

# **KENTUCKY LAWS AND REGULATIONS GOVERNING BLASTING AND EXPLOSIVES**



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**Division of Mine Reclamation and Enforcement**  
**Explosives and Blasting Branch**

## **FOREWORD**

This publication includes the laws and regulations governing the use of explosives, which are enforced by the Kentucky Department for Natural Resources, Division of Mine Reclamation and Enforcement, Explosives and Blasting Branch. It is intended to be a reference for the blaster in the field as well as an aid for applicants studying for the Kentucky Blaster's License examination.

Should you have any questions relating to these regulations, or wish additional information, contact:

Kentucky Department of Natural Resources  
Division of Mine Reclamation and Enforcement  
Explosives and Blasting Branch  
300 Sower Blvd.  
Frankfort, Kentucky 40601  
Phone (502) 782-6564

In addition to the state laws and regulations, the U.S. Department of the Treasury, Bureau of Alcohol, Tobacco and Firearms requirements on storage of explosives 27 CFR 555, Commerce in Explosives (Subpart K) are contained herein. These federal rules are adopted by reference in 805 KAR 4:090.

Martin Brashear, Manager  
Explosives and Blasting Branch

## **BLASTING LAWS**

### **351.310 Definitions for KR5 351.315 to 351.375.**

As used in KRS 351.315 to 351.375 unless the context clearly indicates otherwise:

- 1) "Explosives" means any chemical compound or other substance or mechanical system intended for the purpose of producing an explosion, or that contains oxidizing and combustible units or other ingredients in such proportions or quantities that ignition by detonation may produce an explosion, capable of causing injury to persons or damage to property;
- 2) "Blasting operation" means the use of explosives in the surface blasting of stone, rock, ore or any other natural formation, or in any construction or demolition work, but shall not include its use in agricultural operations;
- 3) "Blaster" means a person licensed to fire or detonate explosives in blasting operations;
- 4) "Charge" means a quantity of explosive or equivalent that is to be detonated within a period of five (5) seconds;
- 5) "Sub-charge" means a quantity of explosive or equivalent that is to be detonated within a period of less than eight (8) milliseconds;
- 6) "Detonation time" means the time at which the detonation is initiated;
- 7) "Department" means the Department for Natural Resources; and
- 8) "Commissioner" means the commissioner of the Department for Natural Resources

### **351.315 Licensing of Blaster – Training Requirements**

- 1) No person shall detonate explosives in any blasting operation in which more than five (5) pounds of explosives or the equivalent are used in a single charge or in which less than five (5) pounds of explosives are used by a regular user, excluding blasting for agriculture and underground coal, unless he is licensed by the department. The department shall issue a license to use explosives to any person who:
  - a) Has worked in blasting operations for at least twenty-four (24) months under the immediate supervision of an experienced blaster or has worked in blasting operations for twelve (12) months and has completed a formal training program approved by the department; and
  - b) Has passed an examination prescribed by the department which shall test the examinee's practice of blasting operations and the storage, moving, handling, and detonation of explosives.
- 2) Application for license shall be in writing upon a form furnished by the department and shall be accompanied by a photograph of the applicant. If the applicant is successful in passing the examination, a license indicating his competency to detonate explosives shall be issued upon the payment of a fee of twenty-five dollars (\$25).
- 3) Any person who is a licensed blaster in another state where the qualifications prescribed at the time of licensing were, in the opinion of the commissioner, equal to those prescribed in the Commonwealth at the date of application, and where reciprocal licensing privileges satisfactory to the department are granted to licensees of the Commonwealth, may be granted a license without an examination, upon the payment of a fee.

- 4) Each blaster shall be required to renew his license every three (3) years by application to the department, which application shall be accompanied by a fee and subject to the following training requirements:
  - a) Each applicant for renewal of a Kentucky blaster's license shall furnish proof that during the preceding three (3) years, the blaster annually has attended a minimum of eight (8) hours of department-approved blaster's training. No more than four (4) hours of the annual blaster training may be attributed to attending a conference unless otherwise approved by the department; and
  - b) Each applicant for renewal of a limited Kentucky blaster's license shall furnish proof that during the preceding three (3) years, the blaster has attended a minimum of four (4) hours of blaster's training approved by the department.
- 5) The department shall not issue a blaster's license to any person not entitled to transport or receive explosives under existing federal law, including persons who:
  - a) Are less than twenty-one (21) years of age; or
  - b) Have been convicted in any court of a crime punishable by imprisonment for a term exceeding one (1) year, unless the United States Bureau of Alcohol, Tobacco and Firearms or its successor, has specifically exempted the conviction.
- 6) The department shall set all fees provided in this section by administrative regulation; however, the fee for an application shall not exceed forty dollars (\$40), the fee for license renewal shall not exceed sixty dollars (\$60), and the fee for reciprocal licensing shall not exceed sixty dollars (\$60).
- 7) The commissioner may suspend any license for due cause, but no license may be revoked until the licensee has been granted adequate opportunity for a hearing before the cabinet's Office of Administrative Hearings.

### **351.325 Classification of Blasters.**

The department may institute classifications of blasters for the purpose of insuring adequate skill in different types of blasting operations. Classification will be determined by passage of a corresponding examination.

