	65	0.036	2.1	5.60E-04	8.26	-	-	-	-	4.82	-	-	1.24	0.08	0.08	0.08	-	-	1.49	-	SDS
IA 2	3	10	Line 1 - 31XXN option	Glass Cleaner, Isopropanol	lb/gal	65	0.002	0.1	3.32E-05	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
IA 4	2	11	Quarter Window Bonding Line (2015) (QW1)	Clear Glass Primer 43518	lb/gal	200	0.003	0.05	1.58E-05	6.97	-	-	-	-	6.94	-	3.40	3.40	-	-	-	-	-	6.80	-	SDS
IA 5	1		Westward Cold Cleaner	N/A			0.002								6.50											
IA 6	1		Diesel Storage Tank, 280 gallon	N/A																						
IA 7	1		MIG Welding Table	Electrode	lb/1000 lb		0.025															-	-		38.40	AP 42 12.19
IA 8	1	10	Sequoia Sidelite (SL7)	Urethane Adhesive x2500 A Plus	lb/gal	171	0.199	5.63	1.16E-03	10.68	-	-	-	-	0.05	0.05	-	-	-	-	-	-	-	0.05	-	
IA 8	2	10	Sequoia Sidelite (SL7)	Urethane Curative x2500 B Plus	lb/gal	171	0.212	5.63	1.24E-03	10.01	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	
IA 8	3	10	Sequoia Sidelite (SL7)	Glass Cleaner, Isopropanol	lb/gal	171	0.038	0.68	2.24E-04	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	
IA 8	5	10	Sequoia Sidelite (SL7)	Electrical Connector	lb/lb	200	0.044	0.10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.20E-04	Process knowledge [1]
IA 8	6	10	Sequoia Sidelite (SL7)	Black Glass Primer, Betaprime 5500	lb/gal	171	0.052	1.10	3.07E-04	7.93	-	-	-	-	4.95	0.08	-	-	-	-	-	-	-	0.08	-	
IA 9	1	10	Line 6/6A BL w/ soldering	Solder	lb/ton	55	3.64E-05	0.60	-	N/A	-	-	-	-	-	-	-	-	-	-	-	-	1.50	-	2.42	AP 42 Table 12.7-2
IA 9	2	10	Line 6/6A BL w/ soldering	Flux	lb/gal	55	0.030	0.25	-	7.43	-	-	-	-	5.66	-	-	-	-	-	-	0.37	-	0.37	-	
Source-wide	1		Isopropanol for Cleaning	Isopropanol	lb/gal		0.06			6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS

f electical connector from soldered attachments is estimated at 0.1 gram per attachment. Assumed 4 attachments per piece. See prev

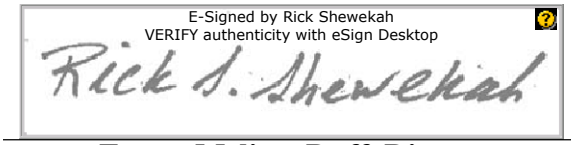
APPENDIX D

Permit Markup

Commonwealth of Kentucky
Energy and Environment Cabinet
Department for Environmental Protection
Division for Air Quality
300 Sower Boulevard, 2nd Floor
Frankfort, Kentucky 40601
(502) 564-3999

AIR QUALITY PERMIT
Issued under 401 KAR 52:040

Permittee Name:	**Pittsburgh Glass Works, LLC.**
Mailing Address:	**2290 Menelaus Rd, Berea, KY 40403**
Source Name:	**Pittsburgh Glass Works, LLC.**
Mailing Address:	**2290 Menelaus Rd** **Berea, KY 40403**
Source Location:	**2290 Menelaus Rd**
Permit ID:	**S-15-052 R4**
Agency Interest #:	**2846**
Activity ID:	**APE20200002**
Review Type:	**Minor Source, Operating**
Source ID:	**21-151-00048**
Regional Office:	**Frankfort Regional Office** **300 Sower Boulevard 1st Floor** **Frankfort, KY 40601** **(502) 564-3358**
County:	**Madison**
Application Complete Date:	**August 13, 2015**
Issuance Date:	**September 8, 2015**
Revision Date:	**April 13, 2021**
Expiration Date:	**September 8, 2025**



For Melissa Duff, Director
Division for Air Quality

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	Permit type	Activity#	Complete Date	Issuance Date	Summary of Action
S-15-052	**Initial**	**APE20150001**	**8/13/2015**	**9/8/2015**	**Initial Construction Permit**
S-15-052 R1	**Revision**	**APE20160001**	**11/4/2016**	**11/23/2016**	**EP05, EP06 Throughput Change, Minor Source Revision**
S-15-052 R2	**Revision**	**APE20190001**	**8/2/2019**	**10/4/2019**	**Throughput change of Dowanol for EP 05, and EP 06. Addition of ten new emission units. Addition of glass vacuum system with baghouse as an insignificant activity.**
S-15-052 R3	**Revision**	**APE20200001**	**7/9/2020**	**9/20/2020**	**Removing EP02, EP03, EP05. Removal of controls on EP07. Conversion of EP 12 to a new process. Adding IA15.**
S-15-052 R4	**Revision**	**APE20200002**	**1/5/2021**	**4/13/2021**	**Add EP20, IA10, IA11, Remove EP08, EP09, and five insignificant activities**

SECTION A - PERMIT AUTHORIZATION

Pursuant to a duly submitted application the Kentucky Energy and Environment Cabinet (Cabinet) hereby authorizes the operation of the equipment described herein in accordance with the terms and conditions of this permit. This permit has been issued under the provisions of Kentucky Revised Statutes (KRS) Chapter 224 and regulations promulgated pursuant thereto.

The permittee shall not construct, reconstruct, or modify any affected facilities without first submitting a complete application and receiving a permit for the planned activity from the permitting authority, except as provided in this permit or in 401 KAR 52:040, State-origin permits.

Issuance of this permit does not relieve the permittee from the responsibility of obtaining any other permits, licenses, or approvals required by the Cabinet or any other federal, state, or local agency.

SECTION B - EMISSION POINTS, EMISSION UNITS, APPLICABLE REGULATIONS, AND OPERATING CONDITIONS

Emission Point 01 **Emergency Generator**

Description:

Model: Caterpillar CA7
Construction Date: 8/1/1989
Power Output: 173 HP
Fuel: diesel
Controls: None. Stack #1

APPLICABLE REGULATIONS:

401 KAR 63:002, Section 2(4)(eeee), 40 C.F.R. 63.6580 to 63.6675, Tables 1a to 8, and Appendix A (Subpart ZZZZ), *National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines*

Note: D.C. Circuit Court [*Delaware v. EPA*, 785 F. 3d 1 (D.C. Cir. 2015)] has vacated the provisions in 40 CFR 63, Subpart ZZZZ that contain the 100-hour exemption for operation of emergency engines for purposes of emergency demand response under 40 CFR 63.6640(f)(2)(ii)-(iii). The D.C. Circuit Court issued the mandate for the vacatur on May 4, 2016.

1. **Operating Limitations:**

   a. The permittee shall meet all of the following management practices [40 CFR 63.6603 and Table 2d]:
      (1) Change oil and filter every 500 hours of operation or annually, whichever comes first;
      (2) Inspect air cleaner every 1,000 hours of operation or annually, whichever comes first;
      (3) Inspect all hoses and belts every 500 hours of operation or annually, whichever comes first, and replace as necessary.
      (4) Minimize the engine's time spent at idle and minimize the engine's startup time at startup to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the non-startup emission limitations apply

   b. There is no time limit on the use of emergency stationary RICE in emergency situations [40 CFR 63.6640 (f)(1)].

   c. The permittee may operate their emergency stationary RICE for the purpose of maintenance checks and readiness testing, provided that the tests are recommended by Federal, State or local government, the manufacturer, the vendor, or the insurance company associated with the engine. Maintenance checks and readiness testing of such units is limited to 100 hours per year. The permittee may petition the Division for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the permittee maintains records indicating that Federal, State, or local standards require maintenance and testing of emergency RICE beyond 100 hours per year [40 CFR 63.6640 (f)(2)(i)].

   d. The permittee may operate their emergency stationary RICE up to 50 hours per year in non-emergency situations, but those 50 hours are counted towards the 100 hours per year provided for maintenance and testing [40 CFR 63.6640 (f)(4)].

SECTION B - EMISSION POINTS, EMISSIONS UNITS, APPLICABLE REGULATIONS, AND OPERATING CONDITIONS (CONTINUED)

2. **Emission Limitations:** Refer to 1. Operating Limitations

See Section D

3. **Testing Requirements:** None

4. **Monitoring Requirements:**

   a. The permittee must operate and maintain each stationary RICE and after-treatment control device (if any) according to the manufacturer's emission related written instructions or develop a maintenance plan which must provide to the extent practicable for the maintenance and operation of the engine in a manner consistent with good air pollution control practice for minimizing emissions [40 CFR 63.6625 (e)].

   b. The permittee must install a non-resettable hour meter if one is not already installed [40 CFR 63.6625 (f)].

5. **Record Keeping Requirements:**

   a. The permittee shall meet all of the following record keeping practices [40 CFR 63.6655 (a)].
      (1) Records of the occurrence and duration of each malfunction of operation (i.e., process equipment) or the air pollution control and monitoring equipment [40 CFR 63.6655 (a)(2)].
      (2) Records of all required maintenance performed on the air pollution control and monitoring equipment [40 CFR 63.6655 (a)(4)].
      (3) Records of actions taken during periods of malfunction to minimize emissions in accordance with 63.6605(b), including corrective actions to restore malfunctioning process and air pollution control and monitoring equipment to its normal or usual manner of operation [40 CFR 63.6655 (a)(5)].
      (4) The permittee must keep records of the maintenance conducted on the stationary RICE in order to demonstrate that you operated and maintained the stationary RICE and after-treatment control device (if any) according to your own maintenance plan [40 CFR 63.6655 (e)].

   b. The permittee must keep records of the hours of operation of the engine that is recorded through the non-resettable hour meter. The permittee must document how many hours are spent for emergency operation, including what classified the operation as emergency and how many hours are spent for non-emergency operation. If the engines are used for demand response operation, the permittee must keep records of the notification of the emergency, and the time the engine was operated as part of demand response [40 CFR 63.6655 (f)].

   c. The permittee's records must be in a form suitable and readily available for expeditious review according to 40 CFR 63.10(b)(1) [40 CFR 63.6660 (a)].

   d. As specified in 40 CFR 63.10(b)(1), the permittee shall keep each record for 5 years following the date of each occurrence, measurement, maintenance, corrective action, report, or record [40 CFR 63.6660 (b)].

SECTION B - EMISSION POINTS, EMISSIONS UNITS, APPLICABLE REGULATIONS, AND OPERATING CONDITIONS (CONTINUED)

5. Record Keeping Requirements (Continued):

e. The permittee must keep each record readily accessible in hard copy or electronic form for at least 5 years after the date of each occurrence, measurement, maintenance, corrective action, report, or record, according to 40 CFR 63.10(b)(1) [40 CFR 63.6660 (c)]

6. Reporting Requirements:

The permittee must report each instance in which you did not meet the operating limitations. These instances are deviations from the emission and operating limitations in this subpart. These deviations must be reported according to the requirements in 63.6650 [40 CFR 63.6640 (b)].

SECTION B - EMISSION POINTS, EMISSIONS UNITS, APPLICABLE REGULATIONS, AND OPERATING CONDITIONS (CONTINUED)

Emission Point 04 **Clip priming (2 Stations)**

Description:

Construction Date: 8/1/2014
Manual application using two applicators of 0.245 gal/hr. each.
Controls: None. Stack #2

~~**Emission Point 06** **Dowanol Application #2**~~

~~**Description:**~~

~~Construction Date: 5/1/1989~~
~~Annual Usage Rate: 500 gals/year.~~
~~Controls: None~~

Emission Point 10 **Sidelite Assembly Line A (SL3)**

Description:

Construction Date: 9/1/2019
Usage Rate: 1.34 gals/hr.
Controls: None. Stack ~~#6~~ #11

Emission Point 11 **Sidelite Assembly Line B (SL4)**

Description:

Construction Date: 9/1/2019
Usage Rate: 1.79 gals/hr.
Controls: None. Stack ~~#6~~ #11

Emission Point 12 **Sidelite Door Cell (SL6)**

Description:

Construction Date: 8/1/2020
Usage Rate: 2.38 gals/hr.
Controls: None. Stack ~~#9~~ #11

Emission Point 13 **Clip Priming Station**

Description:

Construction Date: 9/1/2019
Usage Rate: 0.34 gals/hr.
Controls: None. Stack #6

SECTION B - EMISSION POINTS, EMISSIONS UNITS, APPLICABLE REGULATIONS, AND OPERATING CONDITIONS (CONTINUED)

Emission Point 14 **Backlite Assembly Line (BL2/BL1)**

Description:
Construction Date: 9/1/2019
Usage Rate: 1.81 gals/hr.
Controls: None. Stack ~~#6~~ #11

Emission Point 15 **Quarter Assembly Line (SL5)**

Description:
Construction Date: 9/1/2019
Usage Rate: 0.127 gals/hr.
Controls: None. Stack #8

Emission Point 16 **Windshield Assembly Line (WS2)**

Description:
Construction Date: 9/1/2019
Usage Rate: 0.68 gals/hr.
Controls: None. Stack #6

~~**Emission Point 17** **Backlite / Windshield Line**~~

~~**Description:**~~
~~Construction Date: 9/1/2019 Not yet constructed~~
~~Usage Rate: 0.68 gals/hr.~~
~~Controls: None. Stack #5~~

Emission Point 18 **Windshield Assembly Line 2 (WS1)**

Description:
Construction Date: 9/1/2019
Usage Rate: 0.65 gals/hr.
Controls: None. Stack #7

~~**Emission Point 19** **Quarter / Sidelite Assembly Line**~~

~~**Description:**~~
~~Construction Date: 9/1/2019 Not yet constructed~~
~~Usage Rate: 1.38 gals/hr.~~
~~Controls: None. Stack #5~~

Emission Point 20 **Sidelite Door Line (SL4B/SL8)**

Description:
Construction Date: 11/24/2020
Usage Rate: 1.49 gals/hr.
Controls: None. Stack ~~#2~~ #11

SECTION B - EMISSION POINTS, EMISSIONS UNITS, APPLICABLE REGULATIONS, AND OPERATING CONDITIONS (CONTINUED)

Emission Point 21 **Sidelite Bonding Line (SL2)**

Description:

Construction Date: 2015
Usage Rate: 0.38 gals/hr.
Controls : None. Stack #11

Emission Point 22 **Line 2A Sidelite**

Description:

Construction Date: July 2024
Usage Rate: 0.16 gals/hr.
Controls : None. Stack #10

Emission Point 23 **Line 2B Quarter**

Description:

Construction Date: July 2024
Usage Rate: 0.09 gals/hr.
Controls : None. Stack #10

Emission Point 24 **Line 7 Backlite**

Description:

Construction Date: July 2024
Usage Rate: 0.07 gals/hr.
Controls : None. Stack #12

Emission Point 25 **Line 17 Windshield**

Description:

Construction Date: July 2024
Usage Rate: 0.18 gals/hr.
Controls : None. Stack #10

Emission Point 26 **Line 18 Windshield**

Description:

Construction Date: July 2024
Usage Rate: 0.13 gals/hr.
Controls : None. Stack #12

SECTION B - EMISSION POINTS, EMISSIONS UNITS, APPLICABLE REGULATIONS, AND OPERATING CONDITIONS (CONTINUED)

APPLICABLE REGULATION:

401 KAR 63:020, *Potentially hazardous matter or toxic substances*

1. **Operating Limitations:**

   ~~The usage rate of materials used in all affected facilities shall be limited so as not to exceed the usage rates listed for each emission point above~~.

   N/A

2. **Emission Limitations:**

   a. Based upon the emission rates of toxics and hazardous air pollutants determined by the Cabinet using information provided in the application and supplemental information submitted by the source, the Cabinet determines the affected facility to be in compliance with 401 KAR 63:020.

   b. See Section D

3. **Testing Requirements:**

   Testing shall be conducted at such times as may be required by the Cabinet in accordance with 401 KAR 59:005, Section 2(2) and 50:045, Section 3.

4. **Monitoring Requirements:**

   The permittee shall monitor and maintain records of the monthly amount of coatings (gallons), solvents (gallons) and solder (pounds) for each VOC and HAP containing material used at each emission point listed above.

5. **Recordkeeping Requirements:**

   The permittee shall maintain records of the following information. These records shall be sufficient such that the permittee is capable of demonstrating compliance with minor source status if requested to do so by the Cabinet.

   a. Records in accordance with **4. Monitoring Requirements**.

   b. All purchase orders and invoices for materials containing VOC's and HAP's shall be made available for inspection upon request by any duly authorized representatives of the Division for Air Quality.

   c. SDS, Manufacture's Product Data Sheets, or the results of EPA reference test methods from which the VOC and HAP content of each material can be obtained.

   d. The permittee shall maintain records in accordance with **Section C**.

6. **Reporting Requirements:**

   See Section C.3 for additional information regarding reporting requirements.

SECTION B - EMISSION POINTS, EMISSIONS UNITS, APPLICABLE REGULATIONS, AND OPERATING CONDITIONS (CONTINUED)

Emission Point 07 Cullet Choppers

Description:

Construction Date: 5/1/1989
Max capacity: 129 lbs./hr. of crushed glass.
Controls: None. Stack #3

APPLICABLE REGULATIONS:

401 KAR 59:010, *New Process Operations*,

1. Operating Limitations:

The usage rate of materials used in all affected facilities shall be limited so as not to exceed the emission limitations in the section B(2) below.

2. Emissions Limitations:

a. Standard for Opacity (401 KAR 59:010 Section 3(1)):

No person shall cause, suffer, allow, or permit any continuous emission into the open air from a control device or stack associated with any affected facility which is equal to or greater than twenty (20) percent opacity.

Compliance Demonstration Method:

See Monitoring Requirements.

b. Standard for Particulate Matter (401 KAR 59:010 Section 3(2)):

For emission from a control device or stack, no person shall cause, suffer, allow or permit the emission in to the open air of particulate matter (PM) from any affected facility which is in excess of 2.34 lb./hr.

Compliance Demonstration Method:

The source is assumed to be in compliance when the equipment is operated and properly maintained according to manufacturer's specifications. Refer to Subsection **5. Recordkeeping Requirements**.

3. Testing Requirements:

Pursuant to 401 KAR 50:045, Section 3 and 401 KAR 59:005, Section 2(2) the Cabinet may require testing as deemed necessary in accordance with 401 KAR 50:045, Section 4.

4. Monitoring Requirements:

The permittee shall perform a qualitative visual observation of the opacity of emissions at each stack no less than weekly while the affected facility is operating. If visible emissions from the stacks are observed (not including condensed water in the plume), the permittee shall determine the opacity using Reference Method 9. In lieu of determining the opacity using U.S. EPA Method 9, the permittee shall immediately perform a corrective action which results in no visible emissions (not including condensed water in the plume).

SECTION B - EMISSION POINTS, EMISSIONS UNITS, APPLICABLE REGULATIONS, AND OPERATING CONDITIONS (CONTINUED)

~~**5. Recordkeeping Requirements:**~~

~~a. The permittee shall maintain a log of the visual observations noting date, time and initials of observers, records of corrective actions taken as a result of visible emissions from a stack and records of any Reference Method 9 readings performed.~~

~~b. The permittee shall keep manufacturer's equipment specifications on site.~~

~~**6. Reporting Requirements:**~~

~~See **Section C**, General Conditions~~

SECTION C - GENERAL CONDITIONS

1. **Administrative Requirements**

   a. The permittee shall comply with all conditions of this permit. Noncompliance shall be a violation of 401 KAR 52:040, Section 3(1)(b), and is grounds for enforcement action including but not limited to the termination, revocation and reissuance, or revision of this permit.

   b. This permit shall remain in effect for a fixed term of ten (10) years following the original date of issue. Permit expiration shall terminate the source's right to operate unless a timely and complete renewal application has been submitted to the Division at least six months prior to the expiration date of the permit. Upon a timely and complete submittal, the authorization to operate within the terms and conditions of this permit, including any permit shield, shall remain in effect beyond the expiration date, until the renewal permit is issued or denied by the Division. [401 KAR 52:040, Section 15]

   c. Any condition or portion of this permit which becomes suspended or is ruled invalid as a result of any legal or other action shall not invalidate any other portion or condition of this permit [Section 1a-11 of the *Cabinet Provisions and Procedures for Issuing State-Origin Permits* incorporated by reference in 401 KAR 52:040, Section 23].

   d. Pursuant to materials incorporated by reference by 401 KAR 52:040, this permit may be revised, revoked, reopened, reissued, or terminated for cause. The filing of a request by the permittee for any permit revision, revocation, reissuance, or termination, or of a notification of a planned change or anticipated noncompliance shall not stay any permit condition [Section 1a-4, 5, of the *Cabinet Provisions and Procedures for Issuing State-Origin Permits* incorporated by reference in 401 KAR 52:040, Section 23].

   e. This permit does not convey property rights or exclusive privileges [Section 1a-8 of the *Cabinet Provisions and Procedures for Issuing State-Origin Permits* incorporated by reference in 401 KAR 52:040, Section 23].

   f. Nothing in this permit shall alter or affect the liability of the permittee for any violation of applicable requirements prior to or at the time of permit issuance [401 KAR 52:040, Section 11(3)].

   g. All previously issued permits to this source at this location are hereby null and void.

2. **Recordkeeping Requirements**

   a. Records of all required monitoring data and support information, including calibrations, maintenance records, and original strip chart recordings, and copies of all reports required by the Division for Air Quality, shall be retained by the permittee for a period of at least five years and shall be made available for inspection upon request by any duly authorized representative of the Division for Air Quality [401 KAR 52:040, Section 3(1)(f), and Section 1b-IV-2 of the *Cabinet Provisions and Procedures for Issuing State-Origin Permits* incorporated by reference in 401 KAR 52:040, Section 23].

SECTION C - GENERAL CONDITIONS (CONTINUED)

b. The permittee shall perform compliance certification and recordkeeping sufficient to assure compliance with the terms and conditions of the permit. Documents, including reports, shall be certified by a responsible official pursuant to 401 KAR 52:040, Section 21.

3. **Reporting Requirements**

a. In accordance with the provisions of 401 KAR 50:055, Section 1, the permittee shall notify the Regional Office listed on the front of this permit concerning startups, shutdowns, or malfunctions as follows:
   (1) When emissions during any planned shutdowns and ensuing startups will exceed the standards, notification shall be made no later than three (3) days before the planned shutdown, or immediately following the decision to shut down, if the shutdown is due to events which could not have been foreseen three (3) days before the shutdown.
   (2) When emissions due to malfunctions, unplanned shutdowns and ensuing startups are or may be in excess of the standards, notification shall be made as promptly as possible by telephone (or other electronic media) and shall be submitted in writing upon request.

b. The permittee shall promptly report deviations from permit requirements, including those attributable to upset conditions as defined in the permit, the probable cause of such deviations, and any corrective actions or preventive measures taken shall be submitted to the Regional Office listed on the front of this permit. Where the underlying applicable requirement contains a definition of prompt or otherwise specifies a time frame for reporting deviations, that definition or time frame shall govern. Where the underlying applicable requirement does not identify a specific time frame for reporting deviations, prompt reporting, as required by Sections 1b-V, 3 and 4 of the *Cabinet Provisions and Procedures for Issuing State Origin Permits* incorporated by reference in 401 KAR 52:040, Section 23 shall be defined as follows:
   (1) For emissions of a hazardous air pollutant or a toxic air pollutant (as identified in an applicable regulation) that continue for more than an hour in excess of permit requirements, the report must be made within 24 hours of the occurrence.
   (2) For emissions of any regulated air pollutant, excluding those listed in C.3.a.(1), that continue for more than two hours in excess of permit requirements, the report must be made within 48 hours.
   (3) All deviations from permit requirements, including those previously reported, shall be included in the semiannual report required C.3.d.

c. The permittee shall furnish information requested by the Cabinet to determine if cause exists for modifying, revoking and reissuing, or terminating the permit; or to determine compliance with the permit [Section 1a-6 of the *Cabinet Provisions and Procedures for Issuing State-Origin Permits* incorporated by reference in 401 KAR 52:040, Section 23].

d. Summary reports of monitoring required by this permit shall be submitted to the Regional Office listed on the front of this permit at least every six (6) months during the life of this permit. For emission units that were still under construction or which had not commenced operation at the end of the 6-month period covered by the report and are subject to monitoring requirements in this permit, the report shall indicate that no monitoring was

SECTION C - GENERAL CONDITIONS (CONTINUED)

performed during the previous six months because the emission unit was not in operation. The summary reports are due January 30th and July 30th of each year. All deviations from permit requirements shall be clearly identified in the reports. All reports shall be certified by a responsible official pursuant to 401 KAR 52:040, Section 21.

4. **Inspections**

In accordance with the requirements of 401 KAR 52:040, Section 3(1)(f), the permittee shall allow authorized representatives of the Cabinet to perform the following during reasonable times. Reasonable times are defined as during all hours of operation, during normal office hours, or during an emergency:

a. Enter upon the premises to inspect any facility, equipment (including air pollution control equipment), practice, or operation.

b. To access and copy any records required by the permit.

c. Inspect, at reasonable times, any facilities, equipment (including monitoring and pollution control equipment), practices, or operations required by the permit.

d. Sample or monitor, at reasonable times, substances or parameters to assure compliance with the permit or any applicable requirements.

5. **Emergencies/Enforcement Provisions**

a. The permittee shall not use as defense in an enforcement action, the contention that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance [Section 1a-3 of the *Cabinet Provisions and Procedures for Issuing State-Origin Permits* incorporated by reference in 401 KAR 52:040, Section 23].

b. An emergency shall constitute an affirmative defense to an action brought for the noncompliance with the technology-based emission limitations if the permittee demonstrates through properly signed contemporaneous operating logs or relevant evidence that:
   (1) An emergency occurred and the permittee can identify the cause of the emergency;
   (2) The permitted facility was at the time being properly operated;
   (3) During an emergency, the permittee took all reasonable steps to minimize levels of emissions that exceeded the emissions standards or other requirements in the permit; and
   (4) The permittee notified the Division as promptly as possible and submitted written notice of the emergency to the Division within two working days after the time when emission limitations were exceeded due to the emergency and included a description of the emergency, steps taken to mitigate emissions, and corrective actions taken.

c. Emergency provisions listed in General Condition 5.b are in addition to any emergency or upset provision contained in an applicable requirement [401 KAR 52:040, Section 22(3)].

d. In an enforcement proceeding, the permittee seeking to establish the occurrence of an emergency shall have the burden of proof [401 KAR 52:040, Section 22(2)].

SECTION C - GENERAL CONDITIONS (CONTINUED)

6. **Compliance**

a. Periodic testing or instrumental or non-instrumental monitoring, which may consist of record keeping, shall be performed to the extent necessary to yield reliable data for purposes of demonstration of continuing compliance with the conditions of this permit. For the purpose of demonstration of continuing compliance, the following guidelines shall be followed:

(1) Pursuant to 401 KAR 50:055, General compliance requirements, Section 2(5), all air pollution control equipment and all pollution control measures proposed by the application in response to which this permit is issued shall be in place, properly maintained, and in operation at any time an affected facility for which the equipment and measures are designed is operated, except as provided by 401 KAR 50:055, Section 1.

(2) All the air pollution control systems shall be maintained regularly in accordance with good engineering practices and the recommendations of the respective manufacturers. A log shall be kept of all routine and non-routine maintenance performed on each control device.

b. Pursuant to 401 KAR 52:040, Section 19, the permittee shall certify compliance with the terms and conditions contained in this permit by January 30th of each year, by completing and returning a Compliance Certification Form (DEP 7007CC) (or an approved alternative) to the Regional Office listed on the front of this permit in accordance with the following requirements:

(1) Identification of the term or condition;
(2) Compliance status of each term or condition of the permit;
(3) Whether compliance was continuous or intermittent;
(4) The method used for determining the compliance status for the source, currently and over the reporting period, and
(5) For an emissions unit that was still under construction or which has not commenced operation at the end of the 12-month period covered by the annual compliance certification, the permittee shall indicate that the unit is under construction and that compliance with any applicable requirements will be demonstrated within the timeframes specified in the permit.
(6) The certification shall be submitted by January 30th of each year. Annual compliance certifications shall be sent to the Regional Office listed on the front of this permit.

c. Permit Shield - A permit shield shall not protect the owner or operator from enforcement actions for violating an applicable requirement prior to or at the time of permit issuance. Compliance with the conditions of this permit shall be considered compliance with all:

(1) Applicable requirements that are included and specifically identified in this permit; or
(2) Non-applicable requirements expressly identified in this permit [401 KAR 52:040, Section 11].

7. **Construction Requirements:**

~~Emission Point 20 was authorized to construct pursuant to KAR 52:040 Section 13. EP20 shall be operated in accordance with the terms and conditions of this permit (S-15-052 R4). No construction authorized by Permit S-15-052 R4.~~

SECTION D - INSIGNIFICANT ACTIVITIES

The following listed activities have been determined to be insignificant activities for this source pursuant to 401 KAR 52:040, Section 6. Although these activities are designated as insignificant the permittee must comply with the applicable regulation. Process and emission control equipment at each insignificant activity subject to an opacity standard shall be inspected monthly and a qualitative visible emissions evaluation made. Results of the inspection, evaluation, and any corrective action shall be recorded in a log.

Description	Generally Applicable Regulation
1. Space heaters, 28 units, NG, 4.87 MMBtu/hr. total	None
2. Line 1 (Sidelite and Backlite)	None
~~2. Autoclave plasticizers (2 units)~~	~~None~~
3. Sidelite Bonding Line (2014)	None
~~4. Sidelite Bonding Line (2015)~~	~~None~~
~~5. Backlite Bonding Line w/soldering (2015)~~	~~401KAR 59:10~~
~~6.~~ 4. Quarter Window Bonding Line (2015) (QW1)	None
~~7.~~ 5. Westward cold cleaner, 20 gallon	None
~~8.~~ 6. Diesel fuel storage tank, 280 gallon	None
~~9.~~ 7. MIG welding table	None
~~10. Sequoia Quarter Bonding line~~	~~None~~
~~11.~~ 8. Sequoia Sidelite (SL7) ~~& Backlite Bonding line~~	None
9. Line 6/6A w/ Soldering	401 KAR 59:010

APPENDIX E

Safety Data Sheet (SDS)

Section 1: Product Information

Name:	AN-1M Sealant Curing Agent
Description:	Polyether polyol
Use:	Adhesive
MSDS number:	8077E
Appearance and odor:	White; slight organic odor
Company Identification:	THE Yokohama Rubber CO., LTD
Address:	1-7-7 Shinomiya,Hiratsuka,254-0014 Japan
Contact:	Adhesives, Sealants and Electronic Materials Technical Dept.
Emergency telephone:	81-463-31-2766(Hiratsuka,Japan)
Product information:	81-463-31-2766(Hiratsuka,Japan)
Effective date:	09/16/2019
Supersedes date:	01/31/2018

Section 2: Hazard Identification

GHS CLASSIFICATION OF THE SUBSTANCE OR MIXTURE:

PHYSICAL HAZARDS:	Not applicable
HEALTH HAZARDS:	
Acute toxicity (oral):	Classification not possible
Acute toxicity (skin):	Classification not possible
Acute toxicity (inhalation: gas):	Classification not possible
Acute toxicity (inhalation: vapor):	Classification not possible
Acute toxicity (inhalation: dust, mist):	Category 3
Skin corrosion / irritation:	Classification not possible
Serious eye damages / eye irritation:	Classification not possible
Sensitization-respiratory:	Classification not possible
Sensitization-skin:	Classification not possible
Germ cell mutagenicity:	Classification not possible
Carcinogenicity:	Classification not possible
Reproductive toxicity:	Category 1A
Effects on or via lactation:	Classification not possible
Specific target organ toxicity (Single exposure):	Classification not possible
Specific target organ toxicity (Repeated exposure):	Classification not possible
Aspiration hazard:	Not Applicable
ENVIRONMENTAL HAZARDS:	
Aquatic toxicity (acute):	Category 2
Aquatic toxicity (chronic):	Category 3

GHS LABEL ELEMENTS:

GHS hazard symbols

GHS signal word

Danger

Hazard statements

Harmful if inhaled.
May damage fertility or the unborn child.
Toxic to aquatic life.
Harmful to aquatic life with long lasting effects.

Precautionary statements

<Prevention>

Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Do not breathe dust/fume/gas/mist/vapors/spray.
Use only outdoors or in a well-ventilated area.
Avoid release to the environment.
Wear protective gloves/protective clothing/eye protection/face protection.
Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

<Response>

IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
IF exposed or concerned: Get medical advice/attention.
Call a POISON CENTER or doctor/physician.
Specific treatment (see Safety Data Sheet on this product).

<Storage>

Protect from sunlight. Store in a well-ventilated place.
Keep container tightly closed.
Store locked up.

<Disposal>

Dispose of contents/container to public agency.

A hazard evaluation of this product has been performed. The components listed below are identified as hazardous chemicals under the criteria of the OSHA hazard communication standard (29 CFR 1910.1200).

Section 3: Composition/Information on ingredients

Substance or mixture: Mixture

Chemical identity: Polyether polyol adhesive

Ingredients/concentration:

Common name / Chemical name	CAS number	Approximate %
silica fine powder	7631-86-9	3
Limestone / Calcium carbonate	471-34-1	30

Polyether polyol	9082-00-2, 26316-40-5	67
Ethanol	64-17-5	< 0.5

Section 4: First-aid measures

Eye contact:

Flush eyes with water for at least 15 minutes. If irritation develops, consult a physician.

Skin contact:

Remove contaminated clothing and shoes. Wash affected area with soap and water. If irritation develops, consult a physician. Wash contaminated clothing separately before reuse.

Inhalation:

Remove to fresh air. If symptoms develop, seek immediate medical attention. If not breathing, give artificial respiration, preferably mouth to mouth.

Ingestion:

Do not induce vomiting. Seek medical attention. Do not give anything by mouth if the person is drowsy, unconscious, or has no gag reflex.
Ingestion creates a high risk of aspiration and subsequent chemical pneumonitis. However, if more than one milliliter per kilogram of body weight of the hydrocarbon was ingested, careful emesis or lavage is recommended because of the toxic effects produced by the hydrocarbon.

Note to physician:

Treatment should be directed at preventing absorption, administering to the symptoms as they occur, and providing supportive therapy.

Section 5: Fire-fighting measures

Specific Hazards with Regard to Fire-Fighting Measures:

Fire fighters and others who may be exposed to the products of combustion should be equipped with appropriate positive pressure self-contained apparatus and full protective clothing.

Extinguishing Media:

Use water, foam, dry chemical, or carbon dioxide.

Section 6: Accidental release measures

Responds to spills:

Shovel spilled product and place in container for further handling and disposal.
Do not flush to sewer, stream, or other bodies of water.

Section 7: Handling and storage

Handling/storage:

Store in cool, dry, well ventilated are. Do not store near heat or ignition sources, or in direct sunlight. Always keep containers tightly closed to avoid contamination.

Special warning:

Hot organic chemical vapors or mists can suddenly and without warning combust when mixed with air. Ignition can occur at typical elevated temperature process conditions. Any proposed use in such processes should be evaluated thoroughly to assure safe operating conditions.

Section 8: Exposure Controls/Personal Protection

Eye protection:

Wear chemical splash goggles.
An eye wash facility should be readily available.

Skin protection:

Wear protective clothing and appropriate impervious gloves. Because a variety of protective gloves exist, always consult glove manufacturer to determine the proper type for specific operation.

Inhalation:

Remove to fresh air. If symptoms develop, seek immediate medical attention. If not breathing, give artificial respiration, preferably mouth to mouth.

Ingestion:

Do not induce vomiting. Seek medical attention. Do not give anything by mouth if the person is drowsy, unconscious, or has no gag reflex.
Ingestion creates a high risk of aspiration and subsequent chemical pneumonitis. However, if more than one milliliter per kilogram of body weight of the hydrocarbon was ingested, careful emesis or lavage is recommended because of the toxic effects produced by the hydrocarbon.

Note to physician:

Treatment should be directed at preventing absorption, administering to the symptoms as they occur, and providing supportive therapy.

Airborne exposure limits

Limestone

ACGIH TLV-TWA:	10 mg/m³	total particulate
OSHA PEL:	5(15) mg/m³	respirable reaction (total particulate)

Note:

Because of this product's physical composition, the release or generation of a dust is not expected to occur under normal conditions of use.

Section 9: Physical and chemical properties

Appearance:	White; slight odor
% non-volatile (by weight):	>95
pH:	not applicable
Vapor density (air=1):	not established
Solubility in water:	insoluble
Evaporation rate (n-butyl acetate=1):	not established
Vapor pressure (mmHg @25°C):	not established
Specific gravity (water=1):	>1
Approximate boiling point :	not established
Flash point:	> 150°C 302 °F Test method: setaflash closed cup
Explosive limits:	LEL (%)not established UEL (%)not established UEL

Auto-ignition temperature: not established

Note:The physical data presented above are typical values and should not be construed as a specification.

Section 10: Stability and reactivity

Stable under normal conditions of storage and use: yes

Materials to avoid:

Oxidizing agents.
Acids.
Strong bases.

Hazardous polymerization:

Hazardous polymerization will not occur.

Thermal decomposition products:

If heated to high temperatures or exposed to an open flame, this product may emit the following compounds: smoke , soot , & toxic fumes(e.g. carbon dioxide & carbon monoxide).

Section 11: Toxicological Information

Skin corrosion / irritation: At the time of contact,a weak rash may be caused.
Serious eye damages / eye irritation: No data
Sensitization-respiratory/Sensitization-skin: No data
Germ cell mutagenicity: No data
Carcinogenicity: No data
Reproductive toxicity: No data
Specific target organ toxicity (Single exposure) : No data
Specific target organ toxicity (Repeated exposure) : No data
Aspiration hazard: No data

Limestone

Toxic effects:

Overexposure to calcium carbonate dusts may affect respiratory function.
Note: Naturally occurring calcium carbonate can contain, as an impurity, trace amounts of crystalline silica.

Carcinogenicity - listed by:

ACGIH:	no
IARC monographs:	no
NTP annual report:	no
OSHA:	no

Note:

This product does not contain carbon black or calcium carbonate in the powder form.
The above toxic effects may not apply.

Section 12: Ecological information

Ecotoxicity in water : No specific data are available.

Limestone
Fish: No specific data are available.

Bioaccumulative potential : No specific data are available.

Mobility in soil : No specific data are available.

Other adverse effects : No specific data are available.

Section 13: Disposal Considerations

Disposal methods:

If discarded in its original unused form, this product should be managed (stored/treated/disposed/etc.) at an authorized facility, in compliance with all applicable federal, state, and local requirements. Be sure to contact appropriate government environmental agencies if further disposal guidance is required.

Of the methods of disposal currently available, It is recommended that an alternative be selected according to the following order of preference, based upon environment acceptability:

(1) Recycle or rework if at all feasible,
(2) Incinerate at an authorized facility, or
(3) Treat at an acceptable waste treatment facility.

Section 14: Transport information

DOT shipping name: non-regulated
DOT label: not applicable
DOT identification No.: not applicable

Supplemental section 14 information:
HM-181, IATA/ICAO, IMO - non-regulated

Section 15: Regulatory Information

The YOKOHAMA RUBBER Co., LTD. is not able to check up the regulatory information regarding the substance in your country or region. Therefore, we request this matter would be filled by your responsibility.

Section 16: Other Information

Disclaimer of liability

The information contained herein is, to the best of our knowledge and belief, accurate. However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by use of this material. All chemicals may present unknown health hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards which exist. Final determination of suitability of the chemical is the sole responsibility of the user. No representations of warranties, either expressed or implied, of merchantability, fitness for a particular purpose or any other nature are made hereunder with respect to the information contained herein or the chemical to which the information refers. It is the responsibility of the user to comply with all applicable federal, state and local laws and regulations.

If you have questions with regard to health effects, or other information presented in this document, contact:

THE YOKOHAMA RUBBER CO.,LTD
Adhesives, Sealants and Electronic Materials Technical Dept.
1-7-7 Shinomiya,Hiratsuka,254-0014 Japan
Tel.) 81-463-31-2766 Fax.) 81-463-31-2769

Section 1: Identification

Product Identifiers

Product name ***Aron Mighty FS-175SV10***
Product number AM00101, AM00103, AM00115, AM001P2, AM001Q2

Recommended use of & restrictions on use
Industrial Adhesive

Emergency telephone number

CHEMTREC (800) 424-9300

Manufacturer's Information

Manufacturer's Name

Krazy Glue Co.,
Div. of Toagosei America Inc.
1450 West Main Street
West Jefferson, OH 43162

Telephone: (614) 879-9411

Section 2 – Hazard Identification

Classification of the substance or mixture

Classification according to 1910.1200:

Flammable Liquids	**Category 2**

Label Elements

Pictograms

Flame

Signal word **Danger**

Hazard statements

Highly flammable liquid and vapor.

Precautionary statements

Prevention

Keep away from flames and hot surfaces. – No smoking.
Keep container tightly closed.
Ground/Bond container and receiving equipment.
Use explosion-proof electrical/ventilating/lighting equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Wear protective gloves/eye protection/face protection.

Response

In case of fire: Use dry chemical or carbon dioxide (CO2) to extinguish.
IF ON SKIN (or Hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.

Storage

Store in a cool, well-ventilated place.

Disposal

Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazards Not Otherwise Classified

No data available.

Section 3 – Composition/Information on Ingredients

Chemical Name	Common Name/Synonyms	CAS Number	Concentration %
Ethyl Alcohol	Ethanol	64-17-5	>60
Isopropanol		67-63-0	<8
Methanol		67-56-1	<8

*Non hazardous ingredients are not listed and make up the balance of the product.

Section 4 – First-Aid Measures

Description of first aid measures

Ingestion: Poisonous-Call a physician immediately! Give water and induce vomiting by sticking a finger down the throat. Never give anything by mouth to an unconscious person.

Inhalation: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor if you feel unwell. If not breathing, give artificial respiration, preferably mouth-to-mouth.

Skin: Wash with plenty of water. Take off immediately all contaminated clothing. Wash contaminated clothing before reuse. If skin irritation occurs: Get medical advice/attention.

Eyes: In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

Most important symptoms/effects, acute and delayed
The most important symptoms or effects are described in Section 2 and 11.

Indication of immediate medical attention & special treatment needed. - No data available.

Section 5 – Fire-Fighting Measures

Extinguishing media

Suitable – Use dry chemical or carbon dioxide (CO_2) to extinguish fire.

Unsuitable – No data available.

Special hazards arising from the chemical – Carbon oxides.

Special protective equipment and precautions for fire-fighters – Self-contained breathing apparatus with face piece and protective clothing if involved in a fire of other materials.

Section 6 - Accidental Release Measures

Personal precautions, protective equipment and emergency procedures

Use personal protective recommended in Section 8. Isolate the hazard area and deny entry to unnecessary and unprotected personal. Avoid breathing vapors, mist or gas. Ventilate area. Eliminate all sources of ignition.

Environmental Precautions

Prevent entry into drains, natural bodies of water and the environment.

Methods and materials for containment and clean up

Containment – Material may be taken up with a non-combustible absorbent material (sand or clay). .

Clean-up – Eliminate all sources of ignition. Place in container for disposal according to local/national regulations (see section 13).

Section 7 – Handling and Storage

Precautions for safe handling

Handle in accordance with good industrial hygiene and safety practices. These practices include avoiding unnecessary exposure and removal of the material from eyes, skin and clothing. Wash thoroughly after handling. Avoid inhalation of vapor or mist. Static ignition hazard can result from handling and use. Electrically bond and ground all containers, personnel and equipment before transfer or use.

Conditions for safe storage

Store in a well-ventilated place. Keep cool.

Incompatibilities

Keep away from heat, sparks, flame and other ignition sources.

Section 8 – Exposure Controls/Personal Protection

Exposure guidelines

Component	OSHA TWA	ACGIH TWA	Units
Ethyl Alcohol	1000	1000	ppm
Isopropanol	200	400	ppm
Methanol	200	200	ppm

N. E. = Not Established

Engineering controls

The following exposure control techniques may be used to effectively minimize employee exposure: local exhaust ventilation, enclosed system design, process isolation and remote control in combination with appropriate use of personal protective equipment and prudent work practices.
These techniques may not necessarily address all issues pertaining to your operations. We, therefore, recommend that you consult with experts of your choice to determine whether or not your programs are adequate.

Personal protective equipment

Eye/face protection – Wear safety goggles.

Skin protection – Wear impervious gloves as required to prevent skin contact.

Respiratory protection – Where air contaminants can exceed acceptable criteria, use NIOSH/MSHA approved respiratory protection equipment. Respirators should be selected based on the form and concentration of contaminants in air in accordance OSHA laws and regulations or other applicable standards or guidelines, including ANSI standards regarding respiratory protection.

Section 9 – Physical and Chemical Properties

a) **Appearance:** White liquid
b) **Odor:** Mild
c) **Odor threshold:** No data available
d) **pH:** No data available
e) **Melting point/freezing point:** No data available
f) **Initial boiling point and boiling range:** 78˚C/172˚F
g) **Flash point:** 14˚C/57.2˚F
h) **Evaporation rate –** No data available
i) **Flammability:** No data available

j) **Upper/lower flammability or explosive limits:**
Lower explosion limit: 4.3
Upper explosion limit: 19

k) **Vapor pressure:** 44 (mmHg @ 20˚C), 5865 (Pa @ 20˚C)

l) **Vapor density:** 2.5 (AIR=1)

m) **Relative density:** 0.8 (Water = 1 @ 25˚C)

n) **Solubility in water:** Partially soluble

o) **Partition coefficient:** No data available

p) **Auto-ignition temperature:** No data available

q) **Decomposition temperature:** No data available

r) **Viscosity:** No data available

s) **VOC content:** 597 g/L (SCAQMD Method 316B)

Section 10 – Stability and Reactivity

Reactivity – No data available

Chemical stability – Stable under recommended storage conditions

Possibility of hazardous reactions – No data available

Conditions to avoid – Sparks, heat and flames

Incompatible materials – Strong oxidizing agents, reducing agents, alkalis, acids

Hazardous decomposition products – Carbon dioxide and carbon monoxide

Section 11 – Toxicological Information

Information on likely routes of exposure

Inhalation – May cause drowsiness or dizziness.

Ingestion - No data available.

Skin – No data available.

Eye – No data available.

Symptoms related to physical, chemical and toxicological characteristics

Stomach or intestinal upset (nausea, vomiting, diarrhea), irritation (nose, throat, airways), CNS depression (dizziness, drowsiness, weakness, fatigue, nausea, headache, unconsciousness), visual impairment and death.

Delayed and immediate effects & also chronic effects from short & long term exposure

No data available.

Numerical measures of toxicity

No data available.

Carcinogenicity

NTP – No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

IARC – No components of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by IARC.

OSHA – No components of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

ACGIH – No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

Section 12 – Ecological Information

Ecotoxicity – No data available.

Persistence and degradability – No data available.

Bioaccumulative potential – No data available.

Mobility in soil – No data available.

Other adverse effects – No data available.

Section 13 – Disposal Considerations

Disposal should be in accordance with applicable local, regional and national laws and regulations. Local regulations may be more stringent than regional or national requirements. May contain explosive vapors. DO NOT cut, puncture or weld on or nearby.

Contaminated packaging – Dispose of as unused product.

Section 14 – Transport Information

UN number – UN 1133.

UN proper shipping name – Adhesives.

Transport hazard class(es) – Class 3.

Packing Group – II

Environmental hazards – No data available.

Transport in bulk – No data available.

Special precautions – No data available.

Section 15 – Regulatory Information

US Federal Regulations

SARA Title III: Section 311/312

Fire hazard
Acute health hazard

SARA Title III: Section 313 & 40 CFR Part 372

This product contains the following toxic chemical(s) subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986, and Subpart C-Supplier Notification Requirement of 40 CFR Part 372.

None required per SARA Title III Section 313

TSCA Section 8(b) Inventory

All reportable chemical substances are listed on the TSCA inventory. We rely on certifications of compliance from our suppliers for chemical substances not manufactured by us.

Canadian Regulations

Workplace Hazard Materials Information System (WHMIS)

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulation (CPR) and the SDS contains all the information required by the CPR.

Class B, DIV 2B
Class B, DIV 3

Canadian Environmental Protection Act (CEPA)

All reportable chemical substances are listed on the Domestic Substance List (DSL) or otherwise comply with CEPA new substance notification requirements.

National Pollutant Release Inventory

This product contains the following chemical(s) subject to the reporting requirements of the Canadian Environmental Protection Ace (CEPA) subsection 16 (1), National Pollutant Release Inventory.

None

State and Local Regulations

California Proposition 65

The following statement is made in order to comply with the California Safe Drinking Water and Toxic Enforcement Act of 1986:
This product contains the following substance(s) known to the state of California to cause cancer.

None

This product contains the following substance(s) known to the state of California to cause reproductive harm.

Methanol

Section 16 – Other Information

Version: 1.1
Revised: 11/18/15
Printed: 11/18/2015

HMIS Rating
Health **3**
Flammability **3**
Physical Hazard **1**
0-minimal, 1-slight, 2-moderate, 3-serious, 4-severe

To the best of out knowledge, the information contained herein is accurate. However, neither Toagosei America Ltd. nor any of its subsidiaries assume any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards which exist.

Yokohama Industries Americas Inc.

Safety Data Sheet

Section 1:	Identification
Name:	**B-1M Curing Agent**
Description:	**Polyether Polyol**
Use:	Adhesive
SDS number:	YHAI-56
Appearance and odor:	White, slight organic odor
Company:	Yokohama Industries Americas, Inc. 103 Kuhlman Blvd. Versailles, KY 40383
Emergency telephone:	1-800-424-9300 CHEMTREC
Product information	859-879-2853
Effective date:	3/31/2014
Supersedes date:	5/20/2011

Section 2: Hazard(s) Identification

GHS Classification

GHS Rating: health: 0; flammability: 5; reactivity: 0.

1- severe hazard, 2- serious, 3-moderate, 4-slight and 5- minimal

Skin Irritation- Category 3.
Eye Irritation- Category 2B.

GHS Label

OSHA HCS 2012

Pictograms:

None

Signal Word: ***WARNING*** **!**

Hazard Statements

H302- Harmful if swallowed.
H315- Causes skin irritation.
H320- Causes eye irritation.
H333- May be harmful if inhaled.

Precautionary Statements

P201- Obtain special instructions before use.
P202- Do not handle until all safety precautions have been read and understood.
P232- Protect from moisture.
P235 + P410- Keep cool. Protect from sunlight.
P264- Wash skin thoroughly after handling.
P270- Do not eat, drink or smoke when using this product.
P280- Wear protective gloves/protective clothing/eye protection/face protection.
P308+313- If exposed or concerned: Call a Poison Center or doctor/physician.
P332+313- If skin irritation occurs; get medical advice/attention.
P337+313- If eye irritation persists get medical advice/attention.
P305+351+338- IF IN EYES: Rinse cautiously with water for several minutes.

Remove contact lenses if present and easy to do- continue rinsing.
P403-P233- Store in a well ventilated place. Keep container tightly closed.
P405- Store locked up.
P501- Dispose of contents/container in accordance with local regulation.

Section 3: Composition/Information on Ingredients

A hazard evaluation of this product has been performed. The components listed below are identified as hazardous chemicals under the criteria of the OSHA hazard communication standard (29 CFR 1910.1200).

Common name / Chemical name	CAS number	Approximate %
Calcium Carbonate	471-34-1	25-35
Limestone / Calcium Carbonate	1317-65-3	15-25

Section 4: First-Aid Measures

Primary route(s) of exposure: **Eye - yes** **Skin - yes** **Inhalation - yes**

Eye contact:
Flush eyes with water for at least 15 minutes. Lift eyelids frequently. Get prompt medical attention.

Skin contact:
Remove contaminated clothing and shoes. Wash affected area with soap and water. If irritation develops, consult a physician. Wash contaminated clothing separately before reuse.

Inhalation:
Remove to fresh air. If symptoms develop, seek immediate medical attention. If not breathing, give artificial respiration, preferably mouth to mouth.

Ingestion:
Do not induce vomiting. Seek medical attention. Do not give anything by mouth if the person is drowsy, unconscious, or has no gag reflex.
Ingestion creates a high risk of aspiration and subsequent chemical pneumonitis. However, if more than one milliliter per kilogram of body weight of the hydrocarbon was ingested, careful emesis or lavage is recommended because of the toxic effects produced by the hydrocarbon.
Note to physician:
Bronchial constriction may develop after extensive exposure to isocyanate, even in individuals who have not been shown to be previously sensitized. Use bronchodilators.

Health Effects Summary

Eye contact:
Can cause mild to moderate irritation.
The severity of reaction depends on the duration of exposure and first aid procedures administered

Skin contact:
Prolonged or repeated contact can defat the skin, cause irritation, and lead to the development of dermatitis.

Inhalation:
Can cause irritation to the nose, throat, and upper respiratory tract.
Inhalation can cause dizziness, headaches, and incoordination.
Nausea, vomiting, and gastrointestinal upset can occur.

Ingestion:
Ingestion can cause gastrointestinal irritation.
Can cause nausea, vomiting, and gastrointestinal upset.
Dizziness, faintness, drowsiness, and incoordination (ataxia) can occur.

Additional effects (target organs):
Eye
Skin.

Aggravation of existing conditions:
Skin.

Section 5: Fire-Fighting Measures

Flash point: not established

Explosive limits: LEL (%) - not established UEL (%) - not established

Auto-ignition temperature: not established

Extinguishing media:

Small fires : use agents approved for class B hazards (e.g. dry chemical, carbon dioxide, halon, steam, or foam) or water fog

Large fires : use water spray, fog, or alcohol foam.

Special fire fighting procedures:

Fire fighters and others who may be exposed to the products of combustion should be equipped with NIOSH approved positive pressure self-contained breathing apparatus (SCBA) and full protective clothing.

Unusual fire and explosion hazards:

When exposed to flames or high temperatures encountered during fire conditions, sealed containers may rupture because of the build up of internal pressure. Cool containers with water.

Section 6: Accidental Release Measures

Response to spills:

Shovel or vacuum spilled product and place in closed containers for further handling and disposal

Do not flush to streams, rivers, or other bodies of water.

Precautions:

If the airborne concentration exceeds established exposure limits (TLV or PEL), or if high airborne concentrations can occur, evacuate employees and ventilate the area.

A supplied air respirator or self-contained breathing apparatus (SCBA) should be used for entry into enclosed spaces, or in areas with inadequate ventilation.

Section 7: Handling and Storage

Recommended storage practice and conditions:

Store in cool, dry, well ventilated area. Do not store above, 95°F, 35°C

Container use procedures:

No special precautions are needed. Follow good manufacturing and handling practices.

Empty container precautions:

This container can be hazardous when empty, because it can retain product residues. Therefore, do not reuse container for food, clothing, or products for human or animal consumption or where skin contact may occur.

Section 8: Exposure Controls/ Personal Protection

Ventilation:

Maintain airborne concentration below the established exposure limits (See airborne exposure limits in this section) by providing adequate ventilation. General (dilution) ventilation may be acceptable. However, local exhaust ventilation is recommended when vapors, mists, or dusts can be released.

Personal hygiene:

Wash thoroughly after handling, especially before eating, drinking, smoking, or using restroom facilities.

Wash contaminated goggles, faceshield, and gloves. Professionally launder contaminated clothing. Discard contaminated shoes.

Airborne exposure limits

Calcium Carbonate

ACGIH TLV-TWA: 10 mg/m^3 total particulate

Limestone

ACGIH TLV-TWA: 10 mg/m^3 total particulate

OSHA PEL: 5 (15) mg/m^3 respirable reaction (total particulate)

Note: Because of this product's physical composition, the release or generation of a dust is not expected to occur under normal conditions of use.

Personal Protective Equipment (PPE)

Eye protection:

Wear chemical splash goggles.

An eye wash facility should be readily available.

Skin protection:

Wear protective clothing and appropriate impervious gloves. Because a variety of protective gloves exist, always consult glove manufacturer to determine the proper type for specific operation.

Respiratory protection:

Avoid breathing vapor and/or mist.

When established airborne exposure limits are surpassed (see airborne exposure limits in this section), wear NIOSH/MSHA approved equipment. Determine the appropriate type equipment for specific application by consulting the respirator manufacturer. Observe the respirator use limitations specified by NIOSH/MSHA or the manufacturer.

High airborne concentrations may necessitate the use of self-contained breathing apparatus (SCBA) or a supplied air respirator. In addition, respiratory protection programs must be in compliance with 29 CFR 1910.134.

Section 9:	**Physical and Chemical Properties**
% Non-volatile (by weight):	100
pH:	not applicable
Vapor density (air=1):	not established
Solubility in water:	insoluble
Evaporation rate (n-butyl acetate=1):	not established
Vapor pressure (mmHg @25°C):	not established
Specific gravity (water=1);	>1
Approximate boiling point:	not established

Note: The physical data presented above are typical values and should not be construed as a specification.

Section 10:	**Stability and Reactivity**
Stable under normal conditions of storage and use:	yes

Materials to avoid:

Oxidizing Agents

Acids.

Strong bases.

Hazardous polymerization:

Hazardous polymerization will not occur.

Thermal decomposition products:

If heated to high temperatures, this product may emit the following compounds:

Flammable solvent vapors.

Oxides of nitrogen.

Smoke, soot, & toxic fumes (e.g. carbon dioxide & carbon monoxide).

Section 11:	**Toxicological Information**

Calcium Carbonate

Toxic effects:

Can cause mechanical irritation and discoloration of the eyes and skin. Overexposure to Calcium Carbonate dusts may effect respiratory function. Note: Naturally occurring calcium carbonate can contain, as an impurity, trace amounts of crystalline silica.

Carcinogenicity - listed by:

ACGIH: no IARC monographs: no NTP annual report: no OSHA: no

Limestone

Toxic effects:
Overexposure to Calcium Carbonate dusts may effect respiratory function. Note: Naturally occurring calcium carbonate can contain, as an impurity, trace amounts of crystalline silica.
Carcinogenicity - listed by:
ACGIH: no IARC monographs: no NTP annual report: no OSHA: no

Section 12: Ecological Information

Keep out of sewers, drainage areas, streams, or other bodies of water. Report spills and releases, as applicable, under Federal and State Regulations.

Section 13: Disposal Considerations

Disposal methods:
If discarded in its original unused form, this product should be managed (stored/treated/disposed/etc.) at an authorized facility, in compliance with all applicable federal, state, and local requirements. Be sure to contact appropriate government environmental agencies if further disposal guidance is required.

Of the methods of disposal currently available, it is recommended that an alternative be selected according to the following order of preference, based upon environmental acceptability:
(1) Recycle or rework if at all feasible,
(2) Incinerate at an authorized facility, or
(3) Treat at an acceptable waste treatment facility.

Section 14: Transportation Information

DOT shipping name:	non-regulated
DOT label:	not applicable
DOT identification No.:	not applicable

Supplemental section 14 information:
HM-181, IATA/ICAO and IMO - non-regulated

Section 15: Regulatory Information

Toxic substance control act (TSCA)
Chemical component(s) in this product are on the section 8 (b) chemical substance inventory listing (40 CFR 710).
SARA title III information
Section 313 - toxic chemicals
Pursuant to section 313 of SARA title", this product does not contain a toxic chemical in excess of 1 percent of the mixture (0.1 percent, if the listed toxic chemical is a carcinogen).
Section 302 - extremely hazardous substances
Pursuant to section 302 of SARA title", this product does not contain an extremely hazardous substance.
Section 311/312 - hazard categories
Pursuant to section 311/312 of SARA title", the physical and health hazard categories for this product are identified below:

Fire hazard:	no
Sudden release of pressure hazard:	no
Reactivity hazard:	no
Immediate (acute) health hazard:	yes
Delayed (chronic) health hazard:	yes

Hazardous materials information review regulation - Canada
This material safety data sheet provides information that complies with the requirement set forth under the Canadian workplace hazardous materials information system (WHMIS).

Claim for exemption registry No.:	not applicable
Expiration date:	not applicable

Section 16: Other Information

User Responsibility:

A bulletin such as this cannot be expected to cover all possible individual situations. As the user has the responsibility to provide a safe workplace, all aspects of an individual operation should be examined to determine if, or where, precautions - in addition to those described herein - are required. Any health hazard and safety information contained herein should be passed on to your customers or employees, as the case may be.

Disclaimer of liability

The information contained herein is, to the best of our knowledge and belief, accurate. However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by use of this material. All chemicals may present unknown health hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist. Final determination of suitability of the chemical is the sole responsibility of the user. No representations of warranties, either expressed or implied, of merchantability, fitness for a particular purpose or any other nature are made hereunder with respect to the information contained herein or the chemical to which the information refers. It is the responsibility of the user to comply with all applicable federal, state and local laws and regulations.

State of California addendum to the safety data sheet:

Product name: **B-1M Curing Agent**
Effective date: 3/31/2014

The California safe drinking water and toxic enforcement act of 1986, otherwise known as proposition 65, requires that persons potentially exposed to certain substances be made aware of the chronic effects of the substances specified by the state of California.

This product contains no substances "known to the state of California to cause cancer, birth defects or other reproductive harm."

Commonwealth of Pennsylvania addendum to the safety data sheet:

Product name: **B-1M Curing Agent**
Effective date: 3/31/2014

All of the materials in this product that are required by the commonwealth of Pennsylvania to be identified are listed below. In addition, some of the materials identified may have been placed by the commonwealth of Pennsylvania on their hazardous substance list.

Ingredients	**CAS Number**	**Weight %**

The specific chemical identity of any substance not identified with a chemical abstract service number is being held as a trade secret.

If you have questions with regard to health effects, or other information presented in this document, contact:

Neil Dalton,
Director of Environment, Health and Safety
Yokohama Tire Corporation
1500 Indiana Avenue
Salem, VA 24153
Tel # 540-375-8209 / Fax # 540-375-0226

SAFETY DATA SHEET

DDP Specialty Electronic Materials US, LLC

Product name: BETAPRIME ™ 5500

Issue Date: 01/16/2020
Print Date: 04/11/2024

DDP Specialty Electronic Materials US, LLC encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. IDENTIFICATION

Product name: BETAPRIME ™ 5500

Recommended use of the chemical and restrictions on use
Identified uses: A primer - For use in automotive applications.

COMPANY IDENTIFICATION
DDP Specialty Electronic Materials US,
LLC
974 Centre Road, Building 730,
Wilmington DE 19805
UNITED STATES

Customer Information Number: 833-338-7668
SDSQuestion-NA@dupont.com

EMERGENCY TELEPHONE NUMBER
24-Hour Emergency Contact: 1-800-424-9300
Local Emergency Contact: 800-424-9300

2. HAZARDS IDENTIFICATION

Hazard classification
GHS classification in accordance with 29 CFR 1910.1200
Flammable liquids - Category 2
Acute toxicity - Category 4 - Inhalation
Eye irritation - Category 2A
Respiratory sensitisation - Category 1
Specific target organ toxicity - single exposure - Category 3

Label elements
Hazard pictograms

Signal word: **DANGER!**

Hazards
Highly flammable liquid and vapour.
Causes serious eye irritation.
Harmful if inhaled.
May cause allergy or asthma symptoms or breathing difficulties if inhaled.
May cause drowsiness or dizziness.

Precautionary statements

Prevention
Keep away from heat/sparks/open flames/hot surfaces. No smoking.
Keep container tightly closed.
Ground/bond container and receiving equipment.
Use explosion-proof electrical/ ventilating/ lighting equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
Wash skin thoroughly after handling.
Use only outdoors or in a well-ventilated area.
Wear protective gloves/ eye protection/ face protection.
In case of inadequate ventilation wear respiratory protection.

Response
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If eye irritation persists: Get medical advice/ attention.
If experiencing respiratory symptoms: Call a POISON CENTER/doctor.
In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

Storage
Store in a well-ventilated place. Keep container tightly closed.
Store in a well-ventilated place. Keep cool.
Store locked up.

Disposal
Dispose of contents/ container to an approved waste disposal plant.

Other hazards
Static-accumulating flammable liquid.

3. COMPOSITION/INFORMATION ON INGREDIENTS

This product is a mixture.

Component	CASRN	Concentration

Methyl ethyl ketone	78-93-3	> 50.0 - < 60.0 %
ALIPHATIC BASED SILYLATED POLYMER P99-533	Not available	> 15.0 - < 25.0 %
Carbon black	1333-86-4	> 5.0 - < 15.0 %
3-Methoxy-1-butyl acetate	4435-53-4	< 10.0 %
Methylenediphenyl diisocyanate , glycerol propoxylated , copolymer	68877-65-6	< 10.0 %
1-Isocyanato-3,3,5-trimethyl-5-isocyanatomethylcyclohexane	4098-71-9	< 2.0 %
4,4' -Methylenediphenyl diisocyanate	101-68-8	< 1.0 %

4. FIRST AID MEASURES

Description of first aid measures
General advice:
First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

Inhalation: Move person to fresh air. If not breathing, give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask, etc). If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician or transport to a medical facility.

Skin contact: Remove material from skin immediately by washing with soap and plenty of water. Remove contaminated clothing and shoes while washing. Seek medical attention if irritation persists. Wash clothing before reuse. An MDI skin decontamination study demonstrated that cleaning very soon after exposure is important, and that a polyglycol-based skin cleanser or corn oil may be more effective than soap and water. This may also apply to other isocyanates. Discard items which cannot be decontaminated, including leather articles such as shoes, belts and watchbands. Suitable emergency safety shower facility should be available in work area.

Eye contact: Immediately flush eyes with water; remove contact lenses, if present, after the first 5 minutes, then continue flushing eyes for at least 15 minutes. Obtain medical attention without delay, preferably from an ophthalmologist. Suitable emergency eye wash facility should be immediately available.

Ingestion: Do not induce vomiting. Call a physician and/or transport to emergency facility immediately.

Most important symptoms and effects, both acute and delayed:
Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), any additional important symptoms and effects are described in Section 11: Toxicology Information.

Indication of any immediate medical attention and special treatment needed
Notes to physician: Maintain adequate ventilation and oxygenation of the patient. May cause respiratory sensitization or asthma-like symptoms. Bronchodilators, expectorants and antitussives may be of help. Treat bronchospasm with inhaled beta2 agonist and oral or parenteral corticosteroids. Respiratory symptoms, including pulmonary edema, may be delayed. Persons receiving significant exposure should be observed 24-48 hours for signs of respiratory distress. If you are sensitized to diisocyanates, consult your physician regarding working with other respiratory irritants or sensitizers. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Excessive exposure may aggravate preexisting asthma and other respiratory disorders (e.g. emphysema, bronchitis, reactive airways dysfunction syndrome). Skin contact may aggravate preexisting dermatitis.

5. FIREFIGHTING MEASURES

Extinguishing media

Suitable extinguishing media: Water fog or fine spray.. Dry chemical fire extinguishers.. Carbon dioxide fire extinguishers.. Foam.. Alcohol resistant foams (ATC type) are preferred. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective..

Unsuitable extinguishing media: Do not use direct water stream.. Straight or direct water streams may not be effective to extinguish fire..

Special hazards arising from the substance or mixture

Hazardous combustion products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating.. Combustion products may include and are not limited to:. Nitrogen oxides.. Carbon monoxide.. Carbon dioxide..

Unusual Fire and Explosion Hazards: Container may vent and/or rupture due to fire.. Electrically ground and bond all equipment.. Flammable mixtures of this product are readily ignited even by static discharge.. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition and/or flash back may occur.. Flammable mixtures may exist within the vapor space of containers at room temperature.. Flammable concentrations of vapor can accumulate at temperatures above flash point; see Section 9..

Advice for firefighters

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry.. Stay upwind. Keep out of low areas where gases (fumes) can accumulate.. Water may not be effective in extinguishing fire.. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed.. Burning liquids may be extinguished by dilution with water.. Do not use direct water stream. May spread fire.. Eliminate ignition sources.. Move container from fire area if this is possible without hazard.. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage.. Avoid accumulation of water. Product may be carried across water surface spreading fire or contacting an ignition source.. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage.. Review the "Accidental Release Measures" and the "Ecological Information" sections of this (M)SDS..

Special protective equipment for firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves).. Avoid contact with this material during fire fighting operations. If contact is likely, change to full chemical resistant fire fighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location.. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections..

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Evacuate area. Only trained and properly protected personnel must be involved in clean-up operations. Keep personnel out of low areas. Keep upwind of spill. Ventilate area of leak or spill. No smoking in area. Eliminate all sources of ignition in vicinity of spill or released vapor to avoid fire or explosion. Vapor explosion hazard. Keep out of sewers. For large spills, warn public of downwind explosion hazard. Check area with combustible gas detector before reentering area. Ground and bond all containers and handling equipment. Refer to section 7, Handling, for additional precautionary measures. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Environmental precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

Methods and materials for containment and cleaning up: Contain spilled material if possible. Absorb with materials such as: Cat litter. Sand. Sawdust. Ground and bond all containers and handling equipment. Pump with explosion-proof equipment. If available, use foam to smother or suppress. Collect in suitable and properly labeled containers. See Section 13, Disposal Considerations, for additional information.

7. HANDLING AND STORAGE

Precautions for safe handling: Keep away from heat, sparks and flame. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated contact with skin. Avoid breathing vapor or mist. Do not swallow. Wash thoroughly after handling. Keep container closed. Use only with adequate ventilation. No smoking, open flames or sources of ignition in handling and storage area. Ignition sources can include and are not limited to pilot lights, flames, smoking, sparks, heaters, electrical equipment, and static discharges. Electrically bond and ground all containers, personnel and equipment before transfer or use of material. Containers, even those that have been emptied, can contain vapors. Do not cut, drill, grind, weld, or perform similar operations on or near empty containers. Use of non-sparking or explosion-proof equipment may be necessary, depending upon the type of operation. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition and/or flash back may occur. Never use air pressure for transferring product unless a risk assesment has been conducted that includes consideration of the flammability of the product. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

Conditions for safe storage: Minimize sources of ignition, such as static build-up, heat, spark or flame. Keep container closed. Flammable mixtures may exist within the vapor space of containers at room temperature.

Storage stability

Storage temperature:

> 5 - < 25 °C (> 41 - < 77 °F)

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters
If exposure limits exist, they are listed below. If no exposure limits are displayed, then no values are applicable.

Component	Regulation	Type of listing	Value
Methyl ethyl ketone	Dow IHG	TWA	50 ppm
	Dow IHG	STEL	100 ppm
	ACGIH	TWA	200 ppm
	Further information: CNS impair: Central Nervous System impairment; URT irr: Upper Respiratory Tract irritation; PNS impair: Peripheral Nervous System impairment; BEI: Substances for which there is a Biological Exposure Index or Indices (see BEI® section)		
	ACGIH	STEL	300 ppm
	Further information: CNS impair: Central Nervous System impairment; URT irr: Upper Respiratory Tract irritation; PNS impair: Peripheral Nervous System impairment; BEI: Substances for which there is a Biological Exposure Index or Indices (see BEI® section)		
	OSHA Z-1	TWA	590 mg/m3 200 ppm
	Further information: (b): The value in mg/m3 is approximate.		
	CAL PEL	PEL	590 mg/m3 200 ppm
	CAL PEL	STEL	885 mg/m3 300 ppm
1-Isocyanato-3,3,5-trimethyl-5-isocyanatomethylcyclohexane	Dow IHG	TWA	0.005 ppm
	Further information: DSEN, RSEN: Skin and respiratory sensitizer		
	ACGIH	TWA	0.005 ppm
	Further information: resp sens: Respiratory sensitization		
	CAL PEL	PEL	0.045 mg/m3 0.005 ppm
	Further information: S: Skin		
	CAL PEL	STEL	0.02 ppm
	Further information: S: Skin		
4,4' -Methylenediphenyl diisocyanate	Dow IHG	TWA	0.005 ppm
	Dow IHG	STEL	0.02 ppm
	ACGIH	TWA	0.005 ppm
	Further information: resp sens: Respiratory sensitization		
	OSHA Z-1	C	0.2 mg/m3 0.02 ppm
	Further information: (b): The value in mg/m3 is approximate.; ©: Ceiling limit is to be determined from breathing-zone air samples.		

Although some of the components of this product may have exposure guidelines, no exposure would be expected under normal handling conditions due to the physical state of the material.

Biological occupational exposure limits

Components	CAS-No.	Control parameters	Biological specimen	Sampling time	Permissible concentration	Basis
Methyl ethyl ketone	78-93-3	methyl ethyl	Urine	End of	2 mg/l	ACGIH

	ketone	shift (As soon as possible after exposure ceases)	BEI

Exposure controls
Engineering controls: Use only with adequate ventilation. Local exhaust ventilation may be necessary for some operations. Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines. Exhaust systems should be designed to move the air away from the source of vapor/aerosol generation and people working at this point. The odor and irritancy of this material are inadequate to warn of excessive exposure.

Individual protection measures
Eye/face protection: Use chemical goggles.
Skin protection
Hand protection: Use gloves chemically resistant to this material. Examples of preferred glove barrier materials include: Butyl rubber. Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Examples of acceptable glove barrier materials include: Chlorinated polyethylene. Nitrile/butadiene rubber ("nitrile" or "NBR"). Neoprene. Viton. Avoid gloves made of: Polyvinyl chloride ("PVC" or "vinyl"). NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.
Other protection: Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task.
Respiratory protection: Atmospheric levels should be maintained below the exposure guideline. When atmospheric levels may exceed the exposure guideline, use an approved air-purifying respirator equipped with an organic vapor sorbent and a particle filter. For situations where the atmospheric levels may exceed the level for which an air-purifying respirator is effective, use a positive-pressure air-supplying respirator (air line or self-contained breathing apparatus). For emergency response or for situations where the atmospheric level is unknown, use an approved positive-pressure self-contained breathing apparatus or positive-pressure air line with auxiliary self-contained air supply. The following should be effective types of air-purifying respirators: Organic vapor cartridge with a particulate pre-filter.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	
Physical state	Liquid.
Color	Black
Odor	Characteristic
Odor Threshold	No test data available
pH	No test data available
Melting point/range	No test data available
Freezing point	No test data available
Boiling point (760 mmHg)	80 °C (176 °F) *Estimated.*

Flash point	**closed cup** -10 °C (14 °F) *DIN 51755*
Evaporation Rate (Butyl Acetate = 1)	No test data available
Flammability (solid, gas)	Flammable liquid
Lower explosion limit	8 % vol *Estimated.*
Upper explosion limit	11.5 % vol Estimated.
Vapor Pressure	150 mbar at 20 °C (68 °F) *Estimated.*
Relative Vapor Density (air = 1)	2.5 *Estimated.*
Relative Density (water = 1)	0.95 *Supplier*
Water solubility	Not applicable
Partition coefficient: n-octanol/water	No data available
Auto-ignition temperature	400 °C (752 °F) *Estimated.*
Decomposition temperature	No test data available
Dynamic Viscosity	No test data available
Kinematic Viscosity	No test data available
Explosive properties	No test data available
Oxidizing properties	No test data available
Molecular weight	No data available
Volatile Organic Compounds	4.95 lb/gln *EPA Method No. 24* (typical value)

NOTE: The physical data presented above are typical values and should not be construed as a specification.

10. STABILITY AND REACTIVITY

Reactivity: No dangerous reaction known under conditions of normal use.

Chemical stability: Stable under recommended storage conditions. See Storage, Section 7.

Possibility of hazardous reactions: Polymerization will not occur.

Conditions to avoid: Exposure to elevated temperatures can cause product to decompose. Avoid static discharge.

Incompatible materials: Avoid contact with: Acids. Bases. Oxidizers.

Hazardous decomposition products: Decomposition products depend upon temperature, air supply and the presence of other materials..

11. TOXICOLOGICAL INFORMATION

Toxicological information appears in this section when such data is available.

Acute toxicity

Acute oral toxicity

Low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury. May cause central nervous system effects.
Single dose oral LD50 has not been determined.

Acute dermal toxicity
Prolonged skin contact is unlikely to result in absorption of harmful amounts.
The dermal LD50 has not been determined.

Acute inhalation toxicity
Vapor concentrations are attainable which could be hazardous on single exposure. May cause respiratory irritation and central nervous system depression. Symptoms may include headache, dizziness and drowsiness, progressing to incoordination and unconsciousness. May cause nausea and vomiting. Based on information for component(s): Excessive exposure may cause irritation to upper respiratory tract (nose and throat) and lungs. May cause pulmonary edema (fluid in the lungs.) Effects may be delayed. Decreased lung function has been associated with overexposure to isocyanates. This material contains mineral and/or inorganic fillers. There is essentially no potential for inhalation exposure to these fillers incidental to industrial handling due to the physical state.
The LC50 has not been determined.

Skin corrosion/irritation
Prolonged contact may cause moderate skin irritation with local redness.
May cause drying and flaking of the skin.

Serious eye damage/eye irritation
May cause pain disproportionate to the level of irritation to eye tissues.
May cause moderate eye irritation.
May cause moderate corneal injury.
Vapor may cause eye irritation experienced as mild discomfort and redness.

Sensitization
For skin sensitization:
A component in this mixture has been shown to be a skin sensitizer.
Once an individual is sensitized, reexposure to very small amounts of vapor, mist or liquid isophorone diisocyanate may cause an allergic skin reaction.
Animal studies have shown that skin contact with isocyanates may play a role in respiratory sensitization.

For respiratory sensitization:
A component in this mixture may cause an allergic respiratory response.
Reexposure to extremely low isocyanate concentrations may cause allergic respiratory reactions in individuals already sensitized.
Asthma-like symptoms may include coughing, difficult breathing and a feeling of tightness in the chest.
Occasionally, breathing difficulties may be life threatening.

Specific Target Organ Systemic Toxicity (Single Exposure)
Contains component(s) which are classified as specific target organ toxicant, single exposure, category 3.

Specific Target Organ Systemic Toxicity (Repeated Exposure)
Contains component(s) which have been reported to cause effects on the following organs in animals:
Liver.

Tissue injury in the upper respiratory tract and lungs has been observed in laboratory animals after repeated excessive exposures to MDI/polymeric MDI aerosols.
Methyl ethyl ketone is probably not neurotoxic in itself but it potentiates the neurotoxicity of methyl-n-butyl ketone and n-hexane.
Methyl ethyl ketone has caused liver effects in laboratory animals exposed by inhalation to high concentrations.

Carcinogenicity
Lung tumors have been observed in laboratory animals exposed to respirable aerosol droplets of MDI/Polymeric MDI (6 mg/m3) for their lifetime. Tumors occurred concurrently with respiratory irritation and lung injury. Current exposure guidelines are expected to protect against these effects reported for MDI.

Teratogenicity
Contains component(s) which did not cause birth defects in animals; other fetal effects occurred only at doses toxic to the mother. Contains component(s) which caused birth defects in laboratory animals only at doses toxic to the mother.

Reproductive toxicity
No relevant data found.

Mutagenicity
For the component(s) tested: In vitro genetic toxicity studies were predominantly negative. Genetic toxicity data on MDI are inconclusive. MDI was weakly positive in some in vitro studies; other in vitro studies were negative. Animal mutagenicity studies were predominantly negative.

Aspiration Hazard
Based on available information, aspiration hazard could not be determined.

COMPONENTS INFLUENCING TOXICOLOGY:

Methyl ethyl ketone

Acute oral toxicity
LD50, Rat, 2,657 - 5,554 mg/kg

Acute dermal toxicity
LD50, Rabbit, > 5,000 mg/kg

Acute inhalation toxicity
LC50, Rat, 4 Hour, vapour, 34.5 mg/l

ALIPHATIC BASED SILYLATED POLYMER P99-533

Acute oral toxicity
Single dose oral LD50 has not been determined.

Acute dermal toxicity
The dermal LD50 has not been determined.

Acute inhalation toxicity
The LC50 has not been determined.

Carbon black

Acute oral toxicity
LD50, Rat, > 8,000 mg/kg

Acute dermal toxicity
LD50, Rabbit, > 3,000 mg/kg No deaths occurred at this concentration.

Acute inhalation toxicity
LC50, Rat, 1 Hour, dust/mist, 27 mg/l No deaths occurred at this concentration.

3-Methoxy-1-butyl acetate

Acute oral toxicity
LD50, Rat, 4,210 mg/kg

Acute dermal toxicity
The dermal LD50 has not been determined.

Acute inhalation toxicity
The LC50 has not been determined.

Methylenediphenyl diisocyanate , glycerol propoxylated , copolymer

Acute oral toxicity
Single dose oral LD50 has not been determined.

Acute dermal toxicity
The dermal LD50 has not been determined.

Acute inhalation toxicity
The LC50 has not been determined.

1-Isocyanato-3,3,5-trimethyl-5-isocyanatomethylcyclohexane

Acute oral toxicity
LD50, Rat, 4,825 mg/kg

Acute dermal toxicity
LD50, Rat, > 7,000 mg/kg

Acute inhalation toxicity
LC50, Rat, male and female, 4 Hour, dust/mist, 0.04 mg/l

4,4' -Methylenediphenyl diisocyanate

Acute oral toxicity
LD50, Rat, > 2,000 mg/kg No deaths occurred at this concentration.

Acute dermal toxicity
LD50, Rabbit, > 9,400 mg/kg

Acute inhalation toxicity
LC50, Rat, 1 Hour, dust/mist, 2.24 mg/l

12. ECOLOGICAL INFORMATION

Ecotoxicological information appears in this section when such data is available.

Toxicity

Methyl ethyl ketone

Acute toxicity to fish
Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).
LC50, Pimephales promelas (fathead minnow), static test, 96 Hour, 2,993 mg/l, OECD Test Guideline 203

Acute toxicity to aquatic invertebrates
EC50, Daphnia magna (Water flea), static test, 48 Hour, 308 mg/l, OECD Test Guideline 202

Acute toxicity to algae/aquatic plants
ErC50, Pseudokirchneriella subcapitata (microalgae), static test, 96 Hour, Growth rate inhibition, 2,029 mg/l, OECD Test Guideline 201

Toxicity to bacteria
EC50, Bacteria, 96 Hour, > 1,000 mg/l, hUCC

ALIPHATIC BASED SILYLATED POLYMER P99-533

Acute toxicity to fish
No relevant information found.

Carbon black

Acute toxicity to fish
Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).
LC50, Leuciscus idus (Golden orfe), static test, 96 Hour, > 1,000 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates
EC50, Daphnia magna (Water flea), 24 Hour, > 5,600 mg/l, OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants
NOEC, Desmodesmus subspicatus (green algae), 72 Hour, 10,000 mg/l, OECD Test Guideline 201

3-Methoxy-1-butyl acetate

Acute toxicity to fish
Material is moderately toxic to aquatic organisms on an acute basis (LC50/EC50 between 1 and 10 mg/L in the most sensitive species tested).
LC50, Danio rerio (zebra fish), semi-static test, 96 Hour, 7.1 mg/l

Acute toxicity to aquatic invertebrates
EC50, Daphnia magna (Water flea), 24 Hour, 360 mg/l
LC50, crustacean Chaetogammarus marinus, 96 Hour, 128 mg/l

Acute toxicity to algae/aquatic plants
ErC50, Pseudokirchneriella subcapitata (green algae), 72 Hour, Growth rate inhibition, > 70 mg/l, OECD Test Guideline 201 or Equivalent

Toxicity to bacteria
EC50, Bacteria, 16 Hour, > 1,000 mg/l

Methylenediphenyl diisocyanate , glycerol propoxylated , copolymer

Acute toxicity to fish
No relevant data found.

1-Isocyanato-3,3,5-trimethyl-5-isocyanatomethylcyclohexane

Acute toxicity to fish
Material is moderately toxic to aquatic organisms on an acute basis (LC50/EC50 between 1 and 10 mg/L in the most sensitive species tested).
For this family of materials:
The measured ecotoxicity is that of the hydrolyzed product, generally under conditions maximizing production of soluble species.
LC50, Leuciscus idus (Golden orfe), static test, 48 Hour, 1.8 mg/l

Acute toxicity to aquatic invertebrates
LC50, Daphnia magna (Water flea), 24 Hour, 84 mg/l

Acute toxicity to algae/aquatic plants
EbC50, alga Scenedesmus sp., 72 Hour, Biomass, 119 mg/l

Toxicity to bacteria
EC10, Bacteria, 6 Hour, 554 mg/l

4,4' -Methylenediphenyl diisocyanate

Acute toxicity to fish
The measured ecotoxicity is that of the hydrolyzed product, generally under conditions maximizing production of soluble species.
Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).
Based on information for a similar material:
LC50, Danio rerio (zebra fish), static test, 96 Hour, > 1,000 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates
Based on information for a similar material:
EC50, Daphnia magna (Water flea), static test, 24 Hour, > 1,000 mg/l, OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants
Based on information for a similar material:
NOEC, Desmodesmus subspicatus (green algae), static test, 72 Hour, Growth rate inhibition, 1,640 mg/l, OECD Test Guideline 201 or Equivalent

Toxicity to bacteria
Based on information for a similar material:
EC50, activated sludge, static test, 3 Hour, Respiration rates., > 100 mg/l

Toxicity to soil-dwelling organisms
EC50, Eisenia fetida (earthworms), Based on information for a similar material:, 14 d, > 1,000 mg/kg

Toxicity to terrestrial plants
EC50, Avena sativa (oats), Growth inhibition, 1,000 mg/l
EC50, Lactuca sativa (lettuce), Growth inhibition, 1,000 mg/l

Persistence and degradability

Methyl ethyl ketone

Biodegradability: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.
10-day Window: Not applicable
Biodegradation: 98 %
Exposure time: 28 d
Method: OECD Test Guideline 301D or Equivalent

Theoretical Oxygen Demand: 2.44 mg/mg

Biological oxygen demand (BOD)

Incubation Time	BOD
5 d	71 - 76 %
10 d	71 - 82 %
20 d	71 - 89 %

Photodegradation
Test Type: Half-life (indirect photolysis)
Sensitization: OH radicals
Atmospheric half-life: 8 d
Method: Estimated.

ALIPHATIC BASED SILYLATED POLYMER P99-533

Biodegradability: No relevant data found.

Carbon black

Biodegradability: Biodegradation is not applicable.

3-Methoxy-1-butyl acetate

Biodegradability: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Material is ultimately biodegradable (reaches > 70% mineralization in OECD test(s) for inherent biodegradability).
10-day Window: Pass
Biodegradation: > 90 %
Exposure time: 12 d
Method: OECD Test Guideline 301E or Equivalent
10-day Window: Not applicable
Biodegradation: > 95 %
Exposure time: 20 d
Method: OECD Test Guideline 302B or Equivalent
10-day Window: Not applicable
Biodegradation: 63.5 %
Exposure time: 14 d
Method: OECD Test Guideline 301C or Equivalent

Theoretical Oxygen Demand: 1.97 mg/mg

Photodegradation

Atmospheric half-life: 0.57 d
Method: Estimated.

Methylenediphenyl diisocyanate , glycerol propoxylated , copolymer
Biodegradability: No relevant data found.

1-Isocyanato-3,3,5-trimethyl-5-isocyanatomethylcyclohexane
Biodegradability: Based on stringent OECD test guidelines, this material cannot be considered as readily biodegradable; however, these results do not necessarily mean that the material is not biodegradable under environmental conditions. For this family of materials: In the aquatic and terrestrial environment, material reacts with water forming predominantly insoluble polyureas which appear to be stable. In the atmospheric environment, material is expected to have a short tropospheric half-life, based on calculations and by analogy with related diisocyanates.
10-day Window: Fail
Biodegradation: 62 %
Exposure time: 28 d
Method: OECD Test Guideline 301E or Equivalent

Theoretical Oxygen Demand: 2.59 mg/mg

Photodegradation
Test Type: Half-life (indirect photolysis)
Sensitization: OH radicals
Atmospheric half-life: 1.212 d
Method: Estimated.

4,4' -Methylenediphenyl diisocyanate
Biodegradability: In the aquatic and terrestrial environment, material reacts with water forming predominantly insoluble polyureas which appear to be stable. In the atmospheric environment, material is expected to have a short tropospheric half-life, based on calculations and by analogy with related diisocyanates.
10-day Window: Not applicable
Biodegradation: 0 %
Exposure time: 28 d
Method: OECD Test Guideline 302C or Equivalent

Bioaccumulative potential

Methyl ethyl ketone
Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Partition coefficient: n-octanol/water(log Pow): 0.3 at 40 °C Measured

ALIPHATIC BASED SILYLATED POLYMER P99-533
Bioaccumulation: No relevant information found. No relevant data found.

Carbon black
Bioaccumulation: No relevant data found.

3-Methoxy-1-butyl acetate
Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Partition coefficient: n-octanol/water(log Pow): 1.01 Estimated.

Methylenediphenyl diisocyanate , glycerol propoxylated , copolymer

Bioaccumulation: No relevant information found.

1-Isocyanato-3,3,5-trimethyl-5-isocyanatomethylcyclohexane

Bioaccumulation: For this family of materials: In the aquatic and terrestrial environment, movement is expected to be limited by its reaction with water forming predominantly insoluble polyureas.
Partition coefficient: n-octanol/water(log Pow): 4.75 Estimated.

4,4' -Methylenediphenyl diisocyanate

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3). Reacts with water. In the aquatic and terrestrial environment, movement is expected to be limited by its reaction with water forming predominantly insoluble polyureas.
Bioconcentration factor (BCF): 92 Cyprinus carpio (Carp) 28 d

Mobility in soil

Methyl ethyl ketone

Potential for mobility in soil is very high (Koc between 0 and 50).
Partition coefficient (Koc): 3.8 Estimated.

ALIPHATIC BASED SILYLATED POLYMER P99-533

No relevant data found.

Carbon black

No relevant data found.

3-Methoxy-1-butyl acetate

Potential for mobility in soil is very high (Koc between 0 and 50).
Partition coefficient (Koc): 10 Estimated.

Methylenediphenyl diisocyanate , glycerol propoxylated , copolymer

No relevant data found.

1-Isocyanato-3,3,5-trimethyl-5-isocyanatomethylcyclohexane

For this family of materials:
In the aquatic and terrestrial environment, movement is expected to be limited by its reaction with water forming predominantly insoluble polyureas.
Partition coefficient (Koc): 36000 Estimated.

4,4' -Methylenediphenyl diisocyanate

In the aquatic and terrestrial environment, movement is expected to be limited by its reaction with water forming predominantly insoluble polyureas.

13. DISPOSAL CONSIDERATIONS

Disposal methods: DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. AS YOUR SUPPLIER, WE HAVE NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS

INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information. FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Incinerator or other thermal destruction device.

Treatment and disposal methods of used packaging: Empty containers should be recycled or otherwise disposed of by an approved waste management facility. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. Do not re-use containers for any purpose.

14. TRANSPORT INFORMATION

DOT

Proper shipping name	Coating solution
UN number	UN 1139
Class	3
Packing group	II
Reportable Quantity	Methyl ethyl ketone

Classification for SEA transport (IMO-IMDG):

Proper shipping name	COATING SOLUTION
UN number	UN 1139
Class	3
Packing group	II
Marine pollutant	No
Transport in bulk according to Annex I or II of MARPOL 73/78 and the IBC or IGC Code	Consult IMO regulations before transporting ocean bulk

Classification for AIR transport (IATA/ICAO):

Proper shipping name	Coating solution
UN number	UN 1139
Class	3
Packing group	II

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. REGULATORY INFORMATION

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

Flammable (gases, aerosols, liquids, or solids)
Hazard not otherwise classified (physical hazards)
Serious eye damage or eye irritation
Respiratory or skin sensitisation
Specific target organ toxicity (single or repeated exposure)

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) Section 103
Calculated RQ exceeds reasonably attainable upper limit.

Pennsylvania Right To Know
The following chemicals are listed because of the additional requirements of Pennsylvania law:

Components	**CASRN**
Methyl ethyl ketone	78-93-3
Carbon black	1333-86-4

California Prop. 65
This product contains a chemical that is at or below California Propositions 65's "safe harbor level" as determined via a risk assessment. Therefore, the chemical is not required to be listed as a Prop 65 chemical on the SDS or label.

United States TSCA Inventory (TSCA)
All components of this product are in compliance with the inventory listing requirements of the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

16. OTHER INFORMATION

Hazard Rating System
NFPA

Health	Flammability	Instability
2	3	0

Revision
Identification Number: 225142 / A749 / Issue Date: 01/16/2020 / Version: 15.3
Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

Legend

ACGIH	USA. ACGIH Threshold Limit Values (TLV)
ACGIH BEI	ACGIH - Biological Exposure Indices (BEI)
C	Ceiling
CAL PEL	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
Dow IHG	Dow Industrial Hygiene Guideline

OSHA Z-1	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
PEL	Permissible exposure limit
STEL	Short-term exposure limit
TWA	8-hour time weighted average

Full text of other abbreviations
AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Information Source and References
This SDS is prepared by Product Regulatory Services and Hazard Communications Groups from information supplied by internal references within our company.

DDP Specialty Electronic Materials US, LLC urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-

specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.
US

SAFETY DATA SHEET

DDP Specialty Electronic Materials US, LLC

Product name: BETASEAL™ 43518 Glass Primer

Issue Date: 01/31/2023
Print Date: 04/11/2024

DDP Specialty Electronic Materials US, LLC encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. IDENTIFICATION

Product name: BETASEAL™ 43518 Glass Primer

Recommended use of the chemical and restrictions on use
Identified uses: A primer - For use in automotive applications.

COMPANY IDENTIFICATION
DDP Specialty Electronic Materials US,
LLC
974 Centre Road, Building 730,
Wilmington DE 19805
UNITED STATES

Customer Information Number: 833-338-7668
SDSQuestion-NA@dupont.com

EMERGENCY TELEPHONE NUMBER
24-Hour Emergency Contact: 1-800-424-9300
Local Emergency Contact: 800-424-9300

2. HAZARDS IDENTIFICATION

Hazard classification
GHS classification in accordance with 29 CFR 1910.1200
Flammable liquids - Category 2
Acute toxicity - Category 3 - Oral
Acute toxicity - Category 3 - Inhalation
Acute toxicity - Category 3 - Dermal
Skin irritation - Category 2
Eye irritation - Category 2A
Skin sensitisation - Category 1
Reproductive toxicity - Category 2
Specific target organ toxicity - single exposure - Category 1 - Oral
Specific target organ toxicity - single exposure - Category 3
Specific target organ toxicity - repeated exposure - Category 2 - Inhalation
Aspiration hazard - Category 1

Label elements
Hazard pictograms

Signal word: **DANGER!**

Hazards
Highly flammable liquid and vapour.
Toxic if swallowed, in contact with skin or if inhaled.
May be fatal if swallowed and enters airways.
Causes skin irritation.
May cause an allergic skin reaction.
Causes serious eye irritation.
May cause drowsiness or dizziness.
Suspected of damaging fertility or the unborn child.
Causes damage to organs (Eyes, Central nervous system) if swallowed.
May cause damage to organs (Nervous system) through prolonged or repeated exposure if inhaled.

Precautionary statements

Prevention
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking.
Keep container tightly closed.
Ground/bond container and receiving equipment.
Use explosion-proof electrical/ ventilating/ lighting equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Do not breathe mist or vapours.
Wash skin thoroughly after handling.
Do not eat, drink or smoke when using this product.
Use only outdoors or in a well-ventilated area.
Contaminated work clothing must not be allowed out of the workplace.
Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response
IF SWALLOWED: Immediately call a POISON CENTER/ doctor. Rinse mouth.
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
IF exposed: Call a POISON CENTER or doctor/ physician.
Do NOT induce vomiting.
If skin irritation or rash occurs: Get medical advice/ attention.
If eye irritation persists: Get medical advice/ attention.
Take off contaminated clothing and wash before reuse.
In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

Storage
Store in a well-ventilated place. Keep container tightly closed.
Store in a well-ventilated place. Keep cool.
Store locked up.

Disposal
Dispose of contents/ container to an approved waste disposal plant.

Other hazards
No data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

This product is a mixture.

Component	CASRN	Concentration
Methanol	67-56-1	> 45.0 - < 55.0 %
Toluene	108-88-3	> 45.0 - < 55.0 %
3-Mercaptopropyltrimethoxysilane	4420-74-0	< 5.0 %
N-(3-(Trimethoxysilyl) propyl)-1,2-ethanediamine	1760-24-3	< 1.0 %

4. FIRST AID MEASURES

Description of first aid measures
General advice:
First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

Inhalation: Move person to fresh air. If not breathing, give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask, etc). If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician or transport to a medical facility.

Skin contact: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Obtain medical attention without delay. Wash clothing before reuse. Properly dispose of contaminated leather items, such as shoes, belts, and watchbands. Discard items which cannot be decontaminated, including leather articles such as shoes, belts and watchbands. Suitable emergency safety shower facility should be immediately available.

Eye contact: Immediately flush eyes with water; remove contact lenses, if present, after the first 5 minutes, then continue flushing eyes for at least 15 minutes. Obtain medical attention without delay, preferably from an ophthalmologist. Suitable emergency eye wash facility should be immediately available.

Ingestion: Do not induce vomiting. Seek medical attention immediately. If person is fully conscious give 1 cup or 8 ounces (240 ml) of water. If medical advice is delayed and if an adult has swallowed several ounces of chemical, then give 3-4 ounces (1/3-1/2 Cup) (90-120 ml) of hard liquor such as 80 proof whiskey. For children, give proportionally less liquor at a dose of 0.3 ounce (1 1/2 tsp.) (8 ml) liquor for each 10 pounds of body weight, or 2 ml per kg body weight [e.g., 1.2 ounce (2 1/3 tbsp.) for a 40 pound child or 36 ml for an 18 kg child]. Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed:
Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), any additional important symptoms and effects are described in Section 11: Toxicology Information.

Indication of any immediate medical attention and special treatment needed
Notes to physician: In cases where several ounces (60 - 100 ml) have been ingested, consider the use of ethanol and hemodialysis in the treatment. Consult standard literature for details of treatment. If ethanol is used, a therapeutically effective blood concentration in the range of 100 - 150 mg/dl may be achieved by a rapid loading dose followed by a continuous intravenous infusion. Consult standard literature for details of treatment. 4-Methyl pyrazole (Antizol®) is an effective blocker of alcohol dehydrogenase and should be used in the treatment of ethylene glycol (EG), di- or triethylene glycol (DEG, TEG), ethylene glycol butyl ether (EGBE), or methanol intoxication if available. Fomepizole protocol (Brent, J. et al., New England Journal of Medicine, Feb. 8, 2001, 344:6, p. 424-9): loading dose 15 mg/kg intravenously, follow by bolus dose of 10 mg/kg every 12 hours; after 48 hours, increase bolus dose to 15 mg/kg every 12 hours. Continue fomepizole until serum methanol, EG, DEG, TEG or EGBE are undetectable. The signs and symptoms of poisoning include anion gap metabolic acidosis, CNS depression, renal tubular injury, and possible late stage cranial nerve involvement. Respiratory symptoms, including pulmonary edema, may be delayed. Persons receiving significant exposure should be observed 24-48 hours for signs of respiratory distress. Maintain adequate ventilation and oxygenation of the patient. In severe poisoning, respiratory support with mechanical ventilation and positive end expiratory pressure may be required. If lavage is performed, suggest endotracheal and/or esophageal control. Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach. Chemical eye burns may require extended irrigation. Obtain prompt consultation, preferably from an ophthalmologist. Alcohol consumed before or after exposure may increase adverse effects. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Skin contact may aggravate preexisting dermatitis. Repeated excessive exposure may aggravate preexisting lung disease.

5. FIREFIGHTING MEASURES

Suitable extinguishing media: Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. Alcohol resistant foams (ATC type) are preferred. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective.

Unsuitable extinguishing media: Do not use direct water stream. Straight or direct water streams may not be effective to extinguish fire.

Special hazards arising from the substance or mixture
Hazardous combustion products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Carbon monoxide. Carbon dioxide.

Unusual Fire and Explosion Hazards: Container may vent and/or rupture due to fire. Electrically ground and bond all equipment. Flammable mixtures of this product are readily ignited even by static

discharge. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition and/or flash back may occur. Flammable mixtures may exist within the vapor space of containers at room temperature. Flammable concentrations of vapor can accumulate at temperatures above flash point; see Section 9.

Advice for firefighters
Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Stay upwind. Keep out of low areas where gases (fumes) can accumulate. Water may not be effective in extinguishing fire. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. Burning liquids may be extinguished by dilution with water. Do not use direct water stream. May spread fire. Eliminate ignition sources. Move container from fire area if this is possible without hazard. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage. Avoid accumulation of water. Product may be carried across water surface spreading fire or contacting an ignition source.

Special protective equipment for firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Isolate area. Keep unnecessary and unprotected personnel from entering the area. Keep personnel out of low areas. Keep upwind of spill. Ventilate area of leak or spill. No smoking in area. Eliminate all sources of ignition in vicinity of spill or released vapor to avoid fire or explosion. Vapor explosion hazard. Keep out of sewers. For large spills, warn public of downwind explosion hazard. Check area with combustible gas detector before reentering area. Ground and bond all containers and handling equipment. Refer to section 7, Handling, for additional precautionary measures. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Environmental precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

Methods and materials for containment and cleaning up: Contain spilled material if possible. Absorb with materials such as: Cat litter. Sand. Sawdust. Ground and bond all containers and handling equipment. Pump with explosion-proof equipment. If available, use foam to smother or suppress. Collect in suitable and properly labeled containers. See Section 13, Disposal Considerations, for additional information.

7. HANDLING AND STORAGE

Precautions for safe handling: Keep away from heat, sparks and flame. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated contact with skin. Avoid breathing vapor or mist. Do not swallow. Wash thoroughly after handling. Keep container closed. Use only with adequate ventilation. No smoking, open flames or sources of ignition in handling and storage area. Ignition sources can include and are not limited to pilot lights, flames, smoking, sparks, heaters, electrical equipment, and static discharges. Electrically bond and ground all containers, personnel and equipment before transfer or use of material. Use of non-sparking or explosion-proof equipment may be necessary, depending upon the type of operation. Containers, even those that have been emptied,

can contain vapors. Do not cut, drill, grind, weld, or perform similar operations on or near empty containers. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition and/or flash back may occur. Never use air pressure for transferring product unless a risk assesment has been conducted that includes consideration of the flammability of the product. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

Conditions for safe storage: Minimize sources of ignition, such as static build-up, heat, spark or flame. Keep container closed. Flammable mixtures may exist within the vapor space of containers at room temperature.

Storage stability

Storage temperature:

> 5 - < 35 °C (> 41 - < 95 °F)

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

If exposure limits exist, they are listed below. If no exposure limits are displayed, then no values are applicable.

Component	Regulation	Type of listing	Value
Methanol	DUPONT AEL	AEL *	200 ppm
	ACGIH	TWA	200 ppm
	Further information: Skin: Danger of cutaneous absorption		
	ACGIH	STEL	250 ppm
	Further information: Skin: Danger of cutaneous absorption		
	OSHA Z-1	TWA	260 mg/m3 200 ppm
	CAL PEL	C	1,000 ppm
	Further information: S: Skin		
	CAL PEL	PEL	260 mg/m3 200 ppm
	Further information: S: Skin		
	CAL PEL	STEL	325 mg/m3 250 ppm
	Further information: S: Skin		
	OSHA P0	TWA	260 mg/m3 200 ppm
	Further information: X: Skin notation		
	OSHA P0	STEL	325 mg/m3 250 ppm
	Further information: X: Skin notation		
Toluene	DUPONT AEL	AEL *	20 ppm
	DUPONT AEL	STEL	60 ppm
	ACGIH	TWA	20 ppm
	Further information: OTO: Ototoxicant; A4: Not classifiable as a human carcinogen		
	OSHA Z-1		See Further information
	Further information: (2): See Table Z-2		
	OSHA Z-2	TWA	200 ppm
	Further information: Z37.12-1967		
	OSHA Z-2	CEIL	300 ppm
	Further information: Z37.12-1967		
	OSHA Z-2	Peak	500 ppm
	Further information: Z37.12-1967		
	CAL PEL	PEL	37 mg/m3 10 ppm
	Further information: S: Skin		
	CAL PEL	C	500 ppm

	Further information: S: Skin		
	CAL PEL	STEL	560 mg/m3 150 ppm
	Further information: S: Skin		
3-Mercaptopropyltrimethoxysilane	Dow IHG	TWA	0.1 ppm
	Further information: SKIN: Absorbed via skin		

Biological occupational exposure limits

Components	CAS-No.	Control parameters	Biological specimen	Sampling time	Permissible concentration	Basis
Methanol	67-56-1	Methanol	Urine	End of shift (As soon as possible after exposure ceases)	15 mg/l	ACGIH BEI
Toluene	108-88-3	Toluene	In blood	Prior to last shift of workweek	0.02 mg/l 0.3 mg/g Creatinine	ACGIH BEI

Exposure controls

Engineering controls: Use engineering controls to maintain airborne level below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, use only in enclosed systems or with local exhaust ventilation. Exhaust systems should be designed to move the air away from the source of vapor/aerosol generation and people working at this point. Lethal concentrations may exist in areas with poor ventilation.

Individual protection measures

Eye/face protection: Use chemical goggles. If exposure causes eye discomfort, use a full-face respirator.

Skin protection

Hand protection: Use gloves chemically resistant to this material. Examples of preferred glove barrier materials include: Butyl rubber. Viton. Polyethylene. Neoprene. Chlorinated polyethylene. Natural rubber ("latex"). Polyvinyl chloride ("PVC" or "vinyl"). Ethyl vinyl alcohol laminate ("EVAL"). Examples of acceptable glove barrier materials include: Nitrile/butadiene rubber ("nitrile" or "NBR"). Polyvinyl alcohol ("PVA"). NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Other protection: Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task.

Respiratory protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, use an approved respirator. When respiratory protection is required, use an approved positive-pressure self-contained breathing apparatus or positive-pressure airline with auxiliary self-contained air supply. For emergency conditions, use an approved positive-pressure self-contained breathing apparatus. In confined or poorly ventilated areas, use an approved self-contained breathing apparatus or positive pressure air line with auxiliary self-contained air supply.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	
Physical state	Liquid.
Color	Colorless to amber
Odor	Characteristic
Odor Threshold	No test data available
pH	Substance/mixture is non-soluble (in water).
Melting point/range	No test data available
Freezing point	No test data available
Boiling point (760 mmHg)	No test data available
Flash point	**closed cup** -3 °C (27 °F) *Setaflash Closed Cup ASTM D3828*
Evaporation Rate (Butyl Acetate = 1)	No test data available
Flammability (solid, gas)	Flammable liquid
Lower explosion limit	No test data available
Upper explosion limit	No test data available
Vapor Pressure	No test data available
Relative Vapor Density (air = 1)	No test data available
Relative Density (water = 1)	0.8352 *ASTM D1475*
Water solubility	Not applicable
Partition coefficient: n-octanol/water	No data available
Auto-ignition temperature	No test data available
Decomposition temperature	No test data available
Dynamic Viscosity	No test data available
Kinematic Viscosity	No test data available
Explosive properties	No test data available
Oxidizing properties	No test data available
Molecular weight	No data available
Volatile Organic Compounds	6.94 lb/gln *EPA Method No. 24* (typical value)

NOTE: The physical data presented above are typical values and should not be construed as a specification.

10. STABILITY AND REACTIVITY

Reactivity: No dangerous reaction known under conditions of normal use.

Chemical stability: Stable under recommended storage conditions. See Storage, Section 7.

Possibility of hazardous reactions: Polymerization will not occur.

Conditions to avoid: Exposure to elevated temperatures can cause product to decompose. Avoid static discharge.

Incompatible materials: Avoid contact with: Acids. Bases. Oxidizers.

Hazardous decomposition products: Decomposition products depend upon temperature, air supply and the presence of other materials.

11. TOXICOLOGICAL INFORMATION

Toxicological information appears in this section when such data is available.

Acute toxicity

Acute oral toxicity
Product test data not available. Refer to component data.

Acute dermal toxicity
Product test data not available. Refer to component data.

Acute inhalation toxicity
Product test data not available. Refer to component data.

Skin corrosion/irritation
Product test data not available. Refer to component data.

Serious eye damage/eye irritation
Product test data not available. Refer to component data.

Sensitization
Product test data not available. Refer to component data.

Specific Target Organ Systemic Toxicity (Single Exposure)
Product test data not available. Refer to component data.

Specific Target Organ Systemic Toxicity (Repeated Exposure)
Product test data not available. Refer to component data.

Carcinogenicity
Product test data not available. Refer to component data.

Teratogenicity
Product test data not available. Refer to component data.

Reproductive toxicity
Product test data not available. Refer to component data.

Mutagenicity
Product test data not available. Refer to component data.

Aspiration Hazard
Product test data not available. Refer to component data.

COMPONENTS INFLUENCING TOXICOLOGY:

Methanol

Acute oral toxicity
Methanol is highly toxic to humans and may cause central nervous system effects, visual disturbances up to blindness, metabolic acidosis, and degenerative damage to other organs including liver, kidney, and heart. Effects may be delayed. LD50, Rat, > 5,000 mg/kg

Lethal Dose, Humans, 340 mg/kg Estimated.

Lethal Dose, Humans, 29 - 237 ml Estimated.

Acute dermal toxicity
Effects of methanol are the same as observed via oral and inhalation exposure and include central nervous system (CNS) depression, visual impairment up to blindness, metabolic acidosis, with effects on organ systems such as liver, kidneys and heart, even death. Acute toxicity estimate, 300 mg/kg

Acute inhalation toxicity
Acute toxicity estimate, Not tested on animals, 4 Hour, vapour, 3 mg/l

Skin corrosion/irritation
Brief contact is essentially nonirritating to skin.

Serious eye damage/eye irritation
May cause eye irritation.

Sensitization
For skin sensitization:
Did not cause allergic skin reactions when tested in guinea pigs.

For respiratory sensitization:
No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)
Causes damage to organs.
Route of Exposure: Oral
Target Organs: Eyes, Central nervous system

Specific Target Organ Systemic Toxicity (Repeated Exposure)
Methanol is highly toxic to humans and may cause central nervous system effects, visual disturbances up to blindness, metabolic acidosis, and degenerative damage to other organs including liver, kidney, and heart.

Based on available data, repeated exposures are not anticipated to cause additional significant adverse effects.

Carcinogenicity
Did not cause cancer in laboratory animals.

Teratogenicity

Methanol has caused birth defects in mice at doses nontoxic to the mother as well as slight behavioral effects in offspring of rats.

Reproductive toxicity
In animal studies, did not interfere with reproduction.

Mutagenicity
Animal genetic toxicity studies were negative. In vitro genetic toxicity studies were predominantly negative.

Aspiration Hazard
May be harmful if swallowed and enters airways.

Toluene

Acute oral toxicity
LD50, Rat, 5,580 mg/kg

Acute dermal toxicity
LD50, Rabbit, 12,267 mg/kg

Acute inhalation toxicity
Symptoms may include headache, dizziness and drowsiness, progressing to incoordination and unconsciousness. Alcohol consumption and exertion may increase the adverse effects of toluene. LC50, Rat, male, 4 Hour, vapour, 25.7 mg/l

LC50, Rat, female, 4 Hour, vapour, 30 mg/l

Skin corrosion/irritation
Brief contact may cause slight skin irritation with local redness.
Prolonged contact may cause moderate skin irritation with local redness.
May cause drying and flaking of the skin.

Serious eye damage/eye irritation
May cause slight eye irritation.
May cause slight temporary corneal injury.
Vapor may cause eye irritation experienced as mild discomfort and redness.
Vapor may cause lacrimation (tears).

Sensitization
Did not cause allergic skin reactions when tested in guinea pigs.

For respiratory sensitization:
No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)
May cause drowsiness or dizziness.
Route of Exposure: Inhalation
Target Organs: Central nervous system

Specific Target Organ Systemic Toxicity (Repeated Exposure)
In animals, effects have been reported on the following organs:
central nervous system (CNS) effects
Excessive exposure may cause neurologic signs and symptoms.
Toluene has caused hearing loss in laboratory animals upon exposure to high concentrations.

Intentional misuse by deliberately inhaling toluene may cause nervous system damage, hearing loss, liver and kidney effects and death.

Carcinogenicity
Did not cause cancer in laboratory animals.

Teratogenicity
In laboratory animals, toluene has been toxic to the fetus at doses toxic to the mother; it has caused birth defects in mice when administered orally, but not by inhalation.

Reproductive toxicity
In animal studies, did not interfere with reproduction.

Mutagenicity
The majority and most reliable of the many genetic toxicity studies on toluene, both in vitro and in animals, indicate that it is not genetically toxic.

Aspiration Hazard
May be fatal if swallowed and enters airways.

3-Mercaptopropyltrimethoxysilane

Acute oral toxicity
Swallowing may result in irritation of the mouth, throat, and gastrointestinal tract. Contains a component(s) which hydrolyzes to methanol. Methanol is highly toxic to humans and may cause central nervous system effects, visual disturbances up to blindness, metabolic acidosis, and degenerative damage to other organs including liver, kidney, and heart.

LD50, Rat, male, 914 mg/kg

LD50, Rat, female, 758 mg/kg

Acute dermal toxicity
LD50, Rat, 2,348 mg/kg

Acute inhalation toxicity
Contains a component(s) which hydrolyzes to methanol. Inhalation of methanol may cause effects ranging from headache, narcosis and visual impairment to metabolic acidosis, blindness, and even death.

The LC50 has not been determined.

Skin corrosion/irritation
Brief contact is essentially nonirritating to skin.
Repeated exposure may cause irritation, even a burn.

Serious eye damage/eye irritation
May cause eye irritation.
Corneal injury is unlikely.
Symptoms of exposure may include excess blinking and tear production (blepharospasm).

Sensitization
Has caused allergic skin reactions when tested in guinea pigs.

For respiratory sensitization:

No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)
Available data are inadequate to determine single exposure specific target organ toxicity.

Specific Target Organ Systemic Toxicity (Repeated Exposure)
No data available.

Carcinogenicity
No relevant data found.

Teratogenicity
No relevant data found.

Reproductive toxicity
No relevant data found.

Mutagenicity
In vitro genetic toxicity studies were negative in some cases and positive in other cases.
Animal genetic toxicity studies were negative in some cases and positive in other cases.

Aspiration Hazard
Based on available information, aspiration hazard could not be determined.

N-(3-(Trimethoxysilyl) propyl)-1,2-ethanediamine

Acute oral toxicity
LD50, Rat, male and female, 2,295 mg/kg OPPTS 870.1100

Acute dermal toxicity
LD50, Rabbit, > 2,000 mg/kg No deaths occurred at this concentration.

Acute inhalation toxicity
LC50, Rat, 4 Hour, dust/mist, 1.49 - 2.44 mg/l OECD Test Guideline 403

Skin corrosion/irritation
Brief contact may cause moderate skin irritation with local redness.

Serious eye damage/eye irritation
May cause severe irritation with corneal injury which may result in permanent impairment of vision, even blindness. Chemical burns may occur.

Sensitization
For skin sensitization:
Has caused allergic skin reactions when tested in guinea pigs.

For respiratory sensitization:
No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)
Available data are inadequate to determine single exposure specific target organ toxicity.

Specific Target Organ Systemic Toxicity (Repeated Exposure)
In animals, effects have been reported on the following organs:
Respiratory tract.

Carcinogenicity
No relevant data found.

Teratogenicity
Did not cause birth defects in laboratory animals.

Reproductive toxicity
In animal studies, did not interfere with reproduction.

Mutagenicity
In vitro genetic toxicity studies were negative. Animal genetic toxicity studies were negative.

Aspiration Hazard
Based on available information, aspiration hazard could not be determined.

12. ECOLOGICAL INFORMATION

Ecotoxicological information appears in this section when such data is available.

Toxicity

Methanol

Acute toxicity to fish
Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).
LC50, Bluegill sunfish (Lepomis macrochirus), flow-through test, 96 Hour, 15,400 mg/l

Acute toxicity to aquatic invertebrates
LC50, Daphnia magna (Water flea), 24 Hour, 18,260 mg/l

Toxicity to bacteria
IC50, activated sludge, 3 Hour, > 1,000 mg/l

Chronic toxicity to fish
NOEC, Pimephales promelas (fathead minnow), 28 d, 446 mg/l

Chronic toxicity to aquatic invertebrates
NOEC, Daphnia magna (Water flea), 21 d, 208 mg/l

Toluene

Acute toxicity to fish
Material is moderately toxic to aquatic organisms on an acute basis (LC50/EC50 between 1 and 10 mg/L in the most sensitive species tested).
LC50, Oncorhynchus mykiss (rainbow trout), semi-static test, 96 Hour, 5.8 mg/l

Acute toxicity to aquatic invertebrates
LC50, water flea Ceriodaphnia dubia, semi-static test, 48 Hour, 3.78 mg/l

Acute toxicity to algae/aquatic plants
EbC50, Pseudokirchneriella subcapitata (green algae), 72 Hour, Biomass, 12.5 mg/l, OECD Test Guideline 201

Toxicity to bacteria
IC50, Bacteria, 16 Hour, 29 mg/l

Chronic toxicity to fish
NOEC, Fish, flow-through test, 40 d, growth, 1.4 mg/l

Chronic toxicity to aquatic invertebrates
NOEC, Ceriodaphnia dubia (water flea), 7 d, number of offspring, 0.74 mg/l

Toxicity to soil-dwelling organisms
LC50, Eisenia fetida (earthworms), 150 - 280 mg/kg

3-Mercaptopropyltrimethoxysilane

Acute toxicity to fish
Material is moderately toxic to aquatic organisms on an acute basis (LC50/EC50 between 1 and 10 mg/L in the most sensitive species tested).
LC50, Pimephales promelas (fathead minnow), 96 Hour, 253 mg/l

Acute toxicity to aquatic invertebrates
EC50, Daphnia magna (Water flea), 48 Hour, 4.0 mg/l

Acute toxicity to algae/aquatic plants
ErC50, Scenedesmus subspicatus, 72 Hour, 931 mg/l

Toxicity to bacteria
IC50, Bacteria, 16 Hour, 850 mg/l

N-(3-(Trimethoxysilyl) propyl)-1,2-ethanediamine

Acute toxicity to fish
Material is toxic to aquatic organisms (LC50/EC50/IC50 between 1 and 10 mg/L in the most sensitive species).
For the hydrolysis product(s)
LC50, zebra fish (Brachydanio rerio), 96 Hour, 597 mg/l

Acute toxicity to aquatic invertebrates
For the hydrolysis product(s)
EC50, Daphnia magna (Water flea), 48 Hour, 81 mg/l

Acute toxicity to algae/aquatic plants
For the hydrolysis product(s)
ErC50, Pseudokirchneriella subcapitata (green algae), 72 Hour, Growth rate inhibition, 8.8 mg/l
For the hydrolysis product(s)
NOEC, Pseudokirchneriella subcapitata (green algae), 72 Hour, Growth rate inhibition, 3.1 mg/l

Toxicity to bacteria
For the hydrolysis product(s)
EC50, Pseudomonas putida, 16 Hour, Growth inhibition, 67 mg/l

Chronic toxicity to aquatic invertebrates
For the hydrolysis product(s)
NOEC, Daphnia magna (Water flea), semi-static test, 21 d, number of offspring, > 1 mg/l

Toxicity to Above Ground Organisms
Material is moderately toxic to birds on an acute basis (LD50 between 51 and 500 mg/kg).

Toxicity to soil-dwelling organisms
NOEC, Eisenia fetida (earthworms), 14 d, >= 1,000 mg/kg

Persistence and degradability

Methanol

Biodegradability: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.
10-day Window: Pass
Biodegradation: 82.7 %
Exposure time: 5 d
Method: OECD Test Guideline 301D or Equivalent

Theoretical Oxygen Demand: 1.50 mg/mg

Chemical Oxygen Demand: 1.49 mg/mg Dichromate

Biological oxygen demand (BOD)

Incubation Time	BOD
5 d	72 %
20 d	79 %

Photodegradation
Test Type: Half-life (indirect photolysis)
Sensitization: OH radicals
Atmospheric half-life: 8 - 18 d
Method: Estimated.

Toluene

Biodegradability: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.
10-day Window: Not applicable
Biodegradation: 100 %
Exposure time: 14 d
Method: OECD Test Guideline 301C or Equivalent

Theoretical Oxygen Demand: 3.13 mg/mg Calculated.

Photodegradation
Test Type: Half-life (indirect photolysis)
Sensitization: OH radicals
Atmospheric half-life: 2 d
Method: Estimated.

3-Mercaptopropyltrimethoxysilane

Biodegradability: Biodegradation under aerobic static laboratory conditions is high (BOD20 or BOD28/ThOD > 40%).

Theoretical Oxygen Demand: 1.71 mg/mg Estimated.

Chemical Oxygen Demand: 1.73 mg/mg Estimated.

Photodegradation
Test Type: Half-life (indirect photolysis)
Sensitization: OH radicals
Atmospheric half-life: 0.229 d
Method: Estimated.

N-(3-(Trimethoxysilyl) propyl)-1,2-ethanediamine

Biodegradability: Based on stringent OECD test guidelines, this material cannot be considered as readily biodegradable; however, these results do not necessarily mean that the material is not biodegradable under environmental conditions.
10-day Window: Fail
Biodegradation: 39 %
Exposure time: 28 d
Method: OECD Test Guideline 301A or Equivalent

Theoretical Oxygen Demand: 2.39 mg/mg Estimated.

Chemical Oxygen Demand: 1.76 mg/mg Estimated.

Biological oxygen demand (BOD)

Incubation Time	BOD
5 d	23 %
10 d	30 %
20 d	29 %

Stability in Water (1/2-life)
Hydrolysis, half-life, 0.025 Hour, pH 7

Photodegradation
Test Type: Half-life (indirect photolysis)
Sensitization: OH radicals
Atmospheric half-life: 0.088 d
Method: Estimated.

Bioaccumulative potential

Methanol

Bioaccumulation: Bioaccumulation is unlikely. Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Partition coefficient: n-octanol/water(log Pow): -0.77 Measured
Bioconcentration factor (BCF): < 10 Leuciscus idus (Golden orfe) Measured

Toluene

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Partition coefficient: n-octanol/water(log Pow): 2.73 Measured
Bioconcentration factor (BCF): 13.2 - 90 Fish Measured

3-Mercaptopropyltrimethoxysilane

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Partition coefficient: n-octanol/water(log Pow): 0.25 Estimated. **Partition coefficient: n-octanol/water(log Pow):** 0.25 Estimated.

N-(3-(Trimethoxysilyl) propyl)-1,2-ethanediamine

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Partition coefficient: n-octanol/water(log Pow): < 3 estimated

Mobility in soil

Methanol

Potential for mobility in soil is very high (Koc between 0 and 50).
Partition coefficient (Koc): 0.44 Estimated.

Toluene

Potential for mobility in soil is very high (Koc between 0 and 50).
Partition coefficient (Koc): 37 - 178 Estimated.

3-Mercaptopropyltrimethoxysilane

Potential for mobility in soil is slight (Koc between 2000 and 5000).
Partition coefficient (Koc): 2577 Estimated.
Potential for mobility in soil is slight (Koc between 2000 and 5000).
Partition coefficient (Koc): 2577 Estimated.

N-(3-(Trimethoxysilyl) propyl)-1,2-ethanediamine

Expected to be relatively immobile in soil (Koc > 5000).
Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process.
Partition coefficient (Koc): > 5000 Estimated.

13. DISPOSAL CONSIDERATIONS

Disposal methods: DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. AS YOUR SUPPLIER, WE HAVE NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information. FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Incinerator or other thermal destruction device.

Treatment and disposal methods of used packaging: Empty containers should be recycled or otherwise disposed of by an approved waste management facility. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. Do not re-use containers for any purpose.

14. TRANSPORT INFORMATION

DOT

Proper shipping name	Flammable liquids, toxic, n.o.s.(Methanol, Toluene)
UN number	UN 1992
Class	3 (6.1)
Packing group	II
Reportable Quantity	Methanol, Toluene

Classification for SEA transport (IMO-IMDG):

Proper shipping name	FLAMMABLE LIQUID, TOXIC, N.O.S.(Methanol, Toluene)
UN number	UN 1992
Class	3 (6.1)
Packing group	II
Marine pollutant	No
Transport in bulk according to Annex I or II of MARPOL 73/78 and the IBC or IGC Code	Consult IMO regulations before transporting ocean bulk

Classification for AIR transport (IATA/ICAO):

Proper shipping name	Flammable liquid, toxic, n.o.s.(Methanol, Toluene)
UN number	UN 1992
Class	3 (6.1)
Packing group	II

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. REGULATORY INFORMATION

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312
Flammable (gases, aerosols, liquids, or solids)
Acute toxicity (any route of exposure)

Skin corrosion or irritation
Serious eye damage or eye irritation
Respiratory or skin sensitisation
Reproductive toxicity
Specific target organ toxicity (single or repeated exposure)
Aspiration hazard

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313
The following components are subject to reporting levels established by SARA Title III, Section 313:

Components	CASRN
Toluene	108-88-3
Methanol	67-56-1

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) Section 103

Components	CASRN	RQ (RCRA Code)
Toluene	108-88-3	1000 lbs RQ
Toluene	108-88-3	100 lbs RQ (F005)
Methanol	67-56-1	5000 lbs RQ
Methanol	67-56-1	100 lbs RQ (F003)
Toluene	108-88-3	1000 lbs RQ
Toluene	108-88-3	100 lbs RQ (F005)

Pennsylvania Right To Know
The following chemicals are listed because of the additional requirements of Pennsylvania law:

Components	CASRN
Toluene	108-88-3
Methanol	67-56-1

California Prop. 65
This product contains a chemical that is at or below California Propositions 65's "safe harbor level" as determined via a risk assessment. Therefore, the chemical is not required to be listed as a Prop 65 chemical on the SDS or label.

United States TSCA Inventory (TSCA)
All components of this product are in compliance with the inventory listing requirements of the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

16. OTHER INFORMATION

Hazard Rating System
NFPA

Health	Flammability	Instability
3	3	0

HMIS

Health	Flammability	Physical Hazard
4*	3	0

* = Chronic Effects (See Hazards Identification)

Revision
Identification Number: 30844 / A749 / Issue Date: 01/31/2023 / Version: 20.2
Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

Legend

ACGIH	USA. ACGIH Threshold Limit Values (TLV)
ACGIH BEI	ACGIH - Biological Exposure Indices (BEI)
AEL *	12 hr. TWA, Skin
C	Ceiling
CAL PEL	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
CEIL	Acceptable ceiling concentration
Dow IHG	Dow Industrial Hygiene Guideline
DUPONT AEL	DuPont AEL (Acceptable Exposure Limit)
OSHA P0	USA. Table Z-1-A Limits for Air Contaminants (1989 vacated values)
OSHA Z-1	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
OSHA Z-2	USA. Occupational Exposure Limits (OSHA) - Table Z-2
Peak	Acceptable maximum peak above the acceptable ceiling concentration for an 8-hr shift
PEL	Permissible exposure limit
STEL	Short term exposure limit
TWA	8-hour, time-weighted average

Full text of other abbreviations
AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of

Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Information Source and References
This SDS is prepared by Product Regulatory Services and Hazard Communications Groups from information supplied by internal references within our company.

DDP Specialty Electronic Materials US, LLC urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.
US

SAFETY DATA SHEET

DDP Specialty Electronic Materials US, LLC

Product name: BETASEAL™ 43520A Glass Primer **Issue Date:** 08/09/2023
Print Date: 04/11/2024

DDP Specialty Electronic Materials US, LLC encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. IDENTIFICATION

Product name: BETASEAL™ 43520A Glass Primer

Recommended use of the chemical and restrictions on use
Identified uses: A primer - For use in automotive applications.

COMPANY IDENTIFICATION
DDP Specialty Electronic Materials US,
LLC
974 Centre Road, Building 730,
Wilmington DE 19805
UNITED STATES

Customer Information Number: 833-338-7668
SDSQuestion-NA@dupont.com

EMERGENCY TELEPHONE NUMBER
24-Hour Emergency Contact: 1-800-424-9300
Local Emergency Contact: 800-424-9300

2. HAZARDS IDENTIFICATION

Hazard classification
GHS classification in accordance with 29 CFR 1910.1200
Flammable liquids - Category 2
Skin irritation - Category 2
Eye irritation - Category 2A
Respiratory sensitisation - Category 1
Skin sensitisation - Category 1
Reproductive toxicity - Category 1B
Specific target organ toxicity - single exposure - Category 3
Specific target organ toxicity - repeated exposure - Category 2 - Inhalation
Aspiration hazard - Category 1

Label elements
Hazard pictograms

Signal word: **DANGER!**

Hazards
Highly flammable liquid and vapour.
May be fatal if swallowed and enters airways.
Causes skin irritation.
May cause an allergic skin reaction.
Causes serious eye irritation.
May cause allergy or asthma symptoms or breathing difficulties if inhaled.
May cause drowsiness or dizziness.
May damage fertility or the unborn child.
May cause damage to organs (Nervous system) through prolonged or repeated exposure if inhaled.

Precautionary statements

Prevention
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking.
Keep container tightly closed.
Ground/bond container and receiving equipment.
Use explosion-proof electrical/ ventilating/ lighting equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Do not breathe mist or vapours.
Wash skin thoroughly after handling.
Use only outdoors or in a well-ventilated area.
Contaminated work clothing must not be allowed out of the workplace.
Wear protective gloves/ protective clothing/ eye protection/ face protection.
In case of inadequate ventilation wear respiratory protection.

Response
IF SWALLOWED: Immediately call a POISON CENTER/ doctor.
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor if you feel unwell.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
IF exposed or concerned: Get medical advice/ attention.
Do NOT induce vomiting.
If skin irritation or rash occurs: Get medical advice/ attention.
If eye irritation persists: Get medical advice/ attention.
If experiencing respiratory symptoms: Call a POISON CENTER/ doctor.
Take off contaminated clothing and wash before reuse.
In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

Storage
Store in a well-ventilated place. Keep container tightly closed.
Store in a well-ventilated place. Keep cool.
Store locked up.

Disposal
Dispose of contents/ container to an approved waste disposal plant.

Other hazards
Static-accumulating flammable liquid.

3. COMPOSITION/INFORMATION ON INGREDIENTS

This product is a mixture.

Component	CASRN	Concentration
Methyl ethyl ketone	78-93-3	> 40.0 - < 50.0 %
Carbon black	1333-86-4	> 5.0 - < 15.0 %
Toluene	108-88-3	> 5.0 - < 15.0 %
Benzene, 2,4-diisocyanato-1-methyl-, polymer with 1,6-diisocyanatohexane	26426-91-5	> 5.0 - < 15.0 %
Hexane, 1,6-diisocyanato-, homopolymer, 3-(trimethoxysilyl) -1-propanethiol-blocked	252047-49-7	> 5.0 - < 15.0 %
Polyester	35176-78-4	< 10.0 %
n-Butyl Acetate	123-86-4	< 10.0 %
Butanedioic acid, Pentanedioic acid, Hexanedioic acid methyl ester reaction product with 3-Oxazolidineethanol, 2-(1-methylethyl)-	Not available	< 10.0 %
Xylene	1330-20-7	< 1.0 %
Hexamethylene diisocyanate	822-06-0	< 1.0 %
2,4-Toluene diisocyanate	584-84-9	< 1.0 %
Dipotassium monoxide	12136-45-7	< 0.5 %

4. FIRST AID MEASURES

Description of first aid measures
General advice:
First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

Inhalation: Move person to fresh air. If not breathing, give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask, etc). If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician or transport to a medical facility.

Skin contact: Remove material from skin immediately by washing with soap and plenty of water. Remove contaminated clothing and shoes while washing. Seek medical attention if irritation persists. Wash clothing before reuse. An MDI skin decontamination study demonstrated that cleaning very soon after exposure is important, and that a polyglycol-based skin cleanser or corn oil may be more effective than soap and water. Discard items which cannot be decontaminated, including leather articles such as shoes, belts and watchbands. Suitable emergency safety shower facility should be available in work area.

Eye contact: Immediately flush eyes with water; remove contact lenses, if present, after the first 5 minutes, then continue flushing eyes for at least 15 minutes. Obtain medical attention without delay, preferably from an ophthalmologist. Suitable emergency eye wash facility should be immediately available.

Ingestion: Do not induce vomiting. Call a physician and/or transport to emergency facility immediately.

Most important symptoms and effects, both acute and delayed:
Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), any additional important symptoms and effects are described in Section 11: Toxicology Information.

Indication of any immediate medical attention and special treatment needed
Notes to physician: Maintain adequate ventilation and oxygenation of the patient. May cause respiratory sensitization or asthma-like symptoms. Bronchodilators, expectorants and antitussives may be of help. Treat bronchospasm with inhaled beta2 agonist and oral or parenteral corticosteroids. Respiratory symptoms, including pulmonary edema, may be delayed. Persons receiving significant exposure should be observed 24-48 hours for signs of respiratory distress. If you are sensitized to diisocyanates, consult your physician regarding working with other respiratory irritants or sensitizers. The decision of whether to induce vomiting or not should be made by a physician. If lavage is performed, suggest endotracheal and/or esophageal control. Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach. Alcohol consumed before or after exposure may increase adverse effects. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Skin contact may aggravate preexisting dermatitis. Excessive exposure may aggravate preexisting asthma and other respiratory disorders (e.g. emphysema, bronchitis, reactive airways dysfunction syndrome).

5. FIREFIGHTING MEASURES

Suitable extinguishing media: Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. Alcohol resistant foams (ATC type) are preferred. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective.

Unsuitable extinguishing media: Do not use direct water stream. Straight or direct water streams may not be effective to extinguish fire.

Special hazards arising from the substance or mixture
Hazardous combustion products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Nitrogen oxides. Isocyanates. Hydrogen cyanide. Carbon monoxide. Carbon dioxide.

Unusual Fire and Explosion Hazards: Product reacts with water. Reaction may produce heat and/or gases. Container may rupture from gas generation in a fire situation. Electrically ground and bond all equipment. Flammable mixtures of this product are readily ignited even by static discharge. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition and/or flash back may occur. Flammable mixtures may exist within the vapor space of containers at room temperature. Flammable concentrations of vapor can accumulate at temperatures above flash point; see Section 9. Dense smoke is produced when product burns.

Advice for firefighters
Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Stay upwind. Keep out of low areas where gases (fumes) can accumulate. Water may not be effective in extinguishing fire. Water is not recommended, but may be applied in large quantities as a fine spray when other extinguishing agents are not available. Fight fire from protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles. Immediately withdraw all personnel from the area in case of rising sound from venting safety device or discoloration of the container. Do not use direct water stream. May spread fire. Eliminate ignition sources. Move container from fire area if this is possible without hazard. Avoid accumulation of water. Product may be carried across water surface spreading fire or contacting an ignition source. Use water spray to cool fire-exposed containers and fire-affected zone until fire is out. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this (M)SDS.

Special protective equipment for firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). Avoid contact with this material during fire fighting operations. If contact is likely, change to full chemical resistant fire fighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Evacuate area. Only trained and properly protected personnel must be involved in clean-up operations. Keep personnel out of low areas. Keep upwind of spill. Ventilate area of leak or spill. No smoking in area. Eliminate all sources of ignition in vicinity of spill or released vapor to avoid fire or explosion. Vapor explosion hazard. Keep out of sewers. For large spills, warn public of downwind explosion hazard. Check area

with combustible gas detector before reentering area. Ground and bond all containers and handling equipment. See Section 10 for more specific information. Refer to section 7, Handling, for additional precautionary measures. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Environmental precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

Methods and materials for containment and cleaning up: Contain spilled material if possible. Absorb with materials such as: Cat litter. Sand. Sawdust. Ground and bond all containers and handling equipment. Pump with explosion-proof equipment. If available, use foam to smother or suppress. Collect in suitable and properly labeled containers. See Section 13, Disposal Considerations, for additional information.

7. HANDLING AND STORAGE

Precautions for safe handling: Keep away from heat, sparks and flame. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated contact with skin. Do not swallow. Avoid breathing vapor. Wash thoroughly after handling. Keep container closed. Use only with adequate ventilation. No smoking, open flames or sources of ignition in handling and storage area. Ignition sources can include and are not limited to pilot lights, flames, smoking, sparks, heaters, electrical equipment, and static discharges. Electrically bond and ground all containers, personnel and equipment before transfer or use of material. Use of non-sparking or explosion-proof equipment may be necessary, depending upon the type of operation. Containers, even those that have been emptied, can contain vapors. Do not cut, drill, grind, weld, or perform similar operations on or near empty containers. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition and/or flash back may occur. Never use air pressure for transferring product unless a risk assesment has been conducted that includes consideration of the flammability of the product. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

Conditions for safe storage: Minimize sources of ignition, such as static build-up, heat, spark or flame. Keep container closed. Flammable mixtures may exist within the vapor space of containers at room temperature. Store in a dry place. Avoid moisture.

Storage stability

Storage temperature:

> 10 - < 35 °C (> 50 - < 95 °F)

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

If exposure limits exist, they are listed below. If no exposure limits are displayed, then no values are applicable.

Component	Regulation	Type of listing	Value
Methyl ethyl ketone	Dow IHG	TWA	50 ppm
	Dow IHG	STEL	100 ppm
	ACGIH	TWA	200 ppm
	Further information: CNS impair: Central Nervous System impairment; URT irr: Upper Respiratory Tract irritation; PNS impair: Peripheral Nervous System impairment; BEI: Substances for which there is a Biological Exposure Index or Indices (see BEI®		

	section)		
	ACGIH	STEL	300 ppm
	Further information: CNS impair: Central Nervous System impairment; URT irr: Upper Respiratory Tract irritation; PNS impair: Peripheral Nervous System impairment; BEI: Substances for which there is a Biological Exposure Index or Indices (see BEI® section)		
	OSHA Z-1	TWA	590 mg/m3 200 ppm
	CAL PEL	PEL	590 mg/m3 200 ppm
	CAL PEL	STEL	885 mg/m3 300 ppm
Toluene	DUPONT AEL	AEL *	20 ppm
	DUPONT AEL	STEL	60 ppm
	ACGIH	TWA	20 ppm
	Further information: OTO: Ototoxicant; A4: Not classifiable as a human carcinogen		
	OSHA Z-2	TWA	200 ppm
	OSHA Z-2	CEIL	300 ppm
	OSHA Z-2	Peak	500 ppm
	CAL PEL	PEL	37 mg/m3 10 ppm
	Further information: S: Skin		
	CAL PEL	C	500 ppm
	Further information: S: Skin		
	CAL PEL	STEL	560 mg/m3 150 ppm
	Further information: S: Skin		
n-Butyl Acetate	Dow IHG	TWA	75 ppm
	Dow IHG	STEL	150 ppm
	OSHA Z-1	TWA	710 mg/m3 150 ppm
	Further information: (b): The value in mg/m3 is approximate.		
	CAL PEL	PEL	710 mg/m3 150 ppm
	CAL PEL	STEL	950 mg/m3 200 ppm
	ACGIH	TWA	50 ppm
	Further information: URT irr: Upper Respiratory Tract irritation; eye irr: Eye irritation		
	ACGIH	STEL	150 ppm
	Further information: URT irr: Upper Respiratory Tract irritation; eye irr: Eye irritation		
Xylene	DUPONT AEL	AEL *	100 ppm
	OSHA Z-1	TWA	435 mg/m3 100 ppm
	Further information: (b): The value in mg/m3 is approximate.		
	ACGIH	TWA	20 ppm
	Further information: OTO: Ototoxicant; A4: Not classifiable as a human carcinogen		
Hexamethylene diisocyanate	Dow IHG	TWA	0.005 ppm
	Further information: DSEN, RSEN: Skin and respiratory sensitizer		
	Dow IHG	TLV-C	0.02 ppm
	Further information: DSEN, RSEN: Skin and respiratory sensitizer		
	ACGIH	TWA	0.005 ppm
	Further information: URT irr: Upper Respiratory Tract irritation; resp sens: Respiratory sensitization; BEI: Substances for which there is a Biological Exposure Index or Indices (see BEI® section)		
	CAL PEL	PEL	0.034 mg/m3 0.005 ppm
2,4-Toluene diisocyanate	DUPONT AEL	AEL *	0.005 ppm
	Further information: SKIN, DSEN, RSEN: Absorbed via Skin, Skin Sensitizer, Respiratory sensitizer		
	DUPONT AEL	C	0.02 ppm
	Further information: SKIN, DSEN, RSEN: Absorbed via Skin, Skin Sensitizer, Respiratory sensitizer		
	CAL PEL	PEL	0.04 mg/m3 0.005 ppm
	CAL PEL	C	0.02 ppm

	CAL PEL	STEL	0.15 mg/m3 0.02 ppm
	OSHA Z-1	C	0.14 mg/m3 0.02 ppm
	ACGIH	TWA Inhalable fraction and vapor	0.001 ppm
	Further information: DSEN: Dermal Sensitization; RSEN: Respiratory sensitization; A3: Confirmed animal carcinogen with unknown relevance to humans; Skin: Danger of cutaneous absorption		
	ACGIH	STEL Inhalable fraction and vapor	0.005 ppm
	Further information: DSEN: Dermal Sensitization; RSEN: Respiratory sensitization; A3: Confirmed animal carcinogen with unknown relevance to humans; Skin: Danger of cutaneous absorption		
	OSHA P0	TWA	0.04 mg/m3 0.005 ppm
	OSHA P0	STEL	0.15 mg/m3 0.02 ppm

Although some of the components of this product may have exposure guidelines, no exposure would be expected under normal handling conditions due to the physical state of the material.

Biological occupational exposure limits

Components	CAS-No.	Control parameters	Biological specimen	Sampling time	Permissible concentration	Basis
Methyl ethyl ketone	78-93-3	methyl ethyl ketone	Urine	End of shift (As soon as possible after exposure ceases)	2 mg/l	ACGIH BEI
Toluene	108-88-3	Toluene	In blood	Prior to last shift of workweek	0.02 mg/l 0.3 mg/g Creatinine	ACGIH BEI
Xylene	1330-20-7	Methylhippuric acids	Urine	End of shift (As soon as possible after exposure ceases)	1.5 g/g creatinine	ACGIH BEI
Hexamethylene diisocyanate	822-06-0	1,6-Hexamethylene diamine	Urine	End of shift	15 µg/g creatinine	ACGIH BEI
2,4-Toluene diisocyanate	584-84-9	toluene diamine	Urine	End of shift	5 µg/g creatinine	ACGIH BEI

Exposure controls

Engineering measures: Use only with adequate ventilation. Local exhaust ventilation may be necessary for some operations. Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines. Exhaust systems should be designed to move the air away from the source of vapor/aerosol generation and people working at this point. The odor and irritancy of this material are inadequate to warn of excessive exposure.

Individual protection measures

Eye/face protection: Use chemical goggles.
Skin protection
Hand protection: Use gloves chemically resistant to this material. Examples of preferred glove barrier materials include: Butyl rubber. Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Examples of acceptable glove barrier materials include: Chlorinated polyethylene. Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). Viton. Avoid gloves made of: Polyvinyl chloride ("PVC" or "vinyl"). NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.
Other protection: Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task.
Respiratory protection: Atmospheric levels should be maintained below the exposure guideline. When atmospheric levels may exceed the exposure guideline, use an approved air-purifying respirator equipped with an organic vapor sorbent and a particle filter. For situations where the atmospheric levels may exceed the level for which an air-purifying respirator is effective, use a positive-pressure air-supplying respirator (air line or self-contained breathing apparatus). For emergency response or for situations where the atmospheric level is unknown, use an approved positive-pressure self-contained breathing apparatus or positive-pressure air line with auxiliary self-contained air supply. The following should be effective types of air-purifying respirators: Organic vapor cartridge with a particulate pre-filter.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	
Physical state	Liquid.
Color	Black
Odor	Solvent
Odor Threshold	No test data available
pH	Substance/mixture is non-soluble (in water).
Melting point/range	No test data available
Freezing point	No test data available
Boiling point (760 mmHg)	No test data available
Flash point	**closed cup** -7 °C (19 °F) *Setaflash Closed Cup ASTM D3828*
Evaporation Rate (Butyl Acetate = 1)	No test data available
Flammability (solid, gas)	Flammable liquid
Lower explosion limit	No test data available
Upper explosion limit	No test data available
Vapor Pressure	No test data available
Relative Vapor Density (air = 1)	No test data available
Relative Density (water = 1)	0.99 *ASTM D1475*
Water solubility	Not applicable

Partition coefficient: n-octanol/water	No data available
Auto-ignition temperature	No test data available
Decomposition temperature	No test data available
Kinematic Viscosity	No test data available
Explosive properties	No test data available
Oxidizing properties	No test data available
Molecular weight	No data available
Volatile Organic Compounds	4.82 lb/gln *EPA Method No. 24* (typical value)

NOTE: The physical data presented above are typical values and should not be construed as a specification.

10. STABILITY AND REACTIVITY

Reactivity: No dangerous reaction known under conditions of normal use.

Chemical stability: Stable under recommended storage conditions. See Storage, Section 7.

Possibility of hazardous reactions: Will not occur by itself.

Conditions to avoid: Some components of this product can decompose at elevated temperatures. Generation of gas during decomposition can cause pressure in closed systems. Pressure build-up can be rapid. Avoid static discharge. Avoid moisture. Material reacts slowly with water, releasing carbon dioxide which can cause pressure buildup and rupture of closed containers. Elevated temperatures accelerate this reaction.

Incompatible materials: Avoid contact with: Acids. Alcohols. Amines. Water. Ammonia. Bases. Strong oxidizers. Diisocyanates react with many materials and the rate of reaction increases with temperature as well as increased contact. Contact is increased by stirring or if the other material mixes with the diisocyanate. Diisocyanates are not soluble in water and sink to the bottom, but react slowly at the interface. The reaction forms carbon dioxide gas and a layer of solid polyurea. Reaction with water will generate carbon dioxide and heat.

Hazardous decomposition products: Decomposition products depend upon temperature, air supply and the presence of other materials. Gases are released during decomposition.

11. TOXICOLOGICAL INFORMATION

Toxicological information appears in this section when such data is available.

Acute toxicity

Acute oral toxicity

Low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury. May cause central nervous system effects.

Single dose oral LD50 has not been determined.

Acute dermal toxicity
Prolonged skin contact is unlikely to result in absorption of harmful amounts.
The dermal LD50 has not been determined.

Acute inhalation toxicity
Vapor concentrations are attainable which could be hazardous on single exposure. Excessive exposure to solvent(s) may cause respiratory irritation and central nervous system depression. Symptoms may include headache, dizziness and drowsiness, progressing to incoordination and unconsciousness. May cause nausea and vomiting. Alcohol consumed before or after exposure may increase adverse effects. This material contains mineral and/or inorganic fillers. There is essentially no potential for inhalation exposure to these fillers incidental to industrial handling due to the physical state.
The LC50 has not been determined.

Skin corrosion/irritation
Brief contact may cause slight skin irritation with local redness.
Prolonged contact may cause moderate skin irritation with local redness.
May cause drying and flaking of the skin.
May stain skin.

Serious eye damage/eye irritation
May cause pain disproportionate to the level of irritation to eye tissues.
May cause moderate eye irritation which may be slow to heal.
May cause moderate corneal injury.
Vapor may cause eye irritation experienced as mild discomfort and redness.
Vapor may cause lacrimation (tears).

Sensitization
For skin sensitization:
A component in this mixture has been shown to be a skin sensitizer.
Animal studies have shown that skin contact with isocyanates may play a role in respiratory sensitization.