### **351.330 Requirements Governing Blasting Operations.**

- 1) Blasting or explosives for use in the neighborhood or any public highway, stream or water, dwelling house, public building, school, church, commercial or institutional building, pipeline, or utility shall be done in accordance with the provisions of this section, and rules and regulations promulgated by the department.
- 2) Where necessary in a blasting operation, the department may require that the operator submit a blasting plan to the department for approval.
- 3) In all blasting operations, except as hereinafter otherwise provided, the maximum peak particle velocity or the ground motion in any direction shall not exceed two (2) inches per second at the immediate location of any dwelling house, public building, school, church, commercial or institutional building, and the particle velocity at such location immediately after a period of one (1) second following the peak particle velocity produced by any charge shall not continuously exceed one-half (1/2) inch per second.

- 4) Blasting operations without instrumentation will be considered as being within the limits set forth in this subsection if such blasting operations are conducted in accordance with rules and regulations of the department establishing the maximum amount of explosives to be used in a single charge and in a single sub-charge within specified distances from any location provided by subsection (1). No more than 40,000 pounds of explosives may be used in any charge except with the approval of the commissioner. Regulations promulgated by the department pursuant to this subsection shall be in such terms that compliance therewith will assure compliance with the provisions of subsection (3).
- 5) No two (2) consecutive sub-charges containing the maximum permitted by the department pursuant to this subsection shall have a detonation time separated by less than eight (8) milliseconds, except that if the amount of explosive used in any sub-charge is less than maximum permitted by the department pursuant to subsection (4), the time delay between detonation times may be decreased in the same ratio.
- 6) Any blasting operation may be conducted without reference to any maximum amount or period provided by or pursuant to subsection (4) if the operator of such blasting operation demonstrates by instrumentation that maximum particle velocity of the ground motion in any direction does not exceed the limits provided in subsection (3). Blasting of operator of such blasting operation demonstrates by instrumentation that maximum particle velocity of the ground motion in any direction does not exceed the limits provided in subsection (3) of this section.
- 7) Instruments for determining particle velocity, as set forth in this subsection shall be limited to such specific types of devices as shall have been expressly approved by the department and the commissioner or his duly authorized agent may enter upon any premises for the purpose of conducting or supervising any necessary instrumentations provided by KRS 351.315 to 351.375.
- 8) When blasting operations are contemplated which would result in ground vibrations that would have a particle velocity in any direction in excess of two (2) inches per second at the immediate location of any dwelling house, public building, school, church, commercial or institutional building, blasting operations may proceed after receiving written consent from the property owner or owners affected.
- 9) When blasting operations, other than those conducted at a fixed site as a part of any industry or business operated at such site, are to be conducted within the vicinity of a pipeline or public utility, the blaster or person in charge of the blasting operations shall take due precautionary measures for the protection of the pipeline or utility, and shall give adequate notice to the owner or his agent that such blasting operations are intended. The blaster shall be subject to regulations promulgated by the department concerning such a blasting operation.
- 10) Blasting operations near streams shall be prohibited in all cases where the effect of the blasting is liable to change the course or channel of any stream without first obtaining a permit from the department which has been approved by the Division of Water in the Energy and Environment Cabinet.
- 11) Blasting operations shall not be conducted within eight hundred (800) feet of any public highway, unless due precautionary measures are taken to safeguard the public.

- 12) Mudcapping in blasting operations shall be permitted only where it would endanger the safety of the workers to drill the rock or material to be blasted. If mudcapping is necessary, no more than ten (10) pounds of explosives shall be used for each charge.
- 13) When the use of detonating cord would cause severe air blast the department may cause all trunk lines to be covered by five (5) to six (6) inches of loose earth.
- 14) In blasting operations, flying rocks shall not be allowed to fall greater than one-half (1/2) the distance between the blast and a dwelling house, public building, school, church, or commercial or institutional building. Protective material shall be used to insure this limit.
- 15) When a blast is about to be fired, ample warning shall be given to allow all persons to retreat to a safe place, and care shall be taken to ascertain that all persons are in the clear. Each operator shall follow a definite plan of warning signals that can be clearly seen or heard by anyone in the blasting area. The operator shall inform all employees at the operation as to the established procedure.
- 16) No person shall use explosives in such manner that safety to persons or property is threatened.
- 17) The two (2)-inch-per-second maximum peak particle velocity as specified in subsections (3) and (8) of this section shall be construed as the threshold below which blasting damage is unlikely to occur. However, the department shall have the authority to promulgate regulations requiring more restrictive levels of maximum peak particle velocity when necessary to maintain consistency with federal statutes or regulations.

### **351.335 Rules and Regulations - Authority of Commissioner or His Representative.**

- 1) The department shall have the authority for promulgating regulations concerning the manufacture, transportation, sale, storage, or use of explosives and unassembled components of explosives including, but not limited to, airblasts, preblast surveys, and blasting schedules, and the maintenance of such explosives which has a direct bearing on safety to life and property, and any other rules and regulations necessary to effectuate the provisions of KRS 351.315 to 351.375 or which are consistent with the provisions of the Federal Surface Mining Control and Reclamation Act of 1977, and amendments thereto, pertaining to blasting or explosives, or any rule or regulation promulgated thereunder pertaining to blasting or explosives. No portion of KRS 351.315 to 351.375 shall apply in any manner to the manufacture, transportation, sale, storage, possession, or use of:
  - a) Loaded ammunition for use in small arms or other weapons; or
  - b) Propellant powders for use in small arms or other weapons; or
  - c) Primers for small arms ammunition; or
  - d) Any other component part of small arms ammunition; or
  - e) Tools, equipment, or devices for the manufacture of small arms ammunition; or
  - f) Grades of black powder suitable primarily for use in firearms.
- 2) To promote compatible, uniform, and consistent laws and regulations concerning blasting, all local ordinances, rules, and regulations concerning blasting and explosives promulgated by units of local government within the Commonwealth shall be reviewed and approved, by the department, prior to implementation. Any not so approved shall be invalid. Any local ordinance, rule, or regulation in force on June 19, 1976, shall become invalid, null, and void one hundred twenty (120) days after June 19, 1976, unless it is submitted to the department and is approved as being consistent with the provisions of this section.

- 3) In order to carry out the purposes of KRS 351.315 to 351.375, the commissioner or his authorized representative shall have the authority:
  - a) To enter without delay and advance notice any place where explosives are in use or stored or where blasting records are kept, during regular working hours and at other reasonable times in order to inspect such places, question any explosive user or seller for the purpose of ascertaining compliance or noncompliance with KRS 351.315 to 351.375.
  - b) To administer oaths, take depositions, conduct hearings, take photographs, review any and all blasting records, and secure any other evidence deemed necessary to evaluate any safety hazard in KRS 351.315 to 351.375 or regulations issued pursuant thereto.
- 4) If an explosive user or seller refuses such entry, then the commissioner or his authorized representative may apply to the Franklin Circuit Court, or to the Circuit Court within the county wherein the premises to be entered are located, for an order to enforce the right of entry.
- 5) If, during the course of a lawful inspection, the commissioner or his authorized representative discovers explosives stored or kept in an unlawful manner and such unlawfully stored or kept explosives constitute an imminent and substantial danger to life or property, then the commissioner or his authorized representative may, upon proper affidavit before a magistrate with authority and jurisdiction to issue search warrants, obtain a warrant authorizing seizure of such unlawfully stored or kept explosives and thereby seize and store such explosives in a lawful and safe manner.
  - a) No warrant pursuant to this section shall be issued unless the commissioner or his authorized representative has made arrangements with public or private sources for the lawful and safe storage of the explosives to be seized.
  - b) No warrant pursuant to this section shall be issued upon an affidavit that does not aver that an arrangement has been made between the commissioner or his authorized representative and public or private sources for the lawful and safe storage of the explosives to be seized.
  - c) No warrant pursuant to this section shall be issued upon an affidavit that does not specifically state the place in which the explosives are to be stored in terms of city, county, street address, and name of person, company, or agency accepting the explosives for storage.
  - d) Any owner or person entitled to lawful possession of explosives seized pursuant to this section shall be entitled to recovery of the seized explosives upon written or verbal notification to the commissioner or his authorized representative stating his capability to lawfully and safely store the seized explosives, and upon an inspection by the commissioner or his representative of his storage facilities and methods that reveals his capability to lawfully and safely store the explosives.
  - e) The commissioner or his authorized representative shall make the inspection within five (5) days of receipt of said notification.
  - f) If the commissioner or his authorized representative receive no communication from the owner or person entitled to lawful possession of the seized explosives within thirty (30) days after the seizure of such explosives, then the commissioner or his authorized representative may dispose of the seized explosives in a safe and lawful manner.

### **351.345 Revocation of License -Hearing.**

- 1) The commissioner, before revoking any license shall set the matter down for a hearing before the cabinet's Office of Administrative Hearings.
- 2) No person shall blast once his license has been revoked by the department

### **351.350 Citation for Violation - Action Against Violator.**

- 1) If upon inspection an authorized representative of the commissioner finds that an explosive user or seller has violated any requirement of KRS 351.315 to 351.375, a citation shall be issued to the violator. Each citation shall describe the alleged violation, establish the time period permitted for correction by fixing a reasonable date by which the alleged violation shall be eliminated, if applicable, and propose the civil penalty to be paid. If within fifteen (15) working days from the receipt of the citation the explosive user or seller fails to notify the commissioner that he intends to contest the citation, then the citation shall be deemed a final order and not be subject to review by any court or agency.
- 2) If the explosive user or seller notifies the commissioner that he intends to challenge a citation issued under KRS 351.315 to 351.375, then it shall be the duty of the department or the cabinet's Office of General Counsel upon the request of the commissioner, to bring an action for the recovery of the penalties provided for herein.
- 3) It shall be the duty of the cabinet's Office of General Counsel, upon the request of the commissioner, to bring an action for a restraining order, temporary or permanent injunction against any operator or other person violating or threatening to violate any of the provisions of KRS 351.315 to 351.375.

### **351.355 Notification of Accident - Investigation.**

Whenever serious injury, as defined in KRS 500.080, or loss of life occurs in a blasting operation, the blaster shall immediately give notice forthwith to the department stating the particulars of the accident. To aid in making an investigation of the accident, the commissioner may compel the attendance of witnesses and administer oaths.

### **351.360 Records Required.**

A record of each blast shall be kept. All records including seismograph reports shall be retained at least five (5) years and shall be available for inspection by the department and shall contain such data as the commissioner determines.

### **351.365 Supplier of Explosives to keep register and to register with department.**

Any person who sells, lends, or gives any explosives or blasting agents shall keep a register showing the amount sold, lent, or given, the date of the sale, loan, or gift and for what purpose it is to be used. Such person shall also be required to register with the department.