For respiratory sensitization:
A component in this mixture may cause an allergic respiratory response.
Reexposure to extremely low isocyanate concentrations may cause allergic respiratory reactions in individuals already sensitized.

Specific Target Organ Systemic Toxicity (Single Exposure)
Contains component(s) which are classified as specific target organ toxicant, single exposure, category 3.

Specific Target Organ Systemic Toxicity (Repeated Exposure)
Contains component(s) which have been reported to cause effects on the following organs in animals:
Central nervous system.
Liver.
Nasal tissue.
Methyl ethyl ketone has caused liver effects in laboratory animals exposed by inhalation to high concentrations.
Methyl ethyl ketone is probably not neurotoxic in itself but it potentiates the neurotoxicity of methyl-n-butyl ketone and n-hexane.
Toluene has caused hearing loss in laboratory animals upon exposure to high concentrations.

Intentional misuse by deliberately inhaling toluene may cause nervous system damage, hearing loss, liver and kidney effects and death.

Carcinogenicity
Contains component(s) which did not cause cancer in laboratory animals.

Teratogenicity
Contains component(s) which did not cause birth defects in animals; other fetal effects occurred only at doses toxic to the mother. In laboratory animals, toluene has been toxic to the fetus at doses toxic to the mother; it has caused birth defects in mice when administered orally, but not by inhalation. Contains component(s) which caused birth defects in laboratory animals only at doses toxic to the mother. Exaggerated doses of xylene given orally to pregnant mice resulted in an increase in cleft palate, a common developmental abnormality in mice. In animal inhalation studies, xylene caused toxicity to the fetus but did not cause birth defects.

Reproductive toxicity
In animal studies on component(s), effects on reproduction were seen only at doses that produced significant toxicity to the parent animals. Contains component(s) which did not interfere with reproduction in animal studies.

Mutagenicity
For the component(s) tested: In vitro genetic toxicity studies were predominantly negative. The majority of the many genetic toxicity studies done on toluene and methyl ethyl ketone, both in vitro and in animals, have been negative.

Aspiration Hazard
Aspiration into the lungs may occur during ingestion or vomiting, causing lung damage or even death due to chemical pneumonia.

COMPONENTS INFLUENCING TOXICOLOGY:

Methyl ethyl ketone

Acute oral toxicity
LD50, Rat, 2,193 mg/kg

Acute dermal toxicity
LD50, Rabbit, > 8,049 mg/kg

Acute inhalation toxicity
LC50, Mouse, 4 Hour, vapour, 32 mg/l

Carbon black

Acute oral toxicity
LD50, Rat, > 8,000 mg/kg

Acute dermal toxicity
LD50, Rabbit, > 3,000 mg/kg No deaths occurred at this concentration.

Acute inhalation toxicity
LC50, Rat, 1 Hour, dust/mist, 27 mg/l No deaths occurred at this concentration.

Toluene

Acute oral toxicity
LD50, Rat, 5,580 mg/kg

Acute dermal toxicity
LD50, Rabbit, 12,267 mg/kg

Acute inhalation toxicity
Symptoms may include headache, dizziness and drowsiness, progressing to incoordination and unconsciousness. Alcohol consumption and exertion may increase the adverse effects of toluene. LC50, Rat, male, 4 Hour, vapour, 25.7 mg/l

LC50, Rat, female, 4 Hour, vapour, 30 mg/l

Benzene, 2,4-diisocyanato-1-methyl-, polymer with 1,6-diisocyanatohexane

Acute oral toxicity
Very low toxicity if swallowed. Harmful effects not anticipated from swallowing small amounts.

For similar material(s): LD50, Rat, > 5,000 mg/kg

Acute dermal toxicity
Prolonged skin contact is unlikely to result in absorption of harmful amounts.

The dermal LD50 has not been determined.

Acute inhalation toxicity
Dust may cause irritation to upper respiratory tract (nose and throat).

For similar material(s): LC50, Rat, 4 Hour, dust/mist, > 3.003 mg/l

Hexane, 1,6-diisocyanato-, homopolymer, 3- (trimethoxysilyl) -1-propanethiol-blocked

Acute oral toxicity
LD50, Rat, male, > 2,000 mg/kg No deaths occurred at this concentration.

Acute dermal toxicity
The dermal LD50 has not been determined.

Acute inhalation toxicity
Vapor concentrations are attainable which could be hazardous on single exposure. Excessive exposure to solvent(s) may cause respiratory irritation and central nervous system depression. Symptoms may include headache, dizziness and drowsiness, progressing to incoordination and unconsciousness. May cause nausea and vomiting.

The LC50 has not been determined.

Polyester

Acute oral toxicity
Single dose oral LD50 has not been determined. Excessive exposure may cause: Gastrointestinal irritation. Nausea and/or vomiting. Diarrhea.

Acute dermal toxicity
The dermal LD50 has not been determined.

Acute inhalation toxicity
At room temperature, exposure to vapor is minimal due to low volatility; vapor from heated material may cause respiratory irritation.

The LC50 has not been determined.

n-Butyl Acetate

Acute oral toxicity
LD50, Rat, male, 12,789 mg/kg

LD50 Oral, Rat, female, 10,760 mg/kg

Acute dermal toxicity
LD50, Rabbit, male and female, > 14,112 mg/kg

Acute inhalation toxicity
The LC50 has not been determined.

Butanedioic acid, Pentanedioic acid, Hexanedioic acid methyl ester reaction product with 3-Oxazolidineethanol, 2-(1-methylethyl)-

Acute oral toxicity
Low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury.

LD50, Rat, female, > 2,000 mg/kg No deaths occurred at this concentration.

Acute dermal toxicity
Prolonged skin contact is unlikely to result in absorption of harmful amounts.

LD50, Rat, male and female, > 2,000 mg/kg No deaths occurred at this concentration.

Acute inhalation toxicity
Mist may cause irritation of upper respiratory tract (nose and throat).

The LC50 has not been determined.

Xylene

Acute oral toxicity
LD50, Rat, 3,523 mg/kg

Acute dermal toxicity
LD50, Rabbit, > 4,200 mg/kg

Acute inhalation toxicity
LC50, Rat, 4 Hour, vapour, 27.5 mg/l

Hexamethylene diisocyanate

Acute oral toxicity
LD50, Rat, 710 mg/kg

Acute dermal toxicity
LD50, Rat, > 7,000 mg/kg

Acute inhalation toxicity
LC50, Rat, 4 Hour, vapour, 0.124 mg/l

2,4-Toluene diisocyanate

Acute oral toxicity
LD50, Rat, female, 4,130 mg/kg

Acute dermal toxicity
LD50, Rabbit, male and female, > 9,400 mg/kg

Acute inhalation toxicity
Easily attainable vapor concentrations may cause serious adverse effects, even death. Excessive exposure to TDI may cause severe irritation of the upper respiratory tract and lungs, fluid in the lungs, permanent decrease of lung function, neurologic disorders, cholinesterase depression and gastrointestinal distress.

LC50, Rat, 1 Hour, vapour, 0.48 mg/l

LC50, Mouse, 6 Hour, dust/mist, 0.1 mg/l

Dipotassium monoxide

Acute oral toxicity
For similar material(s): LD50, Rat, male and female, > 2,000 mg/kg OECD Test Guideline 425 No deaths occurred at this concentration.

Acute dermal toxicity
For similar material(s): LD50, Rat, male and female, > 5,000 mg/kg OECD Test Guideline 402

Acute inhalation toxicity
The LC50 has not been determined.

Carcinogenicity

Component	List	Classification
2,4-Toluene diisocyanate	IARC	Group 2B: Possibly carcinogenic to humans
	US NTP	Reasonably anticipated to be a human carcinogen
	ACGIH	A3: Confirmed animal carcinogen with unknown relevance to humans.

12. ECOLOGICAL INFORMATION

Ecotoxicological information appears in this section when such data is available.

Toxicity

Methyl ethyl ketone

Acute toxicity to fish
Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).
LC50, Pimephales promelas (fathead minnow), static test, 96 Hour, 2,993 mg/l, OECD Test Guideline 203

Acute toxicity to aquatic invertebrates
EC50, Daphnia magna (Water flea), static test, 48 Hour, 308 mg/l, OECD Test Guideline 202

Acute toxicity to algae/aquatic plants
ErC50, Pseudokirchneriella subcapitata (microalgae), static test, 96 Hour, Growth rate inhibition, 2,029 mg/l, OECD Test Guideline 201
NOEC, Pseudokirchneriella subcapitata (green algae), 96 Hour, 1,240 mg/l, OECD Test Guideline 201

Toxicity to bacteria
EC50, Bacteria, 96 Hour, > 1,000 mg/l, hUCC

Carbon black

Acute toxicity to fish
Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).
LC50, Leuciscus idus (Golden orfe), static test, 96 Hour, > 1,000 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates
EC50, Daphnia magna (Water flea), 24 Hour, > 5,600 mg/l, OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants
NOEC, Desmodesmus subspicatus (green algae), 72 Hour, 10,000 mg/l, OECD Test Guideline 201

Toluene

Acute toxicity to fish
Material is moderately toxic to aquatic organisms on an acute basis (LC50/EC50 between 1 and 10 mg/L in the most sensitive species tested).
LC50, Oncorhynchus mykiss (rainbow trout), semi-static test, 96 Hour, 5.8 mg/l

Acute toxicity to aquatic invertebrates
LC50, water flea Ceriodaphnia dubia, semi-static test, 48 Hour, 3.78 mg/l

Acute toxicity to algae/aquatic plants
EbC50, Pseudokirchneriella subcapitata (green algae), 72 Hour, Biomass, 12.5 mg/l, OECD Test Guideline 201

Toxicity to bacteria
IC50, Bacteria, 16 Hour, 29 mg/l

Chronic toxicity to fish
NOEC, Fish, flow-through test, 40 d, growth, 1.4 mg/l

Chronic toxicity to aquatic invertebrates
NOEC, Ceriodaphnia dubia (water flea), 7 d, number of offspring, 0.74 mg/l

Toxicity to soil-dwelling organisms
LC50, Eisenia fetida (earthworms), 150 - 280 mg/kg

Benzene, 2,4-diisocyanato-1-methyl-, polymer with 1,6-diisocyanatohexane

Acute toxicity to fish
Not expected to be acutely toxic to aquatic organisms.
No toxicity at the limit of solubility

Hexane, 1,6-diisocyanato-, homopolymer, 3- (trimethoxysilyl) -1-propanethiol-blocked

Acute toxicity to fish

Material is moderately toxic to aquatic organisms on an acute basis (LC50/EC50 between 1 and 10 mg/L in the most sensitive species tested).

LC50, Oncorhynchus mykiss (rainbow trout), 96 Hour, 1.55 mg/l

Polyester

Acute toxicity to fish

Not expected to be acutely toxic to aquatic organisms.

n-Butyl Acetate

Acute toxicity to fish

Material is slightly toxic to aquatic organisms on an acute basis (LC50/EC50 between 10 and 100 mg/L in the most sensitive species tested).

LC50, Pimephales promelas (fathead minnow), flow-through test, 96 Hour, 18 mg/l

Acute toxicity to aquatic invertebrates

LC50, Daphnia magna (Water flea), 48 Hour, 44 mg/l

Acute toxicity to algae/aquatic plants

ErC50, Desmodesmus subspicatus (green algae), 72 Hour, Growth rate inhibition, 648 mg/l

Toxicity to bacteria

EC50, Bacteria, 16 Hour, > 1,000 mg/l

Chronic toxicity to aquatic invertebrates

NOEC, Daphnia magna (Water flea), 21 d, 23 mg/l

Butanedioic acid, Pentanedioic acid, Hexanedioic acid methyl ester reaction product with 3-Oxazolidineethanol, 2-(1-methylethyl)-

Acute toxicity to fish

Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).

LC50, Danio rerio (zebra fish), static test, 96 Hour, > 100 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates

EC50, Daphnia magna (Water flea), 48 Hour, > 100 mg/l, OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants

ErC50, Pseudokirchneriella subcapitata (green algae), 72 Hour, Growth rate inhibition, > 100 mg/l, OECD Test Guideline 201 or Equivalent

Toxicity to bacteria

EC50, activated sludge, 3 Hour, Respiration rates., > 1,000 mg/l

Xylene

Acute toxicity to fish

Material is moderately toxic to aquatic organisms on an acute basis (LC50/EC50 between 1 and 10 mg/L in the most sensitive species tested).

LC50, Oncorhynchus mykiss (rainbow trout), semi-static test, 96 Hour, 2.6 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates
EC50, Daphnia magna (Water flea), 48 Hour, 3.82 mg/l

Acute toxicity to algae/aquatic plants
EC50, Selenastrum capricornutum (fresh water algae), 72 Hour, 4.9 mg/l, OECD Test Guideline 201 or Equivalent
NOEC, Pseudokirchneriella subcapitata (green algae), 72 Hour, Growth rate, 0.44 mg/l, OECD Test Guideline 201 or Equivalent

Chronic toxicity to fish
NOEC, Oncorhynchus mykiss (rainbow trout), flow-through, 56 d, mortality, > 1.3 mg/l

Chronic toxicity to aquatic invertebrates
NOEC, Daphnia magna (Water flea), 21 d, 1.57 mg/l

Hexamethylene diisocyanate

Acute toxicity to fish
The measured ecotoxicity is that of the hydrolyzed product, generally under conditions maximizing production of soluble species.
Not expected to be acutely toxic to aquatic organisms.
LC0, Danio rerio (zebra fish), static test, 96 Hour, >= 82.8 mg/l

Acute toxicity to aquatic invertebrates
EC0, Daphnia magna (Water flea), Static, 48 Hour, >= 89.1 mg/l

Acute toxicity to algae/aquatic plants
No toxicity up to the level of maximum water solubility.
ErC50, Desmodesmus subspicatus (green algae), Static, 72 Hour, Growth rate inhibition, > 77.4 mg/l

Toxicity to bacteria
EC50, 3 Hour, 842 mg/l

2,4-Toluene diisocyanate

Acute toxicity to fish
Material is slightly toxic to aquatic organisms on an acute basis (LC50/EC50 between 10 and 100 mg/L in the most sensitive species tested).
LC50, Oncorhynchus mykiss (rainbow trout), static test, 96 Hour, 133 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates
EC50, Daphnia magna (Water flea), static test, 48 Hour, 12.5 mg/l, OECD Test Guideline 202 or Equivalent
EC50, saltwater mysid Mysidopsis bahia, static test, 48 Hour, 18.3 mg/l, OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants
EC50, Skeletonema costatum (marine diatom), static test, 96 Hour, 3,230 mg/l, OECD Test Guideline 201 or Equivalent
EC50, Chlorella vulgaris (Fresh water algae), static test, 96 Hour, 4,300 mg/l, OECD Test Guideline 201 or Equivalent

Toxicity to bacteria

EC50, activated sludge, Respiration inhibition, 3 Hour, > 100 mg/l, OECD 209 Test

Chronic toxicity to aquatic invertebrates
NOEC, Daphnia magna (Water flea), static test, 21 d, number of offspring, 1.1 mg/l

Dipotassium monoxide

Acute toxicity to fish
For similar material(s):
Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).
LC50, Fish, semi-static test, 96 Hour, 917.6 mg/l, OECD Test Guideline 203

Acute toxicity to aquatic invertebrates
EC50, Daphnia magna, Static, 48 Hour, 660 mg/l, OECD Test Guideline 202

Acute toxicity to algae/aquatic plants
EC50, green algae, 96 Hour, 1,368.296 mg/l

Persistence and degradability

Methyl ethyl ketone

Biodegradability: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.
10-day Window: Not applicable
Biodegradation: 98 %
Exposure time: 28 d
Method: OECD Test Guideline 301D or Equivalent

Theoretical Oxygen Demand: 2.44 mg/mg

Biological oxygen demand (BOD)

Incubation Time	BOD
5 d	71 - 76 %
10 d	71 - 82 %
20 d	71 - 89 %

Photodegradation
Test Type: Half-life (indirect photolysis)
Sensitization: OH radicals
Atmospheric half-life: 8 d
Method: Estimated.

Carbon black

Biodegradability: Biodegradation is not applicable.

Toluene

Biodegradability: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.
10-day Window: Not applicable
Biodegradation: 100 %
Exposure time: 14 d

Method: OECD Test Guideline 301C or Equivalent

Theoretical Oxygen Demand: 3.13 mg/mg Calculated.

Photodegradation
Test Type: Half-life (indirect photolysis)
Sensitization: OH radicals
Atmospheric half-life: 2 d
Method: Estimated.

Benzene, 2,4-diisocyanato-1-methyl-, polymer with 1,6-diisocyanatohexane

Biodegradability: Based on stringent OECD test guidelines, this material cannot be considered as readily biodegradable; however, these results do not necessarily mean that the material is not biodegradable under environmental conditions.
For similar material(s):
Biodegradation: < 60 %
Exposure time: 28 d

Hexane, 1,6-diisocyanato-, homopolymer, 3- (trimethoxysilyl) -1-propanethiol-blocked

Biodegradability: No relevant data found.

Polyester

Biodegradability: No appreciable biodegradation is expected.

n-Butyl Acetate

Biodegradability: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.
10-day Window: Pass
Biodegradation: 83 %
Exposure time: 28 d
Method: OECD Test Guideline 301D or Equivalent

Theoretical Oxygen Demand: 2.20 mg/mg Estimated.

Photodegradation
Sensitization: OH radicals
Atmospheric half-life: 2.32 d
Method: Estimated.

Butanedioic acid, Pentanedioic acid, Hexanedioic acid methyl ester reaction product with 3-Oxazolidineethanol, 2-(1-methylethyl)-

Biodegradability: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.
10-day Window: Pass
Biodegradation: 90.2 %
Exposure time: 28 d
Method: OECD Test Guideline 301F or Equivalent

Xylene

Biodegradability: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.
10-day Window: Pass
Biodegradation: 87.8 %
Exposure time: 28 d

Method: OECD Test Guideline 301F or Equivalent

Theoretical Oxygen Demand: 3.17 mg/mg

Biological oxygen demand (BOD)

Incubation Time	BOD
5 d	37.000 %
10 d	58.000 %
20 d	72.000 %

Photodegradation
Test Type: Half-life (indirect photolysis)
Sensitization: OH radicals
Atmospheric half-life: 19.7 Hour
Method: Estimated.

Hexamethylene diisocyanate

Biodegradability: In the aquatic and terrestrial environment, material reacts with water forming predominantly insoluble polyureas which appear to be stable.
10-day Window: Not applicable
Biodegradation: 0 %
Exposure time: 28 d
Method: OECD Test Guideline 302C or Equivalent
10-day Window: Fail
Biodegradation: 42 %
Exposure time: 28 d
Method: OECD Test Guideline 301F or Equivalent

Theoretical Oxygen Demand: 2.38 mg/mg

Photodegradation
Test Type: Half-life (indirect photolysis)
Sensitization: OH radicals
Atmospheric half-life: 1.345 d
Method: Estimated.

2,4-Toluene diisocyanate

Biodegradability: In the aquatic and terrestrial environment, material reacts with water forming predominantly insoluble polyureas which appear to be stable. In the atmospheric environment, material is expected to have a short tropospheric half-life, based on calculations and by analogy with related diisocyanates.

Dipotassium monoxide

Biodegradability: No relevant data found.

Bioaccumulative potential

Methyl ethyl ketone

Bioaccumulation: Bioaccumulation is unlikely. Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Partition coefficient: n-octanol/water(log Pow): 0.3 at 40 °C Measured

Carbon black
Bioaccumulation: No relevant data found.

Toluene
Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Partition coefficient: n-octanol/water(log Pow): 2.73 Measured
Bioconcentration factor (BCF): 13.2 - 90 Fish Measured

Benzene, 2,4-diisocyanato-1-methyl-, polymer with 1,6-diisocyanatohexane
Bioaccumulation: No relevant data found.

Hexane, 1,6-diisocyanato-, homopolymer, 3- (trimethoxysilyl) -1-propanethiol-blocked
Bioaccumulation: No relevant data found.

Polyester
Bioaccumulation: No bioconcentration is expected because of the relatively high molecular weight (MW greater than 1000).

n-Butyl Acetate
Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Partition coefficient: n-octanol/water(log Pow): Pow: 3.2 at 25 °C Measured
Bioconcentration factor (BCF): 15 Fish Estimated.

Butanedioic acid, Pentanedioic acid, Hexanedioic acid methyl ester reaction product with 3-Oxazolidineethanol, 2-(1-methylethyl)-
Bioaccumulation: No data available.

Xylene
Bioaccumulation: Does not bioaccumulate.
Partition coefficient: n-octanol/water(log Pow): 3.16 at 20 °C
Bioconcentration factor (BCF): 25.9 Rainbow trout (Salmo gairdneri) Measured

Hexamethylene diisocyanate
Bioaccumulation: Reacts with water. In the aquatic and terrestrial environment, movement is expected to be limited by its reaction with water forming predominantly insoluble polyureas.
Bioconcentration factor (BCF): 58 Fish Estimated.

2,4-Toluene diisocyanate
Bioaccumulation: Reacts with water. In the aquatic and terrestrial environment, movement is expected to be limited by its reaction with water forming predominantly insoluble polyureas.

Dipotassium monoxide
Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Partition coefficient: n-octanol/water(log Pow): -5.08
Bioconcentration factor (BCF): 3.16 Fish

Mobility in soil

Methyl ethyl ketone
Potential for mobility in soil is very high (Koc between 0 and 50).

Partition coefficient (Koc): 3.8 Estimated.

Carbon black

No relevant data found.

Toluene

Potential for mobility in soil is very high (Koc between 0 and 50).
Partition coefficient (Koc): 37 - 178 Estimated.

Benzene, 2,4-diisocyanato-1-methyl-, polymer with 1,6-diisocyanatohexane

No relevant data found.

Hexane, 1,6-diisocyanato-, homopolymer, 3- (trimethoxysilyl) -1-propanethiol-blocked

No relevant data found.

Polyester

No relevant data found.

n-Butyl Acetate

Potential for mobility in soil is very high (Koc between 0 and 50).
Partition coefficient (Koc): 19 - 70 Estimated.

Butanedioic acid, Pentanedioic acid, Hexanedioic acid methyl ester reaction product with 3-Oxazolidineethanol, 2-(1-methylethyl)-

No relevant data found.

Xylene

Potential for mobility in soil is medium (Koc between 150 and 500).
Partition coefficient (Koc): 443 Estimated.

Hexamethylene diisocyanate

In the aquatic and terrestrial environment, movement is expected to be limited by its reaction with water forming predominantly insoluble polyureas.

2,4-Toluene diisocyanate

In the aquatic and terrestrial environment, movement is expected to be limited by its reaction with water forming predominantly insoluble polyureas.

Dipotassium monoxide

Potential for mobility in soil is very high (Koc between 0 and 50).
Partition coefficient (Koc): 13.22

13. DISPOSAL CONSIDERATIONS

Disposal methods: DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. AS YOUR SUPPLIER, WE HAVE NO CONTROL OVER THE MANAGEMENT PRACTICES OR

MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information. FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Incinerator or other thermal destruction device.

Treatment and disposal methods of used packaging: Empty containers should be recycled or otherwise disposed of by an approved waste management facility. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. Do not re-use containers for any purpose.

14. TRANSPORT INFORMATION

DOT

Proper shipping name	Coating solution
UN number	UN 1139
Class	3
Packing group	II
Reportable Quantity	Toluene, Methyl ethyl ketone

Classification for SEA transport (IMO-IMDG):

Proper shipping name	COATING SOLUTION
UN number	UN 1139
Class	3
Packing group	II
Marine pollutant	No
Transport in bulk according to Annex I or II of MARPOL 73/78 and the IBC or IGC Code	Consult IMO regulations before transporting ocean bulk

Classification for AIR transport (IATA/ICAO):

Proper shipping name	Coating solution
UN number	UN 1139
Class	3
Packing group	II

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. REGULATORY INFORMATION

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312
Flammable (gases, aerosols, liquids, or solids)
Hazard not otherwise classified (physical hazards)
Skin corrosion or irritation
Serious eye damage or eye irritation
Respiratory or skin sensitisation
Reproductive toxicity
Specific target organ toxicity (single or repeated exposure)
Aspiration hazard

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313
The following components are subject to reporting levels established by SARA Title III, Section 313:

Components	**CASRN**
Toluene	108-88-3

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) Section 103
Calculated RQ exceeds reasonably attainable upper limit.

Components	**CASRN**	**RQ (RCRA Code)**
Methyl ethyl ketone	78-93-3	5000 lbs RQ
Methyl ethyl ketone	78-93-3	5000 lbs RQ (D035)
Methyl ethyl ketone	78-93-3	100 lbs RQ (F005)
Methyl ethyl ketone	78-93-3	5000 lbs RQ
Methyl ethyl ketone	78-93-3	5000 lbs RQ (D035)
Methyl ethyl ketone	78-93-3	100 lbs RQ (F005)
Toluene	108-88-3	1000 lbs RQ
Toluene	108-88-3	100 lbs RQ (F005)
Xylene	1330-20-7	100 lbs RQ
Xylene	1330-20-7	100 lbs RQ (F003)
Toluene	108-88-3	1000 lbs RQ
Toluene	108-88-3	100 lbs RQ (F005)

Pennsylvania Right To Know
The following chemicals are listed because of the additional requirements of Pennsylvania law:

Components	**CASRN**
Methyl ethyl ketone	78-93-3
Toluene	108-88-3
Carbon black	1333-86-4
n-Butyl Acetate	123-86-4
2,4-Toluene diisocyanate	584-84-9

California Prop. 65
WARNING: This product can expose you to chemicals including 2,4-Toluene diisocyanate, which is/are known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

United States TSCA Inventory (TSCA)

All components of this product are in compliance with the Active inventory listing requirements of the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

16. OTHER INFORMATION

Hazard Rating System
NFPA

Health	Flammability	Instability
2	3	1

Revision
Identification Number: 30888 / A749 / Issue Date: 08/09/2023 / Version: 27.0
Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

Legend

ACGIH	USA. ACGIH Threshold Limit Values (TLV)
ACGIH BEI	ACGIH - Biological Exposure Indices (BEI)
AEL *	8 & 12 hr. TWA
C	Ceiling
CAL PEL	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
CEIL	Acceptable ceiling concentration
Dow IHG	Dow Industrial Hygiene Guideline
DUPONT AEL	DuPont AEL (Acceptable Exposure Limit)
OSHA P0	USA. Table Z-1-A Limits for Air Contaminants (1989 vacated values)
OSHA Z-1	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
OSHA Z-2	USA. Occupational Exposure Limits (OSHA) - Table Z-2
Peak	Acceptable maximum peak above the acceptable ceiling concentration for an 8-hr shift
PEL	Permissible exposure limit
STEL	Short term exposure limit
TLV-C	Ceiling Limit Value
TWA	8-hour, time-weighted average

Full text of other abbreviations
AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO -

International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Information Source and References
This SDS is prepared by Product Regulatory Services and Hazard Communications Groups from information supplied by internal references within our company.

DDP Specialty Electronic Materials US, LLC urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.
US

SAFETY DATA SHEET

DDP Specialty Electronic Materials US, LLC

Product name: BETASEAL™ 43533 Body Primer **Issue Date:** 10/17/2018
Print Date: 04/11/2024

DDP Specialty Electronic Materials US, LLC encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. IDENTIFICATION

Product name: BETASEAL™ 43533 Body Primer

Recommended use of the chemical and restrictions on use
Identified uses: A primer - For use in automotive applications.

COMPANY IDENTIFICATION
DDP Specialty Electronic Materials US,
LLC
974 Centre Road, Building 730,
Wilmington DE 19805
UNITED STATES

Customer Information Number: 833-338-7668
SDSQuestion-NA@dupont.com

EMERGENCY TELEPHONE NUMBER
24-Hour Emergency Contact: 1-800-424-9300
Local Emergency Contact: 800-424-9300

2. HAZARDS IDENTIFICATION

Hazard classification
GHS classification in accordance with 29 CFR 1910.1200
Flammable liquids - Category 2
Skin irritation - Category 2
Eye irritation - Category 2A
Respiratory sensitisation - Category 1
Skin sensitisation - Category 1
Reproductive toxicity - Category 1B
Specific target organ toxicity - single exposure - Category 3
Specific target organ toxicity - repeated exposure - Category 2 - Inhalation

Label elements
Hazard pictograms

Signal word: **DANGER!**

Hazards
Highly flammable liquid and vapour.
Causes skin irritation.
May cause an allergic skin reaction.
Causes serious eye irritation.
May cause allergy or asthma symptoms or breathing difficulties if inhaled.
May cause respiratory irritation.
May cause drowsiness or dizziness.
May damage fertility or the unborn child.
May cause damage to organs (Respiratory Tract) through prolonged or repeated exposure if inhaled.

Precautionary statements

Prevention
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Keep away from heat/sparks/open flames/hot surfaces. No smoking.
Keep container tightly closed.
Ground/bond container and receiving equipment.
Use explosion-proof electrical/ ventilating/ lighting equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
Wash skin thoroughly after handling.
Use only outdoors or in a well-ventilated area.
Contaminated work clothing should not be allowed out of the workplace.
Wear protective gloves/ protective clothing/ eye protection/ face protection.
In case of inadequate ventilation wear respiratory protection.

Response
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
IF exposed or concerned: Get medical advice/ attention.
If skin irritation or rash occurs: Get medical advice/ attention.
If eye irritation persists: Get medical advice/ attention.
Take off contaminated clothing and wash before reuse.
In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
In case of fire: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide to extinguish.

Storage
Store in a well-ventilated place. Keep container tightly closed.
Store in a well-ventilated place. Keep cool.
Store locked up.

Disposal
Dispose of contents/ container to an approved waste disposal plant.

Other hazards
No data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

This product is a mixture.

Component	CASRN	Concentration
Methyl ethyl ketone	78-93-3	> 40.0 - < 50.0 %
Diphenylmethane Diisocyanate, isomers and homologues	9016-87-9	> 15.0 - < 25.0 %
Acetone	67-64-1	> 10.0 - < 20.0 %
Polyester	35176-78-4	> 5.0 - < 15.0 %
Talc	14807-96-6	> 5.0 - < 15.0 %
4,4'-Methylenediphenyl diisocyanate	101-68-8	< 5.0 %
Carbon black	1333-86-4	< 5.0 %
Dibutyltin diacetate	1067-33-0	0.1 - < 0.2 %

4. FIRST AID MEASURES

Description of first aid measures
General advice:
First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

Inhalation: Move person to fresh air. If not breathing, give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask, etc). If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician or transport to a medical facility.

Skin contact: Remove material from skin immediately by washing with soap and plenty of water. Remove contaminated clothing and shoes while washing. Seek medical attention if irritation persists. Wash clothing before reuse. An MDI skin decontamination study demonstrated that cleaning very soon after exposure is important, and that a polyglycol-based skin cleanser or corn oil may be more effective than soap and water. Discard items which cannot be decontaminated, including leather articles such as shoes, belts and watchbands. Suitable emergency safety shower facility should be available in work area.

Eye contact: Immediately flush eyes with water; remove contact lenses, if present, after the first 5 minutes, then continue flushing eyes for at least 15 minutes. Obtain medical attention without delay, preferably from an ophthalmologist. Suitable emergency eye wash facility should be immediately available.

Ingestion: Do not induce vomiting. Call a physician and/or transport to emergency facility immediately.

Most important symptoms and effects, both acute and delayed: Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), any additional important symptoms and effects are described in Section 11: Toxicology Information.

Indication of any immediate medical attention and special treatment needed
Notes to physician: Maintain adequate ventilation and oxygenation of the patient. May cause respiratory sensitization or asthma-like symptoms. Bronchodilators, expectorants and antitussives may be of help. Treat bronchospasm with inhaled beta2 agonist and oral or parenteral corticosteroids. Respiratory symptoms, including pulmonary edema, may be delayed. Persons receiving significant exposure should be observed 24-48 hours for signs of respiratory distress. If you are sensitized to diisocyanates, consult your physician regarding working with other respiratory irritants or sensitizers. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Excessive exposure may aggravate preexisting asthma and other respiratory disorders (e.g. emphysema, bronchitis, reactive airways dysfunction syndrome). Skin contact may aggravate preexisting dermatitis.

5. FIREFIGHTING MEASURES

Suitable extinguishing media: Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. Alcohol resistant foams (ATC type) are preferred. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective.

Unsuitable extinguishing media: Do not use direct water stream. Straight or direct water streams may not be effective to extinguish fire.

Special hazards arising from the substance or mixture
Hazardous combustion products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Nitrogen oxides. Isocyanates. Hydrogen cyanide. Carbon monoxide. Carbon dioxide.

Unusual Fire and Explosion Hazards: Product reacts with water. Reaction may produce heat and/or gases. Container may rupture from gas generation in a fire situation. Electrically ground and bond all equipment. Flammable mixtures of this product are readily ignited even by static discharge. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition and/or flash back may occur. Flammable mixtures may exist within the vapor space of containers at room

temperature. Flammable concentrations of vapor can accumulate at temperatures above flash point; see Section 9. Dense smoke is produced when product burns.

Advice for firefighters
Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Stay upwind. Keep out of low areas where gases (fumes) can accumulate. Water may not be effective in extinguishing fire. Water is not recommended, but may be applied in large quantities as a fine spray when other extinguishing agents are not available. Fight fire from protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles. Immediately withdraw all personnel from the area in case of rising sound from venting safety device or discoloration of the container. Do not use direct water stream. May spread fire. Eliminate ignition sources. Move container from fire area if this is possible without hazard. Avoid accumulation of water. Product may be carried across water surface spreading fire or contacting an ignition source. Use water spray to cool fire-exposed containers and fire-affected zone until fire is out. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this (M)SDS.

Special protective equipment for firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). Avoid contact with this material during fire fighting operations. If contact is likely, change to full chemical resistant fire fighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Evacuate area. Only trained and properly protected personnel must be involved in clean-up operations. Keep personnel out of low areas. Keep upwind of spill. Ventilate area of leak or spill. No smoking in area. Eliminate all sources of ignition in vicinity of spill or released vapor to avoid fire or explosion. Vapor explosion hazard. Keep out of sewers. For large spills, warn public of downwind explosion hazard. Check area with combustible gas detector before reentering area. Ground and bond all containers and handling equipment. See Section 10 for more specific information. Refer to section 7, Handling, for additional precautionary measures. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Environmental precautions: Spills or discharge to natural waterways is likely to kill aquatic organisms. Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

Methods and materials for containment and cleaning up: Contain spilled material if possible. Absorb with materials such as: Cat litter. Sand. Sawdust. Ground and bond all containers and handling equipment. Pump with explosion-proof equipment. If available, use foam to smother or suppress. Collect in suitable and properly labeled containers. See Section 13, Disposal Considerations, for additional information.

7. HANDLING AND STORAGE

Precautions for safe handling: Keep away from heat, sparks and flame. Avoid contact with eyes. Avoid prolonged or repeated contact with skin. Avoid breathing vapor or mist. Wash thoroughly after

handling. Keep container closed. Use only with adequate ventilation. No smoking, open flames or sources of ignition in handling and storage area. Ignition sources can include and are not limited to pilot lights, flames, smoking, sparks, heaters, electrical equipment, and static discharges. Electrically bond and ground all containers, personnel and equipment before transfer or use of material. Use of non-sparking or explosion-proof equipment may be necessary, depending upon the type of operation. Containers, even those that have been emptied, can contain vapors. Do not cut, drill, grind, weld, or perform similar operations on or near empty containers. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition and/or flash back may occur. Never use air pressure for transferring product unless a risk assesment has been conducted that includes consideration of the flammability of the product. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

Conditions for safe storage: Minimize sources of ignition, such as static build-up, heat, spark or flame. Keep container closed. Flammable mixtures may exist within the vapor space of containers at room temperature. Store in a dry place. Avoid moisture.

Storage stability

Storage temperature:

10 - 35 °C (50 - 95 °F)

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

If exposure limits exist, they are listed below. If no exposure limits are displayed, then no values are applicable.

Component	Regulation	Type of listing	Value/Notation
Methyl ethyl ketone	Dow IHG	TWA	50 ppm
	Dow IHG	STEL	100 ppm
	ACGIH	TWA	200 ppm
	ACGIH	STEL	300 ppm
	OSHA Z-1	TWA	590 mg/m3 200 ppm
Acetone	Dow IHG	TWA	200 ppm
	Dow IHG	STEL	350 ppm
	ACGIH	TWA	250 ppm
	ACGIH	STEL	500 ppm
	OSHA Z-1	TWA	2,400 mg/m3 1,000 ppm
4,4'-Methylenediphenyl diisocyanate	Dow IHG	TWA	0.005 ppm
	Dow IHG	STEL	0.02 ppm
	ACGIH	TWA	0.005 ppm
	OSHA Z-1	C	0.2 mg/m3 0.02 ppm
Dibutyltin diacetate	ACGIH	TWA	SKIN
	ACGIH	STEL	SKIN
	OSHA Z-1	TWA	0.1 mg/m3 , Tin
	ACGIH	TWA	0.1 mg/m3 , Tin
	ACGIH	STEL	0.2 mg/m3 , Tin

Although some of the components of this product may have exposure guidelines, no exposure would be expected under normal handling conditions due to the physical state of the material.

Biological occupational exposure limits

Components	CAS-No.	Control parameters	Biological specimen	Sampling time	Permissible concentration	Basis
Methyl ethyl ketone	78-93-3	methyl ethyl ketone	Urine	End of shift (As soon as possible after exposure ceases)	2 mg/l	ACGIH BEI
Acetone	67-64-1	Acetone	Urine	End of shift (As soon as possible after exposure ceases)	25 mg/l	ACGIH BEI

Exposure controls

Engineering controls: Use only with adequate ventilation. Local exhaust ventilation may be necessary for some operations. Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines. Exhaust systems should be designed to move the air away from the source of vapor/aerosol generation and people working at this point. The odor and irritancy of this material are inadequate to warn of excessive exposure.

Individual protection measures

Eye/face protection: Use chemical goggles.

Skin protection

Hand protection: Use gloves chemically resistant to this material. Examples of preferred glove barrier materials include: Butyl rubber. Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Examples of acceptable glove barrier materials include: Chlorinated polyethylene. Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). Viton. Avoid gloves made of: Polyvinyl chloride ("PVC" or "vinyl"). NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Other protection: Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task.

Respiratory protection: Atmospheric levels should be maintained below the exposure guideline. When atmospheric levels may exceed the exposure guideline, use an approved air-purifying respirator equipped with an organic vapor sorbent and a particle filter. For situations where the atmospheric levels may exceed the level for which an air-purifying respirator is effective, use a positive-pressure air-supplying respirator (air line or self-contained breathing apparatus). For emergency response or for situations where the atmospheric level is unknown, use an approved positive-pressure self-contained breathing apparatus or positive-pressure air line with auxiliary self-contained air supply.

The following should be effective types of air-purifying respirators: Organic vapor cartridge with a particulate pre-filter.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	
Physical state	Liquid.
Color	Black
Odor	Solvent
Odor Threshold	No test data available
pH	No test data available
Melting point/range	No test data available
Freezing point	No test data available
Boiling point (760 mmHg)	No test data available
Flash point	**closed cup** -9.0 °C (15.8 °F) *Setaflash Closed Cup*
Evaporation Rate (Butyl Acetate = 1)	No test data available
Flammability (solid, gas)	Flammable liquid
Lower explosion limit	No test data available
Upper explosion limit	No test data available
Vapor Pressure	No test data available
Relative Vapor Density (air = 1)	No test data available
Relative Density (water = 1)	0.97 *ASTM D1475*
Water solubility	No test data available
Partition coefficient: n-octanol/water	No data available
Auto-ignition temperature	No test data available
Decomposition temperature	No test data available
Dynamic Viscosity	No test data available
Kinematic Viscosity	No test data available
Explosive properties	No test data available
Oxidizing properties	No test data available
Molecular weight	No data available
Volatile Organic Compounds	4.9 lb/gln *EPA Method No. 24* (typical value)

NOTE: The physical data presented above are typical values and should not be construed as a specification.

10. STABILITY AND REACTIVITY

Reactivity: No dangerous reaction known under conditions of normal use.

Chemical stability: Stable under recommended storage conditions. See Storage, Section 7.

Possibility of hazardous reactions: Will not occur by itself.

Conditions to avoid: Some components of this product can decompose at elevated temperatures. Generation of gas during decomposition can cause pressure in closed systems. Pressure build-up can be rapid. Avoid static discharge. Avoid moisture. Material reacts slowly with water, releasing carbon dioxide which can cause pressure buildup and rupture of closed containers. Elevated temperatures accelerate this reaction.

Incompatible materials: Avoid contact with: Acids. Alcohols. Amines. Water. Ammonia. Bases. Strong oxidizers. Diisocyanates react with many materials and the rate of reaction increases with temperature as well as increased contact. Contact is increased by stirring or if the other material mixes with the diisocyanate. Diisocyanates are not soluble in water and sink to the bottom, but react slowly at the interface. The reaction forms carbon dioxide gas and a layer of solid polyurea. Reaction with water will generate carbon dioxide and heat.

Hazardous decomposition products: Decomposition products depend upon temperature, air supply and the presence of other materials. Gases are released during decomposition.

11. TOXICOLOGICAL INFORMATION

Toxicological information appears in this section when such data is available.

Acute toxicity

Acute oral toxicity
Low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury. May cause central nervous system effects.
Single dose oral LD50 has not been determined.

Acute dermal toxicity
Prolonged skin contact is unlikely to result in absorption of harmful amounts.
The dermal LD50 has not been determined.

Acute inhalation toxicity
Vapor concentrations are attainable which could be hazardous on single exposure. May cause respiratory irritation and central nervous system depression. Symptoms may include headache, dizziness and drowsiness, progressing to incoordination and unconsciousness. May cause nausea and vomiting. Decreased lung function has been associated with overexposure to isocyanates. May cause pulmonary edema (fluid in the lungs.) Effects may be delayed. This material contains mineral and/or inorganic fillers. There is essentially no potential for inhalation exposure to these fillers incidental to industrial handling due to the physical state.
The LC50 has not been determined.

Skin corrosion/irritation
Brief contact may cause slight skin irritation with local redness.
May cause drying and flaking of the skin.

Serious eye damage/eye irritation
May cause moderate eye irritation which may be slow to heal.
May cause moderate corneal injury.
Vapor may cause eye irritation experienced as mild discomfort and redness.

Sensitization

For skin sensitization:
Skin contact may cause an allergic skin reaction.
Animal studies have shown that skin contact with isocyanates may play a role in respiratory sensitization.

For respiratory sensitization:
A component in this mixture may cause an allergic respiratory response.
MDI concentrations below the exposure guidelines may cause allergic respiratory reactions in individuals already sensitized.
Asthma-like symptoms may include coughing, difficult breathing and a feeling of tightness in the chest.
Occasionally, breathing difficulties may be life threatening.

Specific Target Organ Systemic Toxicity (Single Exposure)
Contains component(s) which are classified as specific target organ toxicant, single exposure, category 3.

Specific Target Organ Systemic Toxicity (Repeated Exposure)
Contains component(s) which have been reported to cause effects on the following organs in animals:
Blood.
Kidney.
Liver.
Development of cataracts has been reported in laboratory animals after prolonged repeated skin exposure to acetone.
Tissue injury in the upper respiratory tract and lungs has been observed in laboratory animals after repeated excessive exposures to MDI/polymeric MDI aerosols.
Methyl ethyl ketone is probably not neurotoxic in itself but it potentiates the neurotoxicity of methyl-n-butyl ketone and n-hexane.
Methyl ethyl ketone has caused liver effects in laboratory animals exposed by inhalation to high concentrations.

Carcinogenicity
For the minor component(s): Methylene diphenyl diisocyanate (MDI). Epidemiological evidence has shown no causal relationship between exposure and cancer occurrence in humans.

Teratogenicity
For the major component(s): Has been toxic to the fetus in laboratory animals at doses toxic to the mother. Has caused birth defects in laboratory animals only at doses toxic to the mother. In laboratory animals, MDI/polymeric MDI did not cause birth defects; other fetal effects occurred only at high doses which were toxic to the mother.

Reproductive toxicity
For the minor component(s): In laboratory animal studies, effects on reproduction have been seen only at doses that produced significant toxicity to the parent animals.

Mutagenicity
For the component(s) tested: In vitro genetic toxicity studies were predominantly negative. Animal genetic toxicity studies were negative. Genetic toxicity data on MDI are inconclusive. MDI was weakly positive in some in vitro studies; other in vitro studies were negative. Animal mutagenicity studies were predominantly negative.

Aspiration Hazard
Based on physical properties, not likely to be an aspiration hazard.

COMPONENTS INFLUENCING TOXICOLOGY:

Methyl ethyl ketone

Acute oral toxicity
LD50, Rat, 2,657 - 5,554 mg/kg

Acute dermal toxicity
LD50, Rabbit, > 5,000 mg/kg

Acute inhalation toxicity
LC50, Rat, 4 Hour, vapour, 34.5 mg/l

Diphenylmethane Diisocyanate, isomers and homologues

Acute oral toxicity
Typical for this family of materials. LD50, Rat, > 10,000 mg/kg

Acute dermal toxicity
Typical for this family of materials. LD50, Rabbit, > 9,400 mg/kg

Acute inhalation toxicity
LC50, Rat, 4 Hour, dust/mist, 0.49 mg/l

For similar material(s): 4,4'-Methylenediphenyl diisocyanate (CAS 101-68-8). LC50, Rat, 1 Hour, Aerosol, 2.24 mg/l

For similar material(s): 2,4'-Diphenylmethane diisocyanate (CAS 5873-54-1). LC50, Rat, 4 Hour, Aerosol, 0.387 mg/l

Acetone

Acute oral toxicity
LD50, Rat, 5,800 mg/kg

Acute dermal toxicity
LD50, Rabbit, > 20,000 mg/kg

Acute inhalation toxicity
LC50, Rat, 4 Hour, vapour, 76 mg/l

Polyester

Acute oral toxicity
Single dose oral LD50 has not been determined. Excessive exposure may cause: Gastrointestinal irritation. Nausea and/or vomiting. Diarrhea.

Acute dermal toxicity
The dermal LD50 has not been determined.

Acute inhalation toxicity
At room temperature, exposure to vapor is minimal due to low volatility; vapor from heated material may cause respiratory irritation.

The LC50 has not been determined.

Talc

Acute oral toxicity
Single dose oral LD50 has not been determined.

Acute dermal toxicity
The dermal LD50 has not been determined.

Acute inhalation toxicity
The LC50 has not been determined.

4,4'-Methylenediphenyl diisocyanate

Acute oral toxicity
LD50, Rat, > 2,000 mg/kg No deaths occurred at this concentration.

Acute dermal toxicity
LD50, Rabbit, > 9,400 mg/kg

Acute inhalation toxicity
LC50, Rat, 1 Hour, dust/mist, 2.24 mg/l

Carbon black

Acute oral toxicity
LD50, Rat, > 8,000 mg/kg

Acute dermal toxicity
LD50, Rabbit, > 3,000 mg/kg No deaths occurred at this concentration.

Acute inhalation toxicity
LC50, Rat, 1 Hour, dust/mist, 27 mg/l No deaths occurred at this concentration.

Dibutyltin diacetate

Acute oral toxicity
Oral LD50 has not been determined due to corrosivity.

Acute dermal toxicity
Absorption has not been determined due to corrosivity.

Acute inhalation toxicity
No relevant data found.

The LC50 has not been determined.

12. ECOLOGICAL INFORMATION

Ecotoxicological information appears in this section when such data is available.

Toxicity

Methyl ethyl ketone

Acute toxicity to fish
Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).

LC50, Pimephales promelas (fathead minnow), static test, 96 Hour, 2,993 mg/l, OECD Test Guideline 203

Acute toxicity to aquatic invertebrates
EC50, Daphnia magna (Water flea), static test, 48 Hour, 308 mg/l, OECD Test Guideline 202

Acute toxicity to algae/aquatic plants
ErC50, Pseudokirchneriella subcapitata (microalgae), static test, 96 Hour, Growth rate inhibition, 2,029 mg/l, OECD Test Guideline 201

Toxicity to bacteria
EC50, Bacteria, 96 Hour, > 1,000 mg/l, hUCC

Diphenylmethane Diisocyanate, isomers and homologues

Acute toxicity to fish
The measured ecotoxicity is that of the hydrolyzed product, generally under conditions maximizing production of soluble species.
Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).
Based on information for a similar material:
LC50, Danio rerio (zebra fish), static test, 96 Hour, > 1,000 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates
Based on information for a similar material:
EC50, Daphnia magna (Water flea), static test, 24 Hour, > 1,000 mg/l, OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants
Based on information for a similar material:
NOEC, Desmodesmus subspicatus (green algae), static test, 72 Hour, Growth rate inhibition, 1,640 mg/l, OECD Test Guideline 201 or Equivalent

Toxicity to bacteria
Based on information for a similar material:
EC50, activated sludge, static test, 3 Hour, Respiration rates., > 100 mg/l

Toxicity to soil-dwelling organisms
EC50, Eisenia fetida (earthworms), Based on information for a similar material:, 14 d, > 1,000 mg/kg

Toxicity to terrestrial plants
EC50, Avena sativa (oats), Growth inhibition, 1,000 mg/l
EC50, Lactuca sativa (lettuce), Growth inhibition, 1,000 mg/l

Acetone

Acute toxicity to fish
Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).
LC50, Oncorhynchus mykiss (rainbow trout), 96 Hour, 5,500 - 6,100 mg/l

Acute toxicity to aquatic invertebrates
EC50, Daphnia magna (Water flea), 48 Hour, 6,084 mg/l, Method Not Specified.
LC50, Ceriodaphnia dubia (water flea), 48 Hour, 8,098 mg/l

Acute toxicity to algae/aquatic plants
EC50, Skeletonema costatum (marine diatom), 5 d, Biomass, 11,800 - 14,400 mg/l

Toxicity to bacteria
IC50, activated sludge, 3 Hour, > 1,000 mg/l, OECD 209 Test

Toxicity to Above Ground Organisms
Material is practically non-toxic to birds on a dietary basis (LC50 > 5000 ppm).
dietary LC50, Coturnix japonica (Japanese quail), > 20,000 ppm

Polyester

Acute toxicity to fish
Not expected to be acutely toxic to aquatic organisms.

Talc

Acute toxicity to fish
Material is practically non-toxic to fish on an acute basis (LC50 > 100 mg/L).
LC50, Danio rerio (zebra fish), 24 Hour, > 100,000 mg/l, Method Not Specified.

4,4'-Methylenediphenyl diisocyanate

Acute toxicity to fish
The measured ecotoxicity is that of the hydrolyzed product, generally under conditions maximizing production of soluble species.
Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).
Based on information for a similar material:
LC50, Danio rerio (zebra fish), static test, 96 Hour, > 1,000 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates
Based on information for a similar material:
EC50, Daphnia magna (Water flea), static test, 24 Hour, > 1,000 mg/l, OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants
Based on information for a similar material:
NOEC, Desmodesmus subspicatus (green algae), static test, 72 Hour, Growth rate inhibition, 1,640 mg/l, OECD Test Guideline 201 or Equivalent

Toxicity to bacteria
Based on information for a similar material:
EC50, activated sludge, static test, 3 Hour, Respiration rates., > 100 mg/l

Toxicity to soil-dwelling organisms
EC50, Eisenia fetida (earthworms), Based on information for a similar material:, 14 d, > 1,000 mg/kg

Toxicity to terrestrial plants
EC50, Avena sativa (oats), Growth inhibition, 1,000 mg/l
EC50, Lactuca sativa (lettuce), Growth inhibition, 1,000 mg/l

Carbon black

Acute toxicity to fish

Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).
LC50, Leuciscus idus (Golden orfe), static test, 96 Hour, > 1,000 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates
EC50, Daphnia magna (Water flea), 24 Hour, > 5,600 mg/l, OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants
NOEC, Desmodesmus subspicatus (green algae), 72 Hour, 10,000 mg/l, OECD Test Guideline 201

Dibutyltin diacetate

Acute toxicity to fish
Material is very highly toxic to aquatic organisms on an acute basis (LC50/EC50 <0.1 mg/L in the most sensitive species).
For similar material(s):
LOEC mortality, Danio rerio (zebra fish), Static, 72 Hour, 3.1 mg/l

Acute toxicity to aquatic invertebrates
EC50, Daphnia magna (Water flea), static test, 48 Hour, 1.4 mg/l

Acute toxicity to algae/aquatic plants
EbC50, Skeletonema costatum (marine diatom), Static, 72 Hour, Biomass, 0.035 mg/l

Toxicity to bacteria
EC50, 3 Hour, > 1,000 mg/l, OECD Test Guideline 209

Persistence and degradability

Methyl ethyl ketone

Biodegradability: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.
10-day Window: Not applicable
Biodegradation: 98 %
Exposure time: 28 d
Method: OECD Test Guideline 301D or Equivalent

Theoretical Oxygen Demand: 2.44 mg/mg

Biological oxygen demand (BOD)

Incubation Time	BOD
5 d	71 - 76 %
10 d	71 - 82 %
20 d	71 - 89 %

Photodegradation
Test Type: Half-life (indirect photolysis)
Sensitization: OH radicals
Atmospheric half-life: 8 d

Method: Estimated.

Diphenylmethane Diisocyanate, isomers and homologues

Biodegradability: In the aquatic and terrestrial environment, material reacts with water forming predominantly insoluble polyureas which appear to be stable. In the atmospheric environment, material is expected to have a short tropospheric half-life, based on calculations and by analogy with related diisocyanates.
10-day Window: Not applicable
Biodegradation: 0 %
Exposure time: 28 d
Method: OECD Test Guideline 302C or Equivalent

Acetone

Biodegradability: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.
10-day Window: Pass
Biodegradation: 91 %
Exposure time: 28 d
Method: OECD Test Guideline 301B or Equivalent

Theoretical Oxygen Demand: 2.20 mg/mg Estimated.

Biological oxygen demand (BOD)

Incubation Time	BOD
5 d	69.1 %
10 d	72.7 %
20 d	73.6 %

Photodegradation
Test Type: Half-life (indirect photolysis)
Sensitization: OH radicals
Atmospheric half-life: 52 d
Method: Estimated.

Polyester

Biodegradability: No appreciable biodegradation is expected.

Talc

Biodegradability: Biodegradation is not applicable.

4,4'-Methylenediphenyl diisocyanate

Biodegradability: In the aquatic and terrestrial environment, material reacts with water forming predominantly insoluble polyureas which appear to be stable. In the atmospheric environment, material is expected to have a short tropospheric half-life, based on calculations and by analogy with related diisocyanates.
10-day Window: Not applicable
Biodegradation: 0 %
Exposure time: 28 d
Method: OECD Test Guideline 302C or Equivalent

Carbon black

Biodegradability: Biodegradation is not applicable.

Dibutyltin diacetate

Biodegradability: For similar material(s): Based on stringent OECD test guidelines, this material cannot be considered as readily biodegradable; however, these results do not necessarily mean that the material is not biodegradable under environmental conditions.
10-day Window: Fail
Biodegradation: 23 %
Exposure time: 39 d
Method: OECD Test Guideline 301F or Equivalent

Bioaccumulative potential

Methyl ethyl ketone

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Partition coefficient: n-octanol/water(log Pow): 0.29 Measured

Diphenylmethane Diisocyanate, isomers and homologues

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3). Reacts with water. In the aquatic and terrestrial environment, movement is expected to be limited by its reaction with water forming predominantly insoluble polyureas.
Bioconcentration factor (BCF): 92 Cyprinus carpio (Carp) 28 d

Acetone

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Partition coefficient: n-octanol/water(log Pow): -0.24 Measured
Bioconcentration factor (BCF): 0.69 Fish Measured

Polyester

Bioaccumulation: No bioconcentration is expected because of the relatively high molecular weight (MW greater than 1000).

Talc

Bioaccumulation: Partitioning from water to n-octanol is not applicable.
Bioconcentration factor (BCF): 3 Estimated.

4,4'-Methylenediphenyl diisocyanate

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3). Reacts with water. In the aquatic and terrestrial environment, movement is expected to be limited by its reaction with water forming predominantly insoluble polyureas.
Bioconcentration factor (BCF): 92 Cyprinus carpio (Carp) 28 d

Carbon black

Bioaccumulation: No relevant data found.

Dibutyltin diacetate

Bioaccumulation: Bioconcentration potential is moderate (BCF between 100 and 3000 or Log Pow between 3 and 5).
Partition coefficient: n-octanol/water(log Pow): 3.39 Estimated.

Mobility in soil

Methyl ethyl ketone

Potential for mobility in soil is very high (Koc between 0 and 50).

Partition coefficient (Koc): 3.8 Estimated.

Diphenylmethane Diisocyanate, isomers and homologues

In the aquatic and terrestrial environment, movement is expected to be limited by its reaction with water forming predominantly insoluble polyureas.

Acetone

Potential for mobility in soil is very high (Koc between 0 and 50).
Partition coefficient (Koc): 0.37 - 2.0 Estimated.

Polyester

No relevant data found.

Talc

No data available.

4,4'-Methylenediphenyl diisocyanate

In the aquatic and terrestrial environment, movement is expected to be limited by its reaction with water forming predominantly insoluble polyureas.

Carbon black

No relevant data found.

Dibutyltin diacetate

No relevant data found.

13. DISPOSAL CONSIDERATIONS

Disposal methods: DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. AS YOUR SUPPLIER, WE HAVE NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information. FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Incinerator or other thermal destruction device.

Treatment and disposal methods of used packaging: Empty containers should be recycled or otherwise disposed of by an approved waste management facility. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. Do not re-use containers for any purpose.

14. TRANSPORT INFORMATION

DOT

Proper shipping name	Coating solution
UN number	UN 1139
Class	3
Packing group	II

Reportable Quantity Methyl ethyl ketone, MDI

Classification for SEA transport (IMO-IMDG):

Proper shipping name	COATING SOLUTION
UN number	UN 1139
Class	3
Packing group	II
Marine pollutant	No
Transport in bulk according to Annex I or II of MARPOL 73/78 and the IBC or IGC Code	Consult IMO regulations before transporting ocean bulk

Classification for AIR transport (IATA/ICAO):

Proper shipping name	Coating solution
UN number	UN 1139
Class	3
Packing group	II

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. REGULATORY INFORMATION

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312
Flammable (gases, aerosols, liquids, or solids)
Skin corrosion or irritation
Serious eye damage or eye irritation
Respiratory or skin sensitisation
Reproductive toxicity
Specific target organ toxicity (single or repeated exposure)

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313
The following components are subject to reporting levels established by SARA Title III, Section 313:

Components	**CASRN**
Diphenylmethane Diisocyanate, isomers and homologues	9016-87-9
Methylenebis(4-phenyl isocyanate)	101-68-8

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) Section 103
Calculated RQ exceeds reasonably attainable upper limit.

Components	CASRN	RQ (RCRA Code)
Methyl ethyl ketone	78-93-3	5000 lbs RQ
Methyl ethyl ketone	78-93-3	100 lbs RQ (F005)
Acetone	67-64-1	5000 lbs RQ
Acetone	67-64-1	100 lbs RQ (F003)
Methyl ethyl ketone	78-93-3	5000 lbs RQ
Methyl ethyl ketone	78-93-3	100 lbs RQ (F005)

Pennsylvania Right To Know
The following chemicals are listed because of the additional requirements of Pennsylvania law:

Components	CASRN
Methyl ethyl ketone	78-93-3
Acetone	67-64-1
Talc	14807-96-6
Methylenebis(4-phenyl isocyanate)	101-68-8
Carbon black	1333-86-4

California Prop. 65
WARNING: This product can expose you to chemicals including Ethylene glycol, which is/are known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

United States TSCA Inventory (TSCA)
All components of this product are in compliance with the inventory listing requirements of the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

16. OTHER INFORMATION

Hazard Rating System
NFPA

Health	Flammability	Instability
2	3	1

Revision
Identification Number: 30966 / A749 / Issue Date: 10/17/2018 / Version: 17.0
Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

Legend

ACGIH	USA. ACGIH Threshold Limit Values (TLV)
ACGIH BEI	ACGIH - Biological Exposure Indices (BEI)
C	Ceiling
Dow IHG	Dow Industrial Hygiene Guideline
OSHA Z-1	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
SKIN	Absorbed via skin
STEL	Short term exposure limit
TWA	Time weighted average

Full text of other abbreviations

AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Information Source and References
This SDS is prepared by Product Regulatory Services and Hazard Communications Groups from information supplied by internal references within our company.

DDP Specialty Electronic Materials US, LLC urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.
US

SAFETY DATA SHEET

DDP Specialty Electronic Materials US, LLC

Product name: BETASEAL™ 58702SFHN Urethane Adhesive **Issue Date:** 10/15/2018
Print Date: 04/12/2024

DDP Specialty Electronic Materials US, LLC encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. IDENTIFICATION

Product name: BETASEAL™ 58702SFHN Urethane Adhesive

Recommended use of the chemical and restrictions on use
Identified uses: A urethane adhesive -- For use in automotive applications.

COMPANY IDENTIFICATION
DDP Specialty Electronic Materials US,
LLC
974 Centre Road, Building 730,
Wilmington DE 19805
UNITED STATES

Customer Information Number: 833-338-7668
SDSQuestion-NA@dupont.com

EMERGENCY TELEPHONE NUMBER
24-Hour Emergency Contact: 1-800-424-9300
Local Emergency Contact: 800-424-9300

2. HAZARDS IDENTIFICATION

Hazard classification
GHS classification in accordance with 29 CFR 1910.1200
Respiratory sensitisation - Category 1

Label elements
Hazard pictograms

Signal word: **DANGER!**

Hazards
May cause allergy or asthma symptoms or breathing difficulties if inhaled.

Precautionary statements

Prevention
Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
In case of inadequate ventilation wear respiratory protection.

Response
IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.
If experiencing respiratory symptoms: Call a POISON CENTER/doctor.

Disposal
Dispose of contents/ container to an approved waste disposal plant.

Other hazards
No data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

This product is a mixture.

Component	CASRN	Concentration
Diisononyl phthalate	28553-12-0	> 30.0 - < 40.0 %
MDI based urethane polymer P83-1015	Not available	> 30.0 - < 40.0 %
Carbon black	1333-86-4	> 15.0 - < 25.0 %
Phthalic acid, di-C8-10-branched alkyl esters, C9-rich	68515-48-0	> 15.0 - < 25.0 %
Calcined clay	66402-68-4	> 5.0 - < 15.0 %
4,4'-Methylenediphenyl diisocyanate	101-68-8	< 1.0 %

4. FIRST AID MEASURES

Description of first aid measures
General advice:
First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

Inhalation: Move person to fresh air. If not breathing, give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask, etc). If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician or transport to a medical facility.

Skin contact: Remove material from skin immediately by washing with soap and plenty of water. Remove contaminated clothing and shoes while washing. Seek medical attention if irritation persists. Wash clothing before reuse. An MDI skin decontamination study demonstrated that cleaning very soon after exposure is important, and that a polyglycol-based skin cleanser or corn oil may be more effective than soap and water. Discard items which cannot be decontaminated, including leather articles such as shoes, belts and watchbands. Suitable emergency safety shower facility should be available in work area.

Eye contact: Flush eyes thoroughly with water for several minutes. Remove contact lenses after the initial 1-2 minutes and continue flushing for several additional minutes. If effects occur, consult a physician, preferably an ophthalmologist. Suitable emergency eye wash facility should be available in work area.

Ingestion: If swallowed, seek medical attention. Do not induce vomiting unless directed to do so by medical personnel.

Most important symptoms and effects, both acute and delayed:
Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), any additional important symptoms and effects are described in Section 11: Toxicology Information.

Indication of any immediate medical attention and special treatment needed
Notes to physician: Excessive exposure may aggravate preexisting asthma and other respiratory disorders (e.g. emphysema, bronchitis, reactive airways dysfunction syndrome). Maintain adequate ventilation and oxygenation of the patient. May cause respiratory sensitization or asthma-like symptoms. Bronchodilators, expectorants and antitussives may be of help. Treat bronchospasm with inhaled beta2 agonist and oral or parenteral corticosteroids. Respiratory symptoms, including pulmonary edema, may be delayed. Persons receiving significant exposure should be observed 24-48 hours for signs of respiratory distress. If you are sensitized to diisocyanates, consult your physician regarding working with other respiratory irritants or sensitizers. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

5. FIREFIGHTING MEASURES

Suitable extinguishing media: Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. Alcohol resistant foams (ATC type) are preferred. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective. Water fog, applied gently may be used as a blanket for fire extinguishment.

Unsuitable extinguishing media: Do not use direct water stream. May spread fire.

Special hazards arising from the substance or mixture
Hazardous combustion products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Nitrogen oxides. Carbon monoxide. Carbon dioxide. Combustion products may include trace amounts of: Hydrogen cyanide.

Unusual Fire and Explosion Hazards: Product reacts with water. Reaction may produce heat and/or gases. Any closed container may rupture when exposed to extreme heat in a fire situation. Violent

steam generation or eruption may occur upon application of direct water stream to hot liquids. Dense smoke is produced when product burns.

Advice for firefighters
Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. Fight fire from protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles. Immediately withdraw all personnel from the area in case of rising sound from venting safety device or discoloration of the container. Do not use direct water stream. May spread fire. Move container from fire area if this is possible without hazard. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage. Water fog, applied gently may be used as a blanket for fire extinguishment. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this (M)SDS.

Special protective equipment for firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). Avoid contact with this material during fire fighting operations. If contact is likely, change to full chemical resistant fire fighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Isolate area. Keep unnecessary and unprotected personnel from entering the area. Keep upwind of spill. Ventilate area of leak or spill. Refer to section 7, Handling, for additional precautionary measures. See Section 10 for more specific information. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Environmental precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

Methods and materials for containment and cleaning up: Contain spilled material if possible. Absorb with materials such as: Cat litter. Sand. Sawdust. Collect in suitable and properly labeled containers. See Section 13, Disposal Considerations, for additional information.

7. HANDLING AND STORAGE

Precautions for safe handling: Avoid contact with eyes. Avoid prolonged or repeated contact with skin. Avoid breathing vapor. Wash thoroughly after handling. Keep container closed. Use with adequate ventilation. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

Conditions for safe storage: Protect from atmospheric moisture. Store in a dry place. Avoid moisture.

Storage stability
Storage temperature:
> 5 - < 35 °C (> 41 - < 95 °F)

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters
If exposure limits exist, they are listed below. If no exposure limits are displayed, then no values are applicable.

Component	Regulation	Type of listing	Value/Notation
4,4'-Methylenediphenyl diisocyanate	Dow IHG	TWA	0.005 ppm
	Dow IHG	STEL	0.02 ppm
	ACGIH	TWA	0.005 ppm
	OSHA Z-1	C	0.2 mg/m3 0.02 ppm

Although some of the components of this product may have exposure guidelines, no exposure would be expected under normal handling conditions due to the physical state of the material.

Exposure controls
Engineering controls: Use only with adequate ventilation. Local exhaust ventilation may be necessary for some operations. Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines. Exhaust systems should be designed to move the air away from the source of vapor/aerosol generation and people working at this point. The odor and irritancy of this material are inadequate to warn of excessive exposure.

Individual protection measures

Eye/face protection: Use safety glasses (with side shields).

Skin protection

Hand protection: Use gloves chemically resistant to this material. Examples of preferred glove barrier materials include: Butyl rubber. Chlorinated polyethylene. Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Examples of acceptable glove barrier materials include: Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). Polyvinyl chloride ("PVC" or "vinyl"). Viton. NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Other protection: Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task.

Respiratory protection: Atmospheric levels should be maintained below the exposure guideline. When atmospheric levels may exceed the exposure guideline, use an approved air-purifying respirator equipped with an organic vapor sorbent and a particle filter. For situations where the atmospheric levels may exceed the level for which an air-purifying respirator is effective, use a positive-pressure air-supplying respirator (air line or self-contained breathing apparatus). For emergency response or for situations where the atmospheric level is unknown, use an approved positive-pressure self-contained breathing apparatus or positive-pressure air line with auxiliary self-contained air supply.
The following should be effective types of air-purifying respirators: Organic vapor cartridge with a particulate pre-filter.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	
Physical state	Paste
Color	Black
Odor	Amine.
Odor Threshold	No test data available
pH	No test data available
Melting point/range	No test data available
Freezing point	No test data available
Boiling point (760 mmHg)	No test data available
Flash point	**closed cup** > 110 °C (> 230 °F) *ASTM D3278*
Evaporation Rate (Butyl Acetate = 1)	No test data available
Flammability (solid, gas)	The product is not flammable.
Lower explosion limit	No test data available
Upper explosion limit	No test data available
Vapor Pressure	No test data available
Relative Vapor Density (air = 1)	No test data available
Relative Density (water = 1)	1.18 *ASTM D1475*
Water solubility	No test data available
Partition coefficient: n-octanol/water	No data available
Auto-ignition temperature	No test data available
Decomposition temperature	No test data available
Kinematic Viscosity	No test data available
Explosive properties	No test data available
Oxidizing properties	No test data available
Molecular weight	No data available
Volatile Organic Compounds	0.07 lb/gln *EPA Method No. 24* (typical value)

NOTE: The physical data presented above are typical values and should not be construed as a specification.

10. STABILITY AND REACTIVITY

Reactivity: No dangerous reaction known under conditions of normal use.

Chemical stability: Stable under recommended storage conditions. See Storage, Section 7.

Possibility of hazardous reactions: Polymerization will not occur.

Conditions to avoid: Some components of this product can decompose at elevated temperatures. Avoid moisture.

Incompatible materials: Reaction with water will generate heat. Avoid contact with: Acids. Alcohols. Amines. Water. Ammonia. Bases. Metal compounds. Moist air. Strong oxidizers. Reaction with water will generate carbon dioxide.

Hazardous decomposition products: Decomposition products depend upon temperature, air supply and the presence of other materials. Gases are released during decomposition.

11. TOXICOLOGICAL INFORMATION

Toxicological information appears in this section when such data is available.

Acute toxicity

Acute oral toxicity
Low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury. May cause abdominal discomfort or diarrhea. May cause nausea and vomiting. Single dose oral LD50 has not been determined.

Acute dermal toxicity
Prolonged skin contact is unlikely to result in absorption of harmful amounts.
The dermal LD50 has not been determined.

Acute inhalation toxicity
At room temperature, exposure to vapor is minimal due to low volatility. Vapor from heated material may cause respiratory irritation and other effects. For the minor component(s): Excessive exposure may cause irritation to upper respiratory tract (nose and throat) and lungs. May cause pulmonary edema (fluid in the lungs.) Decreased lung function has been associated with overexposure to isocyanates. Effects may be delayed. This material contains mineral and/or inorganic fillers. There is essentially no potential for inhalation exposure to these fillers incidental to industrial handling due to the physical state.
As product: The LC50 has not been determined.

Skin corrosion/irritation
Prolonged contact may cause slight skin irritation with local redness.
Material may stick to skin causing irritation upon removal.

Serious eye damage/eye irritation
May cause eye irritation.

Sensitization
For skin sensitization:
A component in this mixture has been shown to be a skin sensitizer.
Animal studies have shown that skin contact with isocyanates may play a role in respiratory sensitization.

For respiratory sensitization:
A component in this mixture may cause an allergic respiratory response.
MDI concentrations below the exposure guidelines may cause allergic respiratory reactions in individuals already sensitized.
Asthma-like symptoms may include coughing, difficult breathing and a feeling of tightness in the chest. Occasionally, breathing difficulties may be life threatening.

Specific Target Organ Systemic Toxicity (Single Exposure)
Evaluation of available data suggests that this material is not an STOT-SE toxicant.

Specific Target Organ Systemic Toxicity (Repeated Exposure)
Contains component(s) which have been reported to cause effects on the following organs in animals:
Kidney.
Liver.

Carcinogenicity
Lung tumors have been observed in laboratory animals exposed to respirable aerosol droplets of MDI/Polymeric MDI (6 mg/m3) for their lifetime. Tumors occurred concurrently with respiratory irritation and lung injury. Current exposure guidelines are expected to protect against these effects reported for MDI. For the phthalate ester(s): Kidney effects and/or tumors have been observed in male rats. These effects are believed to be species specific and unlikely to occur in humans. Liver effects and/or tumors have been observed in rats. These effects are believed to be species specific and unlikely to occur in humans.

Teratogenicity
Contains component(s) which did not cause birth defects in animals; other fetal effects occurred only at doses toxic to the mother.

Reproductive toxicity
For the phthalate ester(s): In laboratory animals, excessive doses toxic to the parent animals caused decreased weight and survival of offspring. There were no effects on fertility at any dose.

Mutagenicity
Contains a component(s) which were negative in in vitro genetic toxicity studies. Contains component(s) which were negative in animal genetic toxicity studies. Genetic toxicity data on MDI are inconclusive. MDI was weakly positive in some in vitro studies; other in vitro studies were negative. Animal mutagenicity studies were predominantly negative.

Aspiration Hazard
Based on physical properties, not likely to be an aspiration hazard.

COMPONENTS INFLUENCING TOXICOLOGY:

Diisononyl phthalate

Acute oral toxicity
LD50, Rat, > 10,000 mg/kg

Acute dermal toxicity
LD50, Rabbit, > 3,160 mg/kg No deaths occurred at this concentration.

Acute inhalation toxicity
LC50, Rat, male and female, 4 Hour, dust/mist, > 4.4 mg/l No deaths occurred following exposure to a saturated atmosphere.

MDI based urethane polymer P83-1015

Acute oral toxicity
For similar material(s): LD50, Rat, > 2,000 mg/kg Estimated. No deaths occurred at this concentration.

Acute dermal toxicity
The dermal LD50 has not been determined.

Acute inhalation toxicity
The LC50 has not been determined.

Carbon black

Acute oral toxicity
LD50, Rat, > 8,000 mg/kg

Acute dermal toxicity
LD50, Rabbit, > 3,000 mg/kg No deaths occurred at this concentration.