**351.367 Permit to Purchase, Receive, or Take Possession of Explosives - Procedures - Restrictions - Records.**

- 1) No person, firm, association, or corporation shall purchase, receive, or take possession of explosives without first obtaining a permit from the department.
- 2) The application for a permit to purchase, receive, or take possession of explosives shall be on a form prescribed by the department and shall be accompanied by an application fee of twenty dollars (\$20). The application shall indicate the applicant's name, address, type of business, the location at which the explosives will be used and stored, and the purpose for which the explosives will be used. On those operations for which licensed blasters or certified shotfirers are required, their names and license numbers or certification numbers shall be included on the application.
- 3) Any person, firm, association, or corporation who procures a license from the department to operate a coal or clay mine, pursuant to KRS 351.175, and who at the time of application for license requests a permit to purchase, receive, or take possession of explosives, shall be issued a permit by the department without cost to the applicant.
- 4) Permits to purchase, receive, or take possession of explosives shall be valid for a period not to exceed one (1) year from the date of issue and shall not be transferable.
- 5) Permits shall be issued only to those persons, firms, associations, or corporations who have proper facilities to store explosives, or to those who provide to the department a written plan documenting the manner in which any excess explosives shall be handled and returned to proper storage facilities.
- 6) Explosive materials shall not be sold, given, delivered, or transferred to any person not possessing a valid permit to purchase or receive them.
- 7) Anyone who sells, gives, or distributes explosives shall maintain accurate records for each sale or gift of explosives, listing the name, address, and permit number of the person or company receiving the explosives and the quantity and types of explosives received.
- 8) The commissioner may suspend a permit for a period of twenty (20) days for due cause; however, a permit may not be revoked until completion of a hearing, which shall be conducted in accordance with KRS 351.345.
- 9) Explosives which are transferred, sold, or distributed, for the purpose of resale, by a registered explosive dealer or manufacturer to another registered dealer or manufacturer shall be exempt from the provisions of this section

**351.370 Purchase of Explosives.**

Any person who is a resident of this Commonwealth and who uses explosive materials in the conduct of business or occupation may lawfully purchase explosive materials from a seller located or residing in a state contiguous to this Commonwealth; provided, such person is properly licensed or registered under KRS 351.315 to 351.375.

**351.375 Restriction of Sale and Use of Hazardous Explosives.**

The department may promulgate regulations restricting the sale and use of certain hazardous explosive compounds including, but not limited to, liquid nitroglycerin, fulminate of mercury, and lead azide.

**351.380 Repealed 2018.**

# BLASTING REGULATIONS

## 805 KAR 4:005 Definitions.

- 1) "Artificial barricade" means an artificial mound or revetted wall of earth of a minimum thickness of three (3) feet, or any other approved barricade that offers equivalent protection.
- 2) "Barricaded" means the effective screening of a magazine containing explosive materials from another magazine, a building, a railway, or a highway, either by a natural or artificial barricade. To be properly barricaded, a straight line from the top of any sidewall of the magazine to the eave line of any other magazine or building, or to a point twelve (12) feet above the center of a railway or highway will pass through the barricade.
- 3) "Blast area" means the area in which explosives loading and blasting operations are being conducted.
- 4) "Blasting agent" means any material or mixture consisting of a fuel and oxidizer used for blasting, but not classified an explosive and in which none of the ingredients is classified as an explosive provided the furnished (mixed) product cannot be detonated with a No. 8 test blasting cap when confined.
- 5) "Blasting cap" means a metallic tube closed at one end, containing a charge of one or more detonating compounds, and designed for detonation from the sparks or flame from a safety fuse inserted and crimped into the open end.
- 6) "Block holing," means the breaking of boulders by firing a charge of explosives that has been loaded in a drill hole.
- 7) "Conveyance" means any unit for transporting explosives or blasting agents, including but not limited to trucks, trailers, rail cars, barges, and vessels.
- 8) "Detonating cord," means a flexible cord containing a center core of high explosives which, when detonated, will have sufficient strength to detonate other cap-sensitive explosives with which it is in contact.
- 9) "Detonator" means blasting caps, electric blasting caps, delay electric blasting caps, and nonelectric delay blasting caps.
- 10) "Electric cap" means a blasting cap designed for and capable of detonation by means of an electric blasting current.
- 11) "Electric delay blasting caps" means caps designed to detonate at a predetermined period of time after energy is applied to the ignition system.
- 12) "Flyrock" means any dirt, mud, stone, fragmented rock or other material that is displaced from the blast site by being thrown in the air or cast along the ground.
- 13) "High explosives" means any material that will detonate when initiated by a blasting cap and where the chemical reaction proceeds at supersonic velocities and produces high temperature, high-pressure gases and an associated shock wave.
- 14) "Fuse lighters," means special devices for the purpose of igniting a safety fuse.
- 15) "Low explosives" are materials which deflagrate producing high temperature, high pressure gases. They may be initiated with a blasting cap, or by flame, heat or impact, however, they do not present a mass detonation hazard.
- 16) "Magazine" means any building or structure, other than an explosives manufacturing building, used for the storage of explosives.
- 17) "Misfire" means an explosive charge which failed to detonate.

- 18) "Mud capping" (also known as bulldozing, adobe blasting, or doying) means a method of blasting by placing a quantity of explosives in contact with a rock, boulder, or other object without confining the explosives in a drill hole.
- 19) "Natural barricade" means hills or timber of sufficient density that the surrounding exposures, which require protection, cannot be seen from the magazine when the trees are bare of leaves.
- 20) "Nonelectric delay blasting cap" means a blasting cap with an integral delay element in conjunction with and capable of being detonated by a detonation impulse or signal for miniaturized detonating cord.
- 21) "Primer" means a cartridge or container of explosives into which a detonator or detonating cord is inserted or attached.
- 22) "Safety fuse" means a flexible cord containing an internal burning medium by which fire is conveyed at a continuous and uniform rate for the purpose of firing blasting caps.
- 23) "Stemming" means a suitable inert incombustible material or device used to confine or separate explosives in a drill hole, or to cover explosives in mud capping.
- 24) "Springing" means the creation of a pocket in the bottom of a drill hole by the use of a moderate quantity of explosives in order that larger quantities of explosives may be inserted therein.

## **805 KAR 4:010 Licensing and Classification of Blasters.**

### **Section 1. Licensing and Classification of Blasters**

- 1) The department shall have the following two (2) classifications of blasting licenses, each of which shall have a separate test:
  - a) The "Kentucky blaster's license"; and
  - b) The "limited Kentucky blaster's license".
- 2) Persons holding a "limited Kentucky blaster's license" shall not conduct a blasting operation in which more than five (5) pounds of explosives are used in a single charge.
- 3) Persons applying for either a "Kentucky blaster's license" or a "limited Kentucky blaster's license" shall submit a nonrefundable application fee of forty (40) dollars with the prescribed application form, EC-16 or EC-14. Upon successfully passing the examination and satisfying the experience requirement of KRS 351.315(1), a license shall be issued upon the payment of an additional fee of twenty-five (25) dollars, pursuant to KRS 351.315(2).
- 4) Each blaster shall be required to renew his license every three (3) years by application to the department. The application shall be accompanied by a fee of sixty (60) dollars and documentation verifying that the blaster has completed the hours of blaster retraining required in KRS 351.315(4).
- 5) If a licensed blaster is not in violation of any final administrative or court order concerning blasting-related matters when he makes application for renewal of his license, the department shall renew that license.
- 6) A blaster who fails to renew his "Kentucky blaster's license" within five (5) years of the expiration date of his last valid license shall be required to reapply for a license and retake the blasters ex-amination in a manner established in KRS 351.315. Blasters not in the above category may have their licenses renewed by paying to the department a sum equal to the annual renewal fees for the years of nonrenewal.

- 7) The commissioner may grant a thirty (30) day nonrenewable blaster's license to any person qualified under KRS 351.315(3) upon the payment of a twenty-five (25) dollar fee.
- 8) For the purpose of licensure, a blaster shall be a person who makes any of the following decisions:
  - a) Decides hole size, spacing, or depth;
  - b) Decides total quantity of explosives;
  - c) Decides quantity of explosives in each hole; or
  - d) Decides timing delays to be used.
- 9) The blaster shall also be present when the charge is detonated and either physically detonate the charge or give the order to detonate the charge.
- 10) The blaster shall complete and sign a record for each blast as required in KRS 351.360.
- 11) A licensed blaster shall not take any instruction on the activities described in subsections (8) through (10) of this section from a person not holding a blaster's license if compliance with that instruction may result in an unlawful act or unlawful effect of the blast.
- 12) Anyone failing a blaster's examination may retake the examination after thirty (30) days without paying another application fee. A person failing the examination a second time shall resubmit his application form and pay the fee required in subsection (3) of this section.
- 13) Persons involved in seismic exploration of the subsurface geology and detonating explosives solely for the purpose of monitoring seismic waves generated by such a detonation shall hold either a "Kentucky blaster's license" or a "limited Kentucky blaster's license". The five (5) pound limitation in subsection (2) of this section may be waived for the purpose of seismic exploration based upon a written request to the department.
- 14) Persons engaged in blasting operations in oil production and detonating explosives for the purpose of enhancing oil production, cutting casing, or other similar purposes, if the explosives are placed in an oil well, shall hold either a "Kentucky blaster's license" or a "limited Kentucky blaster's license". The five (5) pound limitation in subsection (2) of this section may be waived for the purpose of oil well shooting based upon a written request to the department. The use of shaped charges of less than ninety (90) grams weight to perforate casing or strata shall not meet the definition of blasting operation and shall not require either license.
- 15) Application for the reciprocal license described in KRS 351.315(3) shall be on a form furnished by the department and accompanied by a fee of sixty (60) dollars.

## **Section 2. Incorporation by Reference.**

- 1) The following material is incorporated by reference:
  - a) Form "EC-14" (revised January 1, 2002); and
  - b) Form "EC-16" (revised January 1, 2002).
- 2) This material may be inspected, copied, or obtained, subject to applicable copyright law, at the Department for Natural Resources, 300 Sower Boulevard, Frankfort, KY 40601, Monday through Friday, 8 a.m. to 4:30 p.m.

**805 KAR 4:020. Blasting Standards.**

- 1) In all blasting operations, except as hereinafter otherwise provided, the maximum peak particle velocity of the ground motion in any direction shall not exceed two (2) inches per second at the immediate location of any dwelling house, public building, school, church, commercial or institutional building.
- 2) This ground velocity limit is not construed to mean property owned, leased, or contracted by the blaster or blaster's company or property on which the owner gives a written waiver.
- 3) No two (2) consecutive sub-charges within any charge shall be separated by a delay time of less than eight (8) milliseconds.
- 4) The department will furnish a table for determining the maximum amount of explosives to be used per delay period.
- 5) The standard table for the maximum charge per delay shall be distances greater than 300 feet generated by the formula:

$$W = \left( \frac{D}{50} \right)^2$$

Where W is the weight of explosive in pounds and D is the distance to the nearest dwelling house, public building, school, church, commercial or institutional building in feet. On sites where the department decides it necessary to comply with the provision of the law this formula may be altered.