Acute inhalation toxicity
LC50, Rat, 1 Hour, dust/mist, 27 mg/l No deaths occurred at this concentration.

Phthalic acid, di-C8-10-branched alkyl esters, C9-rich

Acute oral toxicity
LD50, Rat, > 10,000 mg/kg

Acute dermal toxicity
LD50, Rabbit, > 3,160 mg/kg No deaths occurred at this concentration.

Acute inhalation toxicity
LC50, Rat, male and female, 4 Hour, dust/mist, > 4.4 mg/l No deaths occurred following exposure to a saturated atmosphere.

Calcined clay

Acute oral toxicity
LD50, Rat, female, > 2,000 mg/kg OECD Test Guideline 425 No deaths occurred at this concentration.

Acute dermal toxicity
For similar material(s): LD50, Rat, male and female, > 2,500 mg/kg OECD Test Guideline 402 No deaths occurred at this concentration.

Acute inhalation toxicity
The LC50 has not been determined.

4,4'-Methylenediphenyl diisocyanate

Acute oral toxicity
LD50, Rat, > 2,000 mg/kg No deaths occurred at this concentration.

Acute dermal toxicity
LD50, Rabbit, > 9,400 mg/kg

Acute inhalation toxicity
LC50, Rat, 1 Hour, dust/mist, 2.24 mg/l

12. ECOLOGICAL INFORMATION

Ecotoxicological information appears in this section when such data is available.

Toxicity

Diisononyl phthalate

Acute toxicity to fish
Not expected to be acutely toxic to aquatic organisms.
LC50, Danio rerio (zebra fish), 96 Hour, > 102 mg/l, Directive 67/548/EEC, Annex V, C.1.

Acute toxicity to aquatic invertebrates
No toxicity at the limit of solubility
EC50, Daphnia magna (Water flea), 48 Hour, > 74 mg/l, Directive 67/548/EEC, Annex V, C.2.

Acute toxicity to algae/aquatic plants
No toxicity at the limit of solubility
EC50, Desmodesmus subspicatus (green algae), 72 Hour, > 88 mg/l, Directive 67/548/EEC, Annex V, C.3.
NOEC, Desmodesmus subspicatus (green algae), 72 Hour, 88 mg/l, Directive 67/548/EEC, Annex V, C.3.

Toxicity to bacteria
Based on data from similar materials
EC50, 30 min, > 83.9 mg/l, OECD Test Guideline 209

Chronic toxicity to fish
Based on data from similar materials
NOEC, Oryzias latipes (Orange-red killifish), 284 d, 18.5 - 24.5 mg/l

Chronic toxicity to aquatic invertebrates
NOEC, Daphnia magna (Water flea), 21 d, > 101 mg/l

MDI based urethane polymer P83-1015

Acute toxicity to fish
Not expected to be acutely toxic to aquatic organisms.

Carbon black

Acute toxicity to fish
Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).
LC50, Leuciscus idus (Golden orfe), static test, 96 Hour, > 1,000 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates
EC50, Daphnia magna (Water flea), 24 Hour, > 5,600 mg/l, OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants
NOEC, Desmodesmus subspicatus (green algae), 72 Hour, 10,000 mg/l, OECD Test Guideline 201

Phthalic acid, di-C8-10-branched alkyl esters, C9-rich

Acute toxicity to fish
Not expected to be acutely toxic to aquatic organisms.

Calcined clay

Acute toxicity to fish

No relevant data found.

4,4'-Methylenediphenyl diisocyanate

Acute toxicity to fish

The measured ecotoxicity is that of the hydrolyzed product, generally under conditions maximizing production of soluble species.
Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).
Based on information for a similar material:
LC50, Danio rerio (zebra fish), static test, 96 Hour, > 1,000 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates

Based on information for a similar material:
EC50, Daphnia magna (Water flea), static test, 24 Hour, > 1,000 mg/l, OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants

Based on information for a similar material:
NOEC, Desmodesmus subspicatus (green algae), static test, 72 Hour, Growth rate inhibition, 1,640 mg/l, OECD Test Guideline 201 or Equivalent

Toxicity to bacteria

Based on information for a similar material:
EC50, activated sludge, static test, 3 Hour, Respiration rates., > 100 mg/l

Toxicity to soil-dwelling organisms

EC50, Eisenia fetida (earthworms), Based on information for a similar material:, 14 d, > 1,000 mg/kg

Toxicity to terrestrial plants

EC50, Avena sativa (oats), Growth inhibition, 1,000 mg/l
EC50, Lactuca sativa (lettuce), Growth inhibition, 1,000 mg/l

Persistence and degradability

Diisononyl phthalate

Biodegradability: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Material is ultimately biodegradable (reaches > 70% mineralization in OECD test(s) for inherent biodegradability).
10-day Window: Not applicable
Biodegradation: 74 %
Exposure time: 28 d
Method: OECD Test Guideline 301C or Equivalent
10-day Window: Not applicable
Biodegradation: > 99 %
Exposure time: 28 d
Method: OECD Test Guideline 302A or Equivalent
10-day Window: Not applicable
Biodegradation: 70.5 %
Exposure time: 28 d
Method: OECD Test Guideline 301F or Equivalent

Theoretical Oxygen Demand: 2.64 mg/mg

Stability in Water (1/2-life)
Hydrolysis, half-life, 3.4 year, pH 7, Half-life Temperature 25 °C, Estimated.
Hydrolysis, half-life, 0.34 year, pH 8, Half-life Temperature 25 °C, Estimated.

Photodegradation
Test Type: Half-life (indirect photolysis)
Sensitization: OH radicals
Atmospheric half-life: 5.487 Hour
Method: Estimated.

MDI based urethane polymer P83-1015

Biodegradability: Surface photodegradation is expected with exposure to sunlight. No appreciable biodegradation is expected.

Carbon black

Biodegradability: Biodegradation is not applicable.

Phthalic acid, di-C8-10-branched alkyl esters, C9-rich

Biodegradability: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Material is ultimately biodegradable (reaches > 70% mineralization in OECD test(s) for inherent biodegradability).
10-day Window: Not applicable
Biodegradation: 74 %
Exposure time: 28 d
Method: OECD Test Guideline 301C or Equivalent
10-day Window: Not applicable
Biodegradation: > 99 %
Exposure time: 28 d
Method: OECD Test Guideline 302A or Equivalent
10-day Window: Not applicable
Biodegradation: 70.5 %
Exposure time: 28 d
Method: OECD Test Guideline 301F or Equivalent

Theoretical Oxygen Demand: 2.64 mg/mg

Stability in Water (1/2-life)
Hydrolysis, half-life, 3.4 year, pH 7, Half-life Temperature 25 °C
Hydrolysis, half-life, 125.2 d, pH 8, Half-life Temperature 25 °C

Photodegradation
Test Type: Half-life (indirect photolysis)
Sensitization: OH radicals
Atmospheric half-life: 5.487 Hour
Method: Estimated.

Calcined clay

Biodegradability: Biodegradation is not applicable.

4,4'-Methylenediphenyl diisocyanate

Biodegradability: In the aquatic and terrestrial environment, material reacts with water forming predominantly insoluble polyureas which appear to be stable. In the atmospheric

environment, material is expected to have a short tropospheric half-life, based on calculations and by analogy with related diisocyanates.
10-day Window: Not applicable
Biodegradation: 0 %
Exposure time: 28 d
Method: OECD Test Guideline 302C or Equivalent

Bioaccumulative potential

Diisononyl phthalate

Bioaccumulation: Based on data from similar materials Bioconcentration potential is low (BCF less than 100 or log Pow greater than 7).
Partition coefficient: n-octanol/water(log Pow): 8.8 - 9.7 OECD Test Guideline 117 or Equivalent
Bioconcentration factor (BCF): < 3 Oncorhynchus mykiss (rainbow trout)

MDI based urethane polymer P83-1015

Bioaccumulation: No bioconcentration is expected because of the relatively high molecular weight (MW greater than 1000).

Carbon black

Bioaccumulation: No relevant data found.

Phthalic acid, di-C8-10-branched alkyl esters, C9-rich

Bioaccumulation: Bioconcentration potential is low (BCF less than 100 or log Pow greater than 7).
Partition coefficient: n-octanol/water(log Pow): 9.37 Estimated.

Calcined clay

Bioaccumulation: Partitioning from water to n-octanol is not applicable.

4,4'-Methylenediphenyl diisocyanate

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3). Reacts with water. In the aquatic and terrestrial environment, movement is expected to be limited by its reaction with water forming predominantly insoluble polyureas.
Bioconcentration factor (BCF): 92 Cyprinus carpio (Carp) 28 d

Mobility in soil

Diisononyl phthalate

Expected to be relatively immobile in soil (Koc > 5000).
Partition coefficient (Koc): > 5000 Estimated.

MDI based urethane polymer P83-1015

No relevant data found.

Carbon black

No relevant data found.

Phthalic acid, di-C8-10-branched alkyl esters, C9-rich

Expected to be relatively immobile in soil (Koc > 5000).
Partition coefficient (Koc): > 5000 Estimated.

Calcined clay

No relevant data found.

4,4'-Methylenediphenyl diisocyanate

In the aquatic and terrestrial environment, movement is expected to be limited by its reaction with water forming predominantly insoluble polyureas.

13. DISPOSAL CONSIDERATIONS

Disposal methods: DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. AS YOUR SUPPLIER, WE HAVE NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information. FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Incinerator or other thermal destruction device.

Treatment and disposal methods of used packaging: Empty containers should be recycled or otherwise disposed of by an approved waste management facility. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. Do not re-use containers for any purpose.

14. TRANSPORT INFORMATION

DOT

Not regulated for transport

Classification for SEA transport (IMO-IMDG):

Not regulated for transport

Transport in bulk according to Annex I or II of MARPOL 73/78 and the IBC or IGC Code	Consult IMO regulations before transporting ocean bulk

Classification for AIR transport (IATA/ICAO):

Not regulated for transport

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. REGULATORY INFORMATION

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Pennsylvania (Worker and Community Right-To-KnowAct): Pennsylvania Hazardous Substances List and/or Pennsylvania Environmental Hazardous Substance List:
Pennsylvania (Worker and Community Right-To-KnowAct): Pennsylvania Hazardous Substances List and/or Pennsylvania Environmental Hazardous Substance List:
The following product components are cited in the Pennsylvania Hazardous Substance List and/or the Pennsylvania Environmental Substance List, and are present at levels which require reporting.

Components	CASRN
Diisononyl phthalate	28553-12-0
Carbon black	1333-86-4
Phthalic acid, di-C8-10-branched alkyl esters, C9-rich	68515-48-0

Pennsylvania (Worker and Community Right-To-KnowAct): Pennsylvania Special Hazardous Substances List:
Pennsylvania (Worker and Community Right-To-KnowAct): Pennsylvania Special Hazardous Substances List:
To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

California Prop. 65
WARNING: This product can expose you to chemicals including Diisononyl phthalate, Phthalic acid, di-C8-10-branched alkyl esters, C9-rich, Carbon black, which is/are known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

United States TSCA Inventory (TSCA)
All components of this product are in compliance with the inventory listing requirements of the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

16. OTHER INFORMATION

Hazard Rating System
NFPA

Health	Flammability	Instability
1	1	1

Revision
Identification Number: 284196 / A749 / Issue Date: 10/15/2018 / Version: 9.0

Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

Legend

ACGIH	USA. ACGIH Threshold Limit Values (TLV)
C	Ceiling
Dow IHG	Dow Industrial Hygiene Guideline
OSHA Z-1	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
STEL	Short term exposure limit
TWA	Time weighted average

Full text of other abbreviations

AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Information Source and References

This SDS is prepared by Product Regulatory Services and Hazard Communications Groups from information supplied by internal references within our company.

DDP Specialty Electronic Materials US, LLC urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown

above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.
US

SAFETY DATA SHEET

DDP Specialty Electronic Materials US, LLC

Product name: BETASEAL™ X2500 A Plus

Issue Date: 09/06/2023
Print Date: 04/11/2024

DDP Specialty Electronic Materials US, LLC encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. IDENTIFICATION

Product name: BETASEAL™ X2500 A Plus

Recommended use of the chemical and restrictions on use
Identified uses: An adhesive -- For use in automotive applications.

COMPANY IDENTIFICATION
DDP Specialty Electronic Materials US,
LLC
974 Centre Road, Building 730,
Wilmington DE 19805
UNITED STATES

Customer Information Number: 833-338-7668
SDSQuestion-NA@dupont.com

EMERGENCY TELEPHONE NUMBER
24-Hour Emergency Contact: 1-800-424-9300
Local Emergency Contact: 800-424-9300

2. HAZARDS IDENTIFICATION

Hazard classification
GHS classification in accordance with 29 CFR 1910.1200
Respiratory sensitisation - Category 1
Skin sensitisation - Category 1

Label elements
Hazard pictograms

Signal word: **DANGER!**

Hazards
May cause an allergic skin reaction.
May cause allergy or asthma symptoms or breathing difficulties if inhaled.

Precautionary statements

Prevention
Avoid breathing dust.
Contaminated work clothing must not be allowed out of the workplace.
Wear protective gloves.
In case of inadequate ventilation wear respiratory protection.

Response
IF ON SKIN: Wash with plenty of soap and water.
IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.
If skin irritation or rash occurs: Get medical advice/ attention.
If experiencing respiratory symptoms: Call a POISON CENTER/ doctor.
Wash contaminated clothing before reuse.

Disposal
Dispose of contents/ container to an approved waste disposal plant.

Other hazards
No data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

This product is a mixture.

Component	CASRN	Concentration
MDI based urethane polymer P83-1015	Not available	> 25.0 - < 35.0 %
Diisononyl phthalate	28553-12-0	> 15.0 - < 25.0 %
Clay, calcined china	92704-41-1	> 15.0 - < 25.0 %
Carbon black	1333-86-4	> 15.0 - < 25.0 %
1,2-Benzenedicarboxylic acid, di-C8-10-alkyl esters	71662-46-9	> 10.0 - < 20.0 %
MDI based Urethane Polymer P02-243	Not available	> 5.0 - < 15.0 %
Hexamethylene-1,6-diisocyanate homopolymer	28182-81-2	< 5.0 %
4,4' -Methylenediphenyl diisocyanate	101-68-8	< 5.0 %

4. FIRST AID MEASURES

Description of first aid measures
General advice:
First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

Inhalation: Move person to fresh air. If not breathing, give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask, etc). If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician or transport to a medical facility.

Skin contact: Remove material from skin immediately by washing with soap and plenty of water. Remove contaminated clothing and shoes while washing. Seek medical attention if irritation persists. Wash clothing before reuse. An MDI skin decontamination study demonstrated that cleaning very soon after exposure is important, and that a polyglycol-based skin cleanser or corn oil may be more effective than soap and water. Discard items which cannot be decontaminated, including leather articles such as shoes, belts and watchbands. Suitable emergency safety shower facility should be available in work area.

Eye contact: Flush eyes thoroughly with water for several minutes. Remove contact lenses after the initial 1-2 minutes and continue flushing for several additional minutes. If effects occur, consult a physician, preferably an ophthalmologist. Suitable emergency eye wash facility should be available in work area.

Ingestion: If swallowed, seek medical attention. Do not induce vomiting unless directed to do so by medical personnel.

Most important symptoms and effects, both acute and delayed:
Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), any additional important symptoms and effects are described in Section 11: Toxicology Information.

Indication of any immediate medical attention and special treatment needed
Notes to physician: Maintain adequate ventilation and oxygenation of the patient. May cause respiratory sensitization or asthma-like symptoms. Bronchodilators, expectorants and antitussives may be of help. Treat bronchospasm with inhaled beta2 agonist and oral or parenteral corticosteroids. Respiratory symptoms, including pulmonary edema, may be delayed. Persons receiving significant exposure should be observed 24-48 hours for signs of respiratory distress. If you are sensitized to diisocyanates, consult your physician regarding working with other respiratory irritants or sensitizers. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Excessive exposure may aggravate preexisting asthma and other respiratory disorders (e.g. emphysema, bronchitis, reactive airways dysfunction syndrome).

5. FIREFIGHTING MEASURES

Suitable extinguishing media: Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. Alcohol resistant foams (ATC type) are preferred. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective. Water fog, applied gently may be used as a blanket for fire extinguishment.

Unsuitable extinguishing media: Do not use direct water stream. May spread fire.

Special hazards arising from the substance or mixture
Hazardous combustion products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Nitrogen oxides. Carbon monoxide. Carbon dioxide. Combustion products may include trace amounts of: Hydrogen cyanide.

Unusual Fire and Explosion Hazards: Product reacts with water. Reaction may produce heat and/or gases. Any closed container may rupture when exposed to extreme heat in a fire situation. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids. Dense smoke is produced when product burns.

Advice for firefighters
Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. Fight fire from protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles. Immediately withdraw all personnel from the area in case of rising sound from venting safety device or discoloration of the container. Do not use direct water stream. May spread fire. Move container from fire area if this is possible without hazard. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage. Water fog, applied gently may be used as a blanket for fire extinguishment. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this (M)SDS.

Special protective equipment for firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). Avoid contact with this material during fire fighting operations. If contact is likely, change to full chemical resistant fire fighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Isolate area. Keep unnecessary and unprotected personnel from entering the area. Keep upwind of spill. Ventilate area of leak or spill. Refer to section 7, Handling, for additional precautionary measures. See Section 10 for more specific information. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Environmental precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

Methods and materials for containment and cleaning up: Contain spilled material if possible. Absorb with materials such as: Cat litter. Sand. Sawdust. Collect in suitable and properly labeled containers. See Section 13, Disposal Considerations, for additional information.

7. HANDLING AND STORAGE

Precautions for safe handling: Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated contact with skin. Avoid breathing vapor. Wash thoroughly after handling. Keep container

closed. Use with adequate ventilation. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

Conditions for safe storage: Protect from atmospheric moisture. Store in a dry place.

Storage stability

Storage temperature:

5 - 25 °C (41 - 77 °F)

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

If exposure limits exist, they are listed below. If no exposure limits are displayed, then no values are applicable.

Component	Regulation	Type of listing	Value
Hexamethylene-1,6-diisocyanate homopolymer	Dow IHG	TWA	0.1 mg/m3
	Further information: DSEN, RSEN: Skin and respiratory sensitizer		
	Dow IHG	STEL	0.3 mg/m3
	Further information: DSEN, RSEN: Skin and respiratory sensitizer		
4,4' -Methylenediphenyl diisocyanate	DUPONT AEL	AEL * Vapour	2.5 Parts per billion
	DUPONT AEL	AEL * Vapour	20 Parts per billion
	DUPONT AEL	AEL * particulate	0.025 mg/m3
	ACGIH	TWA	0.005 ppm
	Further information: resp sens: Respiratory sensitization		
	OSHA Z-1	C	0.2 mg/m3 0.02 ppm
	Further information: (b): The value in mg/m3 is approximate.; ©: Ceiling limit is to be determined from breathing-zone air samples.		
	OSHA P0	C	0.2 mg/m3 0.02 ppm

Although some of the components of this product may have exposure guidelines, no exposure would be expected under normal handling conditions due to the physical state of the material.

Exposure controls

Engineering measures: Use only with adequate ventilation. Local exhaust ventilation may be necessary for some operations. Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines. Exhaust systems should be designed to move the air away from the source of vapor/aerosol generation and people working at this point. The odor and irritancy of this material are inadequate to warn of excessive exposure.

Individual protection measures

Eye/face protection: Use safety glasses (with side shields).

Skin protection

Hand protection: Use gloves chemically resistant to this material. Examples of preferred glove barrier materials include: Butyl rubber. Chlorinated polyethylene. Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Examples of acceptable glove barrier materials include: Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). Polyvinyl chloride ("PVC" or "vinyl"). Viton. NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential

body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.
Other protection: Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task.
Respiratory protection: Atmospheric levels should be maintained below the exposure guideline. When atmospheric levels may exceed the exposure guideline, use an approved air-purifying respirator equipped with an organic vapor sorbent and a particle filter. For situations where the atmospheric levels may exceed the level for which an air-purifying respirator is effective, use a positive-pressure air-supplying respirator (air line or self-contained breathing apparatus). For emergency response or for situations where the atmospheric level is unknown, use an approved positive-pressure self-contained breathing apparatus or positive-pressure air line with auxiliary self-contained air supply. The following should be effective types of air-purifying respirators: Organic vapor cartridge with a particulate pre-filter.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	
Physical state	Paste
Color	Black
Odor	Characteristic
Odor Threshold	No test data available
pH	Substance/mixture is non-soluble (in water).
Melting point/range	No test data available
Freezing point	No test data available
Boiling point (760 mmHg)	No test data available
Flash point	**closed cup** >230 °F (230 °F) *ASTM D3278*
Evaporation Rate (Butyl Acetate = 1)	No test data available
Flammability (solid, gas)	The product is not flammable.
Lower explosion limit	No test data available
Upper explosion limit	No test data available
Vapor Pressure	No test data available
Relative Vapor Density (air = 1)	No test data available
Relative Density (water = 1)	1.280 *Calculated.*
Water solubility	Not applicable
Partition coefficient: n-octanol/water	No data available
Auto-ignition temperature	No test data available
Decomposition temperature	No test data available
Dynamic Viscosity	No test data available
Kinematic Viscosity	No test data available
Explosive properties	No test data available

Oxidizing properties	No test data available
Molecular weight	No data available
Volatile Organic Compounds	0.05 lb/gln *EPA Method No. 24* (typical value)

NOTE: The physical data presented above are typical values and should not be construed as a specification.

10. STABILITY AND REACTIVITY

Reactivity: No dangerous reaction known under conditions of normal use.

Chemical stability: Stable under recommended storage conditions. See Storage, Section 7.

Possibility of hazardous reactions: Polymerization will not occur.

Conditions to avoid: Some components of this product can decompose at elevated temperatures. Avoid moisture.

Incompatible materials: Reaction with water will generate heat. Avoid contact with: Acids. Alcohols. Amines. Water. Ammonia. Bases. Metal compounds. Moist air. Strong oxidizers. Reaction with water will generate carbon dioxide.

Hazardous decomposition products: Decomposition products depend upon temperature, air supply and the presence of other materials. Gases are released during decomposition.

11. TOXICOLOGICAL INFORMATION

Toxicological information appears in this section when such data is available.

Acute toxicity

Acute oral toxicity
Low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury. May cause abdominal discomfort or diarrhea. May cause nausea and vomiting. Single dose oral LD50 has not been determined.

Acute dermal toxicity
Prolonged skin contact is unlikely to result in absorption of harmful amounts.
The dermal LD50 has not been determined.

Acute inhalation toxicity
Product test data not available. Refer to component data.

Skin corrosion/irritation
Prolonged contact may cause moderate skin irritation with local redness.
Material may stick to skin causing irritation upon removal.

Serious eye damage/eye irritation

May cause eye irritation.

Sensitization
A component in this mixture has been shown to be a skin sensitizer.
Animal studies have shown that skin contact with isocyanates may play a role in respiratory sensitization.

A component in this mixture may cause an allergic respiratory response.
MDI concentrations below the exposure guidelines may cause allergic respiratory reactions in individuals already sensitized.
Asthma-like symptoms may include coughing, difficult breathing and a feeling of tightness in the chest. Occasionally, breathing difficulties may be life threatening.

Specific Target Organ Systemic Toxicity (Single Exposure)
Evaluation of available data suggests that this material is not an STOT-SE toxicant.

Specific Target Organ Systemic Toxicity (Repeated Exposure)
Contains component(s) which have been reported to cause effects on the following organs in animals:
Kidney.
Liver.
Tissue injury in the upper respiratory tract and lungs has been observed in laboratory animals after repeated excessive exposures to MDI/polymeric MDI aerosols.

Carcinogenicity
Lung tumors have been observed in laboratory animals exposed to respirable aerosol droplets of MDI/Polymeric MDI (6 mg/m3) for their lifetime. Tumors occurred concurrently with respiratory irritation and lung injury. Current exposure guidelines are expected to protect against these effects reported for MDI. For the phthalate ester(s): Kidney effects and/or tumors have been observed in male rats. These effects are believed to be species specific and unlikely to occur in humans. Liver effects and/or tumors have been observed in rats. These effects are believed to be species specific and unlikely to occur in humans.

Teratogenicity
Contains component(s) which did not cause birth defects in animals; other fetal effects occurred only at doses toxic to the mother. In laboratory animals, MDI/polymeric MDI did not cause birth defects; other fetal effects occurred only at high doses which were toxic to the mother.

Reproductive toxicity
For the phthalate ester(s): In laboratory animals, excessive doses toxic to the parent animals caused decreased weight and survival of offspring. There were no effects on fertility at any dose.

Mutagenicity
Contains a component(s) which were negative in in vitro genetic toxicity studies. Genetic toxicity data on MDI are inconclusive. MDI was weakly positive in some in vitro studies; other in vitro studies were negative. Animal mutagenicity studies were predominantly negative.

Aspiration Hazard
Based on physical properties, not likely to be an aspiration hazard.

COMPONENTS INFLUENCING TOXICOLOGY:

MDI based urethane polymer P83-1015
Acute oral toxicity

For similar material(s): LD50, Rat, > 2,000 mg/kg Estimated. No deaths occurred at this concentration.

Acute dermal toxicity
Prolonged skin contact is unlikely to result in absorption of harmful amounts.

The dermal LD50 has not been determined.

Acute inhalation toxicity
At room temperature, exposure to vapor is minimal due to low volatility; vapor from heated material or mist may cause respiratory irritation and other effects.

The LC50 has not been determined.

Diisononyl phthalate

Acute oral toxicity
LD50, Rat, > 10,000 mg/kg

Acute dermal toxicity
LD50, Rabbit, > 3,160 mg/kg No deaths occurred at this concentration.

Acute inhalation toxicity
LC50, Rat, male and female, 4 Hour, dust/mist, > 4.4 mg/l No deaths occurred following exposure to a saturated atmosphere.

Clay, calcined china

Acute oral toxicity
For similar material(s): LD50, Rat, male and female, > 5,000 mg/kg Other No deaths occurred at this concentration.

Acute dermal toxicity
For similar material(s): LD50, Rat, male and female, > 5,000 mg/kg Other guidelines No deaths occurred at this concentration.

Acute inhalation toxicity
LC50, Rat, male and female, 4 Hour, dust/mist, > 2.07 mg/l No deaths occurred at this concentration.

Carbon black

Acute oral toxicity
LD50, Rat, > 8,000 mg/kg

Acute dermal toxicity
LD50, Rabbit, > 3,000 mg/kg No deaths occurred at this concentration.

Acute inhalation toxicity
LC50, Rat, 1 Hour, dust/mist, 27 mg/l No deaths occurred at this concentration.

1,2-Benzenedicarboxylic acid, di-C8-10-alkyl esters

Acute oral toxicity
LD50, Rat, > 2,000 mg/kg

Acute dermal toxicity
The dermal LD50 has not been determined.

Acute inhalation toxicity
The LC50 has not been determined.

MDI based Urethane Polymer P02-243

Acute oral toxicity
Single dose oral LD50 has not been determined.

Acute dermal toxicity
The dermal LD50 has not been determined.

Acute inhalation toxicity
The LC50 has not been determined.

Hexamethylene-1,6-diisocyanate homopolymer

Acute oral toxicity
LD50, Rat, female, > 2,500 mg/kg No deaths occurred at this concentration.

Acute dermal toxicity
LD50, Rabbit, male and female, > 2,000 mg/kg No deaths occurred at this concentration.

Acute inhalation toxicity
LC50, Rat, male, 4 Hour, dust/mist, 0.543 mg/l

LC50, Rat, female, 4 Hour, dust/mist, 0.39 mg/l

4,4' -Methylenediphenyl diisocyanate

Acute oral toxicity
LD50, Rat, > 2,000 mg/kg No deaths occurred at this concentration.

Acute dermal toxicity
LD50, Rabbit, > 9,400 mg/kg

Acute inhalation toxicity
LC50, Rat, 1 Hour, dust/mist, 2.24 mg/l

12. ECOLOGICAL INFORMATION

Ecotoxicological information appears in this section when such data is available.

Toxicity

MDI based urethane polymer P83-1015

Acute toxicity to fish
Not expected to be acutely toxic to aquatic organisms.

Diisononyl phthalate

Acute toxicity to fish
Not expected to be acutely toxic to aquatic organisms.
LC50, Danio rerio (zebra fish), 96 Hour, > 102 mg/l, Directive 67/548/EEC, Annex V, C.1.

Acute toxicity to aquatic invertebrates

No toxicity at the limit of solubility
EC50, Daphnia magna (Water flea), 48 Hour, > 74 mg/l, Directive 67/548/EEC, Annex V, C.2.

Acute toxicity to algae/aquatic plants
No toxicity at the limit of solubility
EC50, Desmodesmus subspicatus (green algae), 72 Hour, > 88 mg/l, Directive 67/548/EEC, Annex V, C.3.
NOEC, Desmodesmus subspicatus (green algae), 72 Hour, 88 mg/l, Directive 67/548/EEC, Annex V, C.3.

Toxicity to bacteria
Based on data from similar materials
EC50, 30 min, > 83.9 mg/l, OECD Test Guideline 209

Chronic toxicity to fish
Based on data from similar materials
NOEC, Oryzias latipes (Orange-red killifish), 284 d, 18.5 - 24.5 mg/l

Chronic toxicity to aquatic invertebrates
NOEC, Daphnia magna (Water flea), 21 d, > 101 mg/l

Clay, calcined china

Acute toxicity to fish
Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).

Acute toxicity to aquatic invertebrates
Based on data from similar materials
EC50, Daphnia magna (Water flea), 48 Hour, > 100 mg/l, OECD Test Guideline 202

Acute toxicity to algae/aquatic plants
Based on data from similar materials
EC50, Desmodesmus subspicatus (green algae), 72 Hour, 2,500 mg/l, OECD Test Guideline 201

Toxicity to bacteria
Based on data from similar materials
EC50, Pseudomonas putida, 16 Hour, 2,800 mg/l

Chronic toxicity to fish
NOEC, Oncorhynchus mykiss (rainbow trout), 30 d, 100 mg/l

Chronic toxicity to aquatic invertebrates
Based on data from similar materials
NOEC, Daphnia magna (Water flea), 21 d, 1,000 mg/l

Carbon black

Acute toxicity to fish
Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).
LC50, Leuciscus idus (Golden orfe), static test, 96 Hour, > 1,000 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates

EC50, Daphnia magna (Water flea), 24 Hour, > 5,600 mg/l, OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants
NOEC, Desmodesmus subspicatus (green algae), 72 Hour, 10,000 mg/l, OECD Test Guideline 201

1,2-Benzenedicarboxylic acid, di-C8-10-alkyl esters

Acute toxicity to fish
Not expected to be acutely toxic to aquatic organisms.
No toxicity at the limit of solubility
LC50, Danio rerio (zebra fish), 96 Hour, > 0.32 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates
No toxicity at the limit of solubility
EC50, Daphnia magna (Water flea), 48 Hour, > 5.8 mg/l, OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants
No toxicity at the limit of solubility
EC50, alga Scenedesmus sp., 72 Hour, Biomass, > 1.11 mg/l, OECD Test Guideline 201 or Equivalent

Chronic toxicity to fish
For similar material(s):
No toxicity at the limit of solubility
NOEC, Oncorhynchus mykiss (rainbow trout), flow-through, 155 d, Growth rate inhibition, > 0.3 mg/l

Chronic toxicity to aquatic invertebrates
For similar material(s):
No toxicity at the limit of solubility
NOEC, Daphnia magna (Water flea), flow-through test, 21 d, number of offspring, 0.1 mg/l

MDI based Urethane Polymer P02-243

Acute toxicity to fish
No relevant data found.

Hexamethylene-1,6-diisocyanate homopolymer

Acute toxicity to fish
Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).
NOEC mortality, Danio rerio (zebra fish), static test, 96 Hour, > 100 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates
NOEC, Daphnia magna (Water flea), static test, 48 Hour, > 100 mg/l, OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants
EC50, alga Scenedesmus sp., static test, 72 Hour, Biomass, > 1,000 mg/l

Toxicity to bacteria
EC50, activated sludge, Respiration inhibition, 3 Hour, > 1,000 mg/l, OECD 209 Test

4,4' -Methylenediphenyl diisocyanate

Acute toxicity to fish

The measured ecotoxicity is that of the hydrolyzed product, generally under conditions maximizing production of soluble species.
Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).
Based on information for a similar material:
LC50, Danio rerio (zebra fish), static test, 96 Hour, > 1,000 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates

Based on information for a similar material:
EC50, Daphnia magna (Water flea), static test, 24 Hour, > 1,000 mg/l, OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants

Based on information for a similar material:
NOEC, Desmodesmus subspicatus (green algae), static test, 72 Hour, Growth rate inhibition, 1,640 mg/l, OECD Test Guideline 201 or Equivalent

Toxicity to bacteria

Based on information for a similar material:
EC50, activated sludge, static test, 3 Hour, Respiration rates., > 100 mg/l

Toxicity to soil-dwelling organisms

EC50, Eisenia fetida (earthworms), Based on information for a similar material:, 14 d, > 1,000 mg/kg

Toxicity to terrestrial plants

EC50, Avena sativa (oats), Growth inhibition, 1,000 mg/l
EC50, Lactuca sativa (lettuce), Growth inhibition, 1,000 mg/l

Persistence and degradability

MDI based urethane polymer P83-1015

Biodegradability: Surface photodegradation is expected with exposure to sunlight. No appreciable biodegradation is expected.

Diisononyl phthalate

Biodegradability: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Material is ultimately biodegradable (reaches > 70% mineralization in OECD test(s) for inherent biodegradability).
10-day Window: Not applicable
Biodegradation: 74 %
Exposure time: 28 d
Method: OECD Test Guideline 301C or Equivalent
10-day Window: Not applicable
Biodegradation: > 99 %
Exposure time: 28 d
Method: OECD Test Guideline 302A or Equivalent
10-day Window: Not applicable
Biodegradation: 70.5 %
Exposure time: 28 d

Method: OECD Test Guideline 301F or Equivalent

Theoretical Oxygen Demand: 2.64 mg/mg

Stability in Water (1/2-life)
Hydrolysis, half-life, 3.4 year, pH 7, Half-life Temperature 25 °C, Estimated.
Hydrolysis, half-life, 0.34 year, pH 8, Half-life Temperature 25 °C, Estimated.

Photodegradation
Test Type: Half-life (indirect photolysis)
Sensitization: OH radicals
Atmospheric half-life: 5.487 Hour
Method: Estimated.

Clay, calcined china

Biodegradability: Biodegradation is not applicable.

Carbon black

Biodegradability: Biodegradation is not applicable.

1,2-Benzenedicarboxylic acid, di-C8-10-alkyl esters

Biodegradability: Material is expected to be readily biodegradable.
10-day Window: Not applicable
Biodegradation: 76 %
Exposure time: 28 d
Method: OECD Test Guideline 303A or Equivalent

Photodegradation
Test Type: Half-life (indirect photolysis)
Sensitization: OH radicals
Atmospheric half-life: 0.7 d
Method: Estimated.

MDI based Urethane Polymer P02-243

Biodegradability: No relevant data found.

Hexamethylene-1,6-diisocyanate homopolymer

Biodegradability: For this family of materials: In the aquatic and terrestrial environment, material reacts with water forming predominantly insoluble polyureas which appear to be stable. In the atmospheric environment, material is expected to have a short tropospheric half-life, based on calculations and by analogy with related diisocyanates.
10-day Window: Fail
Biodegradation: 1 %
Exposure time: 28 d
10-day Window: Fail
Biodegradation: 18 %
Exposure time: 28 d
Method: OECD Test Guideline 302C or Equivalent

4,4' -Methylenediphenyl diisocyanate

Biodegradability: In the aquatic and terrestrial environment, material reacts with water forming predominantly insoluble polyureas which appear to be stable. In the atmospheric environment, material is expected to have a short tropospheric half-life, based on calculations and by analogy with related diisocyanates.
10-day Window: Not applicable
Biodegradation: 0 %
Exposure time: 28 d
Method: OECD Test Guideline 302C or Equivalent

Bioaccumulative potential

MDI based urethane polymer P83-1015

Bioaccumulation: No bioconcentration is expected because of the relatively high molecular weight (MW greater than 1000).

Diisononyl phthalate

Bioaccumulation: Based on data from similar materials Bioconcentration potential is low (BCF less than 100 or log Pow greater than 7).
Partition coefficient: n-octanol/water(log Pow): 8.8 - 9.7 OECD Test Guideline 117 or Equivalent
Bioconcentration factor (BCF): < 3 Oncorhynchus mykiss (rainbow trout)

Clay, calcined china

Bioaccumulation: Partitioning from water to n-octanol is not applicable.

Carbon black

Bioaccumulation: No relevant data found.

1,2-Benzenedicarboxylic acid, di-C8-10-alkyl esters

Bioaccumulation: Bioconcentration potential is low (BCF less than 100 or log Pow greater than 7).
Partition coefficient: n-octanol/water(log Pow): 9.98 Measured

MDI based Urethane Polymer P02-243

Bioaccumulation: No relevant data found.

Hexamethylene-1,6-diisocyanate homopolymer

Bioaccumulation: In the aquatic and terrestrial environment, movement is expected to be limited by its reaction with water forming predominantly insoluble polyureas.

4,4' -Methylenediphenyl diisocyanate

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3). Reacts with water. In the aquatic and terrestrial environment, movement is expected to be limited by its reaction with water forming predominantly insoluble polyureas.
Bioconcentration factor (BCF): 92 Cyprinus carpio (Carp) 28 d

Mobility in soil

MDI based urethane polymer P83-1015

No relevant data found.

Diisononyl phthalate

Expected to be relatively immobile in soil (Koc > 5000).
Partition coefficient (Koc): > 5000 Estimated.

Clay, calcined china

No relevant data found.

Carbon black

No relevant data found.

1,2-Benzenedicarboxylic acid, di-C8-10-alkyl esters

No data available.

MDI based Urethane Polymer P02-243

No relevant data found.

Hexamethylene-1,6-diisocyanate homopolymer

In the aquatic and terrestrial environment, movement is expected to be limited by its reaction with water forming predominantly insoluble polyureas.

4,4' -Methylenediphenyl diisocyanate

In the aquatic and terrestrial environment, movement is expected to be limited by its reaction with water forming predominantly insoluble polyureas.

13. DISPOSAL CONSIDERATIONS

Disposal methods: DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. AS YOUR SUPPLIER, WE HAVE NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information. FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Incinerator or other thermal destruction device.

Treatment and disposal methods of used packaging: Empty containers should be recycled or otherwise disposed of by an approved waste management facility. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. Do not re-use containers for any purpose.

14. TRANSPORT INFORMATION

DOT

Not regulated for transport

Classification for SEA transport (IMO-IMDG):

Not regulated for transport

Transport in bulk according to Annex I or II of MARPOL 73/78 and the IBC or IGC Code	Consult IMO regulations before transporting ocean bulk

Classification for AIR transport (IATA/ICAO):
Not regulated for transport

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. REGULATORY INFORMATION

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312
Respiratory or skin sensitisation

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) Section 103
Calculated RQ exceeds reasonably attainable upper limit.

Components	**CASRN**	**RQ (RCRA Code)**
4,4' -Methylenediphenyl diisocyanate	101-68-8	5000 lbs RQ

Pennsylvania Right To Know
The following chemicals are listed because of the additional requirements of Pennsylvania law:

Components	**CASRN**
Carbon black	1333-86-4

California Prop. 65
WARNING: This product can expose you to chemicals including Diisononyl phthalate, which is/are known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

United States TSCA Inventory (TSCA)
All components of this product are in compliance with the Active inventory listing requirements of the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

16. OTHER INFORMATION

Hazard Rating System
NFPA

Health	Flammability	Instability
2	1	1

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Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

Legend

ACGIH	USA. ACGIH Threshold Limit Values (TLV)
AEL *	8 & 12 hr. TWA
C	Ceiling limit
Dow IHG	Dow Industrial Hygiene Guideline
DUPONT AEL	DuPont AEL (Acceptable Exposure Limit)
OSHA P0	USA. Table Z-1-A Limits for Air Contaminants (1989 vacated values)
OSHA Z-1	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
STEL	Short term exposure limit
TWA	8-hour, time-weighted average

Full text of other abbreviations
AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA -

Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Information Source and References
This SDS is prepared by Product Regulatory Services and Hazard Communications Groups from information supplied by internal references within our company.

DDP Specialty Electronic Materials US, LLC urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.
US

SAFETY DATA SHEET

DDP Specialty Electronic Materials US, LLC

Product name: BETASEAL™ X2500 B Plus **Issue Date:** 10/17/2018
Print Date: 04/11/2024

DDP Specialty Electronic Materials US, LLC encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. IDENTIFICATION

Product name: BETASEAL™ X2500 B Plus

Recommended use of the chemical and restrictions on use
Identified uses: An adhesive -- For use in automotive applications.

COMPANY IDENTIFICATION
DDP Specialty Electronic Materials US,
LLC
974 Centre Road, Building 730,
Wilmington DE 19805
UNITED STATES

Customer Information Number: 833-338-7668
SDSQuestion-NA@dupont.com

EMERGENCY TELEPHONE NUMBER
24-Hour Emergency Contact: 1-800-424-9300
Local Emergency Contact: 800-424-9300

2. HAZARDS IDENTIFICATION

Hazard classification
GHS classification in accordance with 29 CFR 1910.1200
Not a hazardous substance or mixture.

Other hazards
No data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

This product is a mixture.

Component	CASRN	Concentration

Glycerol, propylene oxide, ethylene oxide polymer	9082-00-2	> 35.0 - < 45.0 %
Glycerol, propylene oxide, ethylene oxide, styrene, acrylonitrile polymer	57913-80-1	> 25.0 - < 35.0 %
2-Propenenitrile, polymer with ethenylbenzene	9003-54-7	> 20.0 - < 30.0 %
Ceramic materials and wares, chemicals	66402-68-4	> 10.0 - < 20.0 %
Carbon black	1333-86-4	> 5.0 - < 15.0 %
1,2-Benzenedicarboxylic acid, di-C8-10-alkyl esters	71662-46-9	< 10.0 %
Diisononyl phthalate	28553-12-0	< 10.0 %

4. FIRST AID MEASURES

Description of first aid measures
General advice:
If potential for exposure exists refer to Section 8 for specific personal protective equipment.

Inhalation: Move person to fresh air; if effects occur, consult a physician.

Skin contact: Wash off with plenty of water.

Eye contact: Flush eyes thoroughly with water for several minutes. Remove contact lenses after the initial 1-2 minutes and continue flushing for several additional minutes. If effects occur, consult a physician, preferably an ophthalmologist. Suitable emergency eye wash facility should be available in work area.

Ingestion: If swallowed, seek medical attention. Do not induce vomiting unless directed to do so by medical personnel.

Most important symptoms and effects, both acute and delayed:
Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), any additional important symptoms and effects are described in Section 11: Toxicology Information.

Indication of any immediate medical attention and special treatment needed
Notes to physician: No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

5. FIREFIGHTING MEASURES

Suitable extinguishing media: Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. General purpose synthetic foams (including AFFF type) or protein

foams are preferred if available. Alcohol resistant foams (ATC type) may function. Water fog, applied gently may be used as a blanket for fire extinguishment.

Unsuitable extinguishing media: Do not use direct water stream. May spread fire.

Special hazards arising from the substance or mixture
Hazardous combustion products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Nitrogen oxides. Carbon monoxide. Carbon dioxide. Combustion products may include trace amounts of: Styrene. Hydrogen cyanide. Acrylonitrile.

Unusual Fire and Explosion Hazards: Violent steam generation or eruption may occur upon application of direct water stream to hot liquids.

Advice for firefighters
Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Do not use direct water stream. May spread fire. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage. Water fog, applied gently may be used as a blanket for fire extinguishment.

Special protective equipment for firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Isolate area. Keep unnecessary and unprotected personnel from entering the area. Refer to section 7, Handling, for additional precautionary measures. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Environmental precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

Methods and materials for containment and cleaning up: Contain spilled material if possible. Absorb with materials such as: Cat litter. Sand. Sawdust. Collect in suitable and properly labeled containers. See Section 13, Disposal Considerations, for additional information.

7. HANDLING AND STORAGE

Precautions for safe handling: Avoid contact with eyes, skin, and clothing. Wash thoroughly after handling. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

Conditions for safe storage: Avoid moisture.

Storage stability
Storage temperature:
> 5 - < 25 °C (> 41 - < 77 °F)

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters
If exposure limits exist, they are listed below. If no exposure limits are displayed, then no values are applicable.

Although some of the components of this product may have exposure guidelines, no exposure would be expected under normal handling conditions due to the physical state of the material.

Exposure controls
Engineering controls: Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations. Local exhaust ventilation may be necessary for some operations.

Individual protection measures

Eye/face protection: Use safety glasses (with side shields).

Skin protection

Hand protection: Use gloves chemically resistant to this material. Examples of preferred glove barrier materials include: Butyl rubber. Natural rubber ("latex"). Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Polyvinyl alcohol ("PVA"). Polyvinyl chloride ("PVC" or "vinyl"). NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Other protection: Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task.

Respiratory protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. For most conditions, no respiratory protection should be needed; however, if handling at elevated temperatures without sufficient ventilation, use an approved air-purifying respirator.
The following should be effective types of air-purifying respirators: Organic vapor cartridge.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	
Physical state	Paste
Color	Black
Odor	Characteristic
Odor Threshold	No test data available
pH	No test data available

Melting point/range	No test data available
Freezing point	No test data available
Boiling point (760 mmHg)	No test data available
Flash point	**closed cup** >230 °F (230 °F) *ASTM D3278*
Evaporation Rate (Butyl Acetate = 1)	No test data available
Flammability (solid, gas)	The product is not flammable.
Lower explosion limit	No test data available
Upper explosion limit	No test data available
Vapor Pressure	No test data available
Relative Vapor Density (air = 1)	No test data available
Relative Density (water = 1)	1.21 *Calculated.*
Water solubility	not soluble
Partition coefficient: n-octanol/water	No data available
Auto-ignition temperature	No test data available
Decomposition temperature	No test data available
Dynamic Viscosity	No test data available
Kinematic Viscosity	No test data available
Explosive properties	No test data available
Oxidizing properties	No test data available
Molecular weight	No data available
Volatile Organic Compounds	0.01 lb/gln *EPA Method No. 24* (typical value)

NOTE: The physical data presented above are typical values and should not be construed as a specification.

10. STABILITY AND REACTIVITY

Reactivity: No data available

Chemical stability: Stable under recommended storage conditions. See Storage, Section 7.

Possibility of hazardous reactions: Polymerization will not occur.

Conditions to avoid: Exposure to elevated temperatures can cause product to decompose. Avoid direct sunlight.

Incompatible materials: Avoid contact with oxidizing materials. Avoid contact with: None known.

Hazardous decomposition products: Decomposition products depend upon temperature, air supply and the presence of other materials. Processing may release fumes and other decomposition products. At temperatures exceeding melt temperatures, polymer fragments can be released. Fumes can be irritating. Decomposition products can include and are not limited to: Aromatic compounds. Acrylonitrile. Combustible gases.

11. TOXICOLOGICAL INFORMATION

Toxicological information appears in this section when such data is available.

Acute toxicity

Acute oral toxicity
Low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury. May cause nausea and vomiting. May cause abdominal discomfort or diarrhea. Single dose oral LD50 has not been determined.

Acute dermal toxicity
Prolonged skin contact is unlikely to result in absorption of harmful amounts.
The dermal LD50 has not been determined.

Acute inhalation toxicity
At room temperature, exposure to vapor is minimal due to low volatility; vapor from heated material may cause respiratory irritation. This material contains mineral and/or inorganic fillers. There is essentially no potential for inhalation exposure to these fillers incidental to industrial handling due to the physical state.
As product: The LC50 has not been determined.

Skin corrosion/irritation
Prolonged contact may cause skin irritation with local redness.
Material may stick to skin causing irritation upon removal.

Serious eye damage/eye irritation
May cause eye irritation.

Sensitization
For skin sensitization:
For the component(s) tested:
Did not cause allergic skin reactions when tested in guinea pigs.

For respiratory sensitization:
No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)
Evaluation of available data suggests that this material is not an STOT-SE toxicant.

Specific Target Organ Systemic Toxicity (Repeated Exposure)
Contains component(s) which have been reported to cause effects on the following organs in animals:
Kidney.
Liver.

Carcinogenicity

For the phthalate ester(s): Kidney effects and/or tumors have been observed in male rats. These effects are believed to be species specific and unlikely to occur in humans. Liver effects and/or tumors have been observed in rats. These effects are believed to be species specific and unlikely to occur in humans.

Teratogenicity
Contains component(s) which did not cause birth defects in animals; other fetal effects occurred only at doses toxic to the mother.

Reproductive toxicity
For the phthalate ester(s): In laboratory animals, excessive doses toxic to the parent animals caused decreased weight and survival of offspring. There were no effects on fertility at any dose.

Mutagenicity
Contains a component(s) which were negative in in vitro genetic toxicity studies. Contains component(s) which were negative in animal genetic toxicity studies.

Aspiration Hazard
Based on physical properties, not likely to be an aspiration hazard.

COMPONENTS INFLUENCING TOXICOLOGY:

Glycerol, propylene oxide, ethylene oxide polymer

Acute oral toxicity
Typical for this family of materials. LD50, Rat, > 2,000 mg/kg Estimated. No deaths occurred at this concentration.

Acute dermal toxicity
Typical for this family of materials. LD50, Rabbit, > 2,000 mg/kg Estimated.

Acute inhalation toxicity
The LC50 has not been determined.

Glycerol, propylene oxide, ethylene oxide, styrene, acrylonitrile polymer

Acute oral toxicity
LD50, Rat, > 2,000 mg/kg No deaths occurred at this concentration.

Acute dermal toxicity
LD50, Rabbit, > 2,000 mg/kg No deaths occurred at this concentration.

Acute inhalation toxicity
The LC50 has not been determined.

2-Propenenitrile, polymer with ethenylbenzene

Acute oral toxicity
LD50, Rat, > 5,000 mg/kg Estimated.

Acute dermal toxicity
For similar material(s): LD50, Rabbit, > 2,000 mg/kg Estimated.

Acute inhalation toxicity
The LC50 has not been determined.

Ceramic materials and wares, chemicals

Acute oral toxicity
LD50, Rat, female, > 2,000 mg/kg OECD Test Guideline 425 No deaths occurred at this concentration.

Acute dermal toxicity
For similar material(s): LD50, Rat, male and female, > 2,500 mg/kg OECD Test Guideline 402 No deaths occurred at this concentration.

Acute inhalation toxicity
The LC50 has not been determined.

Carbon black

Acute oral toxicity
LD50, Rat, > 8,000 mg/kg

Acute dermal toxicity
LD50, Rabbit, > 3,000 mg/kg No deaths occurred at this concentration.

Acute inhalation toxicity
LC50, Rat, 1 Hour, dust/mist, 27 mg/l No deaths occurred at this concentration.

1,2-Benzenedicarboxylic acid, di-C8-10-alkyl esters

Acute oral toxicity
LD50, Rat, > 2,000 mg/kg

Acute dermal toxicity
The dermal LD50 has not been determined.

Acute inhalation toxicity
The LC50 has not been determined.

Diisononyl phthalate

Acute oral toxicity
LD50, Rat, > 10,000 mg/kg

Acute dermal toxicity
LD50, Rabbit, > 3,160 mg/kg No deaths occurred at this concentration.

Acute inhalation toxicity
LC50, Rat, male and female, 4 Hour, dust/mist, > 4.4 mg/l No deaths occurred following exposure to a saturated atmosphere.

12. ECOLOGICAL INFORMATION

Ecotoxicological information appears in this section when such data is available.

Toxicity

Glycerol, propylene oxide, ethylene oxide polymer

Acute toxicity to fish
For this family of materials:

Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).

Acute toxicity to aquatic invertebrates
For this family of materials:
LC50, Daphnia magna (Water flea), static test, 48 Hour, 384 mg/l

Acute toxicity to algae/aquatic plants
For this family of materials:
ErC50, alga Scenedesmus sp., static test, 72 Hour, Growth rate, > 100 mg/l

Glycerol, propylene oxide, ethylene oxide, styrene, acrylonitrile polymer

Acute toxicity to fish
For similar material(s):
Material is practically non-toxic to aquatic invertebrates on an acute basis (LC50/EC50 > 100 mg/L).

2-Propenenitrile, polymer with ethenylbenzene

Acute toxicity to fish
No relevant data found.

Ceramic materials and wares, chemicals

Acute toxicity to fish
No relevant data found.

Carbon black

Acute toxicity to fish
Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).
LC50, Leuciscus idus (Golden orfe), static test, 96 Hour, > 1,000 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates
EC50, Daphnia magna (Water flea), 24 Hour, > 5,600 mg/l, OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants
NOEC, Desmodesmus subspicatus (green algae), 72 Hour, 10,000 mg/l, OECD Test Guideline 201

1,2-Benzenedicarboxylic acid, di-C8-10-alkyl esters

Acute toxicity to fish
Not expected to be acutely toxic to aquatic organisms.

Chronic toxicity to fish
For similar material(s):
No toxicity at the limit of solubility
NOEC, Oncorhynchus mykiss (rainbow trout), flow-through, 155 d, Growth rate inhibition, > 0.3 mg/l

Chronic toxicity to aquatic invertebrates
For similar material(s):
No toxicity at the limit of solubility
NOEC, Daphnia magna (Water flea), flow-through test, 21 d, number of offspring, 0.1 mg/l

Diisononyl phthalate

Acute toxicity to fish
Not expected to be acutely toxic to aquatic organisms.
LC50, Danio rerio (zebra fish), 96 Hour, > 102 mg/l, Directive 67/548/EEC, Annex V, C.1.

Acute toxicity to aquatic invertebrates
No toxicity at the limit of solubility
EC50, Daphnia magna (Water flea), 48 Hour, > 74 mg/l, Directive 67/548/EEC, Annex V, C.2.

Acute toxicity to algae/aquatic plants
No toxicity at the limit of solubility
EC50, Desmodesmus subspicatus (green algae), 72 Hour, > 88 mg/l, Directive 67/548/EEC, Annex V, C.3.
NOEC, Desmodesmus subspicatus (green algae), 72 Hour, 88 mg/l, Directive 67/548/EEC, Annex V, C.3.

Toxicity to bacteria
Based on data from similar materials
EC50, 30 min, > 83.9 mg/l, OECD Test Guideline 209

Chronic toxicity to fish
Based on data from similar materials
NOEC, Oryzias latipes (Orange-red killifish), 284 d, 18.5 - 24.5 mg/l

Chronic toxicity to aquatic invertebrates
NOEC, Daphnia magna (Water flea), 21 d, > 101 mg/l

Persistence and degradability

Glycerol, propylene oxide, ethylene oxide polymer
Biodegradability: For this family of materials: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.

Glycerol, propylene oxide, ethylene oxide, styrene, acrylonitrile polymer
Biodegradability: The polymeric component is not expected to biodegrade.

2-Propenenitrile, polymer with ethenylbenzene
Biodegradability: No appreciable biodegradation is expected.

Ceramic materials and wares, chemicals
Biodegradability: Biodegradation is not applicable.

Carbon black
Biodegradability: Biodegradation is not applicable.

1,2-Benzenedicarboxylic acid, di-C8-10-alkyl esters
Biodegradability: Material is expected to be readily biodegradable.
10-day Window: Not applicable
Biodegradation: 76 %
Exposure time: 28 d
Method: OECD Test Guideline 303A or Equivalent

Photodegradation

Test Type: Half-life (indirect photolysis)
Sensitization: OH radicals
Atmospheric half-life: 0.7 d
Method: Estimated.

Diisononyl phthalate

Biodegradability: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Material is ultimately biodegradable (reaches > 70% mineralization in OECD test(s) for inherent biodegradability).
10-day Window: Not applicable
Biodegradation: 74 %
Exposure time: 28 d
Method: OECD Test Guideline 301C or Equivalent
10-day Window: Not applicable
Biodegradation: > 99 %
Exposure time: 28 d
Method: OECD Test Guideline 302A or Equivalent
10-day Window: Not applicable
Biodegradation: 70.5 %
Exposure time: 28 d
Method: OECD Test Guideline 301F or Equivalent

Theoretical Oxygen Demand: 2.64 mg/mg

Stability in Water (1/2-life)
Hydrolysis, half-life, 3.4 year, pH 7, Half-life Temperature 25 °C, Estimated.
Hydrolysis, half-life, 0.34 year, pH 8, Half-life Temperature 25 °C, Estimated.

Photodegradation
Test Type: Half-life (indirect photolysis)
Sensitization: OH radicals
Atmospheric half-life: 5.487 Hour
Method: Estimated.

Bioaccumulative potential

Glycerol, propylene oxide, ethylene oxide polymer

Bioaccumulation: For this family of materials: No bioconcentration is expected because of the relatively high molecular weight (MW greater than 1000).

Glycerol, propylene oxide, ethylene oxide, styrene, acrylonitrile polymer

Bioaccumulation: No bioconcentration of the polymeric component is expected because of its high molecular weight.

2-Propenenitrile, polymer with ethenylbenzene

Bioaccumulation: No bioconcentration is expected because of the relatively high molecular weight (MW greater than 1000).

Ceramic materials and wares, chemicals

Bioaccumulation: Partitioning from water to n-octanol is not applicable.

Carbon black

Bioaccumulation: No relevant data found.

1,2-Benzenedicarboxylic acid, di-C8-10-alkyl esters

Bioaccumulation: Bioconcentration potential is low (BCF less than 100 or log Pow greater than 7).
Partition coefficient: n-octanol/water(log Pow): 9.98 Measured

Diisononyl phthalate

Bioaccumulation: Based on data from similar materials Bioconcentration potential is low (BCF less than 100 or log Pow greater than 7).
Partition coefficient: n-octanol/water(log Pow): 8.8 - 9.7 OECD Test Guideline 117 or Equivalent
Bioconcentration factor (BCF): < 3 Oncorhynchus mykiss (rainbow trout)

Mobility in soil

Glycerol, propylene oxide, ethylene oxide polymer

No relevant data found.

Glycerol, propylene oxide, ethylene oxide, styrene, acrylonitrile polymer

No data available.

2-Propenenitrile, polymer with ethenylbenzene

No relevant data found.

Ceramic materials and wares, chemicals

No relevant data found.

Carbon black

No relevant data found.

1,2-Benzenedicarboxylic acid, di-C8-10-alkyl esters

No data available.

Diisononyl phthalate

Expected to be relatively immobile in soil (Koc > 5000).
Partition coefficient (Koc): > 5000 Estimated.

13. DISPOSAL CONSIDERATIONS

Disposal methods: DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. AS YOUR SUPPLIER, WE HAVE NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information. FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Incinerator or other thermal destruction device.

Treatment and disposal methods of used packaging: Empty containers should be recycled or otherwise disposed of by an approved waste management facility. Waste characterizations and

compliance with applicable laws are the responsibility solely of the waste generator. Do not re-use containers for any purpose.

14. TRANSPORT INFORMATION

DOT

Not regulated for transport

Classification for SEA transport (IMO-IMDG):

Not regulated for transport

Transport in bulk according to Annex I or II of MARPOL 73/78 and the IBC or IGC Code	Consult IMO regulations before transporting ocean bulk

Classification for AIR transport (IATA/ICAO):

Not regulated for transport

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. REGULATORY INFORMATION

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) Section 103
To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

Pennsylvania Worker and Community Right-To-Know Act:
The following chemicals are listed because of the additional requirements of Pennsylvania law:

Components	**CASRN**
Carbon black	1333-86-4
1,2-Benzenedicarboxylic acid, di-C8-10-alkyl esters	71662-46-9
Diisononyl phthalate	28553-12-0

California Prop. 65
WARNING: This product can expose you to chemicals including Carbon black, Diisononyl phthalate, Acrylonitrile, which is/are known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

United States TSCA Inventory (TSCA)
All components of this product are in compliance with the inventory listing requirements of the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

16. OTHER INFORMATION

Hazard Rating System
NFPA

Health	Flammability	Instability
1	0	0

Revision
Identification Number: 11025181 / A749 / Issue Date: 10/17/2018 / Version: 10.1
Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

Full text of other abbreviations
AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations;

UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Information Source and References
This SDS is prepared by Product Regulatory Services and Hazard Communications Groups from information supplied by internal references within our company.

DDP Specialty Electronic Materials US, LLC urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.
US

SAFETY DATA SHEET

This Safety Data Sheet (SDS) is for welding consumables and related products and may be used to comply with OSHA's Hazard Communication standard, 29 CFR 1910.1200, and Superfund Amendments and Reauthorization Act (SARA) of 1986 Public Law 99-499 and Canadian Workplace Hazardous Materials Information System (WHMIS) per Health Canada administrative policy. The OSHA standard must be consulted for specific requirements. This Safety Data Sheet complies with ISO 11014-1 and ANSI Z400.1. This document is translated in several languages and is available on our website at www.hobartbrothers.com, from your sales representative or by calling customer service at 1 (937) 332-4000.

SECTION 1 – IDENTIFICATION

Manufacturer/Supplier
Name: HOBART BROTHERS COMPANY — Telephone No: +1 (937) 332-4000
Address: 101 TRADE SQUARE EAST, TROY, OH 45373 — Emergency No: +1 (800) 424-9300
Website: www.hobartbrothers.com

Product Type: SHIELDED METAL ARC WELDING (SMAW) ELECTRODES

GROUP A: Product For: CARBON STEEL
AWS Specification: E6010, E6011, E6012, E6013, E6022, E7014, E7024-1

GROUP B: Product For: LOW HYDROGEN CARBON STEEL
AWS Specification: E7016, E7018, E7018-1, E7018-M

GROUP C: Product For: LOW HYDROGEN, LOW ALLOY STEEL
AWS Specification: E7018-A1, E7018-G, E8018-B2, E8018-B2L, E8018-B6, E8018-B8, E8018-C1, E8018-C2, E8018-C3, E8018-G, E9015-B9, E9018-B3, E9018-B3L, E9018-M, E10018-D2, E10018-M, E10518-M, E11018-M, E12018-M

GROUP D: Product For: HIGH STRENGTH CELLULOSE CARBON STEEL
AWS Specification: E7010-P1, E8010-P1, E9010-G, E9010-P1

Recommended Use: SHIELDED METAL ARC WELDING (SMAW) ELECTRODES
Restrictions on Use: Use only as indicated for welding operations

SECTION 2 – IDENTIFICATION OF HAZARDS

HAZARD CLASSIFICATION – The products described in Section 1 are not classified as hazardous according to applicable GHS hazard classification criteria as required and defined in OSHA Hazard Communication Standard (29 CFR Part 1910.1200).

LABEL ELEMENTS: **Hazard Symbol** – No symbol required — **Signal Word** – No signal word required
Hazard Statement – Not applicable — **Precautionary Statement** – Not Applicable

HAZARDS NOT OTHERWISE CLASSIFIED

WARNING! - Avoid breathing welding fumes and gases, they may be dangerous to your health. Always use adequate ventilation. Always use appropriate personal protective equipment.
PRIMARY ROUTES OF ENTRY: Respiratory System, Eyes and/or Skin.
ELECTRIC SHOCK: Arc welding and associated processes can kill. See Section 8.
ARC RAYS: The welding arc can injure eyes and burn skin.
FUMES AND GASES: Can be dangerous to your health.

Welding fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the metal being welded, the process, procedures and electrodes used. Most fume ingredients are present as complex oxides and compounds and not as pure metals. When the electrode is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section 3. Decomposition products of normal operation include those originating from the volatilization, reaction or oxidation, plus those from the base metal and coating, etc., of the materials shown in Section 3 of this Safety Data Sheet. Monitor for the component materials identified in the list in Section 3.

Fumes from the use of this product may contain complex oxides or compounds of the following elements and molecules: amorphous silica fume, calcium oxide, chromium, fluorspar or fluorides, manganese, nickel, silica and strontium. Other reasonably expected constituents of the fume would also include complex oxides of iron, titanium, silicon and molybdenum. Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc. Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: coatings on the metal being welded (such as paint, plating or galvanizing), the number of welders and the volume of the work area, the quality and amount of ventilation, the position of the welder's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning and degreasing activities). One recommended way to determine the composition and quantity of fumes and gases to which workers are exposed is to take an air sample inside the welder's helmet if worn or in the worker's breathing zone. See ANSI/AWS F1.1 and F1.3, available from the "American Welding Society", 8669 NW 36 Street, # 130, Miami, Florida 33166-6672, Phone: 800-443-9353 or 305-443-9353.

SECTION 3 – COMPOSITION/INFORMATION ON INGREDIENTS

HAZARDOUS INGREDIENTS

IMPORTANT - This section covers the hazardous materials from which this product is manufactured. This data has been classified according to the criteria of the Globally Harmonized System of Classification and Labeling of Chemicals (GHS) as required and defined in OSHA Hazard Communication Standard (29 CFR Part 1910.1200). The fumes and gases produced during welding with normal use of this product are addressed in Section 8.

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INGREDIENT	CAS NO.	EINECS[r]	GROUP AND %WEIGHT				GHS Classification(s)	GHS HAZARD STATEMENTS (See Section 16 for Complete Phrases)
			A	B	C	D		
ALUMINUM OXIDE	1344-28-1	215-691-6	<5	---	---	---	**NONE**	
CALCIUM CARBONATE	1317-65-3	215-279-6	<2	<2	---	---	**NONE**	
CELLULOSE	9004-34-6	232-674-9	<5	<1	<1	<5	**NONE**	
CHROMIUM (metal)	7440-47-3	231-157-5	---	---	<9	---	**NONE**	
FLUORSPAR	7789-75-5	232-188-7	---	1-12	4-15	---	**NONE**	
IRON	7439-89-6	231-096-4	70-90	70-90	60-90	70-90	**NONE**	
MAGNESIUM CARBONATE	546-93-0	208-915-9	<2	<5	<1	<1	**NONE**	
MANGANESE	7439-96-5	231-105-1	1-5	1-5	1-5	1-5	**- Acute Tox. 4 (Inhalation)[1]** **- Acute Tox. 4 (Oral) [1]** **- STOT RE 1[2]**	**H332** **H302** **H372**
MICA	12001-26-2	None	<5	---	---	---	**NONE**	
MOLYBDENUM	7439-98-7	231-107-2	---	---	<2	<1	**- STOT RE 2[2]** **- Eye Irrit. 2[3]** **- STOT SE 3[4]**	**H373** **H319** **H335**
NICKEL	7440-02-0	231-111-4	---	---	<5	<2	**Powder/Element:** **- Carc. 2[5]** **- Skin Sens. 1[6]** **- STOT RE 1[2]** **- Aquatic Chronic 3**	 **H351** **H317** **H372** **H412**
POTASSIUM SILICATE	1312-76-1	215-199-1	<2	<2	<2	<2	**NONE**	
SILICA	14808-60-7	238-878-4	<7	<8	<7	<7	**- STOT RE 2[2]** **- Carc. 2[5]** **- Acute Tox. 4 (Inhalation)[1]**	**H373** **H351** **H332**
(Amorphous Silica Fume)	69012-64-2	273-761-1	---	---	---	---	**NONE**	
SILICON	7440-21-3	231-130-8	---	<2	<5	<2	**NONE**	
SODIUM SILICATE	1344-09-8	215-687-4	<2	<2	<2	<2	**NONE**	
STRONTIUM CARBONATE	1633-05-2	216-643-7	---	<2	<2	---	**NONE**	
TITANIUM DIOXIDE	13463-67-7	236-675-5	<14	<10	<5	<5	**- Carc. 2[5]**	**H351**
HEXAVALENT CHROMIUM [CHROMIUM (VI) TRIOXIDE] (Fume constituent)	1333-82-0	215-607-8	Varies	Varies	Varies	Varies	**- Ox. Sol. 1[7]** **- Carc. 1A[5]** **- Muta. 1B[8]** **- Repr. Tox 2[9]** **- Acute Tox. 2 (Inhalation)[1]** **- Acute Tox. 3 (Skin & Oral)[1]** **- STOT RE 1[2]** **- Skin Corr. 1A[10]** **- Skin Sens. 1[6]** **- Resp. Sens. 1[11]** **- Aquatic Acute 1** **- Aquatic Chronic 1**	**H271** **H350** **H340** **H361f** **H330** **H311, H301** **H372** **H314** **H317** **H334, H317** **H400** **H410**

--- Dashes indicate the ingredient is not present within the group of products **Γ** – European Inventory of Existing Commercial Chemical Substance Number **(1)** Acute toxicity (Cat. 1, 2, 3 and 4) **(2)** Specific target organ toxicity (STOT) – repeated exposure (Cat. 1 and 2) **(3)** Serious eye damage/eye irritation (Cat. 1 and 2) **(4)** Specific target organ toxicity (STOT) – single exposure ((Cat. 1, 2) and Cat. 3 for narcotic effects and respiratory tract irritation, only) **(5)** Carcinogenicity (Cat. 1A, 1B and 2) **(6)** Skin sensitization (Cat. 1, Sub-cat. 1A and 1B) **(7)** Oxidizing solid (Cat. 1, 2 and 3) **(8)** Germ cell mutagenicity (Cat. 1A, 1B and 2) **(9)** Reproductive toxicity (Cat. 1A, 1B and 2) **(10)** Skin corrosion/irritation (Cat. 1, 1A, 1B, 1C and 2) **(11)** Respiratory sensitization (Cat. 1, Sub-cat. 1A and 1B)

SECTION 4 – FIRST AID MEASURES

INGESTION: Not an expected route of exposure. Do not eat, drink, or smoke while welding; wash hands thoroughly before performing these activities. If symptoms develop, seek medical attention at once.
INHALATION during welding: If breathing is difficult, provide fresh air and contact physician. If breathing has stopped, perform artificial respiration and obtain medical assistance at once.
SKIN CONTACT during welding: Remove contaminated clothing and wash the skin thoroughly with soap and water. If symptoms develop, seek medical attention at once.

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EYE CONTACT during welding: Dust or fume from this product should be flushed from the eyes with copious amounts of clean, tepid water until victim is transported to an emergency medical facility. Do not allow victim to rub or keep eyes tightly closed. Obtain medical assistance at once.
Arc rays can injure eyes. If exposed to arc rays, move victim to dark room, remove contact lenses as necessary for treatment, cover eyes with a padded dressing and rest. Obtain medical assistance if symptoms persist.

Section 11 of this SDS covers the acute effects of overexposure to the various ingredients within the welding consumable. Section 8 of this SDS lists the exposure limits and covers methods for protecting yourself and your co-workers.

SECTION 5 – FIRE-FIGHTING MEASURES

Fire Hazards: Welding consumables applicable to this sheet as shipped are nonreactive, nonflammable, non-explosive and essentially nonhazardous until welded.

Welding arcs and sparks can ignite combustibles and flammable products. If there are flammable materials, including fuel or hydraulic lines, in the work area and the worker cannot move the work or the flammable material, a fire-resistant shield such as a piece of sheet metal or fire resistant blanket should be placed over the flammable material. If welding work is conducted within 35 feet or so of flammable materials, station a responsible person in the work zone to act as fire watcher to observe where sparks are flying and to grab an extinguisher or sound the alarm if needed.
Unused welding consumables may remain hot for a period of time after completion of a welding process. See American National Standard Institute (ANSI) Z49.1 for further general safety information on the use and handling of welding consumables and associated procedures.
Suitable Extinguishing Media: This product is essentially nonflammable until welded; therefore, use a suitable extinguishing agent for a surrounding fire.
Unsuitable Extinguishing Media: None known.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

In the case of a release of solid welding consumable products, solid objects can be picked up and placed into a disposal container. If airborne dust and/or fume is present, use adequate engineering controls and, if needed, personal protection to prevent overexposure. Refer to recommendations in Section 8. Wear proper personal protective equipment while handling. Do not discard as general trash.

SECTION 7 - HANDLING AND STORAGE

HANDLING: No specific requirements in the form supplied. Handle with care to avoid cuts. Wear gloves when handling welding consumables. Avoid exposure to dust. Do not ingest. Some individuals can develop an allergic reaction to certain materials. Retain all warning and product labels.
STORAGE: Keep separate from acids and strong bases to prevent possible chemical reactions.

SECTION 8 - EXPOSURE CONTROLS AND PERSONAL PROTECTION

Read and understand the instructions and the labels on the packaging. Welding fumes do not have a specific OSHA PEL (Permissible Exposure Limit) or ACGIH TLV (Threshold Limit Value). The OSHA PEL for Particulates – Not Otherwise Regulated (PNOR) is 5 mg/m^3 – Respirable Fraction, 15 mg/m^3 – Total Dust. The ACGIH TLV for Particles – Not Otherwise Specified (PNOS) is 3 mg/m^3 – Respirable Particles, 10 mg/m^3 – Inhalable Particles. The individual complex compounds within the fume may have a lower OSHA PEL or ACGIH TLV than the OSHA PNOR and ACGIH PNOS. An Industrial Hygienist, the OSHA PELs for Air Contaminants (29 CFR 1910.1000), and the ACGIH TLVs should be consulted to determine the specific fume constituents present and their respective exposure limits. All exposure limits are in milligrams per cubic meter (mg/m^3).

INGREDIENT	CAS	EINECS	OSHA PEL	ACGIH TLV
ALUMINUM OXIDE##	1344-28-1	215-691-6	5 R*	1 R* {A4}
				10 (as Al, Tot particulate)
CALCIUM CARBONATE	1317-65-3	215-279-6	5 R*, 5 (as CaO)	3 R*, 2 (as CaO)
CELLULOSE	9004-34-6	232-674-9	5 R*	10 (Dust)
CHROMIUM#	7440-47-3	231-157-5	1 (Metal)	0.5 (Metal) {A4}
			0.5 (Cr II & Cr III Cpnds)	0.5 (Cr III Cpnds) {A4}
			0.005 (Cr VI Cpnds	0.05 (Cr VI Sol Cpnds) {A1}
			(Calif. OSHA PEL)	0.01 (Cr VI Insol Cpnds) {A1}
FLUORSPAR	7789-75-5	232-188-7	2.5 (as F)	2.5 (as F) {A4}
IRON+	7439-89-6	231-096-4	5 R*	5 R* (Fe_2O_3) {A4}
IRON OXIDE	1309-37-1	215-168-2	10 (Oxide Fume)	5 R* (Fe_2O_3) {A4}
MAGNESIUM CARBONATE	546-93-0	208-915-9	5 R*	3 R*
MANGANESE#	7439-96-5	231-105-1	5 CL ** (Fume)	0.1 I* {A4} ♦
			1, 3 STEL*** ■	0.02 R* ♦♦
MICA	12001-26-2	None	3 R*■	3 R*
MOLYBDENUM	7439-98-7	231-107-2	5 R*	3 R*; 10 I* (Ele and Insol)
				0.5 R* (Sol Cpnds) {A3}
NICKEL#	7440-02-0	231-111-4	1 (Metal)	1.5 I* (Ele) {A5}
			1 (Sol Cpnds)	0.1 I* (Sol Cpnds) {A4}
			1 (Insol Cpnds)	0.2 I* (Insol Cpnds) {A1}
POTASSIUM SILICATE	1312-76-1	215-199-1	Not established	Not established
SILICA++	14808-60-7	238-878-4	0.1 R*	0.025 R* {A2}
(Amorphous Silica Fume)	69012-64-2	273-761-1	0.8	2 R*
SILICON+	7440-21-3	231-130-8	5 R*	3 R*
SODIUM SILICATE	1344-09-8	215-687-4	Not established	Not established
STRONTIUM CARBONATE+	1633-05-2	216-643-7	5 R*	3 R*
TITANIUM DIOXIDE	13463-67-7	236-675-5	15 (Dust)	10 {A4}

R* - Respirable Fraction I* - Inhalable Fraction ** - Ceiling Limit *** - Short Term Exposure Limit + - As a nuisance particulate covered under "Particulates Not Otherwise Regulated" by OSHA or "Particulates Not Otherwise Classified" by ACGIH ++ - Crystalline silica is bound within the product as it exists in the package. However, research indicates silica is present in welding fume in the amorphous (noncrystalline) form #- Reportable material under Section 313 of SARA ## - Reportable material under Section 313 of SARA only in fibrous form ■ - NIOSH REL TWA and STEL ■ ■ - AIHA Ceiling Limit of 1 mg/m^3 ♦ - Limit of 0.1 mg/m^3 is for Inhalable Mn in 2015 by ACGIH ♦♦ - Limit of 0.02 mg/m^3 is for Respirable Mn in 2015 by ACGIH Ele – Element Sol – Soluble Insol – Insoluble Inorg – Inorganic Cpnds – Compounds NOS – Not Otherwise Specified {A1} - Confirmed Human Carcinogen per ACGIH {A2} - Suspected Human Carcinogen per ACGIH {A3} - Confirmed Animal Carcinogen with Unknown Relevance to Humans per ACGIH {A4} - Not Classifiable as a Human Carcinogen per ACGIH {A5} - Not Suspected as a Human Carcinogen per ACGIH (noncrystalline form) EINECS – European Inventory of Existing Commercial Chemical Substances OSHA – U.S. Occupational Safety and Health Admininstration ACGIH – American Conference of Governmental Industrial Hygienists

VENTILATION: Use enough ventilation or local exhaust at the arc or both to keep the fumes and gases below the PEL/TLV in the worker's breathing zone and the general area. Train the welder to keep his head out of the fumes.
RESPIRATORY PROTECTION: Use NIOSH-approved or equivalent fume respirator or air supplied respirator when welding in confined space or where local exhaust or ventilation does not keep exposure below the regulatory limits.
EYE PROTECTION: Wear helmet or use face shield with filter lens for open arc welding processes. As a rule of thumb begin with Shade Number 14. Adjust if needed by selecting the next lighter and/or darker shade number. Provide protective screens and flash goggles, if necessary, to shield others from the weld arc flash.

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PROTECTIVE CLOTHING: Wear hand, head and body protection which help to prevent injury from radiation, sparks and electrical shock. See ANSI Z49.1. At a minimum this includes welder's gloves and a protective face shield, and may include arm protectors, aprons, hats, shoulder protection as well as dark non-synthetic clothing. Train the welder not to touch live electrical parts and to insulate himself from work and ground.

PROCEDURE FOR CLEANUP OF SPILLS OR LEAKS: Not applicable
SPECIAL PRECAUTIONS (IMPORTANT): When welding with electrodes that require special ventilation (such as stainless or hardfacing, or other products which require special ventilation, or on lead- or cadmium-plated steel and other metals or coatings like galvanized steel, which produce hazardous fumes) maintain exposure below the PEL/TLV. Use industrial hygiene monitoring to ensure that your use of this material does not create exposures which exceed PEL/TLV. Always use exhaust ventilation. Refer to the following sources for important additional information: American National Standard Institute (ANSI) Z49.1; Safety in Welding and Cutting published by the American Welding Society, 8669 NW 36 Street, # 130, Miami, Florida 33166-6672, Phone: 800-443-9353 or 305-443-9353; and OSHA Publication 2206 (29 CFR 1910), U.S. Government Printing Office, Washington, DC 20402.

SECTION 9 – PHYSICAL AND CHEMCIAL PROPERTIES

Welding consumables applicable to this sheet as shipped are nonreactive, nonflammable, non-explosive and essentially nonhazardous until welded.
PHYSICAL STATE: Solid
APPEARANCE: Cored Wire/Coated Rod
COLOR: Gray
ODOR: Not Applicable
ODOR THRESHOLD: Not Applicable
pH: Not Applicable
MELTING POINT/FREEZING POINT: Not Available
INITIAL BOILING POINT AND BOILING RANGE: Not Available
FLASH POINT: Not Available
EVAPORATION RATE: Not Applicable
FLAMMABILITY (SOLID, GAS): Not Available
UPPER/LOWER FLAMMABILITY OR EXPLOSIVE LIMITS: Not Available
VAPOR PRESSURE: Not Applicable
VAPOR DENSITY: Not Applicable
RELATIVE DENSITY: Not Available
SOLUBILITY(IES): Not Available
PARTITION COEFFICIENT: N-OCTANOL/WATER: Not Applicable
AUTO-IGNITION TEMPERATURE: Not Available
DECOMPOSITION TEMPERATURE: Not Available
VISCOSITY: Not Applicable

SECTION 10 – STABILITY AND REACTIVITY

GENERAL: Welding consumables applicable to this sheet are solid and nonvolatile as shipped. This product is only intended for use per the welding parameters it was designed for. When this product is used for welding, hazardous fumes may be created. Other factors to consider include the base metal, base metal preparation and base metal coatings. All of these factors can contribute to the fume and gases generated during welding. The amount of fume varies with the welding parameters.
STABILITY: This product is stable under normal conditions.
REACTIVITY: Contact with acids or strong bases may cause generation of gas.

SECTION 11 – TOXICOLOGICAL INFORMATION

SHORT-TERM (ACUTE) OVEREXPOSURE EFFECTS: Welding Fumes - May result in discomfort such as dizziness, nausea or dryness or irritation of nose, throat or eyes. **Aluminum Oxide** - Irritation of the respiratory system. **Calcium Oxide** - Dust or fumes may cause irritation of the respiratory system, skin and eyes. **Chromium** - Inhalation of fume with chromium (VI) compounds can cause irritation of the respiratory tract, lung damage and asthma-like symptoms. Swallowing chromium (VI) salts can cause severe injury or death. Dust on skin can form ulcers. Eyes may be burned by chromium (VI) compounds. Allergic reactions may occur in some people. **Fluorides** - Fluoride compounds evolved may cause skin and eye burns, pulmonary edema and bronchitis. **Iron, Iron Oxide** - None are known. Treat as nuisance dust or fume. **Magnesium, Magnesium Oxide** - Overexposure to the oxide may cause metal fume fever characterized by metallic taste, tightness of chest and fever. Symptoms may last 24 to 48 hours following overexposure. **Manganese** - Metal fume fever characterized by chills, fever, upset stomach, vomiting, irritation of the throat and aching of body. Recovery is generally complete within 48 hours of the overexposure. **Mica** - Dust may cause irritation of the respiratory system, skin and eyes. **Molybdenum** - Irritation of the eyes, nose and throat. **Nickel, Nickel Compounds** - Metallic taste, nausea, tightness in chest, metal fume fever, allergic reaction. **Potassium Silicate** - Dust or fumes may cause irritation of the respiratory system, skin and eyes. **Silica (Amorphous)** - Dust and fumes may cause irritation of the respiratory system, skin and eyes. **Sodium Silicate** - Dust or fumes may cause irritation of the respiratory system, skin and eyes. **Strontium Compounds** - Strontium salts are generally non-toxic and are normally present in the human body. In large oral doses, they may cause gastrointestinal disorders, vomiting and diarrhea. **Titanium Dioxide** - Irritation of respiratory system.

LONG-TERM (CHRONIC) OVEREXPOSURE EFFECTS: Welding Fumes - Excess levels may cause bronchial asthma, lung fibrosis, pneumoconiosis or "siderosis." Studies have concluded that there is sufficient evidence for ocular melanoma in welders. **Aluminum Oxide** - Pulmonary fibrosis and emphysema. **Calcium Oxide** - Prolonged overexposure may cause ulceration of the skin and perforation of the nasal septum, dermatitis and pneumonia. **Chromium** - Ulceration and perforation of nasal septum. Respiratory irritation may occur with symptoms resembling asthma. Studies have shown that chromate production workers exposed to hexavalent chromium compounds have an excess of lung cancers. Chromium (VI) compounds are more readily absorbed through the skin than chromium (III) compounds. Good practice requires the reduction of employee exposure to chromium (III) and (VI) compounds. **Fluorides** - Serious bone erosion (Osteoporosis) and mottling of teeth. **Iron, Iron Oxide Fumes** - Can cause siderosis (deposits of iron in lungs) which some researchers believe may affect pulmonary function. Lungs will clear in time when exposure to iron and its compounds ceases. Iron and magnetite (Fe_3O_4) are not regarded as fibrogenic materials. **Magnesium, Magnesium Oxide** - No adverse long term health effects have been reported in the literature. **Manganese** - Long-term overexposure to manganese compounds may affect the central nervous system. Symptoms may be similar to Parkinson's disease and can include slowness, changes in handwriting, gait impairment, muscle spasms and cramps and less commonly, tremor and behavioral changes. Employees who are overexposed to manganese compounds should be seen by a physician for early detection of neurologic problems. Overexposure to manganese and manganese compounds above safe exposure limits can cause irreversible damage to the central nervous system, including the brain, symptoms of which may include slurred speech, lethargy, tremor, muscular weakness, psychological disturbances and spastic gait. **Mica** - Prolonged overexposure may cause scarring of the lungs and pneumoconiosis characterized by cough, shortness of breath, weakness and weight loss. **Molybdenum** - Prolonged overexposure may result in loss of appetite, weight loss, loss of muscle coordination, difficulty in breathing and anemia. **Nickel, Nickel Compounds** - Lung fibrosis or pneumoconiosis. Studies of nickel refinery workers indicated a higher incidence of lung and nasal cancers. **Potassium Silicate** - Prolonged overexposure may cause ulceration of the skin and perforation of the nasal septum, dermatitis and pneumonia. **Silica (Amorphous)** - Research indicates that silica is present in welding fume in the amorphous form. Long term overexposure may cause pneumoconiosis. Noncrystalline forms of silica (amorphous silica) are considered to have little fibrotic potential. **Sodium Silicate** - Prolonged overexposure may cause ulceration of the skin and perforation of the nasal septum, dermatitis and pneumonia. **Strontium Compounds** - Strontium at high doses is known to concentrate in bone. Major signs of chronic toxicity, which involve the skeleton, have been labeled as "strontium rickets". **Titanium Dioxide** - Pulmonary irritation and slight fibrosis.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Persons with pre-existing impaired lung functions (asthma-like conditions). Persons with a pacemaker should not go near welding and cutting operations until they have consulted their doctor and obtained information from the manufacturer of the device. Respirators are to be worn only after being medically cleared by your company-designated physician.

SAFETY DATA SHEET

EMERGENCY AND FIRST AID PROCEDURES: Call for medical aid. Employ first aid techniques recommended by the American Red Cross. If irritation or flash burns develop after exposure, consult a physician.

CARCINOGENICITY: Chromium VI compounds, nickel compounds and silica (crystalline quartz) are classified as IARC[E] Group 1 and NTP[Z] Group K carcinogens. Titanium dioxide, nickel metal/alloys and welding fumes are classified as IARC Group 2B carcinogens.

CALIFORNIA PROPOSITION 65: WARNING: These products contains or produces a chemical known to the State of California to cause cancer and birth defects (or other reproductive harm) (California Health and Safety Code Section 25249.5 et seq.).

INGREDIENT	CAS	IARC[E]	NTP[Z]	OSHA[H]	65[Θ]
ALUMINUM OXIDE	1344-28-1	---	---	---	---
CALCIUM CARBONATE	1317-65-3	---	---	---	---
CELLULOSE	9004-34-6	---	---	---	---
CHROMIUM	7440-47-3	3^{Σ}, $1^{\Sigma\Sigma}$	$K^{\Sigma\Sigma}$	$X^{\Sigma\Sigma}$	$X^{\Sigma\Sigma}$
FLUORSPAR	7789-75-5	---	---	---	---
IRON	7439-89-6	---	---	---	---
IRON OXIDE	1309-37-1	3	---	---	---
MAGNESIUM CARBONATE	546-93-0	---	---	---	---
MANGANESE	7439-96-5	---	---	---	---
MICA	12001-26-2	---	---	---	---
MOLYBDENUM	7439-98-7	---	---	---	---
NICKEL	7440-02-0	$2B^{\beta}$, $1^{\beta\beta}$	S^{β}, $K^{\beta\beta}$	---	X^{β}, $X^{\beta\beta}$
POTASSIUM SILICATE	1312-76-1	---	---	---	---
SILICA	14808-60-7	1^{Ψ}	K	---	X
(Amorphous Silica Fume)	69012-64-2	3	K	---	X
SILICON	7440-21-3	---	---	---	---
SODIUM SILICATE	1344-09-8	---	---	---	---
STRONTIUM CARBONATE	1633-05-2	---	---	---	---
TITANIUM DIOXIDE	13463-67-7	2B	---	---	X
Welding Fumes	---	2B	---	---	---

E – International Agency for Research on Cancer (1 – Carcinogenic to Humans, 2A – Probably Carcinogenic to Humans, 2B – Possibly Carcinogenic to Humans, 3 – Not Classifiable as to its Carcinogenicity to Humans, 4 --- Probably Not Carcinogenic to Humans) Z – US National Toxicology Program (K – Known Carcinogen, S – Suspected Carcinogen) H – OSHA Designated Carcinogen List Θ – California Proposition 65 (X – On Proposition 65 list) Σ – Chromium Metal and Chromium III Compounds ΣΣ – Chromium VI β – Nickel metal and alloys ββ -- Nickel compounds Ψ – Silica Crystalline α-Quartz --- Dashes indicate the ingredient is not listed with the IARC, NTP, OSHA or Proposition 65

SECTION 12 – ECOLOGICAL INFORMATION

Welding processes can release fumes directly to the environment. Welding wire can degrade if left outside and unprotected. Residues from welding consumables and processes could degrade and accumulate in the soil and groundwater.

SECTION 13 – DISPOSAL CONSIDERATIONS

Use recycling procedures if available. Discard any product, residue, packaging, disposable container or liner in an environmentally acceptable manner, in full compliance with federal, state and local regulations.

SECTION 14 – TRANSPORT INFORMATION

No international regulations or restrictions are applicable. No special precautions are necessary.

SECTION 15 – REGULATORY INFORMATION

Read and understand the manufacturer's instructions, your employer's safety practices and the health and safety instructions on the label and the safety data sheet. Observe all local and federal rules and regulations. Take all necessary precautions to protect yourself and others.
United States EPA Toxic Substance Control Act: All constituents of these products are on the TSCA inventory list or are excluded from listing.
CERCLA/SARA TITLE III: Reportable Quantities (RQs) and/or Threshold Planning Quantities (TPQs):

Ingredient name	**RQ(lb)**	**TPQ (lb)**
Products on this SDS are a solid solution in the form of a solid article.	--	--

Spills or releases resulting in the loss of any ingredient at or above its RQ require immediate notification to the National Response Center and to your Local Emergency Planning Committee.
Section 311 Hazard Class
As shipped: Immediate In use: Immediate delayed
EPCRA/SARA TITLE III 313 TOXIC CHEMICALS: The following metallic components are listed as SARA 313 "Toxic Chemicals" and potentially subject to annual SARA 312 reporting: Aluminum Oxide, Chromium, Manganese, and Nickel. See Section 3 for weight percentage.
CANADIAN WHMIS CLASSIFICATION: Class D; Division 2, Subdivision A
CANADIAN CONTROLLED PRODUCTS REGULATION: This product has been classified in accordance with the hazard criteria of the CPR and the SDS contains all of the information required by the CPR.
CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA): All constituents of these products are on the Domestic Substance List (DSL).

SECTION 16 – OTHER INFORMATION

The following Hazard Statements, provided in the OSHA Hazard Communication Standard (29 CFR Part 1910.1200) correspond to the columns labeled 'GHS Hazard Statements' within Section 3 of this safety data sheet. Take appropriate precautions and protective measures to eliminate or limit the associated hazard.

H271: May cause fire or explosion; strong oxidizer
H301: Toxic if swallowed
H302: Harmful if swallowed
H311: Toxic in contact with skin
H314: Causes severe skin burns and eye damage
H317: May cause an allergic skin reaction
H319: Causes serious eye irritation

SAFETY DATA SHEET

H330: Fatal if inhaled
H332: Harmful if inhaled
H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled
H335: May cause respiratory irritation
H340: May cause genetic defects
H350: May cause cancer
H351: Suspected of causing cancer
H361f: Suspected of damaging fertility or the unborn child
H372: Causes damage to organs through prolonged or repeated exposure
H373: May cause damage to organs through prolonged or repeated exposure
H400: Very toxic to aquatic life.
H410: Very toxic to aquatic life with long lasting effects
H412: Harmful to aquatic life with long lasting effects.

For additional information please refer to the following sources:

USA: **American National Standard Institute (ANSI) Z49.1** "Safety in Welding and Cutting", **ANSI/American Welding Society (AWS) F1.5** "Methods for Sampling and Analyzing Gases from Welding and Allied Processes", **ANSI/AWS F1.1** "Method for Sampling Airborne Particles Generated by Welding and Allied Processes", **AWSF3.2M/F3.2** "Ventilation Guide for Weld Fume", American Welding Society, 8669 NW 36 Street, # 130, Miami, Florida 33166-6672, Phone: 800-443-9353 or 305-443-9353. Safety and Health Fact Sheets available from AWS at www.aws.org.
OSHA Publication 2206 (29 C.F.R. 1910), U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954.
Threshold Limit Values and Biological Exposure Indices, American Conference of Governmental Industrial Hygienists (ACGIH), 6500 Glenway Ave., Cincinnati, Ohio 45211, USA.
NFPA 51B "Standard for Fire Prevention During Welding, Cutting and Other Hot Work" published by the National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169.

Canada: **CSA Standard CAN/CSA-W117.2-01** "Safety in Welding, Cutting and Allied Processes".

Hobart Brothers Company strongly recommends the users of this product study this SDS, the product label information and become aware of all hazards associated with welding. Hobart Brothers Company believes this data to be accurate and to reflect qualified expert opinion regarding current research. However, Hobart Brothers Company cannot make any expressed or implied warranty as to this information.

29 CFR 1910.1200 (OSHA HazCom 2012)

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product identifier

Trade name : Glasgrip™ 7780
PRIMER
™ Trademark, Ashland or its subsidiaries, registered in various countries

Recommended use of the chemical and restrictions on use

Details of the supplier of the safety data sheet	**Emergency telephone number** 1-800-ASHLAND (1-800-274-5263)
Ashland P.O. Box 2219 Columbus, OH 43216 United States of America EHSProductSafety@ashland.com	**Regulatory Information Number** 1-800-325-3751 **Product Information** 614-790-3333

SECTION 2. HAZARDS IDENTIFICATION

GHS Classification

Flammable liquids	:	Category 2
Acute toxicity (Oral)	:	Category 3
Acute toxicity (Inhalation)	:	Category 3
Acute toxicity (Dermal)	:	Category 3
Skin irritation	:	Category 2
Eye irritation	:	Category 2A
Reproductive toxicity	:	Category 2
Specific target organ systemic toxicity - single	:	Category 1 (Central nervous system, Eyes)

exposure

Specific target organ systemic toxicity - single exposure	:	Category 3 (Central nervous system)
Specific target organ systemic toxicity - repeated exposure (Inhalation)	:	Category 2 (Neurologic: other (neuropsychological effects, auditory dysfunction and effects on colour vision))
Aspiration hazard	:	Category 1

GHS Label element

Hazard pictograms :

Signal Word : Danger

Hazard Statements : Highly flammable liquid and vapor.
Toxic if swallowed, in contact with skin or if inhaled.
May be fatal if swallowed and enters airways.
Causes skin irritation.
Causes serious eye irritation.
May cause drowsiness or dizziness.
Suspected of damaging fertility or the unborn child.
Causes damage to organs (Central nervous system, Eyes).
May cause damage to organs (Neurologic: other (neuropsychological effects, auditory dysfunction and effects on colour vision)) through prolonged or repeated exposure if inhaled.

Precautionary Statements : **Prevention:**
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
Keep container tightly closed.
Ground/bond container and receiving equipment.
Use explosion-proof electrical/ ventilating/ lighting/ equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Do not breathe dust/ fume/ gas/ mist/ vapors/ spray.
Wash skin thoroughly after handling.

Do not eat, drink or smoke when using this product.
Use only outdoors or in a well-ventilated area.
Wear protective gloves/ protective clothing/ eye protection/ face protection.
Response:
IF SWALLOWED: Immediately call a POISON CENTER or doctor/ physician.
IF SWALLOWED: Immediately call a POISON CENTER or doctor/ physician. Rinse mouth.
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor/ physician.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
IF exposed: Call a POISON CENTER or doctor/ physician.
Do NOT induce vomiting.
If skin irritation occurs: Get medical advice/ attention.
If eye irritation persists: Get medical advice/ attention.
Take off contaminated clothing and wash before reuse.
In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
Storage:
Store in a well-ventilated place. Keep container tightly closed.
Store in a well-ventilated place. Keep cool.
Store locked up.
Disposal:
Dispose of contents/ container to an approved waste disposal plant.

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Chemical nature : Static Accumulator

Chemical nature : Defatter

Hazardous components

Chemical Name	CAS-No.	Classification	Concentration (%)

SILANE DERIVATIVE	254504001-5597	Eye Dam. 1; H318	>= 1.50 - < 5.00

The identity of one or more component(s) is being withheld under business confidentiality.

METHANOL	67-56-1	Flam. Liq. 2; H225 Acute Tox. 3; H301 Acute Tox. 3; H331 Acute Tox. 3; H311 STOT SE 1; H370	49.01
TOLUENE	108-88-3	Flam. Liq. 2; H225 Skin Irrit. 2; H315 Eye Irrit. 2A; H319 Repr. 2; H361 STOT SE 3; H336 STOT RE 2; H373 Asp. Tox. 1; H304	48.99

SECTION 4. FIRST AID MEASURES

General advice : Move out of dangerous area.
Consult a physician.
Show this safety data sheet to the doctor in attendance.
Symptoms of poisoning may appear several hours later.
Do not leave the victim unattended.

If inhaled : Move to fresh air.
Call a physician or poison control centre immediately.

Keep patient warm and at rest.
If unconscious place in recovery position and seek medical advice.

In case of skin contact : Remove contaminated clothing. If irritation develops, get medical attention.
If on skin, rinse well with water.
Wash contaminated clothing before re-use.
If on clothes, remove clothes.

In case of eye contact : Immediately flush eye(s) with plenty of water.
Remove contact lenses.
Protect unharmed eye.

If swallowed : Get medical attention immediately.
Do NOT induce vomiting.
Rinse mouth with water.
Do not give milk or alcoholic beverages.
Never give anything by mouth to an unconscious person.
If symptoms persist, call a physician.

Most important symptoms and effects, both acute and delayed : This product contains methanol which can cause intoxication and central nervous system depression. Methanol is metabolized to formic acid and formaldehyde. These metabolites can cause metabolic acidosis, visual disturbances and blindness. Since metabolism is required for these toxic symptoms, their onset may be delayed from 6 to 30 hours following ingestion. Ethanol competes for the same metabolic pathway and has been used to prevent methanol metabolism. Ethanol administration is indicated in symptomatic patients or at blood methanol concentrations above 20 ug/dl. Methanol is effectively removed by hemodialysis.
Inhalation of high concentrations of this material, as could occur in enclosed spaces or during deliberate abuse, may be associated with cardiac arrhythmias. Sympathomimetic drugs may initiate cardiac arrhythmias in persons exposed to this material.
Signs and symptoms of exposure to this material through breathing, swallowing, and/or passage of the material through the skin may include:
stomach or intestinal upset (nausea, vomiting, diarrhea)
irritation (nose, throat, airways)
temporary changes in mood and behavior
muscle cramps
pain in the abdomen and lower back
Blurred vision
Shortness of breath

confusion
irregular heartbeat
cyanosis (causes blue coloring of the skin and nails from lack of oxygen)
visual impairment (including blindness)
Toxic if swallowed, in contact with skin or if inhaled
May be fatal if swallowed and enters airways.
Causes skin irritation.
Causes serious eye irritation.
May cause drowsiness or dizziness.
Suspected of damaging fertility or the unborn child.
Causes damage to organs.
May cause damage to organs through prolonged or repeated exposure if inhaled.

Notes to physician :

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Water spray
Foam
Alcohol-resistant foam
Carbon dioxide (CO2)
Dry chemical

Unsuitable extinguishing media : High volume water jet

Specific hazards during firefighting : Never use welding or cutting torch on or near drum (even empty) because product (even just residue) can ignite explosively.
Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
Do not allow run-off from fire fighting to enter drains or water courses.

Hazardous combustion products : carbon dioxide and carbon monoxide
Hydrocarbons
nitrogen oxides (NOx)
sulfur oxides

Specific extinguishing methods :

Product is compatible with standard fire-fighting agents.

Further information : Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
Use a water spray to cool fully closed containers.

Special protective equipment for firefighters : In the event of fire, wear self-contained breathing apparatus.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures : Evacuate personnel to safe areas.
Remove all sources of ignition.
Use personal protective equipment.
Ensure adequate ventilation.
Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed.

Environmental precautions : Prevent product from entering drains.
Prevent further leakage or spillage if safe to do so.
If the product contaminates rivers and lakes or drains inform respective authorities.

Methods and materials for containment and cleaning up : Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).

Other information : Comply with all applicable federal, state, and local regulations.
Suppress (knock down) gases/vapours/mists with a water spray jet.

SECTION 7. HANDLING AND STORAGE

Advice on safe handling : Open drum carefully as content may be under pressure.
Avoid formation of aerosol.
Provide sufficient air exchange and/or exhaust in work rooms.
Do not breathe vapours/dust.
Do not smoke.
Container hazardous when empty.
Take precautionary measures against static discharges.

Avoid exposure - obtain special instructions before use.
Avoid contact with skin and eyes.
Smoking, eating and drinking should be prohibited in the application area.
For personal protection see section 8.
Dispose of rinse water in accordance with local and national regulations.
Container may be opened only under exhaust ventilation hood.

Conditions for safe storage : Keep container tightly closed in a dry and well-ventilated place.
Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Observe label precautions.
No smoking.
Electrical installations / working materials must comply with the technological safety standards.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
METHANOL	67-56-1	TWA	200 ppm	ACGIH
		STEL	250 ppm	ACGIH
		REL	200 ppm 260 mg/m3	NIOSH/GUIDE
		STEL	250 ppm 325 mg/m3	NIOSH/GUIDE
		PEL	200 ppm 260 mg/m3	OSHA_TRANS
		TWA	200 ppm 260 mg/m3	TN OEL
		STEL	250 ppm 325 mg/m3	TN OEL
TOLUENE	108-88-3	TWA	20 ppm	ACGIH
		REL	100 ppm 375 mg/m3	NIOSH/GUIDE
		STEL	150 ppm 560 mg/m3	NIOSH/GUIDE

		TWA	200 ppm	OSHA/Z2
		Ceiling	300 ppm	OSHA/Z2
		MAX. CONC	500 ppm	OSHA/Z2

Biological occupational exposure limits

Components	CAS-No.	Control parameters	Biological specimen	Sampling time	Permissible concentration	Basis
METHANOL	67-56-1	methanol	Urine	Sampling time: End of shift.	15 mg/l	
Remarks:	Background, Nonspecific					
TOLUENE	108-88-3	o-Cresol, with hydrolysis	Creatinine in urine	Sampling time: End of shift.	0.3 mg/g	
Remarks:	Background					
		toluene	Urine	Sampling time: End of shift.	0.03 mg/l	
		toluene	Blood	Sampling time: Prior to last shift of work week.	0.02 mg/l	

Engineering measures : Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure below exposure guidelines (if applicable) or below levels that cause known, suspected or apparent adverse effects.

Personal protective equipment

Respiratory protection : In the case of vapour formation use a respirator with an approved filter.

A NIOSH-approved air-purifying respirator with an appropriate cartridge and/or filter may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits (if applicable) or if overexposure has otherwise been determined. Protection provided by air-purifying respirators is limited. Use a positive pressure, air-supplied respirator if there is any potential for uncontrolled release, exposure levels are not known or any other

circumstances where an air-purifying respirator may not provide adequate protection.

Hand protection

Material	:	nitrile rubber
Remarks	:	The suitability for a specific workplace should be discussed with the producers of the protective gloves.
Eye protection	:	Wear chemical splash goggles when there is the potential for exposure of the eyes to liquid, vapor or mist.
Skin and body protection	:	Wear as appropriate: impervious clothing Safety shoes Flame-resistant clothing Choose body protection according to the amount and concentration of the dangerous substance at the work place. Discard gloves that show tears, pinholes, or signs of wear. Wear resistant gloves (consult your safety equipment supplier).
Hygiene measures	:	Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product. When using do not eat or drink. When using do not smoke.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state	:	liquid
Colour	:	clear
Odour	:	No data available
Odour Threshold	:	No data available
pH	:	No data available
Melting point/freezing point	:	No data available
Boiling point/boiling range	:	149 °F / 65 °C (1,013.333333 hPa) Calculated Phase Transition Liquid/Gas
Flash point	:	45 °F / 7 °C

		Method: Seta closed cup
Evaporation rate	:	1 Ethyl Ether
Flammability (solid, gas)	:	
		No data available
Flammability (liquids)	:	Static Accumulating liquid
Flammability (liquids)	:	
Upper explosion limit	:	37 %(V) Calculated Explosive Limit
Lower explosion limit	:	1.27 %(V) Calculated Explosive Limit
Vapour pressure	:	129.3333333 hPa (20 °C) Calculated Vapor Pressure
Relative vapour density	:	> 1AIR=1
Relative density	:	0.834 (77.00 °F)
Density	:	0.834 g/cm3 (77.00 °F)
Solubility(ies)		
Water solubility	:	No data available
Solubility in other solvents	:	No data available
Partition coefficient: n-octanol/water	:	No data available
Thermal decomposition	:	No data available
Viscosity		
Viscosity, dynamic	:	No data available
Viscosity, kinematic	:	No data available
Oxidizing properties	:	No data available

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	No decomposition if stored and applied as directed.
Chemical stability	:	Stable under recommended storage conditions.
Possibility of hazardous reactions	:	Vapours may form explosive mixture with air.
Conditions to avoid	:	Heat, flames and sparks. Exposure to moisture
Incompatible materials	:	Acids Alcohols alkalis aluminum Lead sodium strong bases Strong oxidizing agents Zinc Peroxides
Hazardous decomposition products		carbon dioxide and carbon monoxide formaldehyde-like Hydrocarbons Methanol Nitrogen oxides (NOx) sulfur compounds

SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure	:	Inhalation Skin contact Eye Contact Ingestion

Acute toxicity
Toxic if swallowed, in contact with skin or if inhaled
Components:
SILANE DERIVATIVE:

Acute oral toxicity	:	LD50 (Rat, female): 3,780 mg/kg Method: OECD Test Guideline 401 Remarks: Information given is based on data obtained from similar substances.

Acute dermal toxicity	:	LD50 (Rabbit, female): 11,865 mg/kg Method: OECD Test Guideline 402 Remarks: Information given is based on data obtained from similar substances.

Components:
METHANOL:

Acute oral toxicity	:	LD L0 (Human): 300 mg/kg Assessment: The component/mixture is classified as acute oral toxicity, category 3.
Acute inhalation toxicity	:	LC 50 (Rat): 64000 ppm Exposure time: 4 h Assessment: The component/mixture is classified as acute inhalation toxicity, category 3. Remarks: Slightly toxic by inhalation
Acute dermal toxicity	:	LD 50 (Rabbit): 12,800 mg/kg Assessment: The component/mixture is classified as acute dermal toxicity, category 3.

TOLUENE:

Acute oral toxicity	:	LD 50 (Rat): > 5,000 mg/kg
Acute inhalation toxicity	:	LC 50 (Rat): 8000 ppm Exposure time: 4 h
Acute dermal toxicity	:	LD 50 (Rabbit): 12,124 mg/kg

Skin corrosion/irritation
Causes skin irritation.
Product:
Result: Repeated exposure may cause skin dryness or cracking.

Remarks: May cause skin irritation and/or dermatitis.

Components:
SILANE DERIVATIVE:
Species: Rabbit
Method: OECD Test Guideline 404
Result: Slightly irritating to skin

Components:
METHANOL:

Species: Rabbit
Result: Not irritating to skin

TOLUENE:
Result: Irritating to skin

Serious eye damage/eye irritation
Causes serious eye irritation.
Product:
Remarks: Vapours may cause irritation to the eyes, respiratory system and the skin., Causes serious eye irritation.

Components:
SILANE DERIVATIVE:
Species: Rabbit
Result: Corrosive to eyes
Method: OECD Test Guideline 405

Components:
METHANOL:
Species: Rabbit
Result: Mildly irritating to eyes

TOLUENE:
Result: Irritating to eyes

Respiratory or skin sensitisation
Skin sensitisation: Not classified based on available information.
Respiratory sensitisation: Not classified based on available information.
Components:
SILANE DERIVATIVE:
Test Type: Maximisation Test (GPMT)
Species: Guinea pig
Assessment: Did not cause sensitisation on laboratory animals.
Method: OECD Test Guideline 406

Components:
METHANOL:
Test Type: Maximisation Test (GPMT)
Species: Guinea pig
Assessment: Does not cause skin sensitisation.
Method: OECD Test Guideline 406

Germ cell mutagenicity
Not classified based on available information.
Components:
SILANE DERIVATIVE:

Genotoxicity in vitro	:	Test Type: Ames test Test species: Salmonella typhimurium Metabolic activation: with and without metabolic activation Method: OECD Test Guideline 471 Result: negative
Genotoxicity in vivo	:	Test Type: In vivo micronucleus test Test species: Mouse Cell type: peripheral blood cells Method: OECD Test Guideline 474 Result: negative

Carcinogenicity
Not classified based on available information.
Reproductive toxicity
Suspected of damaging fertility or the unborn child.
Components:
TOLUENE**:**

Reproductive toxicity - Assessment	:	Some evidence of adverse effects on sexual function and fertility, and/or on development, based on animal experiments.

STOT - single exposure
May cause drowsiness or dizziness.
Causes damage to organs (Central nervous system, Eyes).
Components:
METHANOL**:**
Target Organs: Central nervous system, Eyes
Assessment: The substance or mixture is classified as specific target organ toxicant, single exposure, category 1.

TOLUENE**:**
Exposure routes: Inhalation
Target Organs: Central nervous system
Assessment: May cause drowsiness or dizziness.

STOT - repeated exposure
May cause damage to organs (Neurologic: other (neuropsychological effects, auditory dysfunction and effects on colour vision)) through prolonged or repeated exposure if inhaled.
Components:
TOLUENE**:**
Exposure routes: Inhalation
Target Organs: Neurologic: other (neuropsychological effects, auditory dysfunction and effects on colour vision)
Assessment: May cause damage to organs through prolonged or repeated exposure.

Aspiration toxicity
May be fatal if swallowed and enters airways.

Product:
May be fatal if swallowed and enters airways.

Components:
TOLUENE**:**
May be fatal if swallowed and enters airways.

Further information
Product:
Remarks: Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting., Concentrations substantially above the TLV value may cause narcotic effects., Solvents may degrease the skin.

Components:
METHANOL**:**
Remarks: Central nervous system

Carcinogenicity:

IARC	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
OSHA	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.
NTP	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:
SILANE DERIVATIVE**:**

Toxicity to fish	:	LC50 (Oncorhynchus mykiss (rainbow trout)): 130 mg/l Exposure time: 96 h Test Type: semi-static test Method: OECD Test Guideline 203
Toxicity to daphnia and other aquatic invertebrates	:	LC 50 (Daphnia magna (Water flea)): > 100 mg/l Exposure time: 48 h Test Type: static test

Method: OECD Test Guideline 202
Remarks: Information given is based on data obtained from similar substances.

Toxicity to algae : EC50 (Desmodesmus subspicatus (green algae)): > 100 mg/l
End point: Growth inhibition
Exposure time: 72 h
Test Type: static test
Method: OECD Test Guideline 201
Remarks: Information given is based on data obtained from similar substances.

NOEC (Desmodesmus subspicatus (green algae)): 22 mg/l
End point: Growth inhibition
Exposure time: 72 h
Test Type: static test
Method: OECD Test Guideline 201
Remarks: Information given is based on data obtained from similar substances.

METHANOL:

Toxicity to fish : LC 50 (Rainbow trout,donaldson trout (Oncorhynchus mykiss)): 18,000 - 20,000 mg/l
Exposure time: 96 h
Test Type: static test

Toxicity to daphnia and other aquatic invertebrates : EC 50 (Water flea (Daphnia magna)): > 10,000 mg/l
Exposure time: 48 h
Test Type: static test

TOLUENE:

Toxicity to fish : LC50 (Oncorhynchus kisutch (coho salmon)): 5.5 mg/l
Exposure time: 96 h
Test Type: flow-through test

Toxicity to daphnia and other aquatic invertebrates : EC50 (Water flea (Ceriodaphnia dubia)): 3.78 mg/l
Exposure time: 48 h
Remarks: Mortality

Toxicity to algae : EC50 (Pseudokirchneriella subcapitata (microalgae)): > 433 mg/l
End point: Growth inhibition
Exposure time: 96 h

NOEC (Scenedesmus quadricauda (Green algae)): > 400 mg/l
End point: Growth inhibition

Exposure time: 7 d

Toxicity to fish (Chronic toxicity) : NOEC (Oncorhynchus mykiss (rainbow trout)): 1.39 mg/l
Exposure time: 40 d
Test Type: flow-through test

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Water flea (Ceriodaphnia dubia)): 0.74 mg/l
Exposure time: 7 d

Persistence and degradability

Components:

SILANE DERIVATIVE:

Biodegradability : Result: Not readily biodegradable.
Biodegradation: 17 %
Exposure time: 28 d
Method: OECD Test Guideline 301D

Stability in water : Remarks: Hydrolyses on contact with water.

METHANOL:

Biodegradability : Biodegradation: 99 %
Exposure time: 28 d
Method: OECD Test Guideline 301D

TOLUENE:

Biodegradability : Result: Readily biodegradable

Bioaccumulative potential

Components:

METHANOL:

Bioaccumulation : Species: Green algae (Chlorella fusca vacuolata)
Bioconcentration factor (BCF): 28,400
Exposure time: 24 h
Concentration: 0.05 mg/l
Method: Static

Partition coefficient: n-octanol/water : log Pow: -0.77

TOLUENE:

Bioaccumulation : Species: Ide, silver or golden orfe (Leuciscus idus)
Bioconcentration factor (BCF): 94
Exposure time: 3 d

Concentration: 0.05 mg/l
Method: Not reported

Partition coefficient: n-octanol/water : log Pow: 2.73

Mobility in soil

Components:
No data available

Other adverse effects

No data available

Product:

Additional ecological information : An environmental hazard cannot be excluded in the event of unprofessional handling or disposal., Toxic to aquatic life., Harmful to aquatic life with long lasting effects.

Components:

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

General advice : The product should not be allowed to enter drains, water courses or the soil.
Do not contaminate ponds, waterways or ditches with chemical or used container.
Send to a licensed waste management company.

Dispose of in accordance with all applicable local, state and federal regulations.

Contaminated packaging : Empty remaining contents.
Dispose of as unused product.
Empty containers should be taken to an approved waste handling site for recycling or disposal.
Do not re-use empty containers.
Do not burn, or use a cutting torch on, the empty drum.

SECTION 14. TRANSPORT INFORMATION

International transport regulations

REGULATION

ID NUMBER	PROPER SHIPPING NAME	*HAZARD CLASS	SUBSIDIARY HAZARDS	PACKING GROUP	MARINE POLLUTANT / LTD. QTY.

U.S. DOT - ROAD

UN	1133	Adhesives	3	II	

CFR_RAIL_C

UN	1133	Adhesives	3	II	

U.S. DOT - INLAND WATERWAYS

UN	1133	Adhesives	3	II	

TDG_ROAD_C

UN	1133	ADHESIVES	3	II	

TDG_RAIL_C

UN	1133	ADHESIVES	3	II	

TDG_INWT_C

UN	1133	ADHESIVES	3	II	

INTERNATIONAL MARITIME DANGEROUS GOODS

UN	1133	ADHESIVES	3	II	

INTERNATIONAL AIR TRANSPORT ASSOCIATION - CARGO

UN	1133	Adhesives	3	II	

INTERNATIONAL AIR TRANSPORT ASSOCIATION - PASSENGER

UN	1133	Adhesives	3	II	

MX_DG

UN	1133	ADHESIVOS	3	II	

***ORM = ORM-D, CBL = COMBUSTIBLE LIQUID**

Marine pollutant		no

Dangerous goods descriptions (if indicated above) may not reflect quantity, end-use or region-specific exceptions that can be applied. Consult shipping documents for descriptions that are specific to the shipment.

SECTION 15. REGULATORY INFORMATION

EPCRA - Emergency Planning and Community Right-to-Know Act

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
TOLUENE	108-88-3	1000	2041.17874

SARA 311/312 Hazards : Acute Health Hazard
Chronic Health Hazard
Fire Hazard

SARA 313 Component(s)

METHANOL	67-56-1	49.01 %
TOLUENE	108-88-3	48.99 %

California Prop 65

WARNING! This product contains a chemical known to the State of California to cause cancer.

ETHYL BENZENE	100-41-4
BENZENE	71-43-2

WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

METHANOL	67-56-1
TOLUENE	108-88-3
BENZENE	71-43-2

The components of this product are reported in the following inventories:

TSCA : On TSCA Inventory

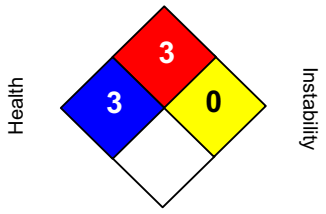
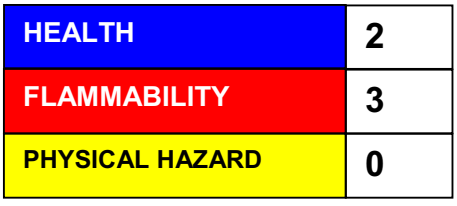
DSL	:	This product contains the following components listed on the Canadian NDSL. All other components are on the Canadian DSL.
AUSTR	:	Not in compliance with the inventory
NZIOC	:	Not in compliance with the inventory
ENCS	:	Not in compliance with the inventory
KECL	:	On the inventory, or in compliance with the inventory
PICCS	:	On the inventory, or in compliance with the inventory
IECSC	:	On the inventory, or in compliance with the inventory

Inventories
AICS (Australia), DSL (Canada), IECSC (China), REACH (European Union), ENCS (Japan), ISHL (Japan), KECI (Korea), NZIoC (New Zealand), PICCS (Philippines), TSCA (USA)
Registration: Trade Secret

Chemical Name	Identification number
SILANE DERIVATIVE	254504001-5597

SECTION 16. OTHER INFORMATION

Further information
Revision Date: 11/07/2016

NFPA:	HMIS III:
	 0 = not significant, 1 =Slight, 2 = Moderate, 3 = High 4 = Extreme, * = Chronic

NFPA Flammable and Combustible Liquids Classification
Flammable Liquid Class IB

Full text of H-Statements referred to under sections 2 and 3.

H225	Highly flammable liquid and vapor.
H301	Toxic if swallowed.
H304	May be fatal if swallowed and enters airways.
H311	Toxic in contact with skin.
H315	Causes skin irritation.
H318	Causes serious eye damage.
H319	Causes serious eye irritation.
H331	Toxic if inhaled.
H336	May cause drowsiness or dizziness.
H361	Suspected of damaging fertility or the unborn child.

Sources of key data used to compile the Safety Data Sheet
Ashland internal data including own and sponsored test reports
The UNECE administers regional agreements implementing harmonised classification for labelling (GHS) and transport.

The information accumulated herein is believed to be accurate but is not warranted to be whether originating with the company or not. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances. This SDS has been prepared by Ashland's Environmental Health and Safety Department (1-800-325-3751).

List of abbreviations and acronyms that could be, but not necessarily are, used in this safety data sheet :
ACGIH : American Conference of Industrial Hygienists
BEI : Biological Exposure Index
CAS : Chemical Abstracts Service (Division of the American Chemical Society).
CMR : Carcinogenic, Mutagenic or Toxic for Reproduction
FG : Food grade
GHS : Globally Harmonized System of Classification and Labeling of Chemicals.
H-statement : Hazard Statement
IATA : International Air Transport Association.
IATA-DGR : Dangerous Goods Regulation by the “International Air Transport Association” (IATA).

ICAO : International Civil Aviation Organization
ICAO-TI (ICAO) : Technical Instructions by the “International Civil Aviation Organization”
IMDG : International Maritime Code for Dangerous Goods
ISO : International Organization for Standardization
logPow : octanol-water partition coefficient

LCxx : Lethal Concentration, for xx percent of test population
LDxx : Lethal Dose, for xx percent of test population.
ICxx : Inhibitory Concentration for xx of a substance
Ecxx : Effective Concentration of xx
N.O.S.: Not Otherwise Specified
OECD : Organization for Economic Co-operation and Development
OEL : Occupational Exposure Limit
P-Statement : Precautionary Statement
PBT : Persistent , Bioaccumulative and Toxic
PPE : Personal Protective Equipment
STEL : Short-term exposure limit
STOT : Specific Target Organ Toxicity
TLV : Threshold Limit Value
TWA : Time-weighted average
vPvB : Very Persistent and Very Bioaccumulative
WEL : Workplace Exposure Level

CERCLA : Comprehensive Environmental Response, Compensation, and Liability Act
DOT : Department of Transportation
FIFRA : Federal Insecticide, Fungicide, and Rodenticide Act
HMIRC : Hazardous Materials Information Review Commission
HMIS : Hazardous Materials Identification System
NFPA : National Fire Protection Association
NIOSH : National Institute for Occupational Safety and Health
OSHA : Occupational Safety and Health Administration
PMRA : Health Canada Pest Management Regulatory Agency
RTK : Right to Know
WHMIS : Workplace Hazardous Materials Information System

SAFETY DATA SHEET

1. Identification

Product identifier	**Isopropyl Alcohol 99%**
Other means of identification	
SDS Number	320817-02
Recommended use	For industrial and manufacturing use only.
Recommended restrictions	None known.
Manufacturer/Importer/Supplier/Distributor information	
Company name	Harcros Chemicals Inc
Address	5200 Speaker Rd. Kansas City, KS 66106 United States
Main Telephone Number	1-913-321-3131
Website	www.harcros.com
E-mail	custserv@harcros.com
Emergency #: CHEMTREC	1-800-424-9300
Emergency #: CHEMTREC	1-703-741-5970 (International Number - Call collect)

2. Hazard(s) identification

Physical hazards	Flammable liquids	Category 3
Health hazards	Serious eye damage/eye irritation	Category 2A
	Specific target organ toxicity, single exposure	Category 3 narcotic effects
Environmental hazards	Not classified.	
OSHA defined hazards	Not classified.	

Label elements

Signal word	Warning
Hazard statement	Flammable liquid and vapor. Causes serious eye irritation. May cause drowsiness or dizziness.
Precautionary statement	
Prevention	Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Keep container tightly closed. Ground/bond container and receiving equipment. Use explosion-proof electrical/ventilating/lighting equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Wash thoroughly after handling. Use only outdoors or in a well-ventilated area. Wear protective gloves/eye protection/face protection.
Response	If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. If inhaled: Remove person to fresh air and keep comfortable for breathing. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a poison center/doctor if you feel unwell. If eye irritation persists: Get medical advice/attention. In case of fire: Use appropriate media to extinguish.
Storage	Store away from incompatible materials. Store in a well-ventilated place. Keep container tightly closed. Store locked up. Store in accordance with local/regional/national/international regulations.
Disposal	Dispose of contents/container in accordance with local/regional/national/international regulations.
Hazard(s) not otherwise classified (HNOC)	None known.
Supplemental information	99.5% of the mixture consists of component(s) of unknown acute inhalation toxicity. 99.5% of the mixture consists of component(s) of unknown acute hazards to the aquatic environment. 99.5% of the mixture consists of component(s) of unknown long-term hazards to the aquatic environment.

3. Composition/information on ingredients

Mixtures

Chemical name	Common name and synonyms	CAS number	%
Isopropanol		67-63-0	90 - 100
Other components below reportable levels			< 1

4. First-aid measures

Inhalation Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a poison center or doctor/physician if you feel unwell.

Skin contact Take off immediately all contaminated clothing. Rinse skin with water/shower. Get medical attention if irritation develops and persists.

Eye contact Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists.

Ingestion Rinse mouth. Get medical attention if symptoms occur.

Most important symptoms/effects, acute and delayed May cause drowsiness and dizziness. Headache. Nausea, vomiting. Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision.

Indication of immediate medical attention and special treatment needed Provide general supportive measures and treat symptomatically. Thermal burns: Flush with water immediately. While flushing, remove clothes which do not adhere to affected area. Call an ambulance. Continue flushing during transport to hospital. Keep victim under observation. Symptoms may be delayed.

General information Take off all contaminated clothing immediately. Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Wash contaminated clothing before reuse.

5. Fire-fighting measures

Suitable extinguishing media Alcohol resistant foam. Dry chemical powder. Carbon dioxide (CO2).

Unsuitable extinguishing media Do not use water jet as an extinguisher, as this will spread the fire.

Specific hazards arising from the chemical Vapors may form explosive mixtures with air. Vapors may travel considerable distance to a source of ignition and flash back. During fire, gases hazardous to health may be formed.

Special protective equipment and precautions for firefighters Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

Fire fighting equipment/instructions In case of fire and/or explosion do not breathe fumes. Move containers from fire area if you can do so without risk.

Specific methods Use standard firefighting procedures and consider the hazards of other involved materials.

General fire hazards Flammable liquid and vapor.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Wear appropriate protective equipment and clothing during clean-up. Avoid breathing mist/vapors. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ventilate closed spaces before entering them. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.

Methods and materials for containment and cleaning up Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Keep combustibles (wood, paper, oil, etc.) away from spilled material. Take precautionary measures against static discharge. Use only non-sparking tools. This product is miscible in water.

Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Following product recovery, flush area with water.

Small Spills: Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal. Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.

Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.

Environmental precautions Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling

Do not handle, store or open near an open flame, sources of heat or sources of ignition. Protect material from direct sunlight. When using do not smoke. Explosion-proof general and local exhaust ventilation. Take precautionary measures against static discharges. All equipment used when handling the product must be grounded. Use non-sparking tools and explosion-proof equipment. Avoid breathing mist/vapors. Avoid contact with eyes. Avoid prolonged exposure. Wear appropriate personal protective equipment. Observe good industrial hygiene practices.

Conditions for safe storage, including any incompatibilities

Store locked up. Keep away from heat, sparks and open flame. Prevent electrostatic charge build-up by using common bonding and grounding techniques. Store in a cool, dry place out of direct sunlight. Store in tightly closed container. Store in a well-ventilated place. Keep in an area equipped with sprinklers. Store away from incompatible materials (see Section 10 of the SDS).

8. Exposure controls/personal protection

Occupational exposure limits

The following constituents are the only constituents of the product which have a PEL, TLV or other recommended exposure limit. At this time, the other constituents have no known exposure limits.

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Material	Type	Value
Isopropyl Alcohol 99%	PEL	980 mg/m3
		400 ppm
Components	**Type**	**Value**
Isopropanol (CAS 67-63-0)	PEL	980 mg/m3
		400 ppm

US. ACGIH Threshold Limit Values

Material	Type	Value
Isopropyl Alcohol 99%	STEL	400 ppm
	TWA	200 ppm
Components	**Type**	**Value**
Isopropanol (CAS 67-63-0)	STEL	400 ppm
	TWA	200 ppm

US. NIOSH: Pocket Guide to Chemical Hazards

Material	Type	Value
Isopropyl Alcohol 99%	STEL	1225 mg/m3
		500 ppm
	TWA	980 mg/m3
		400 ppm
Components	**Type**	**Value**
Isopropanol (CAS 67-63-0)	STEL	1225 mg/m3
		500 ppm
	TWA	980 mg/m3
		400 ppm

Biological limit values

ACGIH Biological Exposure Indices

Material	Value	Determinant	Specimen	Sampling Time
Isopropyl Alcohol 99%	40 mg/l	Acetone	Urine	*
Components	**Value**	**Determinant**	**Specimen**	**Sampling Time**
Isopropanol (CAS 67-63-0)	40 mg/l	Acetone	Urine	*

* - For sampling details, please see the source document.

Appropriate engineering controls	Explosion-proof general and local exhaust ventilation. Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Provide eyewash station. It is recommended that users of this product perform a risk assessment to determine the appropriate PPE.

Individual protection measures, such as personal protective equipment

Eye/face protection	Do not get in eyes. Chemical respirator with organic vapor cartridge and full facepiece. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.
Skin protection	
Hand protection	Wear appropriate chemical resistant gloves.
Other	Wear appropriate chemical resistant clothing.
Respiratory protection	Chemical respirator with organic vapor cartridge and full facepiece.
Thermal hazards	Wear appropriate thermal protective clothing, when necessary.
General hygiene considerations	When using do not smoke. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance	Clear.
Physical state	Liquid.
Form	Liquid.
Color	Colorless.
Odor	Alcohol.
Odor threshold	Not available.
pH	Not available.
Melting point/freezing point	-127.3 °F (-88.5 °C)
Initial boiling point and boiling range	180.5 °F (82.5 °C) @ 101.325 kPa
Flash point	75.0 °F (23.9 °C) Open Cup
Evaporation rate	Not available.
Flammability (solid, gas)	Not applicable.

Upper/lower flammability or explosive limits

Flammability limit - lower (%)	Not available.
Flammability limit - upper (%)	Not available.
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	6.05 kPa @ 25°C
Vapor density	2.1
Relative density	Not available.
Solubility(ies)	
Solubility (water)	Miscible
Partition coefficient (n-octanol/water)	0.05
Auto-ignition temperature	750.2 °F (399 °C)
Decomposition temperature	Not available.
Viscosity	Not available.
Other information	
Density	0.78 - 0.79 g/cm³ @ 20°C
Dynamic viscosity	2.1 mPa.s
Dynamic viscosity temperature	77 °F (25 °C)

Explosive properties	Not explosive.
Heat of combustion (NFPA 30B)	27.4 kJ/g
Molecular formula	C3-H8-O
Molecular weight	60.1 g/mol
Oxidizing properties	Not oxidizing.
Percent volatile	100 %
Specific gravity	0.78 - 0.79 @ 20°C
VOC	100 %

10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	Hazardous polymerization does not occur.
Conditions to avoid	Avoid heat, sparks, open flames and other ignition sources. Avoid temperatures exceeding the flash point. Contact with incompatible materials.
Incompatible materials	Acids. Strong oxidizing agents. Chlorine. Isocyanates.
Hazardous decomposition products	Carbon oxides.

11. Toxicological information

Information on likely routes of exposure

Inhalation	May cause drowsiness and dizziness. Headache. Nausea, vomiting. Prolonged inhalation may be harmful.
Skin contact	No adverse effects due to skin contact are expected.
Eye contact	Causes serious eye irritation.
Ingestion	Expected to be a low ingestion hazard.
Symptoms related to the physical, chemical and toxicological characteristics	May cause drowsiness and dizziness. Headache. Nausea, vomiting. Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision.

Information on toxicological effects

Acute toxicity Not known.

Components	Species	Test Results
Isopropanol (CAS 67-63-0)		
Acute		
Dermal		
LD50	Rabbit	12800 mg/kg
Oral		
LD50	Rat	4.7 g/kg

* Estimates for product may be based on additional component data not shown.

Skin corrosion/irritation	Due to partial or complete lack of data the classification is not possible.
Serious eye damage/eye irritation	Causes serious eye irritation.

Respiratory or skin sensitization

Respiratory sensitization	Due to partial or complete lack of data the classification is not possible.
Skin sensitization	Due to partial or complete lack of data the classification is not possible.
Germ cell mutagenicity	Due to partial or complete lack of data the classification is not possible.
Carcinogenicity	Due to partial or complete lack of data the classification is not possible.

IARC Monographs. Overall Evaluation of Carcinogenicity

Not listed.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053)

Not listed.

US. National Toxicology Program (NTP) Report on Carcinogens

Not listed.

Reproductive toxicity Due to partial or complete lack of data the classification is not possible.

Specific target organ toxicity - single exposure May cause drowsiness and dizziness.

Specific target organ toxicity - repeated exposure Due to partial or complete lack of data the classification is not possible.

Aspiration hazard Due to partial or complete lack of data the classification is not possible.

Chronic effects Prolonged inhalation may be harmful.

12. Ecological information

Ecotoxicity The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Product		Species	Test Results
Isopropyl Alcohol 99%			
Aquatic			
Fish	LC50	Fish	6221.1055 mg/l, 96 hours estimated

Components		Species	Test Results
Isopropanol (CAS 67-63-0)			
Aquatic			
Fish	LC50	Bluegill (Lepomis macrochirus)	> 1400 mg/l, 96 hours

* Estimates for product may be based on additional component data not shown.

Persistence and degradability No data is available on the degradability of this product.

Bioaccumulative potential

Partition coefficient n-octanol / water (log Kow)

Isopropyl Alcohol 99%	0.05
Isopropanol	0.05

Mobility in soil No data available.

Other adverse effects The product contains volatile organic compounds which have a photochemical ozone creation potential.

13. Disposal considerations

Disposal instructions Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Incinerate the material under controlled conditions in an approved incinerator. Do not incinerate sealed containers. If discarded, this product is considered a RCRA ignitable waste, D001. Dispose of contents/container in accordance with local/regional/national/international regulations.

Local disposal regulations Dispose in accordance with all applicable regulations.

Hazardous waste code D001: Waste Flammable material with a flash point <140 F
The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

Waste from residues / unused products Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

Contaminated packaging Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

DOT

UN number UN1219
UN proper shipping name Isopropanol
Transport hazard class(es)
Class 3
Subsidiary risk -
Label(s) 3
Packing group II
Special precautions for user Read safety instructions, SDS and emergency procedures before handling.

Special provisions	IB2, T4, TP1
Packaging exceptions	4b, 150
Packaging non bulk	202
Packaging bulk	242

Reportable Quantity for Isopropanol = 100 lbs.

IATA

UN number	UN1219
UN proper shipping name	Isopropanol
Transport hazard class(es)	
Class	3
Subsidiary risk	-
Packing group	II
Environmental hazards	No.
ERG Code	3L
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.
Other information	
Passenger and cargo aircraft	Allowed with restrictions.
Cargo aircraft only	Allowed with restrictions.

IMDG

UN number	UN1219
UN proper shipping name	ISOPROPANOL
Transport hazard class(es)	
Class	3
Subsidiary risk	-
Packing group	II
Environmental hazards	
Marine pollutant	No.
EmS	F-E, S-D
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

(Flash Point = 12.0°C c.c.)

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not established.

DOT

IATA; IMDG

15. Regulatory information

US federal regulations

All components are on the U.S. EPA TSCA Inventory List.
This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Toxic Substances Control Act (TSCA)

All components of the mixture on the TSCA 8(b) inventory are designated "active".

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Isopropanol (CAS 67-63-0) Listed.

SARA 304 Emergency release notification

Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053)

Not listed.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical Yes

Classified hazard categories
Flammable (gases, aerosols, liquids, or solids)
Serious eye damage or eye irritation
Specific target organ toxicity (single or repeated exposure)

SARA 313 (TRI reporting)

Chemical name	CAS number	% by wt.
Isopropanol	67-63-0	90 - 100

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA) Not regulated.

FEMA Priority Substances Respiratory Health and Safety in the Flavor Manufacturing Workplace

Isopropanol (CAS 67-63-0) Low priority

US state regulations

California Proposition 65

California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins. For more information go to www.P65Warnings.ca.gov.

US. California. Candidate Chemicals List. Safer Consumer Products Regulations (Cal. Code Regs, tit. 22, 69502.3, subd. (a))

Isopropanol (CAS 67-63-0)

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes

Country(s) or region	Inventory name	On inventory (yes/no)*
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
Taiwan	Taiwan Chemical Substance Inventory (TCSI)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision

Issue date 05-18-2015

Revision date 03-12-2019

Version # 03

HMIS® ratings Health: 2
Flammability: 3
Physical hazard: 0

NFPA ratings Health: 2
Flammability: 3
Instability: 0

Disclaimer The information provided in this Safety Data Sheet has been obtained from sources believed to be reliable. Harcros Chemicals Inc., provides no warranties, either expressed or implied and assumes no responsibility for the accuracy or completeness of the data contained herein. This information is offered for your information, consideration, and investigation. You should satisfy yourself that you have all current data relevant to your particular use. Harcros Chemicals Inc., knows of no medical condition, other than those noted on this Safety Data Sheet, which are generally recognized as being aggravated by exposure to this product.

Revision information This document has undergone significant changes and should be reviewed in its entirety.

29 CFR 1910.1200 (OSHA HazCom 2012)

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product identifier

Trade name : Pliogrip™ 7400 ADHESIVE
™ Trademark, Bostik or its subsidiaries, registered in various countries

Relevant identified uses of the substance or mixture and uses advised against

Recommended use : Adhesives

Details of the supplier of the safety data sheet Bostik, Inc. 11320 W Watertown Plank Road Wauwatosa, WI 53226 United States of America (USA) +1 (800) 843-0844 (Domestic Toll Free); +1 (414) 774-2250 (International) EHSproductsafety.US@bostik.com	**Emergency telephone number** Chemtrec 1-800-424-9300, outside US 1-703-527-3887 **Regulatory information** Rocky Mountain Poison center: 1-866-767-5089

SECTION 2. HAZARDS IDENTIFICATION

GHS Classification

Acute toxicity (Inhalation)	:	Category 4
Skin irritation	:	Category 2
Eye irritation	:	Category 2A
Respiratory sensitization	:	Category 1
Skin sensitization	:	Category 1
Specific target organ toxicity - single exposure	:	Category 3 (Respiratory system)
Specific target organ toxicity - repeated exposure	:	Category 2 (Respiratory system, Respiratory Tract)

(Inhalation)

GHS label elements

Hazard pictograms :

Signal Word : Danger

Hazard Statements : Causes skin irritation.
May cause an allergic skin reaction.
Causes serious eye irritation.
Harmful if inhaled.
May cause allergy or asthma symptoms or breathing difficulties if inhaled.
May cause respiratory irritation.
May cause damage to organs (Respiratory system, Respiratory Tract) through prolonged or repeated exposure if inhaled.

Precautionary Statements : If medical advice is needed, have product container or label at hand.
Keep out of reach of children.
Read label before use.
Prevention:
Do not breathe mist or vapors.
Wash skin thoroughly after handling.
Use only outdoors or in a well-ventilated area.
Contaminated work clothing must not be allowed out of the workplace.
Wear protective gloves/ eye protection/ face protection.
In case of inadequate ventilation wear respiratory protection.
Response:
IF ON SKIN: Wash with plenty of soap and water.
IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor if you feel unwell.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If skin irritation or rash occurs: Get medical advice/ attention.
If eye irritation persists: Get medical advice/ attention.
If experiencing respiratory symptoms: Call a POISON CENTER/ doctor.
Take off contaminated clothing and wash before reuse.
Storage:
Store in a well-ventilated place. Keep container tightly closed.

Store locked up.
Disposal:
Dispose of contents/ container to an approved waste disposal plant.

Other hazards

The following percentage of the mixture consists of ingredient(s) with unknown acute inhalation toxicity: 7.3084 %

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Hazardous components

Chemical name	CAS-No.	Classification	Concentration (%)
POLYMER	254504001-5759	Acute Tox. 4; H332 Skin Irrit. 2; H315 Eye Irrit. 2A; H319 Resp. Sens. 1A; H334 Skin Sens. 1A; H317 STOT SE 3; H335 STOT RE 2; H373	>= 10.00 - < 15.00
ALUMINUM SILICATES	254504001-5709	This material is not considered hazardous under the OSHA Hazard Communication Standard (HazCom 2012).	>= 10.00 - < 15.00
URETHANE PREPOLYMER	800986-5572P	Resp. Sens. 1; H334 Skin Sens. 1; H317	>= 5.00 - < 10.00

The identity and concentration of one or more component(s) is being withheld under business confidentiality.

4,4'-DIPHENYLMETHANE DIISOCYANATE	101-68-8	Comb Dust Acute Tox. 4; H332 Skin Irrit. 2; H315 Eye Irrit. 2A; H319 Resp. Sens. 1; H334 Skin Sens. 1; H317 STOT SE 3; H335 STOT RE 2; H373	35.5153
TALC	14807-96-6	Not a hazardous substance or mixture.	10.224
PROPYLENE CARBONATE	108-32-7	Eye Irrit. 2A; H319	1.4964

SECTION 4. FIRST AID MEASURES

General advice : Move out of dangerous area.
Call a POISON CENTRE or doctor/physician if exposed or you feel unwell.
Show this safety data sheet to the doctor in attendance.
Do not leave the victim unattended.

If inhaled : Move to fresh air.
Call a physician or poison control centre immediately.
Keep patient warm and at rest.
If unconscious, place in recovery position and seek medical advice.

In case of skin contact : Remove contaminated clothing. If irritation develops, get medical attention.
If on skin, rinse well with water.
Wash contaminated clothing before re-use.

In case of eye contact : Immediately flush eye(s) with plenty of water.
Remove contact lenses.
Protect unharmed eye.

If swallowed	:	Obtain medical attention. Do not give milk or alcoholic beverages. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician.
Most important symptoms and effects, both acute and delayed	:	Signs and symptoms of exposure to this material through breathing, swallowing, and/or passage of the material through the skin may include: stomach or intestinal upset (nausea, vomiting, diarrhea) irritation (nose, throat, airways) Cough Headache chest pain lung edema (fluid buildup in the lung tissue) Difficulty in breathing Pulmonary edema may be delayed. Causes skin irritation. May cause an allergic skin reaction. Causes serious eye irritation. Harmful if inhaled. May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause respiratory irritation. May cause damage to organs through prolonged or repeated exposure if inhaled.
Notes to physician	:	No hazards which require special first aid measures.

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Water spray Foam Carbon dioxide (CO2) Dry chemical
Unsuitable extinguishing media	:	High volume water jet
Specific hazards during firefighting	:	If product is heated above its flash point it will produce vapors sufficient to support combustion. Vapors are heavier than air and may travel along the ground and be ignited by heat, pilot lights, other flames and ignition sources at locations near the point of release.

Do not allow run-off from fire fighting to enter drains or water courses.

Hazardous combustion products : Carbon dioxide (CO2)
Carbon monoxide
Nitrogen oxides (NOx)
Hydrogen cyanide (hydrocyanic acid)
Isocyanates
Hydrocarbons

Specific extinguishing methods :

Product is compatible with standard fire-fighting agents.

Further information : Standard procedure for chemical fires.

Special protective equipment for firefighters : In the event of fire, wear self-contained breathing apparatus.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures : Use personal protective equipment.
Ensure adequate ventilation.
Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed.

Environmental precautions : Prevent product from entering drains.
Prevent further leakage or spillage if safe to do so.
If the product contaminates rivers and lakes or drains inform respective authorities.

Methods and materials for containment and cleaning up : Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).
Keep in suitable, closed containers for disposal.

Other information : Comply with all applicable federal, state, and local regulations.

SECTION 7. HANDLING AND STORAGE

Advice on protection against fire and explosion : Normal measures for preventive fire protection.

Advice on safe handling : Avoid formation of aerosol.

Provide sufficient air exchange and/or exhaust in work rooms.
Do not breathe vapours/dust.
Do not smoke.
Persons susceptible to skin sensitisation problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used.
Container hazardous when empty.
Avoid exposure - obtain special instructions before use.
Avoid contact with skin and eyes.
Smoking, eating and drinking should be prohibited in the application area.
For personal protection see section 8.
Dispose of rinse water in accordance with local and national regulations.

Conditions for safe storage : Keep container tightly closed in a dry and well-ventilated place.
Observe label precautions.

Materials to avoid : Keep away from oxidizing agents, strongly acid or alkaline materials, as well as of amines, alcohols and water.
For incompatible materials see section 10.

Further information on storage stability : No decomposition if stored and applied as directed.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
ALUMINUM SILICATES	254504001-5709	TWA	1 mg/m3 Respirable particulate matter (Aluminium)	ACGIH

The identity and concentration of one or more component(s) is being withheld under business confidentiality.

4,4'-DIPHENYLMETHANE DIISOCYANATE	101-68-8	TWA	0.005 ppm	ACGIH
TALC	14807-96-6	TWA	20 Million particles per cubic foot	OSHA Z-3

			Dust	
		TWA	2 mg/m3 respirable dust fraction	OSHA P0
		TWA	2 mg/m3 Respirable	NIOSH REL
		PEL	2 mg/m3 Respirable dust	CAL PEL
		TWA	2 mg/m3 Respirable particulate matter	ACGIH

Hazardous components without workplace control parameters

Components	CAS-No.
POLYMER	254504001-5759
URETHANE PREPOLYMER	800986-5572P
PROPYLENE CARBONATE	108-32-7

Engineering measures : Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure below exposure guidelines (if applicable) or below levels that cause known, suspected or apparent adverse effects.

Personal protective equipment

Respiratory protection : Wear a positive-pressure supplied-air respirator with full facepiece.

Hand protection
- Material : butyl-rubber
- Break through time : 480 min
- Glove thickness : > 0.5 mm

Remarks : The exact break through time can be obtained from the protective glove producer and this has to be observed. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.

Eye protection : Wear chemical splash goggles when there is the potential for exposure of the eyes to liquid, vapor or mist.

Skin and body protection : Wear as appropriate:
Impervious clothing
Safety shoes
Choose body protection according to the amount and concentration of the dangerous substance at the work place.
Discard gloves that show tears, pinholes, or signs of wear.

		Wear resistant gloves (consult your safety equipment supplier).
Hygiene measures	:	Wash hands before breaks and at the end of workday. When using do not eat or drink. When using do not smoke.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	viscous
Physical state	:	liquid
Colour	:	beige
Odour	:	mild, musty
Odour Threshold	:	No data available
pH	:	substance/mixture is non-soluble (in water)
Melting point/freezing point	:	not determined
Boiling point/boiling range	:	> 392 °F / > 200 °C
Flash point	:	> 100 °C
Evaporation rate	:	< 1 n-Butyl Acetate = 1
Flammability (solid, gas)	:	
		not determined
Flammability (liquids)	:	not determined
Flammability (liquids)	:	
Upper explosion limit	:	Upper explosion limit not determined
Lower explosion limit	:	Lower explosion limit not determined
Vapour pressure	:	< 0.01333 hPa (25 °C)
Relative vapour density	:	> 1(Air = 1.0)

Relative density	:	No data available
Density	:	1.288 g/cm3 (20 °C)
Solubility(ies)		
Water solubility	:	practically insoluble
Solubility in other solvents	:	No data available
Partition coefficient: n-octanol/water	:	not determined
Auto-ignition temperature	:	No data available
Thermal decomposition	:	No data available
Viscosity		
Viscosity, dynamic	:	ca. 20,000 mPa.s
Viscosity, kinematic	:	not determined
Oxidizing properties	:	Not applicable
Molecular weight	:	No data available

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	No decomposition if stored and applied as directed.
Chemical stability	:	Stable under recommended storage conditions.
Possibility of hazardous reactions	:	Product will not undergo hazardous polymerization.
Conditions to avoid	:	Freezing temperatures. Exposure to moisture
Incompatible materials	:	Acids Alcohols aluminum Amines Ammonia Bases Copper alloys

	fluorides Iron Oxidizing agents strong alkalis strong reducing agents water Zinc Humid air
Hazardous decomposition products	Carbon monoxide Carbon dioxide (CO2) Nitrogen oxides (NOx) Hydrocarbons Acetone

SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure : Inhalation
Skin contact
Eye contact
Ingestion

Acute toxicity
Harmful if inhaled.
Components:
POLYMER**:**

Acute oral toxicity	:	LD50 (Rat): > 5,000 mg/kg Method: OECD Test Guideline 425 GLP: yes
Acute inhalation toxicity	:	Symptoms: Increased heart rate, Rapid respiration, Drowsiness, Headache, Nausea, Vomiting Assessment: The component/mixture is classified as acute inhalation toxicity, category 4.
Acute dermal toxicity	:	(Rabbit): > 9,400 mg/kg Remarks: Information given is based on data obtained from similar substances.