For the purpose of well shooting below 100 feet, the table shall be generated by the formula:

$$W = \left( \frac{D}{50} \right)^3$$

- 6) Where W is the total weight of explosives in the hole and D is the distance from the charge to the nearest dwelling house, public building, school, church, commercial or institutional building.
- 7) If on a particular site the peak ground particle velocity continuously exceed one-half (1/2) inch per second after a period of one (1) second following the maximum ground particle velocity, the department shall require the total time delay of blasting operations to be less than 200 milliseconds or the charge per delay to be reduced so that this limit is complied with.
- 8) For distances less than 300 feet the following table will be used:

Actual Distance	Pounds Per Delay Interval of
In Feet	8 Milliseconds or Greater
5-10	1/8 lb.
11-15	1/4 lb.
16-20	1/2 lb.
21-25	3/4 lb.
26-30	1.0 lb.
31-300	1 lb. plus 1/8 lb. for each foot of distance above 30 feet

Less than five (5) feet the total charge should not exceed one-eighth (1/8) pound.

- 9) If explosive charges of greater than 40,000 pounds are necessary, a permit must be obtained from the Department for Natural Resources. The department shall consider each case on its own merits in making a determination as to whether or not to grant such a permit.

### **805 KAR 4:030 Seismograph Measurements.**

- 1) If a blaster decides that the table of maximum pound per delay established in 805 KAR 4:020 is too conservative, he may use seismograph measurements and increase the charge per delay period, provided the velocity of two (2) inches per second limit is not violated. He must use the seismograph on every shot thereafter so long as the table is not being complied with.
- 2) If a blaster considers the table too conservative for his particular area, he may, upon submission of seismograph reports, petition for a modified table for blasting operation at that particular site but in no case shall the department allow a table that would permit velocities above the two inch per second limit on structures imposed by KRS 351.330.
- 3) In making a seismograph determination of the velocity at a particular position, the following formula shall be used:

$$V = V_0 \left( \frac{D_0}{D} \right)^{1.5}$$

Where **V<sub>0</sub>** is the maximum ground particle velocity at the seismograph, **D<sub>0</sub>** is the distance of the seismograph from the blast, and **D** is the distance from the blast to the position in question and in the same general direction. The distance **D<sub>0</sub>** may not be greater than **D**, and **D** cannot be more than five (5) times **D<sub>0</sub>**. This determined velocity at the site of any dwelling house, public building, school, church, commercial or institutional building shall not exceed the two (2) inches per second limit.

- 4) If special conditions occur which indicate that abnormal or potentially damaging ground vibrations may result from blasting, the department may require a seismograph recording of any or all blasts.

### **805 KAR 4:040 Instrumentation.**

#### **Section 1. Instrumentation**

- 1) A direct reading velocity instrument shall not be approved by the Department for Natural Resources unless it:
  - a) Has a frequency range equal or greater than five (5) cycles per second to 150 cycles per second;
  - b) Has a velocity range from zero to two (2.0) inches per second or greater; and
  - c) Meets the standards established by the Department for Natural Resources.
- 2) Any seismic reports submitted to this office for compliance or petition shall be made using a direct-reading velocity seismograph and accompanied by the most recent calibration report of the seismograph.
- 3) All velocity seismographs used for compliance or petition shall have internal calibration capability and shall be operated in accordance with the recommendations included in the "ISEE" Field Practice Guidelines for Blasting Seismographs".

#### **Section 2. Incorporation by Reference.**

- 1) The "ISEE Field Practice Guidelines for Blasting Seismographs" published by the International Society of Explosive Engineers and included as Appendix K of the ISEE Blaster's Handbook, 17th edition, Second Printing, 2000, is incorporated by reference.
- 2) This material may be inspected, copied, or obtained, subject to applicable copyright law, at the Department for Natural Resources, 300 Sower Boulevard, Frankfort, KY 40601, Monday through Friday, 8 a.m. to 4:30 p.m.

### **805 KAR 4:050 Records.**

**Section 1. Blasting Records.** A record of each blast shall be kept. All records including seismograph reports shall be retained at least five (5) years and shall be available for inspection by the Department for Natural Resources and shall contain the data in subsections one through nineteen of this section:

- 1) Name of company or contractor.
- 2) Exact location of the blast, date, and time of detonation.
- 3) Name, signature, and license number of blaster in charge.
- 4) Type of material blasted.
- 5) Number of holes, burden, and spacing.
- 6) Diameter and depth of holes.
- 7) Types of explosives used.
- 8) Total amount of explosives used.
- 9) Maximum amount of explosives per delay period of eight (8) milliseconds or greater.
- 10) Method of firing and type of circuit.
- 11) Direction, distance in feet, and identification of the nearest dwelling house, public building, school, church, commercial or institutional building neither owned nor leased by the person conducting the blasting.
- 12) Weather conditions.
- 13) Type and height or length of stemming.
- 14) A statement as to whether mats or other protections against flyrock were used.
- 15) Type of blasting caps used and delay periods used.
- 16) The exact location of the seismograph if used and the distance of the seismograph from the blast.
- 17) Seismograph records, if required, shall include:
  - a) Name of person and firm analyzing the seismograph record; and
  - b) Seismograph reading.
- 18) Maximum number of holes per delay period of eight (8) milliseconds or greater.
- 19) Sketch of blast pattern including number of holes, burden, and spacing distance delay pattern, and if decking is used, a hole profile.