URETHANE PREPOLYMER**:**

Acute inhalation toxicity	:	Assessment: Toxic effects cannot be excluded

Components:

4,4'-DIPHENYLMETHANE DIISOCYANATE**:**

Acute oral toxicity	:	LD50 (Rat): 9,200 mg/kg
Acute inhalation toxicity	:	LC50 (Rat): > 2.24 mg/l Exposure time: 1 h Test atmosphere: dust/mist Method: OECD Test Guideline 403 Assessment: The component/mixture is classified as acute inhalation toxicity, category 4.
Acute dermal toxicity	:	LD50 (Rabbit): > 7,900 mg/kg Symptoms: Redness, Swelling of tissue, Itching, Blistering, Pain

TALC**:**

Acute oral toxicity	:	LD50 (Rat): > 5,000 mg/kg Method: OECD Test Guideline 423

PROPYLENE CARBONATE**:**

Acute oral toxicity	:	LD50 (Rat): 29.1 g/kg
Acute inhalation toxicity	:	Assessment: Toxic effects cannot be excluded
Acute dermal toxicity	:	LD50 (Rabbit): > 24 g/kg

Skin corrosion/irritation
Causes skin irritation.
Product:
Remarks: May cause skin irritation and/or dermatitis.

Components:
POLYMER**:**
Result: Irritating to skin.
Remarks: Information given is based on data obtained from similar substances.

ALUMINUM SILICATES**:**
Result: Slight, transient irritation

URETHANE PREPOLYMER**:**
Result: No skin irritation

Components:
4,4'-DIPHENYLMETHANE DIISOCYANATE**:**
Result: Irritating to skin.

TALC**:**

Species: reconstructed human epidermis (RhE)
Result: No skin irritation

PROPYLENE CARBONATE**:**
Species: Rabbit
Method: OECD Test Guideline 404
Result: No skin irritation

Serious eye damage/eye irritation
Causes serious eye irritation.
Product:
Remarks: Vapours may cause irritation to the eyes, respiratory system and the skin., Causes serious eye irritation.

Components:
POLYMER**:**
Result: Irritating to eyes.

ALUMINUM SILICATES**:**
Result: Slight, transient irritation

URETHANE PREPOLYMER**:**
Result: No eye irritation

Components:
4,4'-DIPHENYLMETHANE DIISOCYANATE**:**
Result: Irritating to eyes.

TALC**:**
Species: Rabbit
Result: Slight, transient irritation
Method: OECD Test Guideline 405

PROPYLENE CARBONATE**:**
Species: Rabbit
Result: Irritating to eyes.
Method: OECD Test Guideline 405

Respiratory or skin sensitisation
Skin sensitisation: May cause an allergic skin reaction.
Respiratory sensitisation: May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Components:
POLYMER**:**
Test Type: Maximisation Test
Species: Guinea pig
Assessment: May cause sensitisation by skin contact.
Result: The product is a skin sensitiser, sub-category 1A.

Assessment: May cause sensitisation by inhalation.
Result: The product is a respiratory sensitiser, sub-category 1A.

URETHANE PREPOLYMER**:**
Assessment: May cause sensitisation by skin contact.

Assessment: May cause sensitisation by inhalation.

Components:
4,4'-DIPHENYLMETHANE DIISOCYANATE**:**
Assessment: May cause sensitisation by inhalation.

Assessment: May cause sensitisation by skin contact.

TALC**:**
Test Type: Maximisation Test
Species: Guinea pig
Assessment: Did not cause sensitisation on laboratory animals.
Method: OECD Test Guideline 406

Germ cell mutagenicity
Not classified based on available information.
Components:
POLYMER**:**
Genotoxicity in vitro : Test Type: Ames test
Result: negative
Remarks: Information given is based on data obtained from similar substances.

Genotoxicity in vivo : Test Type: In vivo micronucleus test
Test species: Rat
Method: OECD Test Guideline 474
Remarks: Information given is based on data obtained from similar substances.

Components:
TALC**:**
Genotoxicity in vitro : Test Type: In vitro gene mutation study in bacteria
Test species: Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Result: negative

: Test Type: In vitro gene mutation study in bacteria
Test species: Saccharomyces cerevisiae
Metabolic activation: with and without metabolic activation

Result: negative

Genotoxicity in vivo : Test Type: dominant lethal test
Test species: Rat (male)
Cell type: Bone marrow
Result: negative

PROPYLENE CARBONATE**:**
Genotoxicity in vitro : Test Type: Ames test
Test species: Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

Genotoxicity in vivo : Test Type: Micronucleus test
Test species: Mouse
Cell type: Bone marrow
Method: OECD Test Guideline 474
Result: negative

Carcinogenicity
Not classified based on available information.
Product:
Carcinogenicity - Assessment : Methylene bisphenylisocyanate (MDI) aerosol has been reported to be irritating to lungs at a concentration of 1 mg/m3 with no effect observed at 0.2 mg/m3. Although MDI has been reported to cause an increase in non-carcinogenic lung tumors and a single carcinogenic lung tumor at very high concentrations (6 mg/m3), it is not classified as a carcinogen by IARC, NTP or OSHA.

Reproductive toxicity
Not classified based on available information.
STOT - single exposure
May cause respiratory irritation.
Components:
POLYMER**:**
Exposure routes: Inhalation
Target Organs: Respiratory Tract
Assessment: May cause respiratory irritation.

Components:
4,4'-DIPHENYLMETHANE DIISOCYANATE**:**
Exposure routes: Inhalation
Target Organs: Respiratory system
Assessment: May cause respiratory irritation.

STOT - repeated exposure

May cause damage to organs (Respiratory system, Respiratory Tract) through prolonged or repeated exposure if inhaled.

Components:
POLYMER**:**
Exposure routes: Inhalation
Target Organs: Respiratory Tract
Assessment: May cause damage to organs through prolonged or repeated exposure.

Components:
4,4'-DIPHENYLMETHANE DIISOCYANATE**:**
Exposure routes: Inhalation
Target Organs: Respiratory system
Assessment: May cause damage to organs through prolonged or repeated exposure.

Aspiration toxicity
Not classified based on available information.
Further information
Product:
Remarks: No data available

Carcinogenicity:

IARC	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
OSHA	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.
NTP	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity
Product:
Ecotoxicology Assessment

Short-term (acute) aquatic hazard	:	Not classified based on available information.
Long-term (chronic) aquatic hazard	:	Not classified based on available information.

Components:
POLYMER**:**

Toxicity to fish	:	LC50 (Oryzias latipes (Japanese medaka)): > 3,000 mg/l Exposure time: 96 h Test Type: semi-static test Remarks: Information given is based on data obtained from similar substances.
Toxicity to daphnia and other aquatic invertebrates	:	(Daphnia magna (Water flea)): > 1,000 mg/l Exposure time: 24 h Test Type: static test Method: OECD Test Guideline 202 Remarks: Information given is based on data obtained from similar substances.
Toxicity to algae	:	NOEC (Desmodesmus subspicatus (green algae)): 1,640 mg/l End point: Growth inhibition Exposure time: 72 h Test Type: static test Method: OECD Test Guideline 201 Remarks: Information given is based on data obtained from similar substances.

4,4'-DIPHENYLMETHANE DIISOCYANATE**:**

Toxicity to fish	:	LC50 (Oryzias latipes (Orange-red killifish)): > 3,000 mg/l Exposure time: 96 h Test Type: semi-static test Remarks: Information given is based on data obtained from similar substances.
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): > 100 mg/l Exposure time: 24 h Test Type: static test Method: OECD Test Guideline 202 Remarks: Information given is based on data obtained from similar substances.
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC (Daphnia magna (Water flea)): > 10 mg/l Exposure time: 21 d End point: Reproduction Test Test Type: semi-static test Method: OECD Test Guideline 211 Remarks: Information given is based on data obtained from similar substances.

PROPYLENE CARBONATE**:**

Toxicity to fish	:	LC50 (Cyprinus carpio (Carp)): > 1,000 mg/l Exposure time: 96 h Test Type: semi-static test Method: Directive 67/548/EEC, Annex V, C.1.

Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): > 1,000 mg/l Exposure time: 48 h Test Type: static test Method: OECD Test Guideline 202
Toxicity to algae	:	EC50 (Desmodesmus subspicatus (green algae)): > 900 mg/l End point: Growth inhibition Exposure time: 72 h Test Type: static test Method: OECD Test Guideline 201 NOEC (Desmodesmus subspicatus (green algae)): 900 mg/l End point: Growth inhibition Exposure time: 72 h Test Type: static test Method: OECD Test Guideline 201

Persistence and degradability
Components:
POLYMER**:**

Biodegradability	:	Result: Not readily biodegradable. Biodegradation: 0 % Exposure time: 28 d Method: OECD Test Guideline 302C

4,4'-DIPHENYLMETHANE DIISOCYANATE**:**

Biodegradability	:	Result: Not biodegradable Biodegradation: 0 % Exposure time: 28 d Method: OECD Test Guideline 302C Remarks: Information given is based on data obtained from similar substances.

TALC**:**

Biodegradability	:	Result: The methods for determining biodegradability are not applicable to inorganic substances.

PROPYLENE CARBONATE**:**

Biodegradability	:	Result: Readily biodegradable. Biodegradation: 87.1 % Exposure time: 29 d Method: OECD Test Guideline 301B

No data available
Bioaccumulative potential
Components:
PROPYLENE CARBONATE**:**

Partition coefficient: n-octanol/water : log Pow: -0.41

No data available

Mobility in soil

Components:

No data available

Other adverse effects

No data available

Product:

Additional ecological information : No data available

Components:

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

General advice : Do not dispose of waste into sewer.
Do not contaminate ponds, waterways or ditches with chemical or used container.
Send to a licensed waste management company.

Dispose of in accordance with all applicable local, state and federal regulations.

Contaminated packaging : Empty remaining contents.
Dispose of as unused product.
Empty containers should be taken to an approved waste handling site for recycling or disposal.
Do not re-use empty containers.

SECTION 14. TRANSPORT INFORMATION

International transport regulations

REGULATION

ID NUMBER	PROPER SHIPPING NAME	*HAZARD CLASS	SUBSIDIARY HAZARDS	PACKING GROUP	MARINE POLLUTANT / LTD. QTY.

U.S. DOT - ROAD

Not dangerous goods

CFR_RAIL_C

Not dangerous goods

U.S. DOT - INLAND WATERWAYS

Not dangerous goods

TDG_ROAD_C

Not dangerous goods

TDG_RAIL_C

Not dangerous goods

TDG_INWT_C

Not dangerous goods

INTERNATIONAL MARITIME DANGEROUS GOODS

Not dangerous goods

INTERNATIONAL AIR TRANSPORT ASSOCIATION - CARGO

Not dangerous goods

INTERNATIONAL AIR TRANSPORT ASSOCIATION - PASSENGER

Not dangerous goods

MX_DG

Not dangerous goods

***ORM = ORM-D, CBL = COMBUSTIBLE LIQUID**

Marine pollutant		no

Dangerous goods descriptions (if indicated above) may not reflect quantity, end-use or region-specific exceptions that can be applied. Consult shipping documents for descriptions that are specific to the shipment.

SECTION 15. REGULATORY INFORMATION

TSCA list
No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

EPCRA - Emergency Planning and Community Right-to-Know Act

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
4,4'-DIPHENYLMETHANE DIISOCYANATE	101-68-8	5000	14078

SARA 304 Extremely Hazardous Substances Reportable Quantity
This material does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards : Acute toxicity (any route of exposure)
Skin corrosion or irritation
Serious eye damage or eye irritation
Respiratory or skin sensitisation
Specific target organ toxicity (single or repeated exposure)

SARA 302 : This material does not contain any components with a section 302 EHS TPQ.

SARA 313 The following components are subject to reporting levels established by SARA Title III, Section 313:
4,4'-DIPHENYLMETHANE DIISOCYANATE 101-68-8 35.51 %

California Prop. 65
WARNING: This product can expose you to chemicals including Talc (powder), Quartz, which is/are known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

The components of this product are reported in the following inventories:
TCSI : On the inventory, or in compliance with the inventory

TSCA : All substances listed as active on the TSCA inventory

AIIC	:	Not in compliance with the inventory
DSL	:	All components of this product are on the Canadian DSL
ENCS	:	On the inventory, or in compliance with the inventory
ISHL	:	Not in compliance with the inventory
KECI	:	On the inventory, or in compliance with the inventory
PICCS	:	On the inventory, or in compliance with the inventory
IECSC	:	On the inventory, or in compliance with the inventory
NZIoC	:	Not in compliance with the inventory

Inventories
AIIC (Australia), DSL (Canada), IECSC (China), REACH (European Union), ENCS (Japan), ISHL (Japan), KECI (Korea), NZIoC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TECI (Thailand), TSCA (USA)

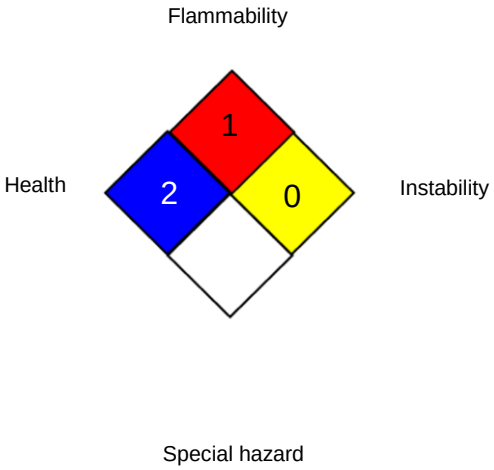
Other regulations

US. Drug Enforcement Administration (DEA) Listed Precursor and Essential Chemicals (21 CFR 1310)	Not applicable

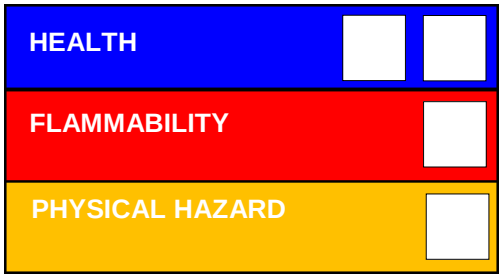
SECTION 16. OTHER INFORMATION

Further information

NFPA 704:



HMIS® IV:



HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. The "*" represents a chronic hazard, while the "/" represents the absence of a chronic hazard.

Full text of H-Statements

H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H332	Harmful if inhaled.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H335	May cause respiratory irritation.
H373	May cause damage to organs through prolonged or repeated exposure if inhaled.

Full text of other abbreviations

AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory

concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

This sds has been prepared by Bostik. (http://www.Bostik.com)

Sources of key data used to compile the Safety Data Sheet	:	Bostik internal data including own and sponsored test reports European Union Law with content from the Official Journal of the European Union. European Chemicals Agency; the EU authority implementing the EU's chemicals legislation for companies. The German Water Hazard Classes. ReachCentrum; a series of support services to help comply with REACH regulations. The European Commission; proposing legislation, administering and implementing EU policies, and enforcing EU law. The UNECE administers regional agreements implementing harmonised classification for labelling (GHS) and transport. Cefic, the European Chemical Industry Council. ESIS European Chemical Substances Information System
Revision Date	:	03/04/2022

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the

specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.
US / EN

Bostik, Inc., 5220 Blazer Parkway, Dublin, OH, USA

Enclosed are the results of EPA 24 VOC testing for PLIOGRIP 7400/7655 Adhesive

The procedure used (modified EPA Method 24, per 40 CFR Subpart PPPP, Appendix A):
1.) Weigh empty aluminum pan
2.) Dispense 1-2 grams through static mixer
3.) Smear adhesive to thin layer in pan
4.) Weigh pan and adhesive
5.) Put in 110°C oven for one hour
6.) Cool in desiccator
7.) Weigh pan and sample

Data for maximum VOC for Pliogrip 7400/7655 Adhesive is summarized in following table:

Max. % VOC	Lb VOC / Lb Adhesive	Lbs VOC / Gal
0.06%	0.0006	0.007

Adhesive: 7400/7655

Sample ID	Weight of Pan	Weight of Adhesive	Weight of Pan & Adhesive	Pan & Adhesive Weight After 1 hour at 110C	Adhesive Weight After 1 hour at 110C	% VOC
1	0.9670	1.7567	2.7237	2.7228	1.7558	0.05
2	0.9726	1.5880	2.5606	2.5598	1.5872	0.05
3	0.9766	1.9581	2.9347	2.9338	1.9572	0.05
4	0.9760	1.7576	2.7336	2.7329	1.7569	0.04
5	0.9744	1.8608	2.8352	2.8340	1.8596	0.06

Sincerely,
Jesse Wenning
(614) 726-0676

29 CFR 1910.1200 (OSHA HazCom 2012)

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product identifier

Trade name : Pliogrip™ 7655
ADHESIVE
™ Trademark, Bostik or its subsidiaries, registered in various countries

Relevant identified uses of the substance or mixture and uses advised against

Recommended use : Adhesives

Details of the supplier of the safety data sheet Bostik, Inc. 11320 W Watertown Plank Road Wauwatosa, WI 53226 United States of America (USA) +1 (800) 843-0844 (Domestic Toll Free); +1 (414) 774-2250 (International) EHSproductsafety.US@bostik.com	**Emergency telephone number** Chemtrec 1-800-424-9300, outside US 1-703-527-3887 **Regulatory information** Rocky Mountain Poison center: 1-866-767-5089

SECTION 2. HAZARDS IDENTIFICATION

GHS Classification

Reproductive toxicity : Category 2

GHS label elements

Hazard pictograms :

Signal Word : Warning

Hazard Statements : Suspected of damaging fertility or the unborn child.

Precautionary Statements : **Prevention:**
Obtain special instructions before use.

Do not handle until all safety precautions have been read and understood.
Wear protective gloves/ protective clothing/ eye protection/ face protection.
Response:
IF exposed or concerned: Get medical advice/ attention.
Storage:
Store locked up.
Disposal:
Dispose of contents/ container to an approved waste disposal plant.

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Hazardous components

Chemical name	CAS-No.	Classification	Concentration (%)
TALC	14807-96-6	Not a hazardous substance or mixture.	22.648
PIPERAZINE	110-85-0	Flam. Sol. 1; H228 Comb Dust Skin Corr. 1B; H314 Eye Dam. 1; H318 Resp. Sens. 1B; H334 Skin Sens. 1B; H317 Repr. 2; H361	0.764

SECTION 4. FIRST AID MEASURES

General advice : Move out of dangerous area.
Show this safety data sheet to the doctor in attendance.
Do not leave the victim unattended.

If inhaled	:	If unconscious, place in recovery position and seek medical advice. If symptoms persist, call a physician.
In case of skin contact	:	First aid is not normally required. However, it is recommended that exposed areas be cleaned by washing with soap and water.
In case of eye contact	:	Flush eyes with water as a precaution. Remove contact lenses. Protect unharmed eye. If eye irritation persists, consult a specialist.
If swallowed	:	Obtain medical attention. Do not give milk or alcoholic beverages. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician.
Most important symptoms and effects, both acute and delayed	:	The most important known symptoms and effects are described in the labelling (see Section 2.2) and/or Section 11. Suspected of damaging fertility or the unborn child.
Notes to physician	:	No hazards which require special first aid measures.

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Water spray Foam Carbon dioxide (CO2) Dry chemical
Unsuitable extinguishing media	:	High volume water jet
Specific hazards during firefighting	:	If product is heated above its flash point it will produce vapors sufficient to support combustion. Vapors are heavier than air and may travel along the ground and be ignited by heat, pilot lights, other flames and ignition sources at locations near the point of release. Do not allow run-off from fire fighting to enter drains or water courses.

Hazardous combustion products	:	Aldehydes Carbon dioxide (CO2) Carbon monoxide Ketones Nitrogen oxides (NOx) Chlorine compounds Halogenated hydrocarbons
Specific extinguishing methods	:	Product is compatible with standard fire-fighting agents.
Further information	:	Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
Special protective equipment for firefighters	:	In the event of fire, wear self-contained breathing apparatus.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Use personal protective equipment. Ensure adequate ventilation. Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed.
Environmental precautions	:	Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.
Methods and materials for containment and cleaning up	:	Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Keep in suitable, closed containers for disposal.
Other information	:	Comply with all applicable federal, state, and local regulations.

SECTION 7. HANDLING AND STORAGE

Advice on protection against fire and explosion	:	Normal measures for preventive fire protection.
Advice on safe handling	:	Do not breathe vapours/dust. Do not smoke.

Container hazardous when empty.
Avoid exposure - obtain special instructions before use.
Avoid contact with skin and eyes.
Smoking, eating and drinking should be prohibited in the application area.
For personal protection see section 8.
Dispose of rinse water in accordance with local and national regulations.

Conditions for safe storage : Keep container tightly closed in a dry and well-ventilated place.
Observe label precautions.

Further information on storage stability : No decomposition if stored and applied as directed.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
TALC	14807-96-6	TWA	20 Million particles per cubic foot Dust	OSHA Z-3
		TWA	2 mg/m3 respirable dust fraction	OSHA P0
		TWA	2 mg/m3 Respirable	NIOSH REL
		PEL	2 mg/m3 Respirable dust	CAL PEL
		TWA	2 mg/m3 Respirable particulate matter	ACGIH
PIPERAZINE	110-85-0	TWA	0.03 ppm Inhalable fraction and vapor (piperazine)	ACGIH

Hazardous components without workplace control parameters

Components	CAS-No.
PIPERAZINE	110-85-0

Engineering measures : Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure below exposure guidelines (if applicable) or below levels that cause known, suspected or apparent adverse effects.

Personal protective equipment

Respiratory protection : In the case of vapour formation use a respirator with an approved filter within the capabilities of the respirator/filter combination.
Where concentrations are above recommended limits or are unknown, or a cartridge type respirator is not adequate, wear a positive-pressure supplied-air respirator.

Hand protection

Material : butyl-rubber

Break through time : 480 min

Glove thickness : > 0.5 mm

Remarks : The exact break through time can be obtained from the protective glove producer and this has to be observed. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.
The suitability for a specific workplace should be discussed with the producers of the protective gloves.

Eye protection : Not required under normal conditions of use. Wear splash-proof safety goggles if material could be misted or splashed into eyes.

Skin and body protection : Wear as appropriate:
Impervious clothing
Safety shoes
Choose body protection according to the amount and concentration of the dangerous substance at the work place.
Wear resistant gloves (consult your safety equipment supplier).

Hygiene measures : Wash hands before breaks and at the end of workday.
When using do not eat or drink.
When using do not smoke.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : viscous

Physical state : liquid

Colour	:	green
Odour	:	No information available.
Odour Threshold	:	No data available
pH	:	No data available
Melting point/freezing point	:	not determined
Boiling point/boiling range	:	not determined
Flash point	:	93.4 °C Method: Seta closed cup
Evaporation rate	:	< 1 Ethyl Ether = 1
Flammability (liquids)	:	not determined
Upper explosion limit	:	Upper explosion limit not determined
Lower explosion limit	:	Lower explosion limit not determined
Vapour pressure	:	not determined
Relative vapour density	:	> 1(Air = 1.0)
Relative density	:	No data available
Density	:	1.225 g/cm3 (77.00 °F)
Solubility(ies)		
Water solubility	:	insoluble
Solubility in other solvents	:	No data available
Partition coefficient: n-octanol/water	:	not determined
Thermal decomposition	:	No data available
Viscosity		
Viscosity, dynamic	:	ca. 18,000 mPa.s (25 °C)

Viscosity, kinematic	:	not determined
Oxidizing properties	:	Not applicable

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	No decomposition if stored and applied as directed.
Chemical stability	:	Stable under recommended storage conditions.
Possibility of hazardous reactions	:	Product will not undergo hazardous polymerization.
Conditions to avoid	:	Heat Exposure to moisture
Incompatible materials	:	alkalis isocyanates oxidizers Phosphorus compounds Strong acids strong oxidizing agents
Hazardous decomposition products		Carbon monoxide Carbon dioxide (CO2) Nitrogen oxides (NOx)

SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure	:	Inhalation Skin contact Eye contact Ingestion

Acute toxicity
Not classified based on available information.
Components:
TALC**:**

Acute oral toxicity	:	LD50 (Rat): > 5,000 mg/kg Method: OECD Test Guideline 423

PIPERAZINE**:**

Acute oral toxicity	:	LD50 (Rat): ca. 2,600 mg/kg Method: OECD Test Guideline 401
Acute inhalation toxicity	:	LC0 (Rat, male and female): 1.61 mg/l Exposure time: 8 h Test atmosphere: vapour

Skin corrosion/irritation
Not classified based on available information.
Components:
TALC**:**
Species: reconstructed human epidermis (RhE)
Result: No skin irritation

PIPERAZINE**:**
Result: Corrosive after 3 minutes to 1 hour of exposure

Serious eye damage/eye irritation
Not classified based on available information.
Product:
Remarks: Unlikely to cause eye irritation or injury.

Components:
TALC**:**
Species: Rabbit
Result: Slight, transient irritation
Method: OECD Test Guideline 405

PIPERAZINE**:**
Result: Corrosive

Respiratory or skin sensitisation
Skin sensitisation: Not classified based on available information.
Respiratory sensitisation: Not classified based on available information.
Components:
TALC**:**
Test Type: Maximisation Test
Species: Guinea pig
Assessment: Did not cause sensitisation on laboratory animals.
Method: OECD Test Guideline 406

PIPERAZINE**:**
Assessment: The product is a respiratory sensitiser, sub-category 1B.

Assessment: The product is a skin sensitiser, sub-category 1B.

Germ cell mutagenicity

Not classified based on available information.

Components:

TALC**:**

Genotoxicity in vitro : Test Type: In vitro gene mutation study in bacteria
Test species: Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Result: negative

: Test Type: In vitro gene mutation study in bacteria
Test species: Saccharomyces cerevisiae
Metabolic activation: with and without metabolic activation
Result: negative

Genotoxicity in vivo : Test Type: dominant lethal test
Test species: Rat (male)
Cell type: Bone marrow
Result: negative

Carcinogenicity

Not classified based on available information.

Reproductive toxicity

Suspected of damaging fertility or the unborn child.

Components:

PIPERAZINE**:**

Reproductive toxicity - Assessment : Some evidence of adverse effects on sexual function and fertility, and/or on development, based on animal experiments.

STOT - single exposure

Not classified based on available information.

STOT - repeated exposure

Not classified based on available information.

Aspiration toxicity

Not classified based on available information.

Further information

Product:

Remarks: No data available

Carcinogenicity:

IARC No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

NTP No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Product:

Ecotoxicology Assessment

Short-term (acute) aquatic hazard : Not classified based on available information.

Long-term (chronic) aquatic hazard : Not classified based on available information.

Components:

PIPERAZINE:

Toxicity to fish : LC50 (Poecilia reticulata (guppy)): > 1,800 mg/l
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 21 mg/l
Exposure time: 48 h
Method: OECD Test Guideline 202

Toxicity to algae : EC50 (Pseudokirchneriella subcapitata (green algae)): > 1,000 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 12.5 mg/l
Exposure time: 21 d
Method: OECD Test Guideline 211

Persistence and degradability

TALC:

Biodegradability : Result: The methods for determining biodegradability are not applicable to inorganic substances.

PIPERAZINE:

Biodegradability : Result: Readily biodegradable.
Biodegradation: 70 %
Exposure time: 28 d
Method: OECD Test Guideline 301F

No data available

Bioaccumulative potential

No data available

Mobility in soil
No data available
Other adverse effects
No data available
Product:
Additional ecological information : No data available

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

General advice : Do not dispose of waste into sewer.
Do not contaminate ponds, waterways or ditches with chemical or used container.
Send to a licensed waste management company.

Dispose of in accordance with all applicable local, state and federal regulations.

Contaminated packaging : Empty remaining contents.
Dispose of as unused product.
Empty containers should be taken to an approved waste handling site for recycling or disposal.
Do not re-use empty containers.

SECTION 14. TRANSPORT INFORMATION

International transport regulations

REGULATION

ID NUMBER	PROPER SHIPPING NAME	*HAZARD CLASS	SUBSIDIARY HAZARDS	PACKING GROUP	MARINE POLLUTANT / LTD. QTY.

U.S. DOT - ROAD

Not dangerous goods

CFR_RAIL_C

Not dangerous goods

U.S. DOT - INLAND WATERWAYS

Not dangerous goods

TDG_ROAD_C

Not dangerous goods

TDG_RAIL_C

Not dangerous goods

TDG_INWT_C

Not dangerous goods

INTERNATIONAL MARITIME DANGEROUS GOODS

Not dangerous goods

INTERNATIONAL AIR TRANSPORT ASSOCIATION - CARGO

Not dangerous goods

INTERNATIONAL AIR TRANSPORT ASSOCIATION - PASSENGER

Not dangerous goods

MX_DG

Not dangerous goods

***ORM = ORM-D, CBL = COMBUSTIBLE LIQUID**

Marine pollutant		no

Dangerous goods descriptions (if indicated above) may not reflect quantity, end-use or region-specific exceptions that can be applied. Consult shipping documents for descriptions that are specific to the shipment.

SECTION 15. REGULATORY INFORMATION

TSCA list
No substances are subject to TSCA 12(b) export notification requirements.

EPCRA - Emergency Planning and Community Right-to-Know Act

CERCLA Reportable Quantity
This material does not contain any components with a CERCLA RQ.

SARA 304 Extremely Hazardous Substances Reportable Quantity
This material does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards	:	Reproductive toxicity
SARA 302	:	This material does not contain any components with a section 302 EHS TPQ.
SARA 313		This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

California Prop. 65
WARNING: This product can expose you to chemicals including Talc (powder), Quartz, Pigment Black 6, which is/are known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

The components of this product are reported in the following inventories:

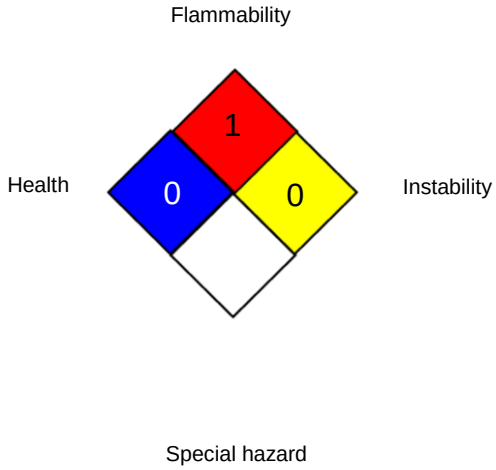
DSL	:	All components of this product are on the Canadian DSL
AICS	:	On the inventory, or in compliance with the inventory
ENCS	:	On the inventory, or in compliance with the inventory
KECI	:	On the inventory, or in compliance with the inventory
PICCS	:	Not in compliance with the inventory
IECSC	:	On the inventory, or in compliance with the inventory
TCSI	:	On the inventory, or in compliance with the inventory
TSCA	:	On the inventory, or in compliance with the inventory

Inventories
AIIC (Australia), DSL (Canada), IECSC (China), REACH (European Union), ENCS (Japan), ISHL (Japan), KECI (Korea), NZIoC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TECI (Thailand), TSCA (USA)

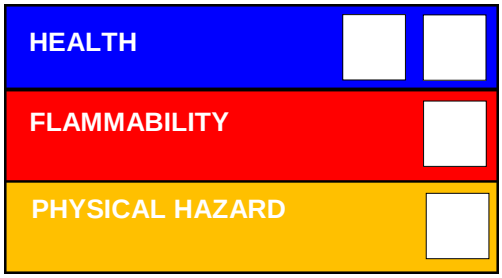
SECTION 16. OTHER INFORMATION

Further information

NFPA 704:



HMIS® IV:



HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. The "*" represents a chronic hazard, while the "/" represents the absence of a chronic hazard.

Full text of H-Statements

H228	Flammable solid.
H314	Causes severe skin burns and eye damage.
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H361	Suspected of damaging fertility or the unborn child.

Full text of other abbreviations

AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx -

Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

This sds has been prepared by Bostik. (http://www.Bostik.com)

Sources of key data used to compile the Safety Data Sheet	:	Bostik internal data including own and sponsored test reports European Union Law with content from the Official Journal of the European Union. European Chemicals Agency; the EU authority implementing the EU's chemicals legislation for companies. The German Water Hazard Classes. ReachCentrum; a series of support services to help comply with REACH regulations. The European Commission; proposing legislation, administering and implementing EU policies, and enforcing EU law. The UNECE administers regional agreements implementing harmonised classification for labelling (GHS) and transport. Cefic, the European Chemical Industry Council. ESIS European Chemical Substances Information System
Revision Date	:	03/04/2022

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.
US / EN

YOKOHAMA
Yokohama Industries Americas Inc.

Safety Data Sheet

Section 1:	Identification
Name:	**RC-50E Body Primer**
Description:	**Formulated Polyurethane**
Use:	Primer for Auto Body
SDS number:	YIA-61
Appearance and odor:	Black liquid, Sweet odor
Company:	Yokohama Industries Americas, Inc. 103 Industry DRive Versailles, KY 40383
Emergency telephone:	1-800-424-9300 CHEMTREC
Product information	859-879-2853
Effective date:	2/20/2017
Supersedes date:	3/31/2014

Section 2: Hazard(s) Identification

GHS Classification

GHS Rating: health: 4*; flammability: 3; reactivity: 0.

1- severe hazard, 2- serious, 3-moderate, 4-slight and 5- minimal

** = chronic effects*

Flammable Liquid- Category 2.
Acute Toxicity (oral)- Category 5.
Acute Toxicity (inhalation)- Category 1.
Skin Irritation- Category 2.
Eye Irritation- Category 2.
Mutagenicity- Category 2.
Carcinogenicity- Category 2.
Target organ toxicity (single exposure)- Category 3.

GHS Label

OSHA HCS 2012

Signal Word: ***DANGER*** **!**

Hazard Statements

H225- Highly flammable liquid and vapour.
H302- Harmful if swallowed.
H315- Causes skin irritation.
H319- Causes serious eye irritation.
H333- May be harmful if inhaled.
H334-May cause allergy or asthma symptoms or breathing difficulties if inhaled.

H335- May cause respiratory irritation.
H336- May cause dizziness or drowsiness.
H351- Suspected of causing cancer.
H373- May cause damage to organs through prolonged or repeated exposures.
Can aggravate existing conditions of the liver, kidneys, blood, respiratory system, skin, immune system and/or specific chemical allergies.

Precautionary Statements
P201- Obtain special instructions before use.
P202- Do not handle until all safety precautions have been read and understood.
P210- Keep away from heat/sparks/open flames/hot surfaces- No Smoking.
P232- Protect from moisture.
P235 + P410- Keep cool. Protect from sunlight.
P240- Ground/bond container and receiving equipment.
P241- Use explosion-proof electrical equipment.
P242- Use only non-sparking tools.
P261- Avoid breathing dust/fume/gas/mist/vapours/spray.
P264- Wash skin thoroughly after handling.
P270- Do not eat, drink or smoke when using this product.
P280- Wear protective gloves/protective clothing/eye protection/face protection.
P308+313- If exposed or concerned: Call a Poison Center or doctor/physician.
P332+313- If skin irritation occurs; get medical advice/attention.
P337+313- If eye irritation persists get medical advice/attention.
P305+351+338- IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do- continue rinsing.
P403-P233- Store in a well ventilated place. Keep container tightly closed.
P405- Store locked up.
P501- Dispose of contents/container in accordance with local regulation.

Section 3: Composition/Information on Ingredients

A hazard evaluation of this product has been performed. The components listed below are identified as hazardous chemicals under the criteria of the OSHA hazard communication standard (29 CFR 1910.1200).

Common name / Chemical name	CAS number	Approximate %
Ethyl acetate/Acetic acid ethyl ester	141-78-6	60- 90
Tris (4-isocyanatephenyl) Thiophosphate	4151-51-3	5-10
Carbon black	1333-86-4	5-10
Butyl acetate, N- / 1-Butyl acetate	123-86-4	1-5
Methylene bis-phenyl isocyanate/ Diphenyl-methane diisocyanate	101-68-8	0.9

Section 4: First-Aid Measures

Primary route(s) of exposure: **Eye - yes** **Skin - yes** **Inhalation - yes**

Eye contact:
Flush eyes with water for at least 15 minutes. Lift eyelids frequently. Get prompt medical attention.

Skin contact:
Remove contaminated clothing and shoes. Wash affected area with soap and water. If irritation develops, consult a physician. Wash contaminated clothing separately before reuse.

Inhalation:
Remove to fresh air. If symptoms develop, seek immediate medical attention. If not breathing, give artificial respiration, preferably mouth to mouth.

Ingestion:

Do not induce vomiting. Seek medical attention. Do not give anything by mouth if the person is drowsy, unconscious, or has no gag reflex.
Ingestion creates a high risk of aspiration and subsequent chemical pneumonitis. However, if more than one milliliter per kilogram of body weight of the hydrocarbon was ingested, careful emesis or lavage is recommended because of the toxic effects produced by the hydrocarbon.
Note to physician:
Bronchial constriction may develop after extensive exposure to isocyanate, even in individuals who have not been shown to be previously sensitized. Use bronchodilators.

Section 5: Fire-Fighting Measures

Flash point:	24°F, -4°C	Test method:setaflash closed cup
Explosive limits:	LEL (%) - not established	UEL (%) - not established
Auto-ignition temperature:	not established	

Extinguishing media:
Small fires : use dry chemical, carbon dioxide, halon, water spray, or foam.
Large fires : use water spray, fog, or alcohol foam.
Special fire fighting procedures:
Fire fighters and others who may be exposed to the products of combustion should be equipped with NIOSH approved positive pressure self-contained breathing apparatus (SCBA) and full protective clothing.
Unusual fire and explosion hazards:
When exposed to flames or high temperatures encountered during fire conditions, sealed containers may rupture because of the build up of internal pressure. Cool containers with water.
Vapors may be heavier than air and may travel considerable distances from the material handling point. A spark, flame, cigarette, electric motor, static discharge, engine, pilot light, hot surface, or other ignition source can ignite vapors.

Section 6: Accidental Release Measures

Response to spills:
Stop discharge, if it can be performed safely, and contain material. Use an absorbent such as fuller's earth, clay, or other appropriate synthetic absorbent. Place contaminated material in a suitable container for disposal.
Appropriate safety measures and protective equipment should be used (see section 6).
Do not flush to streams, rivers, or other bodies of water.
Precautions:
Eliminate all sources of ignition.
If the airborne concentration exceeds established exposure limits (TLV or PEL), or if high airborne concentrations can occur, evacuate employees and ventilate the area.
A supplied air respirator or self-contained breathing apparatus (SCBA) should be used for entry into enclosed spaces, or in areas with inadequate ventilation.

Section 7: Handling and Storage

Recommended storage practice and conditions:
Store in cool, dry, well ventilated area. Do not store near heat or ignition sources, or in direct sunlight. Always keep containers tightly closed to avoid contamination.
Special warning:
Hot organic chemical vapors or mists can suddenly and without warning combust when mixed with air.
Ignition can occur at typical elevated temperature process conditions. Any proposed use in such processes should be evaluated thoroughly to assure safe operating conditions.
Do not store above: 95°F, 35°C
Container use procedures:
Containers should be supported and grounded before opening, dispensing, mixing, pouring, and emptying.
Open with no-sparking tools. If the container is warm, open bung slowly to release internal pressure.
Empty container precautions:

This container is hazardous when empty. Do not use heat, sparks, open flames, torches, or cigarettes on or near empty container. Empty containers can retain product residues. Do not reuse empty container for food, clothing, or products for human or animal consumption or where skin contact may occur.

Section 8: Exposure Controls/ Personal Protection

Ventilation:

Maintain airborne concentration below the established exposure limits (See airborne exposure limits in this section). General (dilution) ventilation may be acceptable. However, local exhaust ventilation is recommended when vapors, mists, or dusts can be released.

Personal hygiene:

Wash thoroughly after handling, especially before eating, drinking, smoking, or using restroom facilities. Wash contaminated goggles, faceshield, and gloves. Professionally launder contaminated clothing. Discard contaminated shoes.

Airborne exposure limits

Ethyl acetate			
ACGIH TLV-TWA:	400 ppm	1440 mg/m3	
OSHA PEL:	400 ppm	1400 mg/m3	
Tris (4-isocyanatophenyl) thiophosphate			
ACGIH TLV-TWA:	not established		
OSHA PEL:	not established		
Carbon black			
ACGIH TLV-TWA:	3.5 mg/m3		
OSHA PEL:	3.5 mg/m3		
Butyl acetate, N-			
ACGIHTLV-TWA:	150 ppm	713 mg/m3	
STEL:	200 ppm	950 mg/m3	
OSHA PEL:	150 ppm	710 mg/m3	
STEL:	200 ppm	950 mg/m3	
Methylene bisphenyl isocyanate			
ACGIH TLV-TWA:	0.005 ppm	0.051 mg/m3	
STEL:	ppm		
OSHA PEL:	0.02 ppm	0.2 mg/m3	ceiling

Note: Because of this product's physical composition, the release or generation of a dust is not expected to occur under normal conditions of use.

Personal Protective Equipment (PPE)

Eye protection:

Wear chemical splash goggles.

An eye wash facility should be readily available.

Skin protection:

Wear protective clothing and appropriate impervious gloves. Because a variety of protective gloves exist, always consult glove manufacturer to determine the proper type for specific operation.

Respiratory protection:

Avoid breathing vapor and/or mist.

When established airborne exposure limits are surpassed (see airborne exposure limits in this section), wear NIOSH/MSHA approved equipment. Determine the appropriate type equipment for specific application by consulting the respirator manufacturer. Observe the respirator use limitations specified by NIOSH/MSHA or the manufacturer.

High airborne concentrations may necessitate the use of self-contained breathing apparatus (SCBA) or a supplied air respirator. In addition, respiratory protection programs must be in compliance with 29 CFR 1910.134.

Section 9:	**Physical and Chemical Properties**
% Non-volatile (by weight):	<33
pH:	not applicable
Vapor density (air=1):	not established
Solubility in water:	insoluble
Evaporation rate (n-butyl acetate=):	>1
Vapor pressure (mmHg @25°C):	not established
Specific gravity (water=1);	>1
Approximate boiling point:	not established

Note: The physical data presented above are typical values and should not be construed as a specification.

Section 10:	**Stability and Reactivity**
Stable under normal conditions of storage and use:	yes

Materials to avoid:
Amines.
Acids.
Strong bases.
Water.

Hazardous polymerization:
Hazardous polymerization will not occur.

Thermal decomposition products:
If heated to high temperatures, this product may emit the following compounds:
Flammable solvent vapors.
Isocyanate containing compounds.
Oxides of nitrogen.
Oxides of sulfur.
Phosgene.
Smoke, soot, & toxic fumes (e.g. carbon dioxide & carbon monoxide).

Section 11:	**Toxicological Information**

The information in this section, though detailed, can be subject to misinterpretation. Therefore, it is essential individuals trained in its evaluation interpret the following information.

Ethyl acetate

Toxic effects:
Contact with eyes or skin can cause irritation. Ingestion may cause gastrointestinal irritation. Ingestion or inhalation may cause central nervous system depression, and kidney and liver damage. Spleen damage and anemia have also been reported.

Acute toxicity studies:

Oral-rat	LD50:	5620 mg/kg
Oral-mouse	LD50:	4100 mg/kg
Oral-rabbit	LD50:	4935 mg/kg
Inhalation-rat	LC50:	1600 ppm/8-hours
Inhalation-mouse	LC50:	45 g/m3/2-hours

Other toxicity studies:
Positive results for mutagenic activities have been observed in several test systems, namely in yeast cells and hamster fibroblasts (cytogenic analysis).

Carcinogenicity - listed by:
ACGIH: no IARC monographs: no NTP annual report: n OSHA: no

Tris (4-isocyanatophenyl) thiophosphate

Toxic effects:
The toxicity of isocyanate-containing compounds is generally considered to be similar. Refer to the toxicity data for monomeric MDI, which are presented in this section, for detailed health effects information.

Carcinogenicity - listed by:

ACGIH: no	IARC monographs: no	NTP annual report: no	OSHA: no

Carbon black

Toxic effects:

Can cause mechanical irritation and discoloration of the eyes and skin. Inhalation can cause irritation to the nose and respiratory tract. Prolonged and repeated inhalation can affect the pulmonary system causing difficulty in breathing, chest pain, and general weakness.

Carcinogenicity - listed by:

ACGIH: no	IARC monographs: 2B	NTP annual report: no	OSHA: no

Butyl acetate, N-

Toxic effects:

Vapors and liquid are irritating to the eyes. Skin contact, especially if prolonged or repeated, can cause dermatitis. Can be absorbed causing systemic effects. Ingestion can cause abdominal pain, sore throat, nausea vomiting, headache, and drowsiness. Vapors are irritating to the upper respiratory tract and can cause coughing, chest pain, and shortness of breath. Kidney and blood changes have been reported. Chronic exposure is reported to cause conjunctival irritation, feeling of chest constriction, and coughing.

Acute toxicity studies:

Oral-rat	LD50:	13,100 mg/kg
Oral-mouse	LD50:	2060 mg/kg
Oral-guinea pig	LD50:	4700 mg/kg
Inhalation-rat	LC50:	2000 ppm/4-hours
Inhalation-mouse	LC50:	6000 mg/m3/2-hours

Carcinogenicity - listed by:

ACGIH: no	IARC monographs: no	NTP annual report: no	OSHA:no

Methylene bisphenyl isocyanate

Toxic effects:

Eye contact and prolonged or repeated skin contact may cause irritation. Skin contact may result in allergic skin reactions or respiratory sensitization. Exposure to vapors or mists above established exposure levels may cause eye, upper respiratory tract, lung irritation and respiratory sensitization in susceptible individuals. Allergic respiratory reactions may occur below established guidelines in sensitized individuals. Symptoms may include coughing, difficulty in breathing, tightness in the chest. Sensitized individuals should not be exposed to any concentration of this material.

Acute toxicity studies:

Oral-mouse	LD50:	2200 mg/kg
Oral-rabbit	LD50:	> 9400 mg/kg
Inhalation-rat	LC50:	178 mg/m3

Chronic toxicity studies:

A mixture of polymeric and monomeric MDI (50:50) administered as an aerosol for 90-days caused inflammation of the lungs and nasal cavities of rats. In another similar study, rats were exposed to aerosolized polymeric MDI for two years. A statistically significant increase in benign (non-cancerous) tumors of the lung was observed; but only in male rats.

Other toxicity studies:

MDI, with metabolic activation, displayed positive mutagenic activity when assayed in the AMES test. MDI has also been shown to induce chromosomal aberrations in human lymphocyte cultures. The incidence of these aberrations was significantly increased following the addition of a metabolic activator. MDI, with and without metabolic activation, increased the incidence of sister-chromatid exchanges.

Carcinogenicity - listed by:

ACGIH: no	IARC monographs: no	NTP annual report: no	OSHA: no

Section 12: Ecological Information

Keep out of sewers, drainage areas, streams, or other bodies of water. Report spills and releases, as applicable, under Federal and State Regulations.

Section 13:	**Disposal Considerations**

Disposal methods:
If discarded in its original unused form, this product exhibits the characteristics of a RCRA hazardous waste as defined under:
40 CFR 261.21 (i.e. ignitable - D001)
Therefore, it must be managed (stored/ treated/disposed/etc.) at a properly permitted facility, in compliance with all-applicable federal, state, and local requirements. Be sure to contact the appropriated government environmental agencies if further guidance is required.
It is recommended that an alternative be selected according to the waste management hierarchy.

Section 14:	**Transportation Information**
DOT shipping name:	adhesive, containing a flammable liquid
DOT label:	flammable liquid
DOT identification No.:	UN 1133

Supplemental section 14 information:
HM-181, IATA/ICAO and IMO - proper shipping name: adhesive, containing a flammable liquid; Hazard class: 3 (IATA HM-181), 3.2 (IMO); subsidiary risk: none; UN No.: 1133;
Packaging group: II; label(s): flammable liquid.

Section 15:	**Regulatory Information**

Toxic substance control act (TSCA)
Chemical component(s) in this product are on the section 8 (b) chemical substance inventory listing (40 CFR 710).
SARA title III information
Section 313 - toxic chemicals
Pursuant to section 313 of SARA title", this product does not contain a toxic chemical in excess of 1 percent of the mixture (0.1 percent, if the listed toxic chemical is a carcinogen).
Section 302 - extremely hazardous substances
Pursuant to section 302 of SARA title", this product does not contain an extremely hazardous substance.
Section 311/312 - hazard categories
Pursuant to section 311/312 of SARA title", the physical and health hazard categories for this product are identified below:

Fire hazard:	yes
Sudden release of pressure hazard:	yes
Reactivity hazard:	no
Immediate (acute) health hazard:	yes
Delayed (chronic) health hazard:	yes

Hazardous materials information review regulation - Canada
This material safety data sheet provides information that complies with the requirement set forth under the Canadian workplace hazardous materials information system (WHMIS).

Claim for exemption registry No.:	not applicable
Expiration date:	not applicable

Section 16:	**Other Information**

User Responsibility:
A bulletin such as this cannot be expected to cover all possible individual situations. As the user has the responsibility to provide a safe workplace, all aspects of an individual operation should be examined to determine if, or where, precautions - in addition to those described herein - are required. Any health hazard and safety information contained herein should be passed on to your customers or employees, as the case may be.
Disclaimer of liability
The information contained herein is, to the best of our knowledge and belief, accurate. However, since the

conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by use of this material. All chemicals may present unknown health hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist. Final determination of suitability of the chemical is the sole responsibility of the user. No representations of warranties, either expressed or implied, of merchantability, fitness for a particular purpose or any other nature are made hereunder with respect to the information contained herein or the chemical to which the information refers. It is the responsibility of the user to comply with all applicable federal, state and local laws and regulations.

State of California addendum to the safety data sheet:

Product name: **RC-50E Body Primer**

Effective date: 2/20/2017

The California safe drinking water and toxic enforcement act of 1986, otherwise known as proposition 65, requires that persons potentially exposed to certain substances be made aware of the chronic effects of the substances specified by the state of California.

This product contains the following substances known to the state of California to cause cancer, birth defects, or other reproductive harm:

Ingredients

Carbon Black

Commonwealth of Pennsylvania addendum to the safety data sheet:

Product name: **RC-50E Body Primer**

Effective date: 2/20/2017

All of the materials in this product that are required by the commonwealth of Pennsylvania to be identified are listed below. In addition, some of the materials identified may have been placed by the Commonwealth of Pennsylvania on their hazardous substance list.

Ingredients	**CAS Number**	**Weight %**
Ethyl acetate / Acetic acid ethyl ester	141-78-6	60 - 90
Non-hazardous trade secret ingredient(s)	Proprietary	5-10
Tris(4-isocyanatophenly) thiophosphate	4151-51-3	5-10
Carbon black	1333-86-4	5-10
Butyl acetate, N- / 1-Butyl acetate	123-86-4	1-5
Methylene bisphenyl isocyanate / diphenylmethane diisocyanate	101-68-8	0.9

The specific chemical identity of any substance not identified with a chemical abstract service number is being held as a trade secret.

If you have questions with regard to health effects, or other information presented in this document, contact:

Al Harrington
Design & Development Manager
103 Industry Drive, Versailles KY 40383
Tel # 859-879-2834 / Fax # 859-879-0574

Yokohama Industries Americas Inc.
Sealant Division

WS-242FK/AN-1M Primerless to Plastic Adhesive

Description

WS-242FK is a specially formulated urethane adhesive for primerless to plastic bonding applications. The product is used with AN-1M curing agent at a 10:1 ratio for rapid curing. WS-242FK/AN-1M can be used in the bonding to the many types of materials. For example composite plastic, fiber reinforced plastic and glass. The main characteristic of WS-242FK/AN-1M is not only fast curing performance but also the ability to bond to plastic materials without primer.

(1) The main agent (WS-242FK) is a moisture curing composition. Therefore, the acceptable mixing range is wider than two component type adhesive with non-moisture curing composition.
(2) WS-242FK/AN-1M has excellent physical properties (rubber like performance and good bonding durability), because the main agent (WS-242FK) has a similar components as direct grazing adhesive.
(3) The curing rate is adjustable by the content of added curing agent (AN-1M).
(4) This adhesive makes it possible to adhere without primer

Typical Properties-(Not a Specification)

- **WS-242FK**

Color :	Black
Property:	non-sagging / paste
Density:	1.27 @20°C
Viscosity:	80 Pa·s (430sec^{-1})

Viscosity: 20 ° C SOD viscometer used.

- **Curing agent: AN-1M**

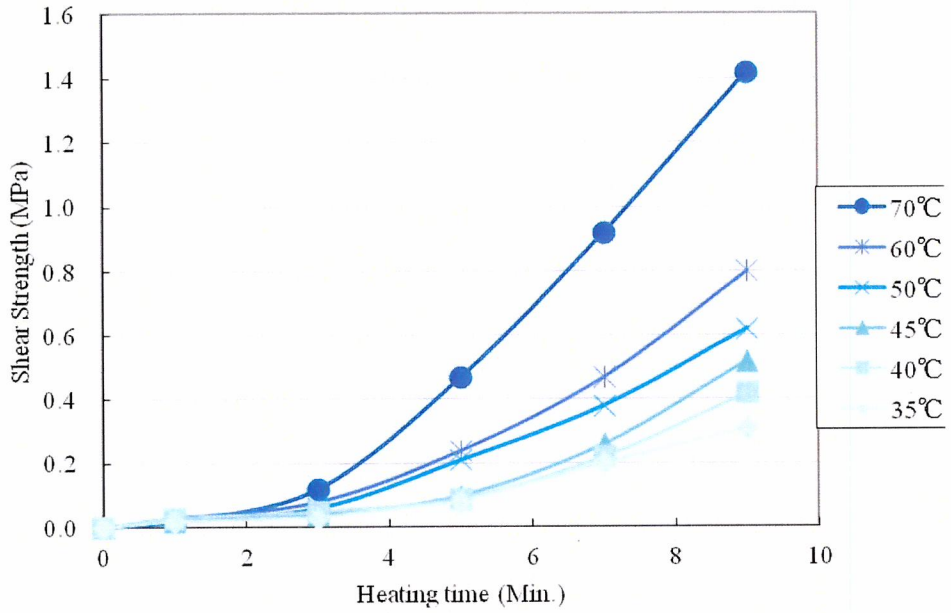
Color:	Off white
Property:	non-sagging / paste
Density:	1.27 @20°C
Viscosity:	18 Pa · s (430sec^{-1})

Viscosity: 20 ° C SOD viscometer used.

YOKOHAMA

Yokohama Industries Americas Inc.
Sealant Division

Curing property under several conditions



Main agent / curing agent = 10/1 (weight ratio)
Specimen: Surface-treated polypropylene / Painted plastic plate
Adhesive layer: 3mmt

Mechanical and Adhesion Performance

Mechanical properties	Hardness (JIS-A)	48
	Tensile strength (MPa)	5.2
	Elongation (%)	350
Lap shear Strength[1] (MPa)	Normal condition	3.8 CF
	Water resistance (40℃×336H)	3.3 CF
	Heat resistance (90℃×336H)	4.1 CF
	Chemical resistance[2] (20℃×336H)	3.2 CF

[1] Adhesion performance without primer
[2] Resistance to window washer fluid (WWF)

According to JASO M-338-89
CF: Cohesive Failure in adhesive layer
Main agent / curing agent = 10/1 (weight ratio)
Specimen: Surface-treated polypropylene / Painted plastic plate
Adhesive layer: 3mmt

YOKOHAMA

Yokohama Industries Americas Inc.
Sealant Division

Mixing

Main agent (WS-242FK) and curing agent (AN-1M) have to be thoroughly mixed using suitable equipment (i.e. static mixer with approx. 30 elements). The mixed product must be homogeneous black and free of streaks. Recommended mixing ratio, main agent / curing agent is 10/1±0.2 (by weight ratio).

Shelf Life

WS-242FK and AN-1M can be stored 6 months in its unopened original packaging at room temperature.

Storage and Handling

Store in cool, dry well-ventilated area at room temperature (10C-40C). Store WS-242FK and AN-1M avoiding direct sunlight. See Safety Section on product label and Safety Data Sheet (SDS) for safe handling instructions.

Safety Precautions

WS-242FK and AN-IM are for industrial use only: Always use protective goggles, gloves and appropriate work clothing when handling, avoid eye and skin contact. Wash hands thoroughly after handling. Do not breathe vapors. Use with adequate ventilation. Refer to the Safety Data Sheet (SDS) for more information.

Availability

The product is available in 400 gram cartridges, five gallon pails, and 55 gallon drums. The product is shipped from our Versailles, Kentucky plant.

YOKOHAMA

Yokohama Industries Americas Inc.

Safety Data Sheet

Section 1:	Identification
Name:	**WS-242FK Sealant**
Description:	**Urethane sealant**
Use:	Automobile parts sealant
SDS number:	YIA-40
Appearance and odor:	Black, no odor
Company:	Yokohama Industries Americas, Inc. 103 Industry Drive Versailles, KY 40383
Emergency telephone:	1-800-424-9300 CHEMTREC
Product information	859-879-2853
Effective date:	9/11/2019
Supersedes date:	1/31/2018

Section 2: Hazard(s) Identification

GHS Classification

GHS Rating: health: 5; flammability: 5; reactivity: 0

1- severe hazard, 2- serious, 3-moderate, 4-slight and 5- minimal

Skin Corrosion- Category 2.
Skin Sensitization- Category 1
Eye Irritation- Category 2.
Respiratory Sensitization- Category 1.
Carcinogenicity- Category 2.
Target Organ Systemic Toxicity (Respiratory Organs)- Category 2 (repeated exposure).
Acute Aquatic Toxicity- Category 2.
Chronic Aquatic Toxicity- Category 2.

GHS Label

OSHA HCS 2012

Signal Word: DANGER!

Hazard Statements

H315: Causes skin irritation.
H319: Causes serious eye irritation.
H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled
H317: May cause an allergic skin reaction

H351: Suspected of causing cancer.

H373: May cause damage to respiratory organs through prolonged or repeated exposure
H401: Toxic to aquatic life
H411:Toxic to aquatic life with long-lasting effects

Precautionary Statements
P264: Wash contaminated area thoroughly after handling.
P260: Do not breathe dust/fume/gas/mist/vapors/spray.
P285: In case of inadequate ventilation wear respiratory protection.
P272: Contaminated work clothing should not be allowed out of the workplace.
P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P273: Avoid release to the environment.
P302+P352: IF ON SKIN: Wash with plenty of soap and water.
P321: Specific treatment see "Section 4: First-Aid Measures".
P362: Take off contaminated clothing and wash before reuse.
P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes.
Remove contact lenses if present and easy to do- continue rinsing.
P337+P313:If eye irritation persists get medical advice/attention.
P342 + P311: If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician.
P333 + P313: If skin irritation or rash occurs: Get medical advice/attention.
P308 + P313: IF exposed or concerned: Get medical advice/attention.
P304 + P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P314: Get medical advice/attention if you feel unwell.
P391: Collect spillage.
P405: Store locked up.
P501- Dispose of contents/container in accordance with local/regional/national/international regulations.

Section 3:	**Composition/Information on Ingredients**	
A hazard evaluation of this product has been performed. The components listed below are identified as hazardous chemicals under the criteria of the OSHA hazard communication standard (29 CFR 1910.1200).		
Common name / Chemical name	**CAS number**	**Approximate %**
Carbon black	1333-86-4	26.7
Calcium carbonate	471-34-1	15.7
Hexanedioic acid, 1,6-diisononyl ester	33703-08-1	6.9
Aliphatic polyisocyanate	Trade secret	<5
Benzene, 1,1'-methylenebis[4-isocyanato-	101-68-8	0.7
Organic silane compound 1	Trade secret	<1
Terpene based compound	Trade secret	<1
Amine compound 1	Trade secret	<1
Amine compound 2	Trade secret	<1
Organic silane compound 2	Trade secret	<1

Section 4:	**First-Aid Measures**		
Primary route(s) of exposure:	**Eye - yes**	**Skin - yes**	**Inhalation - yes**

Eye contact:
Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.
Skin contact:
Wash with plenty of water. If skin irritation or rash occurs: Get medical advice/attention.
Inhalation:
Remove person to fresh air and keep comfortable for breathing. If experiencing respiratory symptoms: Call a poison

control center.
Ingestion:
Call a poison center/doctor if you feel unwell.

Section 5:	Fire-Fighting Measures
Flash point:	>200°C
Explosive limits:	LEL (%) - not established UEL (%) - not established
Auto-ignition temperature:	not established

Extinguishing media:
Use water spray, dry powder, foam, carbon dioxide.
Do not use water jet.
Special fire fighting procedures:
Fight fire upwind.
Wear self-contained breathing apparatus and protective clothing, etc.
Do not allow contaminated extinguishing water to enter the soil, ground-water or surface waters.
Remove containers away from the fire area if safe to do so.
Spray water on the surrounding equipment for cooling.
Unusual fire and explosion hazards:
Fire may produce irritating, corrosive and/or toxic vapors.

Section 6:	Accidental Release Measures

Response to spills:
Absorb and cover with dry earth, sand or other non-combustible material and transfer to sealable containers.
Keep away from ignition sources.
Dispose of waste in accordance with local regulations.
Precautions:
Eliminate all ignition sources.
Keep unnecessary and unprotected personnel away.
Wear appropriate personal protective equipment.
Immediately isolate the site by keeping an appropriate distance in all directions as a leak area.
Ventilate closed spaces before entering.
Environmental precautions:
Avoid release to the environment.

Section 7:	Handling and Storage

Recommended storage practice and conditions:
Sore in a well-ventilated place. Keep container tightly closed.
Sore locked up.
Conditions to avoid:
Avoid contact with hot surfaces, heat.
No flames, no sparks.
Precautions:
Do not breathe dust/fume/gas/mist/vapors/spray.
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Wear protective gloves/protective clothing/eye protection/face protection.
Wash contaminated area thoroughly after handling.
Do not allow contaminated work clothing out of the workplace.
Container use procedures:
No special precautions are needed. Follow good manufacturing and handling practices.
Empty container precautions:
No special precautions are needed. Follow good manufacturing and handling practices.

Section 8:	Exposure Controls/ Personal Protection
Ventilation:	
Provide general or local exhaust ventilation as necessary.	
Hygiene:	
Provide safety shower and eye wash station near work area.	
Occupational exposure limits	
Carbon black	
ACGIH TLV-TWA:	3 mg/m3 (A3)
OSHA PEL:	3.5 mg/m3
NIOSH REL-TWA:	3.5mg/m3
Benzene, 1,1'-methylenebis[4-isocyanato-	
ACGIHTLV-TWA:	0.005ppm
OSHA PEL:	(C)0.02ppm, (C)0.2mg/m3
NIOSH REL-TWA:	0.05mg/m3 (C) 0.2mg/m3(10-min)
A3- Confirmed animals carcinogen with unknown relevance to humans	
C- Ceiling limit	
Personal Protective Equipment (PPE)	
Eye protection:	
Wear safety glasses.	
Skin protection:	
Wear protective glvoes.	
Body protection:	
Wear protective clothing.	

Section 9:	Physical and Chemical Properties
% Non-volatile (by weight):	not available
pH:	not available
Vapor density (air=1):	not available
Solubility in water:	not available
Evaporation rate (n-butyl acetate=1):	not available
Vapor pressure (mmHg @25°C):	not available
Specific gravity (water=1);	not available
Approximate boiling point:	not available
Note: The physical data presented above are typical values and should not be construed as a specification.	

Section 10:	Stability and Reactivity
Stable under normal conditions of storage and use:	yes
Conditions to avoid:	
Avoid contact with hot surfaces, heat.	
No flames, no sparks.	
Incompatible materials:	
Strong oxidizing agents	
Acids	
Ammonium salts	
Mercury/hydrogen mixtures	
Hazardous decomposition products:	
Carbon monoxide	
Carbon dioxide	

Section 11:	Toxicological Information

Calcium Carbonate
Toxic effects:*
Skin corrosion/irritation: Category 2
Serious eye damage/irritation: Category 2
Specific target organ toxicity (Repeated exposure): Category 2 (respiratory organs)

Hexanedioic acid, 1,6-diisononyl ester
Toxic effects:*
Skin corrosion/irritation: Category 2
Serious eye damage/irritation: Category 2

Benzene, 1,1'-methylenebis[4-isocyanato-
Skin corrosion/irritation: Category 2
Serious eye damage/irritation: Category 2
Respiratory sensitization: Category 1
Skin sensitization: Category 1
Carcinogenicity: Category 2
Specific target organ toxicity (Repeated exposure): Category 2 (respiratory tract)

Organic silane compound 1
Skin corrosion/irritation: Category 1B
Serious eye damage/irritation: Category 1
Respiratory sensitization: Category 1
Skin sensitization: Category 1

Organic silane compound 2
Serious eye damage/irritation: Category 1

Amine compound 1
Skin corrosion/irritation: Category 2
Serious eye damage/irritation: Category 2A

Amine compound 2
Skin corrosion/irritation: Category 2
Serious eye damage/irritation: Category 2A

Aliphatic polyisocyanate
Respiratory sensitization: Category 1

Section 12:	Ecological Information

Ecotoxicity:
Hazardous to the Aquatic Environment: Terpene based compound
Acute hazard: Category 1 48hr-EC50=0.0759mg/1 (Daphne magna)
Chronic hazard: Category 1 48hr-EC50=0.0759mg/l (Daphnia magna)
Persistence and degradability:
Terpene based compound: non-rapidly degradable

Section 13:	Disposal Considerations

Disposal methods:
Dispose in accordance with related regulations and standards of the local governments.
Empty the container completely before disposal.

Section 14:	Transportation Information
DOT shipping name:	non-regulated
DOT label:	not applicable
DOT identification No.:	not applicable
Supplemental section 14 information:	
For Canadian shipments:	F115

HM-181, IATA/ICAO, IMO - non-regulated
UN Number: 3077 (Because of aquatic environmental hazards)
UN Proper shipping name: Environmentally Hazardous Substance, Solid, N.O.S. (contains terpene-based compound)
Transport hazard class: 9
Packing group: III
Marine pollutant: Yes
Special precautions: Transport according to relevant regulations.

Section 15: Regulatory Information

Toxic substance control act (TSCA)
Carbon black, Calcium carbonate, Hexanedioic acid, 1,6-diisononyl ester
The Occupational Safety and Health Act
Air contaminates: Applicable
Highly hazardous chemicals: Not applicable
HCS2012: Regulated
CERCLA Regulation:
Benzene, 1,1'-methylenebis[4-isocyanato-: 5000lb, 2270kg
EPCRA 304 Regulation:
Benzene, 1,1'-methylenebis[4-isocyanato-: 5000lb, 2270kg
EPCRA 313 Regulation:
Benzene, 1,1'-methylenebis[4-isocyanato-

Section 16: Other Information

User Responsibility:
A bulletin such as this cannot be expected to cover all possible individual situations. As the user has the responsibility to provide a safe workplace, all aspects of an individual operation should be examined to determine if, or where, precautions - in addition to those described herein - are required. Any health hazard and safety information contained herein should be passed on to your customers or employees, as the case may be.

Disclaimer of liability

The information contained herein is, to the best of our knowledge and belief, accurate. However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by use of this material. All chemicals may present unknown health hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist. Final determination of suitability of the chemical is the sole responsibility of the user. No representations of warranties, either expressed or implied, of merchantability, fitness for a particular purpose or any other nature are made hereunder with respect to the information contained herein or the chemical to which the information refers. It is the responsibility of the user to comply with all applicable federal, state and local laws and regulations.

If you have questions with regard to health effects, or other information presented in this document, contact:
Al Harrington
Design & Development Manager
103 Industry Drive, Versailles KY 40383
Tel # 859-879-2834 / Fax # 859-879-0574

Yokohama Industries Americas Inc.
Sealant Division

WS-242FK/AN-1M Primerless to Plastic Adhesive

Description

WS-242FK is a specially formulated urethane adhesive for primerless to plastic bonding applications. The product is used with AN-1M curing agent at a 10:1 ratio for rapid curing. WS-242FK/AN-1M can be used in the bonding to the many types of materials. For example composite plastic, fiber reinforced plastic and glass. The main characteristic of WS-242FK/AN-1M is not only fast curing performance but also the ability to bond to plastic materials without primer.

(1) The main agent (WS-242FK) is a moisture curing composition. Therefore, the acceptable mixing range is wider than two component type adhesive with non-moisture curing composition.
(2) WS-242FK/AN-1M has excellent physical properties (rubber like performance and good bonding durability), because the main agent (WS-242FK) has a similar components as direct grazing adhesive.
(3) The curing rate is adjustable by the content of added curing agent (AN-1M).
(4) This adhesive makes it possible to adhere without primer

Typical Properties-(Not a Specification)

- **WS-242FK**

Color :	Black
Property:	non-sagging / paste
Density:	1.27 @20°C
Viscosity:	80 Pa·s (430sec^{-1})

Viscosity: 20 ° C SOD viscometer used.

- **Curing agent: AN-1M**

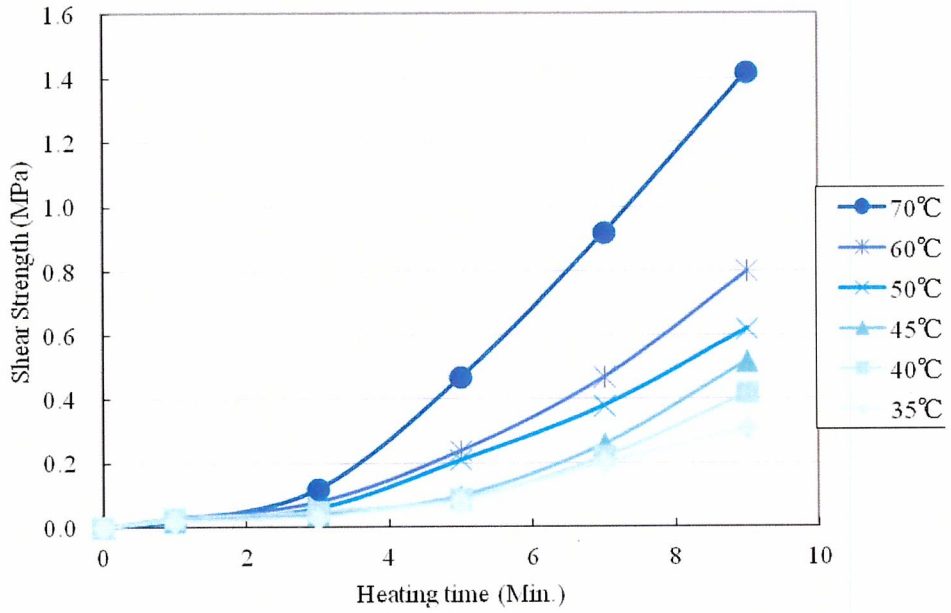
Color:	Off white
Property:	non-sagging / paste
Density:	1.27 @20°C
Viscosity:	18 Pa · s (430sec^{-1})

Viscosity: 20 ° C SOD viscometer used.

YOKOHAMA

Yokohama Industries Americas Inc.
Sealant Division

Curing property under several conditions



Main agent / curing agent = 10/1 (weight ratio)
Specimen: Surface-treated polypropylene / Painted plastic plate
Adhesive layer: 3mmt

Mechanical and Adhesion Performance

Mechanical properties	Hardness (JIS-A)	48
	Tensile strength (MPa)	5.2
	Elongation (%)	350
Lap shear Strength[1] (MPa)	Normal condition	3.8 CF
	Water resistance (40℃×336H)	3.3 CF
	Heat resistance (90℃×336H)	4.1 CF
	Chemical resistance[2] (20℃×336H)	3.2 CF

[1] Adhesion performance without primer
[2] Resistance to window washer fluid (WWF)

According to JASO M-338-89
CF: Cohesive Failure in adhesive layer
Main agent / curing agent = 10/1 (weight ratio)
Specimen: Surface-treated polypropylene / Painted plastic plate
Adhesive layer: 3mmt

YOKOHAMA

Yokohama Industries Americas Inc.
Sealant Division

Mixing

Main agent (WS-242FK) and curing agent (AN-1M) have to be thoroughly mixed using suitable equipment (i.e. static mixer with approx. 30 elements). The mixed product must be homogeneous black and free of streaks. Recommended mixing ratio, main agent / curing agent is 10/1±0.2 (by weight ratio).

Shelf Life

WS-242FK and AN-1M can be stored 6 months in its unopened original packaging at room temperature.

Storage and Handling

Store in cool, dry well-ventilated area at room temperature (10C-40C). Store WS-242FK and AN-1M avoiding direct sunlight. See Safety Section on product label and Safety Data Sheet (SDS) for safe handling instructions.

Safety Precautions

WS-242FK and AN-IM are for industrial use only: Always use protective goggles, gloves and appropriate work clothing when handling, avoid eye and skin contact. Wash hands thoroughly after handling. Do not breathe vapors. Use with adequate ventilation. Refer to the Safety Data Sheet (SDS) for more information.

Availability

The product is available in 400 gram cartridges, five gallon pails, and 55 gallon drums. The product is shipped from our Versailles, Kentucky plant.

Yokohama Industries Americas Inc.

Safety Data Sheet

Section 1:	Identification
Name:	**WS-292-A Sealant**
Description:	**Urethane sealant**
Use:	Windshield sealant
SDS number:	YHAI-2009-01
Appearance and odor:	Black, no odor
Company:	Yokohama Industries Americas, Inc. 103 Kuhlman Blvd. Versailles, KY 40383
Emergency telephone:	1-800-424-9300 CHEMTREC
Product information	859-879-2853
Effective date:	3/31/2014
Supersedes date:	5/20/2011

Section 2: Hazard(s) Identification

GHS Classification

GHS Rating: health: 5; flammability: 5; reactivity: 0.

1- severe hazard, 2- serious, 3-moderate, 4-slight and 5- minimal

Skin Irritation- Category 2.
Eye Irritation- Category 2B.
Carcinogenicity- Category 2.