### **Section 2. Notification of Blasting Operations on Construction, Demolition, and Industrial**

### **Sites.**

- 1) Any person conducting blasting operations at a site that does not have a permit issued pursuant to KRS Chapter 350 or an agreement with the Department for Natural Resources, shall provide notice of its blasting operations to the Department for Natural Resources at least twenty four (24) hours prior to the commencement of blasting activities.
- 2) The notice shall include:
  - a) The identification of the person or company performing the blasting, including current contact information;
  - b) The specific location of the site where blasting will occur, which may include physical address, latitudinal and longitudinal, or Global Positioning System coordinates;
  - c) The date and time blasting operations are expected to commence; and
  - d) The projected duration of the blasting operations.

### **805 KAR 4:060 Blasting Safety**

- 1) When operating within 800 feet of a highway if there is chance of flying rock landing on the highway, traffic must be stopped at a safe distance. Blasted material shall not be thrown on a public highway in sufficient quantity to impede traffic, and any material thrown on a highway shall be removed promptly.
- 2) Where a blasting operation is conducted in the vicinity of an active deep mine, the blaster shall observe all procedures necessary to secure the health and safety of the deep mine workers.
- 3) Blasting operations shall be conducted during daylight hours (one-half (1/2) hour before sunrise to one-half (1/2) hour after sunset) except by special permit issued by the Department for Natural Resources. Said permit shall be issued on the basis of safety.
- 4) If, as a result of a blast, the vibrational levels are exceeded or material is hurled through the air causing damage to homes or other property, or causing personal injury or death, or endangering public safety, health and general welfare in violation of any standard promulgated by this agency, the department may consider this due cause for revocation of blaster's license and invoke penalties according to KRS 351.990.
- 5) The contractor or operator as well as the blaster shall be responsible for the conduct of blasting on any operation.
- 6) Nothing contained herein shall relieve the contractor or operator or other persons of responsibility and liability under any other laws

### **805 KAR 4:075 General Blasting Provisions**

- 1) An employer shall permit only authorized and qualified persons to handle and use explosives.
- 2) Smoking, firearms, matches, open flame lamps, and other fires, flame, or heat producing devices and sparks shall be prohibited in or near explosive magazines or while explosives are being handled, transported, or used.
- 3) No person shall be allowed to handle or use explosives while under the influence of intoxicating liquors, narcotics, or other dangerous drugs.
- 4) All explosives shall be accounted for at all times. Explosives not being used shall be kept in a locked magazine, unavailable to persons not authorized to handle them. The employer shall maintain an inventory and use record of all explosives. Appropriate authorities shall be notified of any loss, theft, or unauthorized entry into a magazine.
- 5) No explosives or blasting agents shall be abandoned.
- 6) No fire shall be fought where the fire is in imminent danger of contact with explosives. All employees shall be removed to a safe area and the fire area guarded against intruders.
- 7) Original containers or equivalent packaging materials shall be used for taking detonators and other explosives from storage magazines to the blasting area.
- 8) When blasting is done in congested areas or in proximity to a structure, railway, or highway, or any other installation that may be damaged, the blaster shall take special precautions in the loading, delaying, initiation, and confinement of each blast with mats or other methods so as to control the throw of fragments, and thus prevent bodily injury or death.
- 9) Employees authorized to prepare explosive charges or conduct blasting operations shall use every reasonable precaution including, but not limited to, visual and audible warning signals, flags, or barricades, to ensure safety to all persons.
- 10) In so far as possible, blasting operations above ground shall be conducted between sunup and sundown.
- 11) Empty boxes and paper and fiber packing materials which have previously contained high explosives shall not be used again for any purpose, but shall be destroyed by burning at an approved location.
- 12) Explosives, blasting agents, and blasting supplies that are obviously deteriorated or damaged shall not be used.
- 13) Delivery and issue of explosives shall only be made by and to authorized persons and into authorized magazines or approved temporary storage or handling areas.
- 14) Blasting operations in the proximity of overhead power lines, communication lines, utility services, or other services or structures shall not be carried on until the operators and/or owners have been notified at least twenty-four (24) hours in advance and measures for safe control have been taken.
- 15) The use of black powder shall be prohibited, except when a desired result cannot be obtained with another type of explosive such as in quarrying certain types of dimension stone.
- 16) All loading and firing shall be directed and supervised by competent persons thoroughly experienced in this field.
- 17) No one shall be permitted to carry detonators or primers of any kind on his person; provided, however, that it shall not be unlawful to carry detonators or primers in one's hands.

- 1) A blaster shall be able to understand and give written and oral orders.
- 2) A blaster should be in good physical condition and not be addicted to narcotics, intoxicants, or similar types of drugs.
- 3) A blaster shall be qualified by reason of training, knowledge or experience, in the field of transporting, storing, handling, and the use of explosives, and have a working knowledge of state and local laws and regulations which pertain to explosives.
- 4) Blasters shall be required to furnish satisfactory evidence of competency in handling explosives and performing in a safe manner the type of blasting that will be required.
- 5) The blaster shall be knowledgeable and competent in the use of each type of blasting method used.