GHS Label

OSHA HCS 2012

Signal Word: ***WARNING*** **!**

Hazard Statements

H302- Harmful if swallowed.
H315- Causes skin irritation.
H320- Causes eye irritation.
H333- May be harmful if inhaled.
H351- Suspected of causing cancer.

Precautionary Statements

P201- Obtain special instructions before use.
P202- Do not handle until all safety precautions have been read and understood.
P232- Protect from moisture.
P235 + P410- Keep cool. Protect from sunlight.

P264- Wash skin thoroughly after handling.
P270- Do not eat, drink or smoke when using this product.
P280- Wear protective gloves/protective clothing/eye protection/face protection.
P308+313- If exposed or concerned: Call a Poison Center or doctor/physician.
P332+313- If skin irritation occurs; get medical advice/attention.
P337+313- If eye irritation persists get medical advice/attention.
P305+351+338- IF IN EYES: Rinse cautiously with water for several minutes.
Remove contact lenses if present and easy to do- continue rinsing.
P403-P233- Store in a well ventilated place. Keep container tightly closed.
P405- Store locked up.
P501- Dispose of contents/container in accordance with local regulation.

Section 3: Composition/Information on Ingredients

A hazard evaluation of this product has been performed. The components listed below are identified as hazardous chemicals under the criteria of the OSHA hazard communication standard (29 CFR 1910.1200).

Common name / Chemical name	CAS number	Approximate %
Carbon black	1333-86-4	20 - 30
Limestone / Calcium carbonate	1317-65-3	10 - 20
Urethane prepolymer	Trade Secret	30 - 40

Section 4: First-Aid Measures

Primary route(s) of exposure: **Eye - yes** **Skin - yes** **Inhalation - yes**

Eye contact:
Flush eyes with water for at least 15 minutes. If irritation develops, consult a physician.

Skin contact:
Remove contaminated clothing and shoes. Wash affected area with soap and water. If irritation develops, consult a physician. Wash contaminated clothing separately before reuse.

Inhalation:
Remove to fresh air. If symptoms develop, seek immediate medical attention. If abnormal respiration is observed, artificial respiration (preferably mouth to mouth) and oxygen should be administered by a qualified first aid responder.

Ingestion:
Do not induce vomiting. Seek medical attention. Do not give anything by mouth if the person is drowsy, unconscious, or has no gag reflex.
Ingestion creates a high risk of aspiration and subsequent chemical pneumonitis. However, if more than one milliliter per kilogram of body weight of the hydrocarbon was ingested, careful emesis or lavage is recommended because of the toxic effects produced by the hydrocarbon.
Note to physician:
Treatment should be directed at preventing absorption, administering to the symptoms as they occur, and providing supportive therapy.

Health Effects Summary

Eye contact:
Can cause mild to moderate irritation.
The severity of reaction depends on duration of exposure and first aid procedures administered.

Skin contact:
Prolonged or repeated contact can defat the skin, cause irritation, and lead to the development of dermatitis.

Inhalation:
Can cause irritation to the nose, throat, and upper respiratory tract.
Inhalation can cause dizziness, headaches, and incoordination.
Nausea, vomiting, and gastrointestinal upset can occur.
In case of hypersensitivity of respiratory tract (for example, asthmatics and those who suffer from chronic

bronchitis) it is not advisable to work with this product unless sufficient ventilation and personal protective equipment are used.

Ingestion:

Ingestion can cause gastrointestinal irritation.
Can cause nausea, vomiting, and gastrointestinal upset.
Dizziness, faintness, drowsiness, and incoordination (ataxia) can occur.

Additional effects (target organs):

Eye.
Skin.

Aggravation of existing conditions:

Skin.

Section 5: Fire-Fighting Measures

Flash point:	> 150°C	Test method:setaflash closed cup
Explosive limits:	LEL (%) - not established	UEL (%) - not established
Auto-ignition temperature:	not established	

Extinguishing media:

Small fires : Use agents approved for class B hazards (e.g. dry chemical, carbon dioxide, halon, foam, and steam) or water fog.
Large fires : Use water spray, fog, or alcohol foam.

Special fire fighting procedures:

Fire fighters and others who may be exposed to the products of combustion should be equipped with NIOSH approved positive pressure self-contained breathing apparatus (SCBA) and full protective clothing.

Unusual fire and explosion hazards:

When exposed to flames or high temperatures encountered during fire conditions, sealed containers may rupture because of the build up of internal pressure. Cool containers with water.

Section 6: Accidental Release Measures

Response to spills:

Shovel or scoop spilled product and place in closed containers for further handling and disposal.

Precautions:

If the airborne concentration exceeds established exposure limits (TLV or PEL), or if high airborne concentrations can occur, evacuate employees and ventilate the area.
A supplied air respirator or self-contained breathing apparatus (SCBA) should be used for entry into enclosed spaces, or in areas with inadequate ventilation.

Section 7: Handling and Storage

Recommended storage practice and conditions:

Store in cool, dry, well ventilated area. Do not store above: 95°F, 35°C.

Container use procedures:

No special precautions are needed. Follow good manufacturing and handling practices.

Empty container precautions:

This container can be hazardous when empty, because it can retain product residues. Therefore, do not reuse container for food, clothing, or products for human or animal consumption or where skin contact may occur.

Section 8: Exposure Controls/ Personal Protection

Ventilation:

Maintain airborne concentration below the established exposure limits (See airborne exposure limits in this section). General (dilution) ventilation may be acceptable. However, local exhaust ventilation is recommended when vapors, mists, or dusts can be released.

Personal hygiene:

Wash thoroughly after handling, especially before eating, drinking, smoking, or using restroom facilities. Wash

contaminated goggles, faceshield, and gloves. Professionally launder contaminated clothing. Discard contaminated shoes.

Airborne exposure limits

Carbon black

ACGIH TLV-TWA:		3.5 mg/m3	
OSHA PEL:		3.5 mg/m3	

Limestone

ACGIHTLV-TWA:		10 mg/m3	total particulate
OSHA PEL:	5	(15) mg/m3	respirable reaction (total particulate)

Note: Because of this product's physical composition, the release or generation of a dust is not expected to occur under normal conditions of use.

Personal Protective Equipment (PPE)

Eye protection:

Wear chemical splash goggles.

An eye wash facility should be readily available.

Skin protection:

Wear protective clothing and appropriate impervious gloves. Because a variety of protective gloves exist, always consult glove manufacturer to determine the proper type for specific operation.

Respiratory protection:

Respiratory protection is not usually required.

Industrial hygiene consultation is recommended because airborne exposure levels vary depending on the nature of the operation being performed.

Section 9:	**Physical and Chemical Properties**
% Non-volatile (by weight):	100
pH:	not applicable
Vapor density (air=1):	not applicable
Solubility in water:	insoluble
Evaporation rate (n-butyl acetate=1):	not applicable
Vapor pressure (mmHg @25oC):	not applicable
Specific gravity (water=1);	>1
Approximate boiling point:	not applicable
Supplemental section 11 information:	VOC =0.01 #/Gal

Note: The physical data presented above are typical values and should not be construed as a specification.

Section 10:	**Stability and Reactivity**
Stable under normal conditions of storage and use:	yes

Materials to avoid:

Amines.

Oxidizing agents.

Acids.

Strong bases.

Water.

Hazardous polymerization:

Hazardous polymerization will not occur.

Thermal decomposition products:

If heated to high temperatures, this product may emit the following compounds:

Isocyanate containing compounds.

Oxides of nitrogen, Phosgene

Smoke, soot, & toxic fumes (e.g. carbon dioxide & carbon monoxide).

Section 11: Toxicological Information

Carbon black

Toxic effects:*

Can cause mechanical irritation and discoloration of the eyes and skin. Inhalation can cause irritation to the nose and respiratory tract. Prolonged and repeated inhalation can affect the pulmonary system causing difficulty in breathing, chest pain, and general weakness.

Carcinogenicity - listed by:

ACGIH: no **IARC monographs: 2B** **NTP annual report: n** **OSHA: no**

Limestone

Toxic effects:*

Overexposure to calcium carbonate dusts may affect respiratory function.

Note: Naturally occurring calcium carbonate can contain, as an impurity, trace amounts of crystalline silica.

Carcinogenicity - listed by:

ACGIH: no **IARC monographs: no** **NTP annual report: n** **OSHA:no**

** Note: This product does not contain carbon black or calcium carbonate in the powder form. The above toxic effects may not apply.*

Section 12: Ecological Information

Keep out of sewers, drainage areas, streams, or other bodies of water. Report spills and releases, as applicable, under Federal and State Regulations.

Section 13: Disposal Considerations

Disposal methods:

If discarded in its original unused form, this product should be managed (stored/treated/disposed/etc.) at an authorized facility, in compliance with all applicable federal, state, and local requirements. Be sure to contact appropriate government environmental agencies if further disposal guidance is required.

Of the methods of disposal currently available, it is recommended that an alternative be selected according to the following order of preference, based upon environmental acceptability:

(1) Recycle or rework if at all feasible
(2) Incinerate at an authorized facility, or
(3) Treat at an acceptable waste treatment facility.

Section 14: Transportation Information

DOT shipping name: non-regulated
DOT label: not applicable
DOT identification No.: not applicable

Supplemental section 12 information:

HM-181, IATA/ICAO, IMO - non-regulated

Section 15: Regulatory Information

Toxic substance control act (TSCA)

Chemical component(s) in this product are on the section 8 (b) chemical substance inventory listing (40 CFR 710).

SARA title III information

Section 313 - toxic chemicals

Pursuant to section 313, this product does not contain a toxic chemical in excess of 1 percent of the mixture (0.1 percent, if the listed toxic chemical is a carcinogen).

Section 302 - extremely hazardous substances

Pursuant to section 302, this product does not contain an extremely hazardous substance.

Section 311/312 - hazard categories

Pursuant to section 311/312, the physical and health hazard categories for this product are identified below:

Fire hazard: no

Sudden release of pressure hazard:	no
Reactivity hazard:	no
Immediate (acute) health hazard:	yes
Delayed (chronic) health hazard:	yes

Hazardous materials information review regulation - Canada

This material safety data sheet provides information that complies with the requirement set forth under the Canadian workplace hazardous materials information system (WHMIS). However, please note the TSCA designation above in reference to DSL and NDSL list status in Canada.

Claim for exemption registry No.:	not applicable
Filing date for claim:	not applicable

Section 16: Other Information

User Responsibility:

A bulletin such as this cannot be expected to cover all possible individual situations. As the user has the responsibility to provide a safe workplace, all aspects of an individual operation should be examined to determine if, or where, precautions - in addition to those described herein - are required. Any health hazard and safety information contained herein should be passed on to your customers or employees, as the case may be.

Disclaimer of liability

The information contained herein is, to the best of our knowledge and belief, accurate. However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by use of this material. All chemicals may present unknown health hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist. Final determination of suitability of the chemical is the sole responsibility of the user. No representations of warranties, either expressed or implied, of merchantability, fitness for a particular purpose or any other nature are made hereunder with respect to the information contained herein or the chemical to which the information refers. It is the responsibility of the user to comply with all applicable federal, state and local laws and regulations.

State of California addendum to the safety data sheet:

Product name:	**WS-292-A Sealant**
Effective date:	3/31/2014

The California safe drinking water and toxic enforcement act of 1986, otherwise known as proposition 65, requires that persons potentially exposed to certain substances be made aware of the chronic effects of the substances specified by the state of California.

This product contains the following substances known to the state of California to cancer, birth defects, or other reproductive harm.

Ingredients

Commonwealth of Pennsylvania addendum to the safety data sheet:

Product name:	**WS-292-A Sealant**
Effective date:	3/13/2014

All of the materials in this product that are required by the Commonwealth of Pennsylvania to be identified are listed below. In addition, some of the materials identified may have been placed by the Commonwealth of Pennsylvania on their hazardous substance list.

Ingredients	**CAS Number**	**Weight %**
Carbon black	1333-86-4	20 - 30
Limestone / Calcium carbonate	1317-65-3	10 - 20
Urethane prepolymer	Trade Secret	30 - 40

**Note the above chemicals are not in the powder form in this product.*

The specific chemical identity of any substance not identified with a chemical abstract service number is being held as a trade secret.

If you have questions with regard to health effects, or other information presented in this document, contact:

Neil Dalton
Director of Environment, Health and Safety
Yokohama Tire Corporation
1500 Indiana Avenue
Salem, VA 24153
Tel # 540-375-8209 / Fax # 540-375-0226

From: Daniel Porter
To: Hughes, Jonathon (EEC)
Subject: FW: Vitro (AI 2846)
Date: Thursday, April 25, 2024 8:30:19 AM
Attachments: image001.png
image002.jpg

Jonathon,

Additional stack information for Vitro.

Vitro Stack Information

Stack ID	Equivalent Diameter (ft)	Height (ft)	Base Elevation (ft)	UTM Northing (m)	UTM Easting (m)	Flowrate (acfm)	Temperature (°F)	Exit Velocity (ft/sec)	source info
6	6.18	29.79	~985	4164506.49	738128.55	19950	77	11.1	2019 app/EIS
7	6.18	27.88	~985	4164522.24	738128.09	19200	77	10.7	2019 app/EIS
8	6.18	29.04	~985	4164506.49	738139.77	24400	77	13.5	2019 app/EIS
10	3.33	32	~985	4164469.00	738120.00	19,950	70	38.1	NEW
11	3.33	36	~985	4164427.00	738128.00	19,950	70	38.1	NEW
12	3.33	32	~985	4164430.00	738153.00	19,950	70	38.1	NEW

Dan

From: Yang, Shufang (EEC) <Shufang.Yang@ky.gov>
Sent: Tuesday, April 23, 2024 4:01 PM
To: Nicole Galavotti <Nicole_Galavotti@shieldmw.com>; Hughes, Jonathon (EEC) <Jonathon.Hughes@ky.gov>
Cc: Daniel Porter <Daniel_Porter@shieldmw.com>
Subject: RE: Vitro (AI 2846)

Received. Thank you.

From: Nicole Galavotti <Nicole_Galavotti@shieldmw.com>
Sent: Tuesday, April 23, 2024 4:00 PM
To: Yang, Shufang (EEC) <Shufang.Yang@ky.gov>; Hughes, Jonathon (EEC) <Jonathon.Hughes@ky.gov>
Cc: Daniel Porter <Daniel_Porter@shieldmw.com>
Subject: RE: Vitro (AI 2846)

Apologies, it appears my outlook didn't pull the last correspondence. Vitro's application was submitted today.

From: Yang, Shufang (EEC) <Shufang.Yang@ky.gov>
Sent: Monday, April 22, 2024 11:10 AM
To: Nicole Galavotti <Nicole_Galavotti@shieldmw.com>
Subject: RE: Vitro (AI 2846)

I'll be on the lookout for this application. Jonathon will process this application.
Thanks,

Shufang

From: Nicole Galavotti <Nicole_Galavotti@shieldmw.com>
Sent: Monday, April 22, 2024 11:04 AM
To: Yang, Shufang (EEC) <Shufang.Yang@ky.gov>
Subject: RE: Vitro (AI 2846)

Thanks Shufang. The different coatings that can be used for different parts that go down the same line make this a little confusing. I think getting them limits as a conditional major will help in the long run, I just wanted to walk through it out after a long weekend. We will have this over to you tomorrow. Just a heads up, we are going to go ahead and ask for VOC and total HAP limit so we don't have to go through this again if/when they consolidate the other plant that may come to Berea. Thanks for getting back to me so quickly.
Nicole

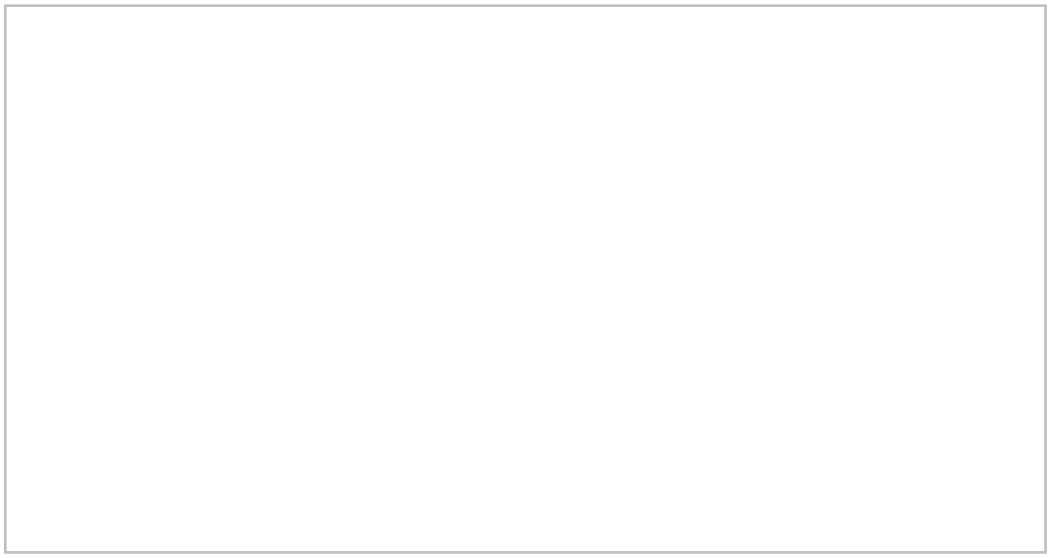
From: Yang, Shufang (EEC) <Shufang.Yang@ky.gov>
Sent: Monday, April 22, 2024 10:54 AM
To: Nicole Galavotti <Nicole_Galavotti@shieldmw.com>
Subject: RE: Vitro (AI 2846)

State origin needs to base on true PTE. You could count the worst case of one adhesive used. But we won't be able to cap usage rate below PTE.
The time it takes to issue a final state origin permit vs draft conditional major permit will be the same. Company will have construction authority upon issuance of draft permit for regular conditional major (not synthetic minor) prior to 30 days public notice.

If you need to discuss, please feel free to give me a call. We will expedite this permit application.

From: Nicole Galavotti <Nicole_Galavotti@shieldmw.com>
Sent: Sunday, April 21, 2024 3:22 PM
To: Yang, Shufang (EEC) <Shufang.Yang@ky.gov>
Subject: RE: Vitro (AI 2846)

Shufang below is the announcement that came out Friday for the Vitro facility. We originally thought the combination of the two facilities would bump the VOCs over 100 tons/yr however they are only at about 70 tons/yr. The toluene is around 12 ton/yr but that doesn't take into account any reduction in the two adhesives used. These materials are all hand applied. Due to the transition, the company is very concerned about the construction timeline. Originally we discussed that you thought 60 days would be realistic with the change from a state origin to a conditional major. Do you think any time would be saved if they remained a state origin and capped the amount of coating they use to ensure the max toluene is below 10 tons/yr potential? If it is easier to discuss over the phone just give me a call when you have an opportunity. The application should be submitted Tuesday.



From: Yang, Shufang (EEC) <Shufang.Yang@ky.gov>
Sent: Tuesday, March 19, 2024 10:32 AM
To: Nicole Galavotti <Nicole_Galavotti@shieldmw.com>
Subject: RE: Vitro (AI 2846)

It works for me.

From: Nicole Galavotti <Nicole_Galavotti@shieldmw.com>
Sent: Tuesday, March 19, 2024 10:21 AM
To: Yang, Shufang (EEC) <Shufang.Yang@ky.gov>
Subject: RE: Vitro (AI 2846)

Does 1pm work for you?

From: Yang, Shufang (EEC) <Shufang.Yang@ky.gov>
Sent: Tuesday, March 19, 2024 10:18 AM
To: Nicole Galavotti <Nicole_Galavotti@shieldmw.com>
Subject: RE: Vitro (AI 2846)

Yes, I'm available on Wednesday.

From: Nicole Galavotti <Nicole_Galavotti@shieldmw.com>
Sent: Monday, March 18, 2024 8:21 PM
To: Yang, Shufang (EEC) <Shufang.Yang@ky.gov>
Cc: Monica Murphy <Monica_Murphy@shieldmw.com>
Subject: Vitro (AI 2846)

Good evening Shufang. I wanted to see if you had time to discuss some air permitting changes that will be needed at Vitro (Pittsburgh Glass Works, LLC.) AI# 2846. Some planned changes will take place at the facility, however, they are still confidential in nature so I am not able to put them in an email. Would you be able to discuss Wednesday or Friday this week?

Nicole R. Galavotti, P.E.
Principal/Sr. Environmental Engineer
Shield Environmental Associates, Inc.
948 Floyd Drive
Lexington, KY 40505
Office (859) 294-5155
Fax (859) 294-5255
Cell (859) 396-8453

Dripping water hollows out stone, not through force but through persistence - Ovid

From: Daniel Porter
To: Hughes, Jonathon (EEC)
Cc: Monica Murphy; Nicole Galavotti
Subject: Updated stack information for Vitro (AI 2846)
Date: Tuesday, June 11, 2024 2:29:12 PM
Attachments: image001.png
image002.png
24MIS689 MDI Bulk, Pittsburgh Glass.pdf
24MIS689 HDI TDI Bulk, Pittsburgh Glass.pdf
BETASEAL™ 43520A Glass Primer.pdf
24MIS689 Toluene Bulk, Pittsburgh Glass.pdf
Updated Vitro PTE.pdf

Jonathon,

I appreciate your patience on this; it took longer than expected to get analytical results back to update the TDI and HDI content. The SDS for BETASEAL 43520A Glass Primer had the TDI and HDI at less than 1%. The results from the LCS laboratory show that the percentage of TDI and HDI are below the reporting limit of 0.05% (See attached). The table below shows all stacks' updated lb/hr of TDI and HDI.

Stack ID	TDI and HDI emission rate in lbs/hr
All Stacks Combined	0.00389
6	0.00062
7	0.00062
8	0.00039
10	0.00114
11	0.00063
12	0.00042
2	0.00009

We also had LCS analyze the amount of Toluene in the Black Glass Primer 43520A and Clear Glass Primer 43518 and the amount of MDI present in the Body Primer 43533 (See attached). I've attached the updated PTE tables incorporating these results with adjusted EFs for MDI, Toluene, HDI, and TDI. Please note that the Toluene TPY is now under 10 TPY, but Vitro still wishes to be Conditional Major. Let me know if you have any further questions or need more information.

Thanks,
Daniel Porter, Ph.D., P.E.
Environmental Engineer
Shield Environmental Associates, Inc.
948 Floyd Drive
Lexington, KY 40505
Office| 859.294.5155 Ext. 109
Mobile| 859.229.8637
Fax| 859.294.5255
https://www.shieldenvassociates.com/

From: Daniel Porter
Sent: Wednesday, May 15, 2024 3:03 PM
To: Hughes, Jonathon (EEC) <Jonathon.Hughes@ky.gov>
Cc: Nicole Galavotti <Nicole_Galavotti@shieldmw.com>; Monica Murphy <Monica_Murphy@shieldmw.com>
Subject: RE: Updated stack information for Vitro (AI 2846)

Jonathon,

We are working with the client to get new emission factors for TDI and HDI. This should be completed sometime next week.

Dan

From: Hughes, Jonathon (EEC) <Jonathon.Hughes@ky.gov>
Sent: Wednesday, May 15, 2024 2:58 PM
To: Daniel Porter <Daniel_Porter@shieldmw.com>
Cc: Nicole Galavotti <Nicole_Galavotti@shieldmw.com>; Monica Murphy <Monica_Murphy@shieldmw.com>
Subject: RE: Updated stack information for Vitro (AI 2846)

Thank you for the updated information. Are you all still working on the HDI and TDI emission factors?

From: Daniel Porter <Daniel_Porter@shieldmw.com>
Sent: Wednesday, May 15, 2024 2:36 PM
To: Hughes, Jonathon (EEC) <Jonathon.Hughes@ky.gov>
Cc: Galavotti, Nicole <Nicole_galavotti@shieldmw.com>; Monica Murphy <Monica_Murphy@shieldmw.com>
Subject: Updated stack information for Vitro (AI 2846)

Jonathon,

We have obtained updated stack information for stacks 6, 7, 8, 10, 11, and 12 (See red text in the table below). We also have stack information for SL1, which is emitted from

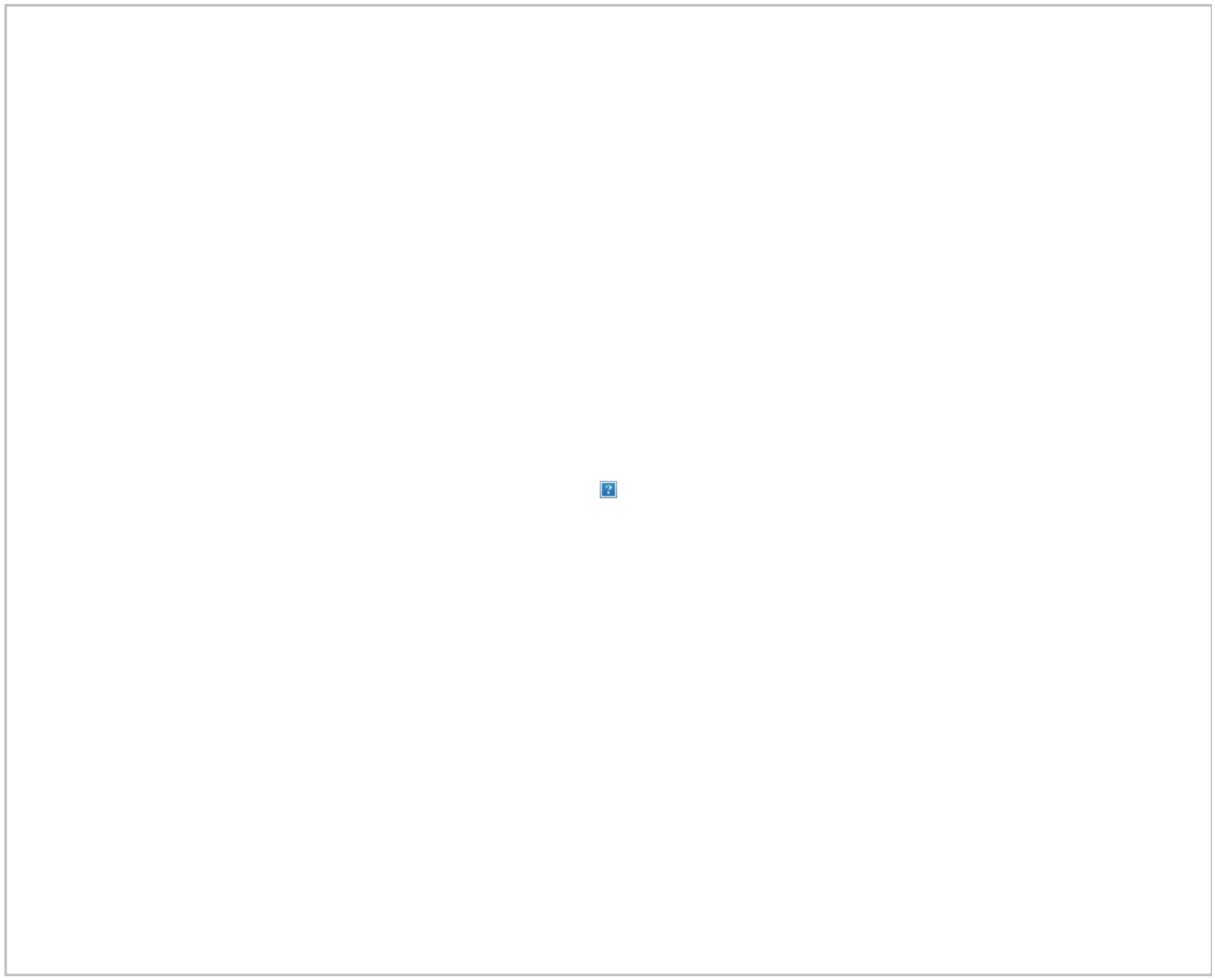
Stack 2 (See the table below)).

Vitro Stack Information

Stack ID	Equivalent Diameter (ft)*	Height (ft)	Base Elevation (ft)	UTM Northing (m)	UTM Easting (m)	Flowrate (acfm)	Temperature (°F)	Exit Velocity (ft/sec)	source info
6	3.68	30.5	~985	4164506.49	738128.55	19,950	77	31.2	2019 app/EIS/Updated info from client
7	3.68	30.5	~985	4164522.24	738128.09	19,200	77	30.0	2019 app/EIS/Updated info from client
8	3.68	30.5	~985	4164506.49	738139.77	24,400	77	38.2	2019 app/EIS/Updated info from client
10	3.33	31.92	~985	4164469.00	738120.00	19,950	70	38.1	NEW
11	3.33	35.92	~985	4164427.00	738128.00	19,950	70	38.1	NEW
12	3.33	31.92	~985	4164430.00	738153.00	19,950	70	38.1	NEW
2 (SL1)	3.33	31.92	~985	4164483.00	738260.00	15,000	75	28.6	2015 app/EIS/Updated info from client

*The stack for 6, 7, and 8 only has exhaust on the outer edge of the stack (See attached PowerPoint).

Update stack location map with stack 2.



ADDRESS: 700 COLLIP CIRCLE,
SUITE 218, LONDON, ON,
N6G 4X8, CANADA

LCS LABORATORY INC.

PHONE: (519) 777-5232
EMAIL: INFO@LCSLABORATORY.COM
WEB: WWW.LCSLABORATORY.COM

CERTIFICATE OF ANALYSIS

Client:	Pittsburg Glass Works, LLC/Vitro Automotive Glass Elkin Plant 300 PGW Drive, Elkin NC 28621 USA	Work Order:	24MIS689
		Date Received:	May 17, 2024
		Date Analyzed:	May 28-30, 2024
		Date Reported:	June 03, 2024
Submitted by:	Kenneth Herzer, EHS Manager	Analysis:	Hexamethylene Diisocyanate, Toluene Diisocyanate, content in Bulk Sample
Client's project:	194231; Primer Lab Analysis	Reference Procedure:	OSHA 42/47 with modification[1)] HPLC

Results:

Client Sample ID	Laboratory Sample ID	Hexamethylene Diisocyanate %	Toluene Diisocyanate %
Black Glass Primer 43520A	24MIS689-ISO-1	<RL	<RL
Reporting Limit (RL)		**RL=0.05%**	**RL=0.05%**

Comment:

- The method was modified for analysis of the bulk material. The sample portion was treated with 1-(2-pyridyl) piperazine to preserve and derivatize diisocyanates. Extract was analyzed using High Performance Liquid Chromatography.

Note:

- Samples were accepted for analysis.
- Reporting Limit (RL) is the lowest concentration reported by the laboratory.
- Test results pertain only to the analysis of samples herein reported.

Analyst: Raisa Stadnichenko, Ph.D.

Reviewer: Stepan Reut, Ph.D.

ADDRESS: 700 COLLIP CIRCLE, SUITE 218, LONDON, ON, N6G 4X8, CANADA

LCS LABORATORY INC.

PHONE: (519) 777-5232
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CERTIFICATE OF ANALYSIS

Client:	Pittsburgh Glass Works, LLC/Vitro Automotive Glass Elkin Plant 300 PGW Drive, Elkin NC 28621 USA	Work Order:	24MIS689
		Date Received:	May 17, 2024
		Date Analyzed:	May 28-30, 2024
		Date Reported:	June 03, 2024
Submitted by:	Kenneth Herzer, EHS Manager	Analysis:	Methylene Diisocyanate, content in Bulk Sample
Client's project:	194231; Primer Lab Analysis	Reference Procedure:	OSHA 47 with modification[1)] HPLC

Results:

Client Sample ID	Laboratory Sample ID	Methylene Diisocyanate %
Body Primer 43533	24MIS689-ISO-2	4.7%
Reporting Limit (RL)		**RL=0.05%**

Comment:

- 1) The method was modified for analysis of the bulk material. The sample portion was treated with 1-(2-pyridyl) piperazine to preserve and derivatize diisocyanates. Extract was analyzed using High Performance Liquid Chromatography.

Note:

- Samples were accepted for analysis.
- Reporting Limit (RL) is the lowest concentration reported by the laboratory.
- Test results pertain only to the analysis of samples herein reported.

Analyst: Raisa Stadnichenko, Ph.D.

Reviewer: Stepan Reut, Ph.D.

ADDRESS: 700 COLLIP CIRCLE, SUITE 218, LONDON, ON, N6G 4X8, CANADA

LCS LABORATORY INC.

PHONE: (519) 777-5232
EMAIL: INFO@LCSLABORATORY.COM
WEB: WWW.LCSLABORATORY.COM

CERTIFICATE OF ANALYSIS

Client:	Pittsburgh Glass Works, LLC/Vitro Automotive Glass Elkin Plant 300 PGW Drive, Elkin NC 28621 USA	Work Order:	24MIS689
		Date Received:	May 17, 2024
		Date Analyzed:	May 28-30, 2024
		Date Reported:	June 03, 2024
Submitted by:	Kenneth Herzer, EHS Manager	Analysis:	Toluene, content in Bulk Sample
Client's project:	194231; Primer Lab Analysis	Reference Procedure:	GC-FID

Results:

Client Sample ID	Laboratory Sample ID	Toluene %
Black Glass Primer 43520A	24MIS689-Tol-1	4.8%
Clear Glass Primer 43518	24MIS689-Tol-3	26.6%
Reporting Limit (RL)		**RL=0.05%**

Note:

- Samples were accepted for analysis.
- Reporting Limit (RL) is the lowest concentration reported by the laboratory
- Test results pertain only to the analysis of samples herein reported.

Analyst: Raisa Stadnichenko, Ph.D.

Reviewer: Stepan Reut, Ph.D.

SAFETY DATA SHEET

DDP Specialty Electronic Materials US, LLC

Product name: BETASEAL™ 43520A Glass Primer **Issue Date:** 08/09/2023
Print Date: 04/11/2024

DDP Specialty Electronic Materials US, LLC encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. IDENTIFICATION

Product name: BETASEAL™ 43520A Glass Primer

Recommended use of the chemical and restrictions on use
Identified uses: A primer - For use in automotive applications.

COMPANY IDENTIFICATION
DDP Specialty Electronic Materials US,
LLC
974 Centre Road, Building 730,
Wilmington DE 19805
UNITED STATES

Customer Information Number: 833-338-7668
SDSQuestion-NA@dupont.com

EMERGENCY TELEPHONE NUMBER
24-Hour Emergency Contact: 1-800-424-9300
Local Emergency Contact: 800-424-9300

2. HAZARDS IDENTIFICATION

Hazard classification
GHS classification in accordance with 29 CFR 1910.1200
Flammable liquids - Category 2
Skin irritation - Category 2
Eye irritation - Category 2A
Respiratory sensitisation - Category 1
Skin sensitisation - Category 1
Reproductive toxicity - Category 1B
Specific target organ toxicity - single exposure - Category 3
Specific target organ toxicity - repeated exposure - Category 2 - Inhalation
Aspiration hazard - Category 1

Label elements
Hazard pictograms

Signal word: **DANGER!**

Hazards
Highly flammable liquid and vapour.
May be fatal if swallowed and enters airways.
Causes skin irritation.
May cause an allergic skin reaction.
Causes serious eye irritation.
May cause allergy or asthma symptoms or breathing difficulties if inhaled.
May cause drowsiness or dizziness.
May damage fertility or the unborn child.
May cause damage to organs (Nervous system) through prolonged or repeated exposure if inhaled.

Precautionary statements

Prevention
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking.
Keep container tightly closed.
Ground/bond container and receiving equipment.
Use explosion-proof electrical/ ventilating/ lighting equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Do not breathe mist or vapours.
Wash skin thoroughly after handling.
Use only outdoors or in a well-ventilated area.
Contaminated work clothing must not be allowed out of the workplace.
Wear protective gloves/ protective clothing/ eye protection/ face protection.
In case of inadequate ventilation wear respiratory protection.

Response
IF SWALLOWED: Immediately call a POISON CENTER/ doctor.
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor if you feel unwell.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
IF exposed or concerned: Get medical advice/ attention.
Do NOT induce vomiting.
If skin irritation or rash occurs: Get medical advice/ attention.
If eye irritation persists: Get medical advice/ attention.
If experiencing respiratory symptoms: Call a POISON CENTER/ doctor.
Take off contaminated clothing and wash before reuse.
In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

Storage
Store in a well-ventilated place. Keep container tightly closed.
Store in a well-ventilated place. Keep cool.
Store locked up.

Disposal
Dispose of contents/ container to an approved waste disposal plant.

Other hazards
Static-accumulating flammable liquid.

3. COMPOSITION/INFORMATION ON INGREDIENTS

This product is a mixture.

Component	CASRN	Concentration
Methyl ethyl ketone	78-93-3	> 40.0 - < 50.0 %
Carbon black	1333-86-4	> 5.0 - < 15.0 %
Toluene	108-88-3	> 5.0 - < 15.0 %
Benzene, 2,4-diisocyanato-1-methyl-, polymer with 1,6-diisocyanatohexane	26426-91-5	> 5.0 - < 15.0 %
Hexane, 1,6-diisocyanato-, homopolymer, 3-(trimethoxysilyl) -1-propanethiol-blocked	252047-49-7	> 5.0 - < 15.0 %
Polyester	35176-78-4	< 10.0 %
n-Butyl Acetate	123-86-4	< 10.0 %
Butanedioic acid, Pentanedioic acid, Hexanedioic acid methyl ester reaction product with 3-Oxazolidineethanol, 2-(1-methylethyl)-	Not available	< 10.0 %
Xylene	1330-20-7	< 1.0 %
Hexamethylene diisocyanate	822-06-0	< 1.0 %
2,4-Toluene diisocyanate	584-84-9	< 1.0 %
Dipotassium monoxide	12136-45-7	< 0.5 %

4. FIRST AID MEASURES

Description of first aid measures
General advice:
First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

Inhalation: Move person to fresh air. If not breathing, give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask, etc). If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician or transport to a medical facility.

Skin contact: Remove material from skin immediately by washing with soap and plenty of water. Remove contaminated clothing and shoes while washing. Seek medical attention if irritation persists. Wash clothing before reuse. An MDI skin decontamination study demonstrated that cleaning very soon after exposure is important, and that a polyglycol-based skin cleanser or corn oil may be more effective than soap and water. Discard items which cannot be decontaminated, including leather articles such as shoes, belts and watchbands. Suitable emergency safety shower facility should be available in work area.

Eye contact: Immediately flush eyes with water; remove contact lenses, if present, after the first 5 minutes, then continue flushing eyes for at least 15 minutes. Obtain medical attention without delay, preferably from an ophthalmologist. Suitable emergency eye wash facility should be immediately available.

Ingestion: Do not induce vomiting. Call a physician and/or transport to emergency facility immediately.

Most important symptoms and effects, both acute and delayed:
Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), any additional important symptoms and effects are described in Section 11: Toxicology Information.

Indication of any immediate medical attention and special treatment needed
Notes to physician: Maintain adequate ventilation and oxygenation of the patient. May cause respiratory sensitization or asthma-like symptoms. Bronchodilators, expectorants and antitussives may be of help. Treat bronchospasm with inhaled beta2 agonist and oral or parenteral corticosteroids. Respiratory symptoms, including pulmonary edema, may be delayed. Persons receiving significant exposure should be observed 24-48 hours for signs of respiratory distress. If you are sensitized to diisocyanates, consult your physician regarding working with other respiratory irritants or sensitizers. The decision of whether to induce vomiting or not should be made by a physician. If lavage is performed, suggest endotracheal and/or esophageal control. Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach. Alcohol consumed before or after exposure may increase adverse effects. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Skin contact may aggravate preexisting dermatitis. Excessive exposure may aggravate preexisting asthma and other respiratory disorders (e.g. emphysema, bronchitis, reactive airways dysfunction syndrome).

5. FIREFIGHTING MEASURES

Suitable extinguishing media: Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. Alcohol resistant foams (ATC type) are preferred. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective.

Unsuitable extinguishing media: Do not use direct water stream. Straight or direct water streams may not be effective to extinguish fire.

Special hazards arising from the substance or mixture
Hazardous combustion products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Nitrogen oxides. Isocyanates. Hydrogen cyanide. Carbon monoxide. Carbon dioxide.

Unusual Fire and Explosion Hazards: Product reacts with water. Reaction may produce heat and/or gases. Container may rupture from gas generation in a fire situation. Electrically ground and bond all equipment. Flammable mixtures of this product are readily ignited even by static discharge. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition and/or flash back may occur. Flammable mixtures may exist within the vapor space of containers at room temperature. Flammable concentrations of vapor can accumulate at temperatures above flash point; see Section 9. Dense smoke is produced when product burns.

Advice for firefighters
Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Stay upwind. Keep out of low areas where gases (fumes) can accumulate. Water may not be effective in extinguishing fire. Water is not recommended, but may be applied in large quantities as a fine spray when other extinguishing agents are not available. Fight fire from protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles. Immediately withdraw all personnel from the area in case of rising sound from venting safety device or discoloration of the container. Do not use direct water stream. May spread fire. Eliminate ignition sources. Move container from fire area if this is possible without hazard. Avoid accumulation of water. Product may be carried across water surface spreading fire or contacting an ignition source. Use water spray to cool fire-exposed containers and fire-affected zone until fire is out. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this (M)SDS.

Special protective equipment for firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). Avoid contact with this material during fire fighting operations. If contact is likely, change to full chemical resistant fire fighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Evacuate area. Only trained and properly protected personnel must be involved in clean-up operations. Keep personnel out of low areas. Keep upwind of spill. Ventilate area of leak or spill. No smoking in area. Eliminate all sources of ignition in vicinity of spill or released vapor to avoid fire or explosion. Vapor explosion hazard. Keep out of sewers. For large spills, warn public of downwind explosion hazard. Check area

with combustible gas detector before reentering area. Ground and bond all containers and handling equipment. See Section 10 for more specific information. Refer to section 7, Handling, for additional precautionary measures. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Environmental precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

Methods and materials for containment and cleaning up: Contain spilled material if possible. Absorb with materials such as: Cat litter. Sand. Sawdust. Ground and bond all containers and handling equipment. Pump with explosion-proof equipment. If available, use foam to smother or suppress. Collect in suitable and properly labeled containers. See Section 13, Disposal Considerations, for additional information.

7. HANDLING AND STORAGE

Precautions for safe handling: Keep away from heat, sparks and flame. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated contact with skin. Do not swallow. Avoid breathing vapor. Wash thoroughly after handling. Keep container closed. Use only with adequate ventilation. No smoking, open flames or sources of ignition in handling and storage area. Ignition sources can include and are not limited to pilot lights, flames, smoking, sparks, heaters, electrical equipment, and static discharges. Electrically bond and ground all containers, personnel and equipment before transfer or use of material. Use of non-sparking or explosion-proof equipment may be necessary, depending upon the type of operation. Containers, even those that have been emptied, can contain vapors. Do not cut, drill, grind, weld, or perform similar operations on or near empty containers. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition and/or flash back may occur. Never use air pressure for transferring product unless a risk assesment has been conducted that includes consideration of the flammability of the product. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

Conditions for safe storage: Minimize sources of ignition, such as static build-up, heat, spark or flame. Keep container closed. Flammable mixtures may exist within the vapor space of containers at room temperature. Store in a dry place. Avoid moisture.

Storage stability

Storage temperature:

> 10 - < 35 °C (> 50 - < 95 °F)

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

If exposure limits exist, they are listed below. If no exposure limits are displayed, then no values are applicable.

Component	Regulation	Type of listing	Value
Methyl ethyl ketone	Dow IHG	TWA	50 ppm
	Dow IHG	STEL	100 ppm
	ACGIH	TWA	200 ppm
	Further information: CNS impair: Central Nervous System impairment; URT irr: Upper Respiratory Tract irritation; PNS impair: Peripheral Nervous System impairment; BEI: Substances for which there is a Biological Exposure Index or Indices (see BEI®		

	section)		
	ACGIH	STEL	300 ppm
	Further information: CNS impair: Central Nervous System impairment; URT irr: Upper Respiratory Tract irritation; PNS impair: Peripheral Nervous System impairment; BEI: Substances for which there is a Biological Exposure Index or Indices (see BEI® section)		
	OSHA Z-1	TWA	590 mg/m3 200 ppm
	CAL PEL	PEL	590 mg/m3 200 ppm
	CAL PEL	STEL	885 mg/m3 300 ppm
Toluene	DUPONT AEL	AEL *	20 ppm
	DUPONT AEL	STEL	60 ppm
	ACGIH	TWA	20 ppm
	Further information: OTO: Ototoxicant; A4: Not classifiable as a human carcinogen		
	OSHA Z-2	TWA	200 ppm
	OSHA Z-2	CEIL	300 ppm
	OSHA Z-2	Peak	500 ppm
	CAL PEL	PEL	37 mg/m3 10 ppm
	Further information: S: Skin		
	CAL PEL	C	500 ppm
	Further information: S: Skin		
	CAL PEL	STEL	560 mg/m3 150 ppm
	Further information: S: Skin		
n-Butyl Acetate	Dow IHG	TWA	75 ppm
	Dow IHG	STEL	150 ppm
	OSHA Z-1	TWA	710 mg/m3 150 ppm
	Further information: (b): The value in mg/m3 is approximate.		
	CAL PEL	PEL	710 mg/m3 150 ppm
	CAL PEL	STEL	950 mg/m3 200 ppm
	ACGIH	TWA	50 ppm
	Further information: URT irr: Upper Respiratory Tract irritation; eye irr: Eye irritation		
	ACGIH	STEL	150 ppm
	Further information: URT irr: Upper Respiratory Tract irritation; eye irr: Eye irritation		
Xylene	DUPONT AEL	AEL *	100 ppm
	OSHA Z-1	TWA	435 mg/m3 100 ppm
	Further information: (b): The value in mg/m3 is approximate.		
	ACGIH	TWA	20 ppm
	Further information: OTO: Ototoxicant; A4: Not classifiable as a human carcinogen		
Hexamethylene diisocyanate	Dow IHG	TWA	0.005 ppm
	Further information: DSEN, RSEN: Skin and respiratory sensitizer		
	Dow IHG	TLV-C	0.02 ppm
	Further information: DSEN, RSEN: Skin and respiratory sensitizer		
	ACGIH	TWA	0.005 ppm
	Further information: URT irr: Upper Respiratory Tract irritation; resp sens: Respiratory sensitization; BEI: Substances for which there is a Biological Exposure Index or Indices (see BEI® section)		
	CAL PEL	PEL	0.034 mg/m3 0.005 ppm
2,4-Toluene diisocyanate	DUPONT AEL	AEL *	0.005 ppm
	Further information: SKIN, DSEN, RSEN: Absorbed via Skin, Skin Sensitizer, Respiratory sensitizer		
	DUPONT AEL	C	0.02 ppm
	Further information: SKIN, DSEN, RSEN: Absorbed via Skin, Skin Sensitizer, Respiratory sensitizer		
	CAL PEL	PEL	0.04 mg/m3 0.005 ppm
	CAL PEL	C	0.02 ppm

	CAL PEL	STEL	0.15 mg/m3 0.02 ppm
	OSHA Z-1	C	0.14 mg/m3 0.02 ppm
	ACGIH	TWA Inhalable fraction and vapor	0.001 ppm
	Further information: DSEN: Dermal Sensitization; RSEN: Respiratory sensitization; A3: Confirmed animal carcinogen with unknown relevance to humans; Skin: Danger of cutaneous absorption		
	ACGIH	STEL Inhalable fraction and vapor	0.005 ppm
	Further information: DSEN: Dermal Sensitization; RSEN: Respiratory sensitization; A3: Confirmed animal carcinogen with unknown relevance to humans; Skin: Danger of cutaneous absorption		
	OSHA P0	TWA	0.04 mg/m3 0.005 ppm
	OSHA P0	STEL	0.15 mg/m3 0.02 ppm

Although some of the components of this product may have exposure guidelines, no exposure would be expected under normal handling conditions due to the physical state of the material.

Biological occupational exposure limits

Components	CAS-No.	Control parameters	Biological specimen	Sampling time	Permissible concentration	Basis
Methyl ethyl ketone	78-93-3	methyl ethyl ketone	Urine	End of shift (As soon as possible after exposure ceases)	2 mg/l	ACGIH BEI
Toluene	108-88-3	Toluene	In blood	Prior to last shift of workweek	0.02 mg/l 0.3 mg/g Creatinine	ACGIH BEI
Xylene	1330-20-7	Methylhippuric acids	Urine	End of shift (As soon as possible after exposure ceases)	1.5 g/g creatinine	ACGIH BEI
Hexamethylene diisocyanate	822-06-0	1,6-Hexamethylene diamine	Urine	End of shift	15 µg/g creatinine	ACGIH BEI
2,4-Toluene diisocyanate	584-84-9	toluene diamine	Urine	End of shift	5 µg/g creatinine	ACGIH BEI

Exposure controls

Engineering measures: Use only with adequate ventilation. Local exhaust ventilation may be necessary for some operations. Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines. Exhaust systems should be designed to move the air away from the source of vapor/aerosol generation and people working at this point. The odor and irritancy of this material are inadequate to warn of excessive exposure.

Individual protection measures

Eye/face protection: Use chemical goggles.
Skin protection
Hand protection: Use gloves chemically resistant to this material. Examples of preferred glove barrier materials include: Butyl rubber. Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Examples of acceptable glove barrier materials include: Chlorinated polyethylene. Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). Viton. Avoid gloves made of: Polyvinyl chloride ("PVC" or "vinyl"). NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.
Other protection: Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task.
Respiratory protection: Atmospheric levels should be maintained below the exposure guideline. When atmospheric levels may exceed the exposure guideline, use an approved air-purifying respirator equipped with an organic vapor sorbent and a particle filter. For situations where the atmospheric levels may exceed the level for which an air-purifying respirator is effective, use a positive-pressure air-supplying respirator (air line or self-contained breathing apparatus). For emergency response or for situations where the atmospheric level is unknown, use an approved positive-pressure self-contained breathing apparatus or positive-pressure air line with auxiliary self-contained air supply. The following should be effective types of air-purifying respirators: Organic vapor cartridge with a particulate pre-filter.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	
Physical state	Liquid.
Color	Black
Odor	Solvent
Odor Threshold	No test data available
pH	Substance/mixture is non-soluble (in water).
Melting point/range	No test data available
Freezing point	No test data available
Boiling point (760 mmHg)	No test data available
Flash point	**closed cup** -7 °C (19 °F) *Setaflash Closed Cup ASTM D3828*
Evaporation Rate (Butyl Acetate = 1)	No test data available
Flammability (solid, gas)	Flammable liquid
Lower explosion limit	No test data available
Upper explosion limit	No test data available
Vapor Pressure	No test data available
Relative Vapor Density (air = 1)	No test data available
Relative Density (water = 1)	0.99 *ASTM D1475*
Water solubility	Not applicable

Partition coefficient: n-octanol/water	No data available
Auto-ignition temperature	No test data available
Decomposition temperature	No test data available
Kinematic Viscosity	No test data available
Explosive properties	No test data available
Oxidizing properties	No test data available
Molecular weight	No data available
Volatile Organic Compounds	4.82 lb/gln *EPA Method No. 24* (typical value)

NOTE: The physical data presented above are typical values and should not be construed as a specification.

10. STABILITY AND REACTIVITY

Reactivity: No dangerous reaction known under conditions of normal use.

Chemical stability: Stable under recommended storage conditions. See Storage, Section 7.

Possibility of hazardous reactions: Will not occur by itself.

Conditions to avoid: Some components of this product can decompose at elevated temperatures. Generation of gas during decomposition can cause pressure in closed systems. Pressure build-up can be rapid. Avoid static discharge. Avoid moisture. Material reacts slowly with water, releasing carbon dioxide which can cause pressure buildup and rupture of closed containers. Elevated temperatures accelerate this reaction.

Incompatible materials: Avoid contact with: Acids. Alcohols. Amines. Water. Ammonia. Bases. Strong oxidizers. Diisocyanates react with many materials and the rate of reaction increases with temperature as well as increased contact. Contact is increased by stirring or if the other material mixes with the diisocyanate. Diisocyanates are not soluble in water and sink to the bottom, but react slowly at the interface. The reaction forms carbon dioxide gas and a layer of solid polyurea. Reaction with water will generate carbon dioxide and heat.

Hazardous decomposition products: Decomposition products depend upon temperature, air supply and the presence of other materials. Gases are released during decomposition.

11. TOXICOLOGICAL INFORMATION

Toxicological information appears in this section when such data is available.

Acute toxicity

Acute oral toxicity

Low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury. May cause central nervous system effects.

Single dose oral LD50 has not been determined.

Acute dermal toxicity
Prolonged skin contact is unlikely to result in absorption of harmful amounts.
The dermal LD50 has not been determined.

Acute inhalation toxicity
Vapor concentrations are attainable which could be hazardous on single exposure. Excessive exposure to solvent(s) may cause respiratory irritation and central nervous system depression. Symptoms may include headache, dizziness and drowsiness, progressing to incoordination and unconsciousness. May cause nausea and vomiting. Alcohol consumed before or after exposure may increase adverse effects. This material contains mineral and/or inorganic fillers. There is essentially no potential for inhalation exposure to these fillers incidental to industrial handling due to the physical state.
The LC50 has not been determined.

Skin corrosion/irritation
Brief contact may cause slight skin irritation with local redness.
Prolonged contact may cause moderate skin irritation with local redness.
May cause drying and flaking of the skin.
May stain skin.

Serious eye damage/eye irritation
May cause pain disproportionate to the level of irritation to eye tissues.
May cause moderate eye irritation which may be slow to heal.
May cause moderate corneal injury.
Vapor may cause eye irritation experienced as mild discomfort and redness.
Vapor may cause lacrimation (tears).

Sensitization
For skin sensitization:
A component in this mixture has been shown to be a skin sensitizer.
Animal studies have shown that skin contact with isocyanates may play a role in respiratory sensitization.

For respiratory sensitization:
A component in this mixture may cause an allergic respiratory response.
Reexposure to extremely low isocyanate concentrations may cause allergic respiratory reactions in individuals already sensitized.

Specific Target Organ Systemic Toxicity (Single Exposure)
Contains component(s) which are classified as specific target organ toxicant, single exposure, category 3.

Specific Target Organ Systemic Toxicity (Repeated Exposure)
Contains component(s) which have been reported to cause effects on the following organs in animals:
Central nervous system.
Liver.
Nasal tissue.
Methyl ethyl ketone has caused liver effects in laboratory animals exposed by inhalation to high concentrations.
Methyl ethyl ketone is probably not neurotoxic in itself but it potentiates the neurotoxicity of methyl-n-butyl ketone and n-hexane.
Toluene has caused hearing loss in laboratory animals upon exposure to high concentrations.

Intentional misuse by deliberately inhaling toluene may cause nervous system damage, hearing loss, liver and kidney effects and death.

Carcinogenicity
Contains component(s) which did not cause cancer in laboratory animals.

Teratogenicity
Contains component(s) which did not cause birth defects in animals; other fetal effects occurred only at doses toxic to the mother. In laboratory animals, toluene has been toxic to the fetus at doses toxic to the mother; it has caused birth defects in mice when administered orally, but not by inhalation. Contains component(s) which caused birth defects in laboratory animals only at doses toxic to the mother. Exaggerated doses of xylene given orally to pregnant mice resulted in an increase in cleft palate, a common developmental abnormality in mice. In animal inhalation studies, xylene caused toxicity to the fetus but did not cause birth defects.

Reproductive toxicity
In animal studies on component(s), effects on reproduction were seen only at doses that produced significant toxicity to the parent animals. Contains component(s) which did not interfere with reproduction in animal studies.

Mutagenicity
For the component(s) tested: In vitro genetic toxicity studies were predominantly negative. The majority of the many genetic toxicity studies done on toluene and methyl ethyl ketone, both in vitro and in animals, have been negative.

Aspiration Hazard
Aspiration into the lungs may occur during ingestion or vomiting, causing lung damage or even death due to chemical pneumonia.

COMPONENTS INFLUENCING TOXICOLOGY:

Methyl ethyl ketone

Acute oral toxicity
LD50, Rat, 2,193 mg/kg

Acute dermal toxicity
LD50, Rabbit, > 8,049 mg/kg

Acute inhalation toxicity
LC50, Mouse, 4 Hour, vapour, 32 mg/l

Carbon black

Acute oral toxicity
LD50, Rat, > 8,000 mg/kg

Acute dermal toxicity
LD50, Rabbit, > 3,000 mg/kg No deaths occurred at this concentration.

Acute inhalation toxicity
LC50, Rat, 1 Hour, dust/mist, 27 mg/l No deaths occurred at this concentration.

Toluene

Acute oral toxicity
LD50, Rat, 5,580 mg/kg

Acute dermal toxicity
LD50, Rabbit, 12,267 mg/kg

Acute inhalation toxicity
Symptoms may include headache, dizziness and drowsiness, progressing to incoordination and unconsciousness. Alcohol consumption and exertion may increase the adverse effects of toluene. LC50, Rat, male, 4 Hour, vapour, 25.7 mg/l

LC50, Rat, female, 4 Hour, vapour, 30 mg/l

Benzene, 2,4-diisocyanato-1-methyl-, polymer with 1,6-diisocyanatohexane

Acute oral toxicity
Very low toxicity if swallowed. Harmful effects not anticipated from swallowing small amounts.

For similar material(s): LD50, Rat, > 5,000 mg/kg

Acute dermal toxicity
Prolonged skin contact is unlikely to result in absorption of harmful amounts.

The dermal LD50 has not been determined.

Acute inhalation toxicity
Dust may cause irritation to upper respiratory tract (nose and throat).

For similar material(s): LC50, Rat, 4 Hour, dust/mist, > 3.003 mg/l

Hexane, 1,6-diisocyanato-, homopolymer, 3- (trimethoxysilyl) -1-propanethiol-blocked

Acute oral toxicity
LD50, Rat, male, > 2,000 mg/kg No deaths occurred at this concentration.

Acute dermal toxicity
The dermal LD50 has not been determined.

Acute inhalation toxicity
Vapor concentrations are attainable which could be hazardous on single exposure. Excessive exposure to solvent(s) may cause respiratory irritation and central nervous system depression. Symptoms may include headache, dizziness and drowsiness, progressing to incoordination and unconsciousness. May cause nausea and vomiting.

The LC50 has not been determined.

Polyester

Acute oral toxicity
Single dose oral LD50 has not been determined. Excessive exposure may cause: Gastrointestinal irritation. Nausea and/or vomiting. Diarrhea.

Acute dermal toxicity
The dermal LD50 has not been determined.

Acute inhalation toxicity
At room temperature, exposure to vapor is minimal due to low volatility; vapor from heated material may cause respiratory irritation.

The LC50 has not been determined.

n-Butyl Acetate

Acute oral toxicity
LD50, Rat, male, 12,789 mg/kg

LD50 Oral, Rat, female, 10,760 mg/kg

Acute dermal toxicity
LD50, Rabbit, male and female, > 14,112 mg/kg

Acute inhalation toxicity
The LC50 has not been determined.

Butanedioic acid, Pentanedioic acid, Hexanedioic acid methyl ester reaction product with 3-Oxazolidineethanol, 2-(1-methylethyl)-

Acute oral toxicity
Low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury.

LD50, Rat, female, > 2,000 mg/kg No deaths occurred at this concentration.

Acute dermal toxicity
Prolonged skin contact is unlikely to result in absorption of harmful amounts.

LD50, Rat, male and female, > 2,000 mg/kg No deaths occurred at this concentration.

Acute inhalation toxicity
Mist may cause irritation of upper respiratory tract (nose and throat).

The LC50 has not been determined.

Xylene

Acute oral toxicity
LD50, Rat, 3,523 mg/kg

Acute dermal toxicity
LD50, Rabbit, > 4,200 mg/kg

Acute inhalation toxicity
LC50, Rat, 4 Hour, vapour, 27.5 mg/l

Hexamethylene diisocyanate

Acute oral toxicity
LD50, Rat, 710 mg/kg

Acute dermal toxicity
LD50, Rat, > 7,000 mg/kg

Acute inhalation toxicity
LC50, Rat, 4 Hour, vapour, 0.124 mg/l

2,4-Toluene diisocyanate

Acute oral toxicity
LD50, Rat, female, 4,130 mg/kg

Acute dermal toxicity
LD50, Rabbit, male and female, > 9,400 mg/kg

Acute inhalation toxicity
Easily attainable vapor concentrations may cause serious adverse effects, even death. Excessive exposure to TDI may cause severe irritation of the upper respiratory tract and lungs, fluid in the lungs, permanent decrease of lung function, neurologic disorders, cholinesterase depression and gastrointestinal distress.

LC50, Rat, 1 Hour, vapour, 0.48 mg/l

LC50, Mouse, 6 Hour, dust/mist, 0.1 mg/l

Dipotassium monoxide

Acute oral toxicity
For similar material(s): LD50, Rat, male and female, > 2,000 mg/kg OECD Test Guideline 425 No deaths occurred at this concentration.

Acute dermal toxicity
For similar material(s): LD50, Rat, male and female, > 5,000 mg/kg OECD Test Guideline 402

Acute inhalation toxicity
The LC50 has not been determined.

Carcinogenicity

Component	List	Classification
2,4-Toluene diisocyanate	IARC	Group 2B: Possibly carcinogenic to humans
	US NTP	Reasonably anticipated to be a human carcinogen
	ACGIH	A3: Confirmed animal carcinogen with unknown relevance to humans.

12. ECOLOGICAL INFORMATION

Ecotoxicological information appears in this section when such data is available.

Toxicity

Methyl ethyl ketone

Acute toxicity to fish
Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).
LC50, Pimephales promelas (fathead minnow), static test, 96 Hour, 2,993 mg/l, OECD Test Guideline 203

Acute toxicity to aquatic invertebrates
EC50, Daphnia magna (Water flea), static test, 48 Hour, 308 mg/l, OECD Test Guideline 202

Acute toxicity to algae/aquatic plants
ErC50, Pseudokirchneriella subcapitata (microalgae), static test, 96 Hour, Growth rate inhibition, 2,029 mg/l, OECD Test Guideline 201
NOEC, Pseudokirchneriella subcapitata (green algae), 96 Hour, 1,240 mg/l, OECD Test Guideline 201

Toxicity to bacteria
EC50, Bacteria, 96 Hour, > 1,000 mg/l, hUCC

Carbon black

Acute toxicity to fish
Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).
LC50, Leuciscus idus (Golden orfe), static test, 96 Hour, > 1,000 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates
EC50, Daphnia magna (Water flea), 24 Hour, > 5,600 mg/l, OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants
NOEC, Desmodesmus subspicatus (green algae), 72 Hour, 10,000 mg/l, OECD Test Guideline 201

Toluene

Acute toxicity to fish
Material is moderately toxic to aquatic organisms on an acute basis (LC50/EC50 between 1 and 10 mg/L in the most sensitive species tested).
LC50, Oncorhynchus mykiss (rainbow trout), semi-static test, 96 Hour, 5.8 mg/l

Acute toxicity to aquatic invertebrates
LC50, water flea Ceriodaphnia dubia, semi-static test, 48 Hour, 3.78 mg/l

Acute toxicity to algae/aquatic plants
EbC50, Pseudokirchneriella subcapitata (green algae), 72 Hour, Biomass, 12.5 mg/l, OECD Test Guideline 201

Toxicity to bacteria
IC50, Bacteria, 16 Hour, 29 mg/l

Chronic toxicity to fish
NOEC, Fish, flow-through test, 40 d, growth, 1.4 mg/l

Chronic toxicity to aquatic invertebrates
NOEC, Ceriodaphnia dubia (water flea), 7 d, number of offspring, 0.74 mg/l

Toxicity to soil-dwelling organisms
LC50, Eisenia fetida (earthworms), 150 - 280 mg/kg

Benzene, 2,4-diisocyanato-1-methyl-, polymer with 1,6-diisocyanatohexane

Acute toxicity to fish
Not expected to be acutely toxic to aquatic organisms.
No toxicity at the limit of solubility

Hexane, 1,6-diisocyanato-, homopolymer, 3- (trimethoxysilyl) -1-propanethiol-blocked

Acute toxicity to fish

Material is moderately toxic to aquatic organisms on an acute basis (LC50/EC50 between 1 and 10 mg/L in the most sensitive species tested).

LC50, Oncorhynchus mykiss (rainbow trout), 96 Hour, 1.55 mg/l

Polyester

Acute toxicity to fish

Not expected to be acutely toxic to aquatic organisms.

n-Butyl Acetate

Acute toxicity to fish

Material is slightly toxic to aquatic organisms on an acute basis (LC50/EC50 between 10 and 100 mg/L in the most sensitive species tested).

LC50, Pimephales promelas (fathead minnow), flow-through test, 96 Hour, 18 mg/l

Acute toxicity to aquatic invertebrates

LC50, Daphnia magna (Water flea), 48 Hour, 44 mg/l

Acute toxicity to algae/aquatic plants

ErC50, Desmodesmus subspicatus (green algae), 72 Hour, Growth rate inhibition, 648 mg/l

Toxicity to bacteria

EC50, Bacteria, 16 Hour, > 1,000 mg/l

Chronic toxicity to aquatic invertebrates

NOEC, Daphnia magna (Water flea), 21 d, 23 mg/l

Butanedioic acid, Pentanedioic acid, Hexanedioic acid methyl ester reaction product with 3-Oxazolidineethanol, 2-(1-methylethyl)-

Acute toxicity to fish

Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).

LC50, Danio rerio (zebra fish), static test, 96 Hour, > 100 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates

EC50, Daphnia magna (Water flea), 48 Hour, > 100 mg/l, OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants

ErC50, Pseudokirchneriella subcapitata (green algae), 72 Hour, Growth rate inhibition, > 100 mg/l, OECD Test Guideline 201 or Equivalent

Toxicity to bacteria

EC50, activated sludge, 3 Hour, Respiration rates., > 1,000 mg/l

Xylene

Acute toxicity to fish

Material is moderately toxic to aquatic organisms on an acute basis (LC50/EC50 between 1 and 10 mg/L in the most sensitive species tested).

LC50, Oncorhynchus mykiss (rainbow trout), semi-static test, 96 Hour, 2.6 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates
EC50, Daphnia magna (Water flea), 48 Hour, 3.82 mg/l

Acute toxicity to algae/aquatic plants
EC50, Selenastrum capricornutum (fresh water algae), 72 Hour, 4.9 mg/l, OECD Test Guideline 201 or Equivalent
NOEC, Pseudokirchneriella subcapitata (green algae), 72 Hour, Growth rate, 0.44 mg/l, OECD Test Guideline 201 or Equivalent

Chronic toxicity to fish
NOEC, Oncorhynchus mykiss (rainbow trout), flow-through, 56 d, mortality, > 1.3 mg/l

Chronic toxicity to aquatic invertebrates
NOEC, Daphnia magna (Water flea), 21 d, 1.57 mg/l

Hexamethylene diisocyanate

Acute toxicity to fish
The measured ecotoxicity is that of the hydrolyzed product, generally under conditions maximizing production of soluble species.
Not expected to be acutely toxic to aquatic organisms.
LC0, Danio rerio (zebra fish), static test, 96 Hour, >= 82.8 mg/l

Acute toxicity to aquatic invertebrates
EC0, Daphnia magna (Water flea), Static, 48 Hour, >= 89.1 mg/l

Acute toxicity to algae/aquatic plants
No toxicity up to the level of maximum water solubility.
ErC50, Desmodesmus subspicatus (green algae), Static, 72 Hour, Growth rate inhibition, > 77.4 mg/l

Toxicity to bacteria
EC50, 3 Hour, 842 mg/l

2,4-Toluene diisocyanate

Acute toxicity to fish
Material is slightly toxic to aquatic organisms on an acute basis (LC50/EC50 between 10 and 100 mg/L in the most sensitive species tested).
LC50, Oncorhynchus mykiss (rainbow trout), static test, 96 Hour, 133 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates
EC50, Daphnia magna (Water flea), static test, 48 Hour, 12.5 mg/l, OECD Test Guideline 202 or Equivalent
EC50, saltwater mysid Mysidopsis bahia, static test, 48 Hour, 18.3 mg/l, OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants
EC50, Skeletonema costatum (marine diatom), static test, 96 Hour, 3,230 mg/l, OECD Test Guideline 201 or Equivalent
EC50, Chlorella vulgaris (Fresh water algae), static test, 96 Hour, 4,300 mg/l, OECD Test Guideline 201 or Equivalent

Toxicity to bacteria

EC50, activated sludge, Respiration inhibition, 3 Hour, > 100 mg/l, OECD 209 Test

Chronic toxicity to aquatic invertebrates
NOEC, Daphnia magna (Water flea), static test, 21 d, number of offspring, 1.1 mg/l

Dipotassium monoxide

Acute toxicity to fish
For similar material(s):
Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).
LC50, Fish, semi-static test, 96 Hour, 917.6 mg/l, OECD Test Guideline 203

Acute toxicity to aquatic invertebrates
EC50, Daphnia magna, Static, 48 Hour, 660 mg/l, OECD Test Guideline 202

Acute toxicity to algae/aquatic plants
EC50, green algae, 96 Hour, 1,368.296 mg/l

Persistence and degradability

Methyl ethyl ketone

Biodegradability: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.
10-day Window: Not applicable
Biodegradation: 98 %
Exposure time: 28 d
Method: OECD Test Guideline 301D or Equivalent

Theoretical Oxygen Demand: 2.44 mg/mg

Biological oxygen demand (BOD)

Incubation Time	BOD
5 d	71 - 76 %
10 d	71 - 82 %
20 d	71 - 89 %

Photodegradation
Test Type: Half-life (indirect photolysis)
Sensitization: OH radicals
Atmospheric half-life: 8 d
Method: Estimated.

Carbon black

Biodegradability: Biodegradation is not applicable.

Toluene

Biodegradability: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.
10-day Window: Not applicable
Biodegradation: 100 %
Exposure time: 14 d

Method: OECD Test Guideline 301C or Equivalent

Theoretical Oxygen Demand: 3.13 mg/mg Calculated.

Photodegradation
Test Type: Half-life (indirect photolysis)
Sensitization: OH radicals
Atmospheric half-life: 2 d
Method: Estimated.

Benzene, 2,4-diisocyanato-1-methyl-, polymer with 1,6-diisocyanatohexane

Biodegradability: Based on stringent OECD test guidelines, this material cannot be considered as readily biodegradable; however, these results do not necessarily mean that the material is not biodegradable under environmental conditions.
For similar material(s):
Biodegradation: < 60 %
Exposure time: 28 d

Hexane, 1,6-diisocyanato-, homopolymer, 3- (trimethoxysilyl) -1-propanethiol-blocked

Biodegradability: No relevant data found.

Polyester

Biodegradability: No appreciable biodegradation is expected.

n-Butyl Acetate

Biodegradability: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.
10-day Window: Pass
Biodegradation: 83 %
Exposure time: 28 d
Method: OECD Test Guideline 301D or Equivalent

Theoretical Oxygen Demand: 2.20 mg/mg Estimated.

Photodegradation
Sensitization: OH radicals
Atmospheric half-life: 2.32 d
Method: Estimated.

Butanedioic acid, Pentanedioic acid, Hexanedioic acid methyl ester reaction product with 3-Oxazolidineethanol, 2-(1-methylethyl)-

Biodegradability: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.
10-day Window: Pass
Biodegradation: 90.2 %
Exposure time: 28 d
Method: OECD Test Guideline 301F or Equivalent

Xylene

Biodegradability: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.
10-day Window: Pass
Biodegradation: 87.8 %
Exposure time: 28 d

Method: OECD Test Guideline 301F or Equivalent

Theoretical Oxygen Demand: 3.17 mg/mg

Biological oxygen demand (BOD)

Incubation Time	BOD
5 d	37.000 %
10 d	58.000 %
20 d	72.000 %

Photodegradation
Test Type: Half-life (indirect photolysis)
Sensitization: OH radicals
Atmospheric half-life: 19.7 Hour
Method: Estimated.

Hexamethylene diisocyanate

Biodegradability: In the aquatic and terrestrial environment, material reacts with water forming predominantly insoluble polyureas which appear to be stable.
10-day Window: Not applicable
Biodegradation: 0 %
Exposure time: 28 d
Method: OECD Test Guideline 302C or Equivalent
10-day Window: Fail
Biodegradation: 42 %
Exposure time: 28 d
Method: OECD Test Guideline 301F or Equivalent

Theoretical Oxygen Demand: 2.38 mg/mg

Photodegradation
Test Type: Half-life (indirect photolysis)
Sensitization: OH radicals
Atmospheric half-life: 1.345 d
Method: Estimated.

2,4-Toluene diisocyanate

Biodegradability: In the aquatic and terrestrial environment, material reacts with water forming predominantly insoluble polyureas which appear to be stable. In the atmospheric environment, material is expected to have a short tropospheric half-life, based on calculations and by analogy with related diisocyanates.

Dipotassium monoxide

Biodegradability: No relevant data found.

Bioaccumulative potential

Methyl ethyl ketone

Bioaccumulation: Bioaccumulation is unlikely. Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Partition coefficient: n-octanol/water(log Pow): 0.3 at 40 °C Measured

Carbon black
Bioaccumulation: No relevant data found.

Toluene
Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Partition coefficient: n-octanol/water(log Pow): 2.73 Measured
Bioconcentration factor (BCF): 13.2 - 90 Fish Measured

Benzene, 2,4-diisocyanato-1-methyl-, polymer with 1,6-diisocyanatohexane
Bioaccumulation: No relevant data found.

Hexane, 1,6-diisocyanato-, homopolymer, 3- (trimethoxysilyl) -1-propanethiol-blocked
Bioaccumulation: No relevant data found.

Polyester
Bioaccumulation: No bioconcentration is expected because of the relatively high molecular weight (MW greater than 1000).

n-Butyl Acetate
Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Partition coefficient: n-octanol/water(log Pow): Pow: 3.2 at 25 °C Measured
Bioconcentration factor (BCF): 15 Fish Estimated.

Butanedioic acid, Pentanedioic acid, Hexanedioic acid methyl ester reaction product with 3-Oxazolidineethanol, 2-(1-methylethyl)-
Bioaccumulation: No data available.

Xylene
Bioaccumulation: Does not bioaccumulate.
Partition coefficient: n-octanol/water(log Pow): 3.16 at 20 °C
Bioconcentration factor (BCF): 25.9 Rainbow trout (Salmo gairdneri) Measured

Hexamethylene diisocyanate
Bioaccumulation: Reacts with water. In the aquatic and terrestrial environment, movement is expected to be limited by its reaction with water forming predominantly insoluble polyureas.
Bioconcentration factor (BCF): 58 Fish Estimated.

2,4-Toluene diisocyanate
Bioaccumulation: Reacts with water. In the aquatic and terrestrial environment, movement is expected to be limited by its reaction with water forming predominantly insoluble polyureas.

Dipotassium monoxide
Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Partition coefficient: n-octanol/water(log Pow): -5.08
Bioconcentration factor (BCF): 3.16 Fish

Mobility in soil

Methyl ethyl ketone
Potential for mobility in soil is very high (Koc between 0 and 50).

Partition coefficient (Koc): 3.8 Estimated.

Carbon black

No relevant data found.

Toluene

Potential for mobility in soil is very high (Koc between 0 and 50).
Partition coefficient (Koc): 37 - 178 Estimated.

Benzene, 2,4-diisocyanato-1-methyl-, polymer with 1,6-diisocyanatohexane

No relevant data found.

Hexane, 1,6-diisocyanato-, homopolymer, 3- (trimethoxysilyl) -1-propanethiol-blocked

No relevant data found.

Polyester

No relevant data found.

n-Butyl Acetate

Potential for mobility in soil is very high (Koc between 0 and 50).
Partition coefficient (Koc): 19 - 70 Estimated.

Butanedioic acid, Pentanedioic acid, Hexanedioic acid methyl ester reaction product with 3-Oxazolidineethanol, 2-(1-methylethyl)-

No relevant data found.

Xylene

Potential for mobility in soil is medium (Koc between 150 and 500).
Partition coefficient (Koc): 443 Estimated.

Hexamethylene diisocyanate

In the aquatic and terrestrial environment, movement is expected to be limited by its reaction with water forming predominantly insoluble polyureas.

2,4-Toluene diisocyanate

In the aquatic and terrestrial environment, movement is expected to be limited by its reaction with water forming predominantly insoluble polyureas.

Dipotassium monoxide

Potential for mobility in soil is very high (Koc between 0 and 50).
Partition coefficient (Koc): 13.22

13. DISPOSAL CONSIDERATIONS

Disposal methods: DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. AS YOUR SUPPLIER, WE HAVE NO CONTROL OVER THE MANAGEMENT PRACTICES OR

MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information. FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Incinerator or other thermal destruction device.

Treatment and disposal methods of used packaging: Empty containers should be recycled or otherwise disposed of by an approved waste management facility. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. Do not re-use containers for any purpose.

14. TRANSPORT INFORMATION

DOT

Proper shipping name	Coating solution
UN number	UN 1139
Class	3
Packing group	II
Reportable Quantity	Toluene, Methyl ethyl ketone

Classification for SEA transport (IMO-IMDG):

Proper shipping name	COATING SOLUTION
UN number	UN 1139
Class	3
Packing group	II
Marine pollutant	No
Transport in bulk according to Annex I or II of MARPOL 73/78 and the IBC or IGC Code	Consult IMO regulations before transporting ocean bulk

Classification for AIR transport (IATA/ICAO):

Proper shipping name	Coating solution
UN number	UN 1139
Class	3
Packing group	II

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. REGULATORY INFORMATION

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312
Flammable (gases, aerosols, liquids, or solids)
Hazard not otherwise classified (physical hazards)
Skin corrosion or irritation
Serious eye damage or eye irritation
Respiratory or skin sensitisation
Reproductive toxicity
Specific target organ toxicity (single or repeated exposure)
Aspiration hazard

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313
The following components are subject to reporting levels established by SARA Title III, Section 313:

Components	**CASRN**
Toluene	108-88-3

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) Section 103
Calculated RQ exceeds reasonably attainable upper limit.

Components	**CASRN**	**RQ (RCRA Code)**
Methyl ethyl ketone	78-93-3	5000 lbs RQ
Methyl ethyl ketone	78-93-3	5000 lbs RQ (D035)
Methyl ethyl ketone	78-93-3	100 lbs RQ (F005)
Methyl ethyl ketone	78-93-3	5000 lbs RQ
Methyl ethyl ketone	78-93-3	5000 lbs RQ (D035)
Methyl ethyl ketone	78-93-3	100 lbs RQ (F005)
Toluene	108-88-3	1000 lbs RQ
Toluene	108-88-3	100 lbs RQ (F005)
Xylene	1330-20-7	100 lbs RQ
Xylene	1330-20-7	100 lbs RQ (F003)
Toluene	108-88-3	1000 lbs RQ
Toluene	108-88-3	100 lbs RQ (F005)

Pennsylvania Right To Know
The following chemicals are listed because of the additional requirements of Pennsylvania law:

Components	**CASRN**
Methyl ethyl ketone	78-93-3
Toluene	108-88-3
Carbon black	1333-86-4
n-Butyl Acetate	123-86-4
2,4-Toluene diisocyanate	584-84-9

California Prop. 65
WARNING: This product can expose you to chemicals including 2,4-Toluene diisocyanate, which is/are known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

United States TSCA Inventory (TSCA)

All components of this product are in compliance with the Active inventory listing requirements of the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

16. OTHER INFORMATION

Hazard Rating System
NFPA

Health	Flammability	Instability
2	3	1

Revision
Identification Number: 30888 / A749 / Issue Date: 08/09/2023 / Version: 27.0
Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

Legend

ACGIH	USA. ACGIH Threshold Limit Values (TLV)
ACGIH BEI	ACGIH - Biological Exposure Indices (BEI)
AEL *	8 & 12 hr. TWA
C	Ceiling
CAL PEL	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
CEIL	Acceptable ceiling concentration
Dow IHG	Dow Industrial Hygiene Guideline
DUPONT AEL	DuPont AEL (Acceptable Exposure Limit)
OSHA P0	USA. Table Z-1-A Limits for Air Contaminants (1989 vacated values)
OSHA Z-1	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
OSHA Z-2	USA. Occupational Exposure Limits (OSHA) - Table Z-2
Peak	Acceptable maximum peak above the acceptable ceiling concentration for an 8-hr shift
PEL	Permissible exposure limit
STEL	Short term exposure limit
TLV-C	Ceiling Limit Value
TWA	8-hour, time-weighted average

Full text of other abbreviations
AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO -

International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Information Source and References
This SDS is prepared by Product Regulatory Services and Hazard Communications Groups from information supplied by internal references within our company.

DDP Specialty Electronic Materials US, LLC urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.
US

Table 1
Vitro Automotive Glass AI #2846
Berea, Kentucky
Potential to Emit TPY

EP#	Process ID	Stack	EP Description	Process Description	CO_2	CO	NO_2	SO_2	VOC	MDI	Methanol	Toluene	Xylene	HDI	TDI	Methyl Isobutyl Ketone	Lead	HAP	PM/ PM10
1	1	EG 1	Emergency Generator	Diesel Usage	49.654	0.288	1.335	1.335	0.106	-	-	-	-	-	-	-	-	-	0.094
4	1	2	Clip Priming (2 Stations) - 43533	Body Primer 43533	-	-	-	-	5.261	0.408	-	-	-	-	-	-	-	0.408	-
10	1	11	Sidelite Assembly Line A (SL3)	Clear Glass Primer 43518	-	-	-	-	0.952	-	0.466	0.254	-	-	-	-	-	0.720	-
10	2	11	Sidelite Assembly Line A (SL3)	Urethane Adhesive WS-292FK	-	-	-	-	0.029	-	-	-	-	-	-	-	-	-	-
10	3	11	Sidelite Assembly Line A (SL3)	Urethane Curative B-1M	-	-	-	-	0.396	-	-	-	-	-	-	-	-	-	-
11	1	11	Sidelite Assembly Line B (SL4)	Clear Glass Primer 43518	-	-	-	-	1.269	-	0.621	0.339	-	-	-	-	-	0.960	-
11	2	11	Sidelite Assembly Line B (SL4)	Urethane Adhesive WS-292FK	-	-	-	-	0.039	-	-	-	-	-	-	-	-	-	-
11	3	11	Sidelite Assembly Line B (SL4)	Urethane Curative B-1M	-	-	-	-	0.528	-	-	-	-	-	-	-	-	-	-
11	4	11	Sidelite Assembly Line B (SL4)	Isopropanol	-	-	-	-	1.448	-	-	-	-	-	-	-	-	-	-
12	1	11	Sidelite Door Cell (SL6) - YH America AN-1M Option	Clear Glass Primer 43518	-	-	-	-	1.423	-	0.697	0.380	-	-	-	-	-	1.077	-
12	2	11	Sidelite Door Cell (SL6) - YH America AN-1M Option	Urethane Adhesive WS-242FK	-	-	-	-	0.230	-	-	-	-	-	-	-	-	-	-
12	3	11	Sidelite Door Cell (SL6) - YH America AN-1M Option	Urethane Curative AN-1M	-	-	-	-	2.358	-	-	-	-	-	-	-	-	-	-
13	1	6	Clip Priming Station - 43533	Body Primer 43533	-	-	-	-	7.201	0.559	-	-	-	-	-	-	-	0.559	-
14	1	11	Backlite Assembly Line (BL2)	Clear Glass Primer 43518	-	-	-	-	1.562	-	0.765	0.417	-	-	-	-	-	1.182	-
14	2	11	Backlite Assembly Line (BL2)	Black Glass Primer 43520A	-	-	-	-	2.746	-	-	0.226	0.047	0.002	0.002	-	-	0.278	-
14	3	11	Backlite Assembly Line (BL2)	Electrical Connector	-	-	-	-	-				-	-	-	-	-		0.000
15	1	8	Quarter Assembly Line (SL5)	Clear Glass Primer 43518	-	-	-	-	1.010	-	0.494	0.270	-	-	-	-	-	0.764	-
15	2	8	Quarter Assembly Line (SL5)	Black Glass Primer 43520A	-	-	-	-	1.972	-	-	0.162	0.034	0.002	0.002	-	-	0.199	-
15	3	8	Quarter Assembly Line (SL5)	Electrical Connector	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000
16	1	6	Windshield Assembly Line 1 (WS2)	Clear Glass Primer 43518	-	-	-	-	1.803	-	0.883	0.482	-	-	-	-	-	1.364	-
16	2	6	Windshield Assembly Line 1 (WS2)	Black Glass Primer 43520A	-	-	-	-	3.169	-	-	0.261	0.054	0.003	0.003	-	-	0.320	-
16	3	6	Windshield Assembly Line 1 (WS2)	Body Primer 43533	-	-	-	-	0.376	0.029	-	-	-	-	-	-	-	0.029	-
16	4	6	Windshield Assembly Line 1 (WS2)	Urethane Adhesive x2500 A Plus	-	-	-	-	0.046	0.046	-	-	-	-	-	-	-	0.046	-
16	5	6	Windshield Assembly Line 1 (WS2)	Urethane Curative x2500 B Plus	-	-	-	-	0.006	-	-	-	-	-	-	-	-	-	-
16	6	6	Windshield Assembly Line 1 (WS2)	Isopropanol	-	-	-	-	0.362	-	-	-	-	-	-	-	-	-	-
18	1	7	Windshield Assembly Line 2 (WS1) - 500B Option	Clear Glass Primer 43518	-	-	-	-	1.803	-	0.883	0.482	-	-	-	-	-	1.364	-
18	2	7	Windshield Assembly Line 2 (WS1) - 500B Option	Black Glass Primer 43520A	-	-	-	-	3.169	-	-	0.261	0.054	0.003	0.003	-	-	0.320	-
18	3	7	Windshield Assembly Line 2 (WS1) - 500B Option	Body Primer 43533	-	-	-	-	0.439	0.034	-	-	-	-	-	-	-	0.034	-
18	4	7	Windshield Assembly Line 2 (WS1) - 500B Option	Aron Mighty	-	-	-	-	0.170	-	0.018	-	-	-	-	-	-	0.018	-
18	5	7	Windshield Assembly Line 2 (WS1) - 500B Option	Urethane Adhesive x2500 A Plus	-	-	-	-	0.046	0.046	-	-	-	-	-	-	-	0.046	-
18	6	7	Windshield Assembly Line 2 (WS1) - 500B Option	Urethane Curative x2500 B Plus	-	-	-	-	0.006	-	-	-	-	-	-	-	-	-	-
18	7	7	Windshield Assembly Line 2 (WS1) - 500B Option	Isopropanol	-	-	-	-	0.362	-	-	-	-	-	-	-	-	-	-
20	1	11	Sidelite Door Line (SL4B / SL8)	Clear Glass Primer 43518	-	-	-	-	1.058	-	0.518	0.283	-	-	-	-	-	0.800	-
20	2	11	Sidelite Door Line (SL4B / SL8)	Urethane Adhesive WS-292FK	-	-	-	-	0.032	-	-	-	-	-	-	-	-	-	-
20	3	11	Sidelite Door Line (SL4B / SL8)	Urethane Curative B-1M	-	-	-	-	0.440	-	-	-	-	-	-	-	-	-	-
20	4	11	Sidelite Door Line (SL4B / SL8)	Isopropanol	-	-	-	-	1.207	-	-	-	-	-	-	-	-	-	-
21	1	11	Sidelite Bonding Line (2015) (SL2)	Clear Glass Primer 43518	-	-	-	-	0.385	-	0.188	0.103	-	-	-	-	-	0.291	-
21	2	11	Sidelite Bonding Line (2015) (SL2)	Black Glass Primer 43520A	-	-	-	-	0.451	-	-	0.037	0.008	0.000	0.000	-	-	0.046	-
21	3	11	Sidelite Bonding Line (2015) (SL2)	Urethane Adhesive x2500 A Plus	-	-	-	-	0.036	0.036	-	-	-	-	-	-	-	0.036	-
21	4	11	Sidelite Bonding Line (2015) (SL2)	Urethane Curative x2500 B Plus	-	-	-	-	0.005	-	-	-	-	-	-	-	-	-	-
21	5	11	Sidelite Bonding Line (2015) (SL2)	Glass Cleaner, Isopropanol	-	-	-	-	0.193	-	-	-	-	-	-	-	-	-	-
22	1	10	Line 2A - Large SL option (previously 2AL)	Pliogrip 7655 Adhesive	-	-	-	-	0.000	0.000	-	-	-	-	-	-	-	0.000	-
22	2	10	Line 2A - Large SL option (previously 2AL)	Pliogrip 7400 Adhesive	-	-	-	-	0.000	0.000	-	-	-	-	-	-	-	0.000	-
22	3	10	Line 2A - Large SL option (previously 2AL)	Clear Glass Primer 43518	-	-	-	-	0.736	-	0.360	0.196	-	-	-	-	-	0.557	-
22	4	10	Line 2A - Large SL option (previously 2AL)	Black Glass Primer 43520A	-	-	-	-	2.586	-	-	0.213	0.044	0.002	0.002	-	-	0.261	-
22	5	10	Line 2A - Large SL option (previously 2AL)	Glass Cleaner, Isopropanol	-	-	-	-	0.205	-	-	-	-	-	-	-	-	-	-
23	1	10	Line 2B (Qtr)	Pliogrip 7655 Adhesive	-	-	-	-	0.000	0.000	-	-	-	-	-	-	-	0.000	-
23	2	10	Line 2B (Qtr)	Pliogrip 7400 Adhesive	-	-	-	-	0.000	0.000	-	-	-	-	-	-	-	0.000	-
23	3	10	Line 2B (Qtr)	Clear Glass Primer 43518	-	-	-	-	0.409	-	0.200	0.109	-	-	-	-	-	0.309	-
23	4	10	Line 2B (Qtr)	Black Glass Primer 43520A	-	-	-	-	1.389	-	-	0.114	0.024	0.001	0.001	-	-	0.140	-
23	5	10	Line 2B (Qtr)	Glass Cleaner, Isopropanol	-	-	-	-	0.205	-	-	-	-	-	-	-	-	-	-
24	1	12	Line 7 (BL)	Betaseal 58702SFHN	-	-	-	-	0.006	0.006	-	-	-	-	-	-	-	0.006	-
24	2	12	Line 7 (BL)	Clear Glass Primer 43518	-	-	-	-	0.375	-	0.184	0.100	-	-	-	-	-	0.284	-
24	3	12	Line 7 (BL)	Black Glass Primer 43520A	-	-	-	-	0.586	-	-	0.048	0.010	0.001	0.001	-	-	0.059	-
24	4	12	Line 7 (BL)	Solder	-	-	-	-	-	-	-	-	-	-	-	-	2.824E-04	2.824E-04	4.555E-04
24	5	12	Line 7 (BL)	Flux	-	-	-	-	0.120	-	-	-	-	-	-	0.008	-	0.008	-
24	6	12	Line 7 (BL)	Glass Cleaner, Isopropanol	-	-	-	-	0.157	-	-	-	-	-	-	-	-	-	-
25	1	10	Line 17 (WS)	Betaseal 58702SFHN	-	-	-	-	0.022	0.022	-	-	-	-	-	-	-	0.022	-
25	2	10	Line 17 (WS)	Clear Glass Primer 43518	-	-	-	-	0.500	-	0.245	0.134	-	-	-	-	-	0.378	-
25	3	10	Line 17 (WS)	Black Glass Primer 43520A	-	-	-	-	1.831	-	-	0.151	0.031	0.002	0.002	-	-	0.185	-
25	4	10	Line 17 (WS)	Glass Cleaner, Isopropanol	-	-	-	-	0.157	-	-	-	-	-	-	-	-	-	-
26	1	12	Line 18 (WS)	Urethane Adhesive x2500 A Plus	-	-	-	-	0.004	0.004	-	-	-	-	-	-	-	0.004	-
26	2	12	Line 18 (WS)	Urethane Curative x2500 B Plus	-	-	-	-	0.001	-	-	-	-	-	-	-	-	-	-
26	3	12	Line 18 (WS)	Clear Glass Primer 43518	-	-	-	-	0.625	-	0.306	0.167	-	-	-	-	-	0.473	-
26	4	12	Line 18 (WS)	Black Glass Primer 43520A	-	-	-	-	1.538	-	-	0.127	0.026	0.001	0.001	-	-	0.156	-
26	5	12	Line 18 (WS)	Glass Cleaner, Isopropanol	-	-	-	-	0.157	-	-	-	-	-	-	-	-	-	-

Table 1
Vitro Automotive Glass AI #2846
Berea, Kentucky
Potential to Emit TPY

EP#	Process ID	Stack	EP Description	Process Description	CO_2	CO	NO_2	SO_2	VOC	MDI	Methanol	Toluene	Xylene	HDI	TDI	Methyl Isobutyl Ketone	Lead	HAP	PM/ PM10
IA 1	1	0	Space heaters (28 units) 4.87 MMBtu/hr total	Natural Gas Usage	2,509.482	1.757	2.091	2.091	0.115	-	-	-	-	-	-	-	-	-	0.159
IA 2	1	10	Line 1 - GMT610 option	Glasgrip 7780 Primer	-	-	-	-	0.123	-	0.062	0.061	-	-	-	-	-	0.123	-
IA 2	2	10	Line 1 - GMT610 option	Pliogrip 7655 Adhesive	-	-	-	-	0.001	0.001	-	-	-	-	-	-	-	0.001	-
IA 2	3	10	Line 1 - GMT610 option	Pliogrip 7400 Adhesive	-	-	-	-	0.001	0.001	-	-	-	-	-	-	-	0.001	-
IA 2	4	10	Line 1 - GMT610 option	Isopropanol	-	-	-	-	0.314	-	-	-	-	-	-	-	-	-	-
IA 3	1	2	Sidelite Bonding Line (2014) (SL1) - 43518 & 43520A Option	Clear Glass Primer 43518	-	-	-	-	0.385	-	0.188	0.103	-	-	-	-	-	0.291	-
IA 3	2	2	Sidelite Bonding Line (2014) (SL1) - 43518 & 43520A Option	Black Glass Primer 43520A	-	-	-	-	0.451	-	-	0.037	0.008	0.000	0.000	-	-	0.046	-
IA 3	3	2	Sidelite Bonding Line (2014) (SL1) - 43518 & 43520A Option	Urethane Adhesive x2500 A Plus	-	-	-	-	0.036	0.036	-	-	-	-	-	-	-	0.036	-
IA 3	4	2	Sidelite Bonding Line (2014) (SL1) - 43518 & 43520A Option	Urethane Curative x2500 B Plus	-	-	-	-	0.005	-	-	-	-	-	-	-	-	-	-
IA 3	5	2	Sidelite Bonding Line (2014) (SL1) - 43518 & 43520A Option	Glass Cleaner, Isopropanol	-	-	-	-	0.193	-	-	-	-	-	-	-	-	-	-
IA 4	2	11	Quarter Window Bonding Line (2015) (QW1)	Clear Glass Primer 43518	-	-	-	-	0.096	-	0.047	0.026	-	-	-	-	-	0.073	-
IA 5	1	0	Westward Cold Cleaner	N/A	-	-	-	-	0.065	-	-	-	-	-	-	-	-	-	-
IA 6	1	0	Diesel Storage Tank, 280 gallon	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IA 7	1	0	MIG Welding Table	Electrode	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.205
IA 8	1	10	Sequoia Sidelite (SL7)	Urethane Adhesive x2500 A Plus	-	-	-	-	0.044	0.044	-	-	-	-	-	-	-	0.044	-
IA 8	2	10	Sequoia Sidelite (SL7)	Urethane Curative x2500 B Plus	-	-	-	-	0.006	-	-	-	-	-	-	-	-	-	-
IA 8	3	10	Sequoia Sidelite (SL7)	Glass Cleaner, Isopropanol	-	-	-	-	1.117	-	-	-	-	-	-	-	-	-	-
IA 8	5	10	Sequoia Sidelite (SL7)	Electrical Connector	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000
IA 8	6	10	Sequoia Sidelite (SL7)	Black Glass Primer, Betaprime 5500	-	-	-	-	1.137	0.018	-	-	-	-	-	-	-	0.018	-
IA 9	1	10	Line 6/6A BL w/ soldering	Solder	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-	0.000
Source-wide	1		Isopropanol for Cleaning	Isopropanol	-	-	-	-	1.663	-	-	-	-	-	-	-	-	-	-
				Maximum HAP Scenario Source-wide Emissions (Tons)	2559.137	2.044	3.426	3.426	61.453	1.292	7.124	5.541	0.341	0.017	0.017	0.008	0.001	14.341	4.459

Table 2
Vitro Automotive Glass AI #2846
Berea, Kentucky
Hourly Emissions (lb/hr)

EP#	Process ID	Stack	EP Description	Process Description	CO_2	CO	NO_2	SO_2	VOC	MDI	Methanol	Toluene	Xylene	HDI	TDI	Methyl Isobutyl Ketone	Lead	HAP	PM/ PM10
1	1	EG 1	Emergency Generator	Diesel Usage	198.617	1.151	5.341	5.341	0.424	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.375
4	1	2	Clip Priming (2 Stations) - 43533	Body Primer 43533	0.000	0.000	0.000	0.000	1.201	0.093	0.000	0.000	0.000	0.000	0.0000	0.000	0.00E+00	0.093	0.000
10	1	11	Sidelite Assembly Line A (SL3)	Clear Glass Primer 43518	0.000	0.000	0.000	0.000	0.217	0.000	0.106	0.058	0.000	0.000	0.0000	0.000	0.000	0.164	0.000
10	2	11	Sidelite Assembly Line A (SL3)	Urethane Adhesive WS-292FK	0.000	0.000	0.000	0.000	0.007	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.000
10	3	11	Sidelite Assembly Line A (SL3)	Urethane Curative B-1M	0.000	0.000	0.000	0.000	0.090	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.000
11	1	11	Sidelite Assembly Line B (SL4)	Clear Glass Primer 43518	0.000	0.000	0.000	0.000	0.290	0.000	0.142	0.077	0.000	0.000	0.0000	0.000	0.000	0.219	0.000
11	2	11	Sidelite Assembly Line B (SL4)	Urethane Adhesive WS-292FK	0.000	0.000	0.000	0.000	0.009	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.000
11	3	11	Sidelite Assembly Line B (SL4)	Urethane Curative B-1M	0.000	0.000	0.000	0.000	0.121	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.000
11	4	11	Sidelite Assembly Line B (SL4)	Isopropanol	0.000	0.000	0.000	0.000	0.331	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.000
12	1	11	Sidelite Door Cell (SL6) - YH America AN-1M Option	Clear Glass Primer 43518	0.000	0.000	0.000	0.000	0.325	0.000	0.159	0.087	0.000	0.000	0.0000	0.000	0.000	0.246	0.000
12	2	11	Sidelite Door Cell (SL6) - YH America AN-1M Option	Urethane Adhesive WS-242FK	0.000	0.000	0.000	0.000	0.053	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.000
12	3	11	Sidelite Door Cell (SL6) - YH America AN-1M Option	Urethane Curative AN-1M	0.000	0.000	0.000	0.000	0.538	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.000
13	1	6	Clip Priming Station - 43533	Body Primer 43533	0.000	0.000	0.000	0.000	1.644	0.128	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.128	0.000
14	1	11	Backlite Assembly Line (BL2)	Clear Glass Primer 43518	0.000	0.000	0.000	0.000	0.357	0.000	0.175	0.095	0.000	0.000	0.0000	0.000	0.000	0.270	0.000
14	2	11	Backlite Assembly Line (BL2)	Black Glass Primer 43520A	0.000	0.000	0.000	0.000	0.627	0.000	0.000	0.052	0.011	0.001	0.0005	0.000	0.000	0.063	0.000
14	3	11	Backlite Assembly Line (BL2)	Electrical Connector	0.000	0.000	0.000	0.000	0.000				0.000	0.000	0.0000	0.000	0.000		0.000
15	1	8	Quarter Assembly Line (SL5)	Clear Glass Primer 43518	0.000	0.000	0.000	0.000	0.230	0.000	0.113	0.062	0.000	0.000	0.0000	0.000	0.000	0.174	0.000
15	2	8	Quarter Assembly Line (SL5)	Black Glass Primer 43520A	0.000	0.000	0.000	0.000	0.450	0.000	0.000	0.037	0.008	0.000	0.0004	0.000	0.000	0.046	0.000
15	3	8	Quarter Assembly Line (SL5)	Electrical Connector	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.000
16	1	6	Windshield Assembly Line 1 (WS2)	Clear Glass Primer 43518	0.000	0.000	0.000	0.000	0.412	0.000	0.202	0.110	0.000	0.000	0.0000	0.000	0.000	0.311	0.000
16	2	6	Windshield Assembly Line 1 (WS2)	Black Glass Primer 43520A	0.000	0.000	0.000	0.000	0.723	0.000	0.000	0.060	0.012	0.001	0.0006	0.000	0.000	0.073	0.000
16	3	6	Windshield Assembly Line 1 (WS2)	Body Primer 43533	0.000	0.000	0.000	0.000	0.086	0.007	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.007	0.000
16	4	6	Windshield Assembly Line 1 (WS2)	Urethane Adhesive x2500 A Plus	0.000	0.000	0.000	0.000	0.011	0.011	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.011	0.000
16	5	6	Windshield Assembly Line 1 (WS2)	Urethane Curative x2500 B Plus	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.000
16	6	6	Windshield Assembly Line 1 (WS2)	Isopropanol	0.000	0.000	0.000	0.000	0.083	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.000
18	1	7	Windshield Assembly Line 2 (WS1) - 500B Option	Clear Glass Primer 43518	0.000	0.000	0.000	0.000	0.412	0.000	0.202	0.110	0.000	0.000	0.0000	0.000	0.000	0.311	0.000
18	2	7	Windshield Assembly Line 2 (WS1) - 500B Option	Black Glass Primer 43520A	0.000	0.000	0.000	0.000	0.723	0.000	0.000	0.060	0.012	0.001	0.0006	0.000	0.000	0.073	0.000
18	3	7	Windshield Assembly Line 2 (WS1) - 500B Option	Body Primer 43533	0.000	0.000	0.000	0.000	0.100	0.008	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.008	0.000
18	4	7	Windshield Assembly Line 2 (WS1) - 500B Option	Aron Mighty	0.000	0.000	0.000	0.000	0.039	0.000	0.004	0.000	0.000	0.000	0.0000	0.000	0.000	0.004	0.000
18	5	7	Windshield Assembly Line 2 (WS1) - 500B Option	Urethane Adhesive x2500 A Plus	0.000	0.000	0.000	0.000	0.011	0.011	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.011	0.000
18	6	7	Windshield Assembly Line 2 (WS1) - 500B Option	Urethane Curative x2500 B Plus	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.000
18	7	7	Windshield Assembly Line 2 (WS1) - 500B Option	Isopropanol	0.000	0.000	0.000	0.000	0.083	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.000
20	1	11	Sidelite Door Line (SL4B / SL8)	Clear Glass Primer 43518	0.000	0.000	0.000	0.000	0.241	0.000	0.118	0.065	0.000	0.000	0.0000	0.000	0.000	0.183	0.000
20	2	11	Sidelite Door Line (SL4B / SL8)	Urethane Adhesive WS-292FK	0.000	0.000	0.000	0.000	0.007	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.000
20	3	11	Sidelite Door Line (SL4B / SL8)	Urethane Curative B-1M	0.000	0.000	0.000	0.000	0.101	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.000
20	4	11	Sidelite Door Line (SL4B / SL8)	Isopropanol	0.000	0.000	0.000	0.000	0.276	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.000
21	1	11	Sidelite Bonding Line (2015) (SL2)	Clear Glass Primer 43518	0.000	0.000	0.000	0.000	0.088	0.000	0.043	0.023	0.000	0.000	0.0000	0.000	0.000	0.066	0.000
21	2	11	Sidelite Bonding Line (2015) (SL2)	Black Glass Primer 43520A	0.000	0.000	0.000	0.000	0.103	0.000	0.000	0.008	0.002	0.000	0.0001	0.000	0.000	0.010	0.000
21	3	11	Sidelite Bonding Line (2015) (SL2)	Urethane Adhesive x2500 A Plus	0.000	0.000	0.000	0.000	0.008	0.008	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.008	0.000
21	4	11	Sidelite Bonding Line (2015) (SL2)	Urethane Curative x2500 B Plus	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.000
21	5	11	Sidelite Bonding Line (2015) (SL2)	Glass Cleaner, Isopropanol	0.000	0.000	0.000	0.000	0.044	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.000
22	1	10	Line 2A - Large SL option (previously 2AL)	Pliogrip 7655 Adhesive	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.000
22	2	10	Line 2A - Large SL option (previously 2AL)	Pliogrip 7400 Adhesive	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.000
22	3	10	Line 2A - Large SL option (previously 2AL)	Clear Glass Primer 43518	0.000	0.000	0.000	0.000	0.168	0.000	0.082	0.045	0.000	0.000	0.0000	0.000	0.000	0.127	0.000
22	4	10	Line 2A - Large SL option (previously 2AL)	Black Glass Primer 43520A	0.000	0.000	0.000	0.000	0.590	0.000	0.000	0.049	0.010	0.001	0.0005	0.000	0.000	0.060	0.000
22	5	10	Line 2A - Large SL option (previously 2AL)	Glass Cleaner, Isopropanol	0.000	0.000	0.000	0.000	0.047	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.000
23	1	10	Line 2B (Qtr)	Pliogrip 7655 Adhesive	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.000
23	2	10	Line 2B (Qtr)	Pliogrip 7400 Adhesive	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.000
23	3	10	Line 2B (Qtr)	Clear Glass Primer 43518	0.000	0.000	0.000	0.000	0.093	0.000	0.046	0.025	0.000	0.000	0.0000	0.000	0.000	0.071	0.000
23	4	10	Line 2B (Qtr)	Black Glass Primer 43520A	0.000	0.000	0.000	0.000	0.317	0.000	0.000	0.026	0.005	0.000	0.0003	0.000	0.000	0.032	0.000
23	5	10	Line 2B (Qtr)	Glass Cleaner, Isopropanol	0.000	0.000	0.000	0.000	0.047	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.000
24	1	12	Line 7 (BL)	Betaseal 58702SFHN	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.001	0.000
24	2	12	Line 7 (BL)	Clear Glass Primer 43518	0.000	0.000	0.000	0.000	0.086	0.000	0.042	0.023	0.000	0.000	0.0000	0.000	0.000	0.065	0.000
24	3	12	Line 7 (BL)	Black Glass Primer 43520A	0.000	0.000	0.000	0.000	0.134	0.000	0.000	0.011	0.002	0.000	0.0001	0.000	0.000	0.014	0.000
24	4	12	Line 7 (BL)	Solder	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.000
24	5	12	Line 7 (BL)	Flux	0.000	0.000	0.000	0.000	0.027	0.000	0.000	0.000	0.000	0.000	0.0000	0.002	0.000	0.002	0.000
24	6	12	Line 7 (BL)	Glass Cleaner, Isopropanol	0.000	0.000	0.000	0.000	0.036	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.000
25	1	10	Line 17 (WS)	Betaseal 58702SFHN	0.000	0.000	0.000	0.000	0.005	0.005	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.005	0.000
25	2	10	Line 17 (WS)	Clear Glass Primer 43518	0.000	0.000	0.000	0.000	0.114	0.000	0.056	0.030	0.000	0.000	0.0000	0.000	0.000	0.086	0.000
25	3	10	Line 17 (WS)	Black Glass Primer 43520A	0.000	0.000	0.000	0.000	0.418	0.000	0.000	0.034	0.007	0.000	0.0004	0.000	0.000	0.042	0.000
25	4	10	Line 17 (WS)	Glass Cleaner, Isopropanol	0.000	0.000	0.000	0.000	0.036	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.000
26	1	12	Line 18 (WS)	Urethane Adhesive x2500 A Plus	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.001	0.000
26	2	12	Line 18 (WS)	Urethane Curative x2500 B Plus	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.000
26	3	12	Line 18 (WS)	Clear Glass Primer 43518	0.000	0.000	0.000	0.000	0.143	0.000	0.070	0.038	0.000	0.000	0.0000	0.000	0.000	0.108	0.000
26	4	12	Line 18 (WS)	Black Glass Primer 43520A	0.000	0.000	0.000	0.000	0.351	0.000	0.000	0.029	0.006	0.000	0.0003	0.000	0.000	0.036	0.000
26	5	12	Line 18 (WS)	Glass Cleaner, Isopropanol	0.000	0.000	0.000	0.000	0.036	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.000

Table 2
Vitro Automotive Glass AI #2846
Berea, Kentucky
Hourly Emissions (lb/hr)

EP#	Process ID	Stack	EP Description	Process Description	CO_2	CO	NO_2	SO_2	VOC	MDI	Methanol	Toluene	Xylene	HDI	TDI	Methyl Isobutyl Ketone	Lead	HAP	PM/ PM10
IA 1	1	0	Space heaters (28 units) 4.87 MMBtu/hr total	Natural Gas Usage	572.941	0.401	0.477	0.477	0.026	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.036
IA 2	1	10	Line 1 - GMT610 option	Glasgrip 7780 Primer	0.000	0.000	0.000	0.000	0.028	0.000	0.014	0.014	0.000	0.000	0.0000	0.000	0.000	0.028	0.000
IA 2	2	10	Line 1 - GMT610 option	Pliogrip 7655 Adhesive	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.000
IA 2	3	10	Line 1 - GMT610 option	Pliogrip 7400 Adhesive	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.000
IA 2	4	10	Line 1 - GMT610 option	Isopropanol	0.000	0.000	0.000	0.000	0.072	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.000
IA 3	1	2	Sidelite Bonding Line (2014) (SL1) - 43518 & 43520A Option	Clear Glass Primer 43518	0.000	0.000	0.000	0.000	0.088	0.000	0.043	0.023	0.000	0.000	0.0000	0.000	0.000	0.066	0.000
IA 3	2	2	Sidelite Bonding Line (2014) (SL1) - 43518 & 43520A Option	Black Glass Primer 43520A	0.000	0.000	0.000	0.000	0.103	0.000	0.000	0.008	0.002	0.000	0.0001	0.000	0.000	0.010	0.000
IA 3	3	2	Sidelite Bonding Line (2014) (SL1) - 43518 & 43520A Option	Urethane Adhesive x2500 A Plus	0.000	0.000	0.000	0.000	0.008	0.008	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.008	0.000
IA 3	4	2	Sidelite Bonding Line (2014) (SL1) - 43518 & 43520A Option	Urethane Curative x2500 B Plus	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.000
IA 3	5	2	Sidelite Bonding Line (2014) (SL1) - 43518 & 43520A Option	Glass Cleaner, Isopropanol	0.000	0.000	0.000	0.000	0.044	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.000
IA 4	2	11	Quarter Window Bonding Line (2015) (QW1)	Clear Glass Primer 43518	0.000	0.000	0.000	0.000	0.022	0.000	0.011	0.006	0.000	0.000	0.0000	0.000	0.000	0.017	0.000
IA 5	1	0	Westward Cold Cleaner	N/A	0.000	0.000	0.000	0.000	0.015	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.000
IA 6	1	0	Diesel Storage Tank, 280 gallon	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.000
IA 7	1	0	MIG Welding Table	Electrode	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.960
IA 8	1	10	Sequoia Sidelite (SL7)	Urethane Adhesive x2500 A Plus	0.000	0.000	0.000	0.000	0.010	0.010	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.010	0.000
IA 8	2	10	Sequoia Sidelite (SL7)	Urethane Curative x2500 B Plus	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.000
IA 8	3	10	Sequoia Sidelite (SL7)	Glass Cleaner, Isopropanol	0.000	0.000	0.000	0.000	0.255	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.000
IA 8	5	10	Sequoia Sidelite (SL7)	Electrical Connector	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.000
IA 8	6	10	Sequoia Sidelite (SL7)	Black Glass Primer, Betaprime 5500	0.000	0.000	0.000	0.000	0.260	0.004	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.004	0.000
IA 9	1	10	Line 6/6A BL w/ soldering	Solder	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.000
IA 9	2	10	Line 6/6A BL w/ soldering	Flux	0.000	0.000	0.000	0.000	0.172	0.000	0.000	0.000	0.000	0.000	0.0000	0.011	0.000	0.011	0.000
ource-wid	1	0	Isopropanol for Cleaning	Isopropanol	0.000	0.000	0.000	0.000	0.380	0.000	0.000	0.000	0.000	0.000	0.0000	0.000	0.000	0.000	0.000

Table 3
Vitro Automotive Glass AI #2846
Berea, Kentucky
Emission Factors

EP#	Process ID	Stack	EP Description	Process Description	Emission Factor Units	Capacity (parts/hr)	Throughput (SCC unit/hr)	Usage per Part (gram/part)	Usage Per Part (gal/part)	Density (lb/gal)	CO_2	CO	NO_2	SO_2	VOC	MDI	Methanol	Toluene	Xylene	HDI	TDI	Methyl Isobutyl Ketone	Lead	HAP	PM/ PM10	Emission Factor Reference
1	1	EG 1	Emergency Generator	Diesel Usage	lb/1000 gal	-	0.00884	-	-	-	22,468.00	130.15	604.17	39.73	47.95	-	-	-	-	-	-	-	-	-	42.47	AP 42
4	1	2	Clip Priming (2 Stations) - 43533	Body Primer 43533	lb/gal	1000	0.245	0.90	2.45E-04	8.09	-	-	-	-	4.90	0.38	-	-	-	-	-	-	-	0.38	-	SDS/LCS Lab Results
4	1	2	Clip Priming (2 Stations) - RC-50E	RC-50E Body Primer	lb/gal	1000	0.242	0.90	2.42E-04	8.20	-	-	-	-	6.40	0.07	-	-	-	-	-	-	-	0.07	-	SDS
10	1	11	Sidelite Assembly Line A (SL3)	Clear Glass Primer 43518	lb/gal	225	0.031	0.44	1.39E-04	6.97	-	-	-	-	6.94	-	3.40	1.85	-	-	-	-	-	5.25	-	SDS/LCS Lab Results
10	2	11	Sidelite Assembly Line A (SL3)	Urethane Adhesive WS-292FK	lb/gal	225	0.664	14.03	2.95E-03	10.48	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	SDS
10	3	11	Sidelite Assembly Line A (SL3)	Urethane Curative B-1M	lb/gal	225	0.646	13.89	2.87E-03	10.66	-	-	-	-	0.14	-	-	-	-	-	-	-	-	-	-	SDS
11	1	11	Sidelite Assembly Line B (SL4)	Clear Glass Primer 43518	lb/gal	300	0.042	0.44	1.39E-04	6.97	-	-	-	-	6.94	-	3.40	1.85	-	-	-	-	-	5.25	-	SDS/LCS Lab Results
11	2	11	Sidelite Assembly Line B (SL4)	Urethane Adhesive WS-292FK	lb/gal	300	0.885	14.03	2.95E-03	10.48	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	SDS
11	3	11	Sidelite Assembly Line B (SL4)	Urethane Curative B-1M	lb/gal	300	0.862	13.89	2.87E-03	10.66	-	-	-	-	0.14	-	-	-	-	-	-	-	-	-	-	SDS
11	4	11	Sidelite Assembly Line B (SL4)	Isopropanol	lb/gal	300	0.050	0.50	1.66E-04	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
12	1	11	Sidelite Door Cell (SL6) - YH America AN-1M Option	Clear Glass Primer 43518	lb/gal	225	0.047	0.66	2.08E-04	6.97	-	-	-	-	6.94	-	3.40	1.85	-	-	-	-	-	5.25	-	SDS/LCS Lab Results
12	2	11	Sidelite Door Cell (SL6) - YH America AN-1M Option	Urethane Adhesive WS-242FK	lb/gal	225	1.313	28.05	5.83E-03	10.60	-	-	-	-	0.04	-	-	-	-	-	-	-	-	-	-	SDS
12	3	11	Sidelite Door Cell (SL6) - YH America AN-1M Option	Urethane Curative AN-1M	lb/gal	225	1.016	21.71	4.52E-03	10.60	-	-	-	-	0.53	-	-	-	-	-	-	-	-	-	-	SDS
12	1	11	Sidelite Door Cell (SL6) - YH America B-1M Option	Clear Glass Primer 43518	lb/gal	225	0.031	0.44	1.39E-04	6.97	-	-	-	-	6.94	-	3.40	1.85	-	-	-	-	-	5.25	-	SDS/LCS Lab Results
12	2	11	Sidelite Door Cell (SL6) - YH America B-1M Option	Urethane Adhesive WS-292FK	lb/gal	225	0.664	14.03	2.95E-03	10.48	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	SDS
12	3	11	Sidelite Door Cell (SL6) - YH America B-1M Option	Urethane Curative B-1M	lb/gal	225	0.646	13.89	2.87E-03	10.66	-	-	-	-	0.14	-	-	-	-	-	-	-	-	-	-	SDS
13	1	6	Clip Priming Station - 43533	Body Primer 43533	lb/gal	800	0.336	1.54	4.19E-04	8.09	-	-	-	-	4.90	0.38	-	-	-	-	-	-	-	0.38	-	SDS/LCS Lab Results
13	2	6	Clip Priming Station - RC-50E	RC-50E Body Primer	lb/gal	800	0.331	1.54	4.14E-04	8.20	-	-	-	-	6.40	0.07	-	-	-	-	-	-	-	0.07	-	SDS
14	1	11	Backlite Assembly Line (BL2)	Clear Glass Primer 43518	lb/gal	65	0.051	2.50	7.91E-04	6.97	-	-	-	-	6.94	-	3.40	1.85	-	-	-	-	-	5.25	-	SDS/LCS Lab Results
14	2	11	Backlite Assembly Line (BL2)	Black Glass Primer 43520A	lb/gal	65	0.130	7.50	2.00E-03	8.26	-	-	-	-	4.82	-	-	0.40	0.08	0.0041	0.0041	-	-	0.49	-	SDS/LCS Lab Results
14	3	11	Backlite Assembly Line (BL2)	Electrical Connector	lb/lb	260	0.029	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00	Process knowledge [1]
14	1	11	Backlite Bonding Line w/ Soldering (2015) (BL1)	Clear Glass Primer 43518	lb/gal	50	0.011	0.70	2.21E-04	6.97	-	-	-	-	6.94	-	3.40	1.85	-	-	-	-	-	5.25	-	SDS/LCS Lab Results
14	2	11	Backlite Bonding Line w/ Soldering (2015) (BL1)	Black Glass Primer 43520A	lb/gal	50	0.053	4.00	1.07E-03	8.26	-	-	-	-	4.82	-	-	0.40	0.08	0.0041	0.0041	-	-	0.49	-	SDS/LCS Lab Results
14	3	11	Backlite Bonding Line w/ Soldering (2015) (BL1)	Glass Cleaner, Isopropanol	lb/gal	50	0.002	0.10	3.32E-05	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
14	4	11	Backlite Bonding Line w/ Soldering (2015) (BL1)	Electrical Connector	lb/lb	100	0.022	0.10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00	Process knowledge [1]
14	1	11	Backlite Bonding Line w/ Soldering (2015) (BL1) - IPA & 550 Option	Isopropanol, Pre Wipe	lb/gal	50	0.012	0.70	2.32E-04	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
14	2	11	Backlite Bonding Line w/ Soldering (2015) (BL1) - IPA & 550 Option	Black Glass Primer, Beteprime 5500	lb/gal	50	0.056	4.00	1.11E-03	7.93	-	-	-	-	4.95	0.08	-	-	-	-	-	-	-	0.08	-	SDS
14	3	11	Backlite Bonding Line w/ Soldering (2015) (BL1) - IPA & 550 Option	Glass Cleaner, Isopropanol	lb/gal	50	0.002	0.10	3.32E-05	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
14	4	11	Backlite Bonding Line w/ Soldering (2015) (BL1) - IPA & 550 Option	Electrical Connector	lb/lb	100	0.022	0.10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00	Process knowledge [1]
15	1	8	Quarter Assembly Line (SL5)	Clear Glass Primer 43518	lb/gal	70	0.033	1.50	4.74E-04	6.97	-	-	-	-	6.94	-	3.40	1.85	-	-	-	-	-	5.25	-	SDS/LCS Lab Results
15	2	8	Quarter Assembly Line (SL5)	Black Glass Primer 43520A	lb/gal	70	0.093	5.00	1.33E-03	8.26	-	-	-	-	4.82	-	-	0.40	0.08	0.0041	0.0041	-	-	0.49	-	SDS/LCS Lab Results
15	3	8	Quarter Assembly Line (SL5)	Electrical Connector	lb/lb	280	0.031	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00	Process knowledge [1]
16	1	6	Windshield Assembly Line 1 (WS2)	Clear Glass Primer 43518	lb/gal	75	0.059	2.50	7.91E-04	6.97	-	-	-	-	6.94	-	3.40	1.85	-	-	-	-	-	5.25	-	SDS/LCS Lab Results
16	2	6	Windshield Assembly Line 1 (WS2)	Black Glass Primer 43520A	lb/gal	75	0.150	7.50	2.00E-03	8.26	-	-	-	-	4.82	-	-	0.40	0.08	0.0041	0.0041	-	-	0.49	-	SDS/LCS Lab Results
16	3	6	Windshield Assembly Line 1 (WS2)	Body Primer 43533	lb/gal	75	0.018	0.858	2.34E-04	8.09	-	-	-	-	4.90	0.38	-	-	-	-	-	-	-	0.38	-	SDS/LCS Lab Results
16	4	6	Windshield Assembly Line 1 (WS2)	Urethane Adhesive x2500 A Plus	lb/gal	75	0.210	13.572	2.80E-03	10.68	-	-	-	-	0.05	0.05	-	-	-	-	-	-	-	0.05	-	SDS
16	5	6	Windshield Assembly Line 1 (WS2)	Urethane Curative x2500 B Plus	lb/gal	75	0.228	13.784	3.04E-03	10.01	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	SDS
16	6	6	Windshield Assembly Line 1 (WS2)	Isopropanol	lb/gal	75	0.012	0.5	1.66E-04	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
18	1	7	Windshield Assembly Line 2 (WS1) - 500B Option	Clear Glass Primer 43518	lb/gal	75	0.059	2.50	7.91E-04	6.97	-	-	-	-	6.94	-	3.40	1.85	-	-	-	-	-	5.25	-	SDS/LCS Lab Results
18	2	7	Windshield Assembly Line 2 (WS1) - 500B Option	Black Glass Primer 43520A	lb/gal	75	0.150	7.50	2.00E-03	8.26	-	-	-	-	4.82	-	-	0.40	0.08	0.0041	0.0041	-	-	0.49	-	SDS/LCS Lab Results
18	3	7	Windshield Assembly Line 2 (WS1) - 500B Option	Body Primer 43533	lb/gal	75	0.020	1.001	2.73E-04	8.09	-	-	-	-	4.90	0.38	-	-	-	-	-	-	-	0.38	-	SDS/LCS Lab Results
18	4	7	Windshield Assembly Line 2 (WS1) - 500B Option	Aron Mighty	lb/gal	75	0.0078	0.315	1.04E-04	6.68	-	-	-	-	4.98	-	0.53	-	-	-	-	-	-	0.53	-	SDS
18	5	7	Windshield Assembly Line 2 (WS1) - 500B Option	Urethane Adhesive x2500 A Plus	lb/gal	75	0.210	13.572	2.80E-03	10.68	-	-	-	-	0.05	0.05	-	-	-	-	-	-	-	0.05	-	SDS
18	6	7	Windshield Assembly Line 2 (WS1) - 500B Option	Urethane Curative x2500 B Plus	lb/gal	75	0.228	13.784	3.04E-03	10.01	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	SDS
18	7	7	Windshield Assembly Line 2 (WS1) - 500B Option	Isopropanol	lb/gal	75	0.012	0.5	1.66E-04	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
18	1	7	Windshield Assembly Line 2 (WS1) - C1UG/C1UH Option	Clear Glass Primer 43518	lb/gal	75	0.059	2.5	7.91E-04	6.97	-	-	-	-	6.94	-	3.40	1.85	-	-	-	-	-	5.25	-	SDS/LCS Lab Results
18	2	7	Windshield Assembly Line 2 (WS1) - C1UG/C1UH Option	Black Glass Primer 43520A	lb/gal	75	0.150	7.5	2.00E-03	8.26	-	-	-	-	4.82	-	-	0.40	0.08	0.0041	0.0041	-	-	0.49	-	SDS/LCS Lab Results
18	3	7	Windshield Assembly Line 2 (WS1) - C1UG/C1UH Option	Body Primer 43533	lb/gal	75	0.002	0.095	2.59E-05	8.09	-	-	-	-	4.90	0.38	-	-	-	-	-	-	-	0.38	-	SDS/LCS Lab Results
18	4	7	Windshield Assembly Line 2 (WS1) - C1UG/C1UH Option	Urethane Adhesive x2500 A Plus	lb/gal	75	0.210	13.572	2.80E-03	10.68	-	-	-	-	0.05	0.05	-	-	-	-	-	-	-	0.05	-	SDS
18	5	7	Windshield Assembly Line 2 (WS1) - C1UG/C1UH Option	Urethane Curative x2500 B Plus	lb/gal	75	0.228	13.784	3.04E-03	10.01	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	SDS
18	6	7	Windshield Assembly Line 2 (WS1) - C1UG/C1UH Option	Isopropanol	lb/gal	75	0.012	0.5	1.66E-04	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
20	1	11	Sidelite Door Line (SL4B / SL8)	Clear Glass Primer 43518	lb/gal	250	0.035	0.44	1.39E-04	6.97	-	-	-	-	6.94	-	3.40	1.85	-	-	-	-	-	5.25	-	SDS/LCS Lab Results
20	2	11	Sidelite Door Line (SL4B / SL8)	Urethane Adhesive WS-292FK	lb/gal	250	0.738	14.03	2.95E-03	10.48	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	SDS
20	3	11	Sidelite Door Line (SL4B / SL8)	Urethane Curative B-1M	lb/gal	250	0.718	13.89	2.87E-03	10.66	-	-	-	-	0.14	-	-	-	-	-	-	-	-	-	-	SDS
20	4	11	Sidelite Door Line (SL4B / SL8)	Isopropanol	lb/gal	250	0.041	0.50	1.66E-04	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
21	1	11	Sidelite Bonding Line (2015) (SL2)	Clear Glass Primer 43518	lb/gal	200	0.013	0.2	6.33E-05	6.97	-	-	-	-	6.94	-	3.40	1.85	-	-	-	-	-	5.25	-	SDS/LCS Lab Results
21	2	11	Sidelite Bonding Line (2015) (SL2)	Black Glass Primer 43520A	lb/gal	200	0.021	0.4	1.07E-04	8.26	-	-	-	-	4.82	-	-	0.40	0.08	0.0041	0.0041	-	-	0.49	-	SDS/LCS Lab Results
21	3	11	Sidelite Bonding Line (2015) (SL2)	Urethane Adhesive x2500 A Plus	lb/gal	200	0.165	4	8.26E-04	10.68	-	-	-	-	0.05	0.05	-	-	-	-	-	-	-	0.05	-	SDS
21	4	11	Sidelite Bonding Line (2015) (SL2)	Urethane Curative x2500 B Plus	lb/gal	200	0.176	4	8.81E-04	10.01	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	SDS
21	5	11	Sidelite Bonding Line (2015) (SL2)	Glass Cleaner, Isopropanol	lb/gal	200	0.007	0.1	3.32E-05	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
21	1	11	Sidelite Bonding Line (2015) (SL2) - IPA & 5500 Option	Isopropanol, Pre Wipe	lb/gal	200	0.007	0.1	3.32E-05	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
21	2	11	Sidelite Bonding Line (2015) (SL2) - IPA & 5500 Option	Black Glass Primer, Beteprime 5500	lb/gal	200	0.022	0.4	1.11E-04	7.93	-	-	-	-	4.95	0.08	-	-	-	-	-	-	-	0.08	-	SDS
21	3	11	Sidelite Bonding Line (2015) (SL2) - IPA & 5500 Option	Urethane Adhesive x2500 A Plus	lb/gal	200	0.165	4	8.26E-04	10.68	-	-	-	-	0.05	0.05	-	-	-	-	-	-	-	0.05	-	SDS
21	4	11	Sidelite Bonding Line (2015) (SL2) - IPA & 5500 Option	Urethane Curative x2500 B Plus	lb/gal	200	0.176	4	8.81E-04	10.01	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	SDS
21	5	11	Sidelite Bonding Line (2015) (SL2) - IPA & 5500 Option	Glass Cleaner, Isopropanol	lb/gal	200	0.007	0.1	3.32E-05	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
21	1	11	Sidelite Bonding Line (2015) (SL2) - YH America Primerless WS-292-A Option	Isopropanol, Pre Wipe	lb/gal	200	0.007	0.1	3.32E-05	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
21	2	11	Sidelite Bonding Line (2015) (SL2) - YH America Primerless WS-292-A Option	Urethane Adhesive WS-292FK	lb/gal	200	0.151	3.6	7.57E-04	10.48	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	SDS
21	3	11	Sidelite Bonding Line (2015) (SL2) - YH America Primerless WS-292-A Option	Urethane Curative B-1M	lb/gal	200	0.015	0.36	7.45E-05	10.66	-	-	-	-	0.14	-	-	-	-	-	-	-	-	-	-	SDS
21	4	11	Sidelite Bonding Line (2015) (SL2) - YH America Primerless WS-292-A Option	Glass Cleaner, Isopropanol	lb/gal	200	0.007	0.1	3.32E-05	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
21	1	11	Sidelite Bonding Line (2015) (SL2) - IPA & 5500 Option 2	Isopropanol	lb/gal	200	0.020	0.3	9.95E-05	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
21	2	11	Sidelite Bonding Line (2015) (SL2) - IPA & 5500 Option 2	Black Glass Primer, Beteprime 5500	lb/gal	200	0.028	0.5	1.39E-04	7.93	-	-	-	-	4.95	0.08	-	-	-	-	-	-	-	0.08	-	SDS
21	3	11	Sidelite Bonding Line (2015) (SL2) - IPA & 5500 Option 2	Urethane Adhesive x2500 A Plus	lb/gal	200	0.155	3.75	7.74E-04	10.68	-	-	-	-	0.05	0.05	-	-	-	-	-	-	-	0.05	-	SDS
21	4	11	Sidelite Bonding Line (2015) (SL2) - IPA & 5500 Option 2	Urethane Curative x2500 B Plus	lb/gal	200	0.165	3.75	8.26E-04	10.01	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	SDS
22	1	10	Line 2A - Small SL option	Pliogrip 7655 Adhesive	lb/gal	85	0.007	0.4	8.39E-05	10.51	-	-	-	-	0.01	0.01	-	-	-	-	-	-	-	0.01	-	SDS
22	2	10	Line 2A - Small SL option	Pliogrip 7400 Adhesive	lb/gal	85	0.007	0.4	8.20E-05	10.75	-	-	-	-	0.01	0.01	-	-	-	-	-	-	-	0.01	-	SDS
22	3	10	Line 2A - Small SL option	Clear Glass Primer 43518	lb/gal	85	0.013	0.5	1.58E-04	6.97	-	-	-	-	6.94	-	3.40	1.85	-	-	-	-	-	5.25	-	SDS/LCS Lab Results
22	4	10	Line 2A - Small SL option	Black Glass Primer 43520A	lb/gal	85	0.066	2.9	7.74E-04	8.26	-	-	-	-	4.82	-	-	0.40	0.08	0.0041	0.0041	-	-	0.49	-	SDS/LCS Lab Results
22	5	10	Line 2A - Small SL option	Glass Cleaner, Isopropanol	lb/gal	85	0.007	0.25	8.29E-05	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
22	1	10	Line 2A - Medium SL option (previously 2AL)	Pliogrip 7655 Adhesive	lb/gal	85	0.007	0.4	8.39E-05	10.51	-	-	-	-	0.01	0.01	-	-	-	-	-	-	-	0.01	-	SDS
22	2	10	Line 2A - Medium SL option (previously 2AL)	Pliogrip 7400 Adhesive	lb/gal	85	0.007	0.4	8.20E-05	10.75	-	-	-	-	0.01	0.01	-	-	-	-	-	-	-	0.01	-	SDS
22	3	10	Line 2A - Medium SL option (previously 2AL)	Clear Glass Primer 43518	lb/gal	85	0.016	0.6	1.90E-04	6.97	-	-	-	-	6.94	-	3.40	1.85	-	-	-	-	-	5.25	-	SDS/LCS Lab Results
22	4	10	Line 2A - Medium SL option (previously 2AL)	Black Glass Primer 43520A	lb/gal	85	0.109	4.8	1.28E-03	8.26	-	-	-	-	4.82	-	-	0.40	0.08	0.0041	0.0041	-	-	0.49	-	SDS/LCS Lab Results
22	5	10	Line 2A - Medium SL option (previously 2AL)	Glass Cleaner, Isopropanol	lb/gal	85	0.007	0.25	8.29E-05	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
22	1	10	Line 2A - Large SL option (previously 2AL)	Pliogrip 7655 Adhesive	lb/gal	85	0.007	0.4	8.39E-05	10.51	-	-	-	-	0.01	0.01	-	-	-	-	-	-	-	0.01	-	SDS
22	2	10	Line 2A - Large SL option (previously 2AL)	Pliogrip 7400 Adhesive	lb/gal	85	0.007	0.4	8.20E-05	10.75	-	-	-	-	0.01	0.01	-	-	-	-	-	-	-	0.01	-	SDS
22	3	10	Line 2A - Large SL option (previously 2AL)	Clear Glass Primer 43518	lb/gal	85	0.024	0.9	2.85E-04	6.97	-	-	-	-	6.94	-	3.40	1.85	-	-	-	-	-	5.25	-	SDS/LCS Lab Results
22	4	10	Line 2A - Large SL option (previously 2AL)	Black Glass Primer 43520A	lb/gal	85	0.122	5.4	1.44E-03	8.26	-	-	-	-	4.82	-	-	0.40	0.08	0.0041	0.0041	-	-	0.49	-	SDS/LCS Lab Results
22	5	10	Line 2A - Large SL option (previously 2AL)	Glass Cleaner, Isopropanol	lb/gal	85	0.007	0.25	8.29E-05	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
23	1	10	Line 2B (Qtr)	Pliogrip 7655 Adhesive	lb/gal	85	0.007	0.4	8.39E-05	10.51	-	-	-	-	0.01	0.01	-	-	-	-	-	-	-	0.01	-	SDS
23	2	10	Line 2B (Qtr)	Pliogrip 7400 Adhesive	lb/gal	85	0.007	0.4	8.20E-05	10.75	-	-	-	-	0.01	0.01	-	-	-	-	-	-	-	0.01	-	SDS
23	3	10	Line 2B (Qtr)	Clear Glass Primer 43518	lb/gal	85	0.013	0.5	1.58E-04	6.97	-	-	-	-	6.94	-	3.40	1.85	-	-	-	-	-	5.25	-	SDS/LCS Lab Results
23	4	10	Line 2B (Qtr)	Black Glass Primer 43520A	lb/gal	85	0.066	2.9	7.74E-04	8.26	-	-	-	-	4.82	-	-	0.40	0.08	0.0041	0.0041	-	-	0.49	-	SDS/LCS Lab Results
23	5	10	Line 2B (Qtr)	Glass Cleaner, Isopropanol	lb/gal	85	0.007	0.25	8.29E-05	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
24	1	12	Line 7 (BL)	Betaseal 58702SFHN	lb/gal	65	0.020	1.4	3.13E-04	9.85	-	-	-	-	0.07	0.07	-	-	-	-	-	-	-	0.07	-	SDS
24	2	12	Line 7 (BL)	Clear Glass Primer 43518	lb/gal	65	0.012	0.6	1.90E-04	6.97	-	-	-	-	6.94	-	3.40	1.85	-	-	-	-	-	5.25	-	SDS/LCS Lab Results
24	3	12	Line 7 (BL)	Black Glass Primer 43520A	lb/gal	65	0.028	1.6	4.27E-04	8.26	-	-	-	-	4.82	-	-	0.40	0.08	0.0041	0.0041	-	-	0.49	-	SDS/LCS Lab Results
24	4	12	Line 7 (BL)	Solder	lb/ton	65	4.30E-05	0.6	-	N/A	-	-	-	-	-	-	-	-	-	-	-	-	1.50	-	2.42	SDS
24	5	12	Line 7 (BL)	Flux	lb/gal	65	0.005	0.25	7.42E-05	7.43	-	-	-	-	5.66	-	-	-	-	-	-	0.37	-	0.37	-	SDS
24	6	12	Line 7 (BL)	Glass Cleaner, Isopropanol	lb/gal	65	0.005	0.25	8.29E-05	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
25	1	10	Line 17 (WS)	Betaseal 58702SFHN	lb/gal	65	0.073	5	1.12E-03	9.85	-	-	-	-	0.07	0.07	-	-	-	-	-	-	-	0.07	-	SDS
25	2	10	Line 17 (WS)	Clear Glass Primer 43518	lb/gal	65	0.016	0.8	2.53E-04	6.97	-	-	-	-	6.94	-	3.40	1.85	-	-	-	-	-	5.25	-	SDS/LCS Lab Results
25	3	10	Line 17 (WS)	Black Glass Primer 43520A	lb/gal	65	0.087	5	1.33E-03	8.26	-	-	-	-	4.82	-	-	0.40	0.08	0.0041	0.0041	-	-	0.49	-	SDS/LCS Lab Results
25	4	10	Line 17 (WS)	Glass Cleaner, Isopropanol	lb/gal	65	0.005	0.25	8.29E-05	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
26	1	12	Line 18 (WS)	Urethane Adhesive x2500 A Plus	lb/gal	65	0.018	1.35	2.79E-04	10.68	-	-	-	-	0.05	0.05	-	-	-	-	-	-	-	0.05	-	SDS
26	2	12	Line 18 (WS)	Urethane Curative x2500 B Plus	lb/gal	65	0.019	1.35	2.97E-04	10.01	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	SDS
26	3	12	Line 18 (WS)	Clear Glass Primer 43518	lb/gal	65	0.021	1	3.16E-04	6.97	-	-	-	-	6.94	-	3.40	1.85	-	-	-	-	-	5.25	-	SDS/LCS Lab Results
26	4	12	Line 18 (WS)	Black Glass Primer 43520A	lb/gal	65	0.073	4.2	1.12E-03	8.26	-	-	-	-	4.82	-	-	0.40	0.08	0.0041	0.0041	-	-	0.49	-	SDS/LCS Lab Results
26	5	12	Line 18 (WS)	Glass Cleaner, Isopropanol	lb/gal	65	0.005	0.25	8.29E-05	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS

Table 3
Vitro Automotive Glass AI #2846
Berea, Kentucky
Emission Factors

EP#	Process ID	Stack	EP Description	Process Description	Emission Factor Units	Capacity (parts/hr)	Throughput (SCC unit/hr)	Usage per Part (gram/part)	Usage Per Part (gal/part)	Density (lb/gal)	CO_2	CO	NO_2	SO_2	VOC	MDI	Methanol	Toluene	Xylene	HDI	TDI	Methyl Isobutyl Ketone	Lead	HAP	PM/ PM10	Emission Factor Reference
IA 1	1		Space heaters (28 units) 4.87 MMBtu/hr total	Natural Gas Usage	lb/MMSCF		4.77E-03		-	N/A	120,000	84	100	0.60	5.50	-	-	-	-	-	-	-	-	-	7.60	AP 42 Table 1.4-2
IA 2	1	10	Line 1 - GMT610 option	Glasgrip 7780 Primer	lb/gal	65	0.004	0.2	6.34E-05	6.96	-	-	-	-	6.82	-	3.41	3.41	-	-	-	-	-	6.82	-	SDS
IA 2	2	10	Line 1 - GMT610 option	Pliogrip 7655 Adhesive	lb/gal	65	0.031	2.25	4.72E-04	10.51	-	-	-	-	0.01	0.01	-	-	-	-	-	-	-	0.01	-	SDS
IA 2	3	10	Line 1 - GMT610 option	Pliogrip 7400 Adhesive	lb/gal	65	0.030	2.25	4.61E-04	10.75	-	-	-	-	0.01	0.01	-	-	-	-	-	-	-	0.01	-	SDS
IA 2	4	10	Line 1 - GMT610 option	Isopropanol	lb/gal	65	0.011	0.5	1.66E-04	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
IA 3	1	2	Sidelite Bonding Line (2014) (SL1) - 43518 & 43520A Option	Clear Glass Primer 43518	lb/gal	200	0.013	0.2	6.33E-05	6.97	-	-	-	-	6.94	-	3.40	1.85	-	-	-	-	-	5.25	-	SDS/LCS Lab Results
IA 3	2	2	Sidelite Bonding Line (2014) (SL1) - 43518 & 43520A Option	Black Glass Primer 43520A	lb/gal	200	0.021	0.4	1.07E-04	8.26	-	-	-	-	4.82	-	-	0.40	0.08	0.0041	0.0041	-	-	0.49	-	SDS/LCS Lab Results
IA 3	3	2	Sidelite Bonding Line (2014) (SL1) - 43518 & 43520A Option	Urethane Adhesive x2500 A Plus	lb/gal	200	0.165	4	8.26E-04	10.68	-	-	-	-	0.05	0.05	-	-	-	-	-	-	-	0.05	-	SDS
IA 3	4	2	Sidelite Bonding Line (2014) (SL1) - 43518 & 43520A Option	Urethane Curative x2500 B Plus	lb/gal	200	0.176	4	8.81E-04	10.01	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	SDS
IA 3	5	2	Sidelite Bonding Line (2014) (SL1) - 43518 & 43520A Option	Glass Cleaner, Isopropanol	lb/gal	200	0.007	0.1	3.32E-05	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
IA 3	1	2	Sidelite Bonding Line (2014) (SL1) - IPA & 5500 Option	Isopropanol, Pre Wipe	lb/gal	200	0.007	0.1	3.32E-05	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
IA 3	2	2	Sidelite Bonding Line (2014) (SL1) - IPA & 5500 Option	Black Glass Primer, Betaprime 5500	lb/gal	200	0.022	0.4	1.11E-04	7.93	-	-	-	-	4.95	0.08	-	-	-	-	-	-	-	0.08	-	SDS
IA 3	3	2	Sidelite Bonding Line (2014) (SL1) - IPA & 5500 Option	Urethane Adhesive x2500 A Plus	lb/gal	200	0.165	4	8.26E-04	10.68	-	-	-	-	0.05	0.05	-	-	-	-	-	-	-	0.05	-	SDS
IA 3	4	2	Sidelite Bonding Line (2014) (SL1) - IPA & 5500 Option	Urethane Curative x2500 B Plus	lb/gal	200	0.176	4	8.81E-04	10.01	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	SDS
IA 3	5	2	Sidelite Bonding Line (2014) (SL1) - IPA & 5500 Option	Glass Cleaner, Isopropanol	lb/gal	200	0.007	0.1	3.32E-05	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
IA 3	1	2	Sidelite Bonding Line (2014) (SL1) - YH America Primerless WS-292-A Option	Isopropanol, Pre Wipe	lb/gal	200	0.007	0.1	3.32E-05	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
IA 3	2	2	Sidelite Bonding Line (2014) (SL1) - YH America Primerless WS-292-A Option	Urethane Adhesive WS-292FK	lb/gal	200	0.151	3.6	7.57E-04	10.48	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	SDS
IA 3	3	2	Sidelite Bonding Line (2014) (SL1) - YH America Primerless WS-292-A Option	Urethane Curative B-1M	lb/gal	200	0.015	0.36	7.45E-05	10.66	-	-	-	-	0.14	-	-	-	-	-	-	-	-	-	-	SDS
IA 3	4	2	Sidelite Bonding Line (2014) (SL1) - YH America Primerless WS-292-A Option	Glass Cleaner, Isopropanol	lb/gal	200	0.007	0.1	3.32E-05	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS
IA 4	2	11	Quarter Window Bonding Line (2015) (QW1)	Clear Glass Primer 43518	lb/gal	200	0.003	0.05	1.58E-05	6.97	-	-	-	-	6.94	-	3.40	1.85	-	-	-	-	-	5.25	-	SDS/LCS Lab Results
IA 5	1		Wetward Cold Cleaner	N/A			0.002								6.50											
IA 6	1		Diesel Storage Tank, 280 gallon	N/A																						
IA 7	1		MIG Welding Table	Electrode	lb/1000 lb		0.025															-	-		38.40	AP 42 12.19
IA 8	1	10	Sequoia Sidelite (SL7)	Urethane Adhesive x2500 A Plus	lb/gal	171	0.199	5.63	1.16E-03	10.68	-	-	-	-	0.05	0.05	-	-	-	-	-	-	-	0.05	-	
IA 8	2	10	Sequoia Sidelite (SL7)	Urethane Curative x2500 B Plus	lb/gal	171	0.212	5.63	1.24E-03	10.01	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	
IA 8	3	10	Sequoia Sidelite (SL7)	Glass Cleaner, Isopropanol	lb/gal	171	0.038	0.68	2.24E-04	6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	
IA 8	5	10	Sequoia Sidelite (SL7)	Electrical Connector	lb/lb	200	0.044	0.10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.20E-04	Process knowledge [1]
IA 8	6	10	Sequoia Sidelite (SL7)	Black Glass Primer, Betaprime 5500	lb/gal	171	0.052	1.10	3.07E-04	7.93	-	-	-	-	4.95	0.08	-	-	-	-	-	-	-	0.08	-	
IA 9	1	10	Line 6/6A BL w/ soldering	Solder	lb/ton	55	3.64E-05	0.60	-	N/A	-	-	-	-	-	-	-	-	-	-	-	-	1.50	-	2.42	AP 42 Table 12.7-2
IA 9	2	10	Line 6/6A BL w/ soldering	Flux	lb/gal	55	0.030	0.25	-	7.43	-	-	-	-	5.66	-	-	-	-	-	-	0.37	-	0.37	-	
Source-wide	1		Isopropanol for Cleaning	Isopropanol	lb/gal		0.06			6.65	-	-	-	-	6.65	-	-	-	-	-	-	-	-	-	-	SDS

[1] Weight loss of electical connector from soldered attachments is estimated at 0.1 gram per attachment. Assumed 4 attachments per piece. See previous applications.

From: Nicole Galavotti
To: Patil, Durga D (EEC); Hughes, Jonathon (EEC)
Subject: Vitro responsibility delegation
Date: Thursday, June 27, 2024 4:22:01 PM
Attachments: image001.jpg
PGW-Vitro_Berea KY_Air Permit_Responsible Official_06 26 2024 signed.pdf

Nicole R. Galavotti, P.E.
Principal/Sr. Environmental Engineer
Shield Environmental Associates, Inc.
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Dripping water hollows out stone, not through force but through persistence - Ovid

Pittsburgh Glass Works, LLC
d/b/a Vitro Automotive Glass
Berea Plant
2290 Menelaus Road
Berea, KY 40403 USA
www.vitro.com

June 26, 2024

State of Kentucky
Department of Environmental Protection
Division of Air Quality
300 Sower Boulevard
2nd Floor
Frankfort, KY 40601

RE: Responsible Official
Conditional Major Air Permit

To Whom It May Concern,

The Pittsburgh Glass Works, LLC (PGW) d/b/a Vitro Automotive Glass (Vitro) Berea Plant in Berea, KY submitted an application for a Conditional Major Air Permit as part of a business consolidation plan and process to meet customer demand for high-quality automotive glass. Mr. Edson Aldape is the Plant Manager for the Berea Plant. Please be advised that Mr. Aldape is the Responsible Official for the Berea Plant as a duly authorized representative that is responsible for business, operations, and results at the Berea Plant with gross annual sales at or above $25 million dollars.

If you have questions or need additional support, please contact Mr. Aldape by phone 859-986-5054 or email EALDAPEM@vitro.com.

Sincerely,

Albert Szwajkowski, ~~Senior~~ Vice President

cc:
Edson Aldape, Plant Manager – Berea Plant
Tony Kloss, Director EHS – Vitro US+EUR