### **805 KAR 4:085 Dealer Registration; Record Requirements.**

**Section 1.** A person intending to engage in business as an importer, manufacturer, or dealer of explosive materials is required by KRS 351.365 to register with the Department for Natural Resources. Registration shall be done, prior to engaging in business, by filling out the registration form (EC-12). This form shall be completed and submitted to the department annually.

### **Section 2. Record Requirements**

- 1) A person, corporation or entity engaged in the manufacture, purchase, distribution or selling, of explosives shall maintain, in a permanent form, records of importation, production, shipment, receipt, sale or other disposition, including the number of the permit to purchase explosives.
- 2) All records shall be retained for a period of not less than five (5) years from the date the transaction occurs or until discontinuance of business or operations. All records shall be subject to inspection and examination by the Department for Natural Resources.
- 3) The records required to be maintained pursuant to Title 26, part 55.121-55.129 of the Code of Federal Regulations of the Bureau of Alcohol, Tobacco, and Firearms shall satisfy the requirements of this section.

### **Section 3. Magazine Identification**

- 1) A magazine shall have identification tags. A semitrailer containing blasting agents is excluded from this requirement if it has a current license plate attached.
- 2) An identification tag shall be approximately three (3) inches long by two (2) inches wide and shall be lettered or painted directly onto the magazine or attached so that normal use and weather will not render the tag illegible.
- 3) The tag shall provide the following information:
  - a) Name of owner;
  - b) Address;
  - c) Person responsible for security of the magazine; and
  - d) Telephone number.

### **Section 4. Incorporation by Reference**

- 1) Form "(EC-12)", (revised December 1996), is incorporate-rated by reference.
- 2) It may be inspected, copied, or obtained from the Department for Natural Resources, 300 Sower Boulevard, Frankfort, KY 40601 during normal business hours, Monday through Friday, 8 a.m. to 4:30 p.m.

#### **805 KAR 4:087 Explosives**

- 1) Explosive magazines shall be posted with suitable danger signs so located that a bullet passing through the face of a sign will not strike the magazine.
- 2) Containers of explosives or blasting agents shall be stacked in a stable manner, but not more than eight (8) feet high.
- 3) Ammonium nitrate fuel oil blasting agents shall be physically separated from other explosives, safety fuse, or detonating cord stored in the same magazine and in such a manner that oil does not contaminate the other explosives, safety fuse or detonating cord.
- 4) Special precautions shall be taken when blasting in close proximity to underground operations, and no blasting shall be done which would be hazardous to persons working underground.
- 5) Only non-sparking implements shall be used to punch holes in an explosive cartridge.
- 6) Delay connectors for firing detonating cord shall be treated and handled with the same safety precautions as blasting caps and electric detonators.
- 7) Primers containing a detonator shall be prepared with the detonator container securely and completely within the explosive charge or within a suitable tunnel or cap well.
- 8) Explosives or blasting agents shall be kept separate from detonators until charging is started.
- 9) Ammonium nitrate and the components used for the sensitizing thereof shall be stored, mixed, transported and used in accordance with the recommendations in Bureau of Mines Information Circular 8179, "Safety Recommendations for Sensitized Ammonium Nitrate Blasting Agents," or sub-sequent revisions.
- 10) Excessive force shall not be used in assembling any connecting device or primer cartridges. No tool shall be used to dislodge a detonator, or a component containing a detonator, from a primer.
- 11) A cast primer or booster shall not be used if the hole for the detonator is too small to accept the detonator; no one shall enlarge a hole or cap well in a cast primer or booster to accept a detonator.
- 12) No detonator shall come in contact with a high explosive cartridge until the primer is being assembled, and immediately upon assembly, the primer shall be loaded into the borehole.

#### **805 KAR 4:090 Storage of Explosives and Blasting Agents.**

- 1) Explosives and related materials shall be stored in approved facilities required under the applicable provisions of the Internal Revenue Service regulations contained in 27 CFR 55, Commerce in Explosives.
- 2) Blasting caps, electric blasting caps, detonating primers, and primed cartridges shall not be stored in the same magazine with other explosives or blasting agents.
- 3) Smoking and open flames shall not be permitted within fifty (50) feet of explosives and detonator storage magazines.
- 4) Permanent underground magazines containing detonators shall not be located closer than twenty-five (25) feet to any magazine containing other explosives or blasting agents.

### **805 KAR 4:093 Permit to Purchase or Possess Explosives.**

#### **Section 1.**

- 1) Each person, firm, association, or corporation intending to purchase or take possession of explosives shall complete the application form (EC-52), and pay the application fee established by KRS 351.367(2).
- 2) Each holder of a permit to purchase or possess explosives shall provide a copy of his permit to the explosive dealer or distributor prior to the transfer of the explosive materials.
- 3) A permit to purchase or possess explosives shall be obtained prior to purchasing or taking possession of any explosive materials, including all high explosives, blasting agents, and detonators, and two (2) component, binary explosive compounds.
- 4) The following materials are exempt from the requirement to obtain a permit:
  - a) Oil well perforating charges of less than ninety (90) grams each;
  - b) All grades of black powder suitable for firearms;
  - c) All fireworks; and
  - d) Any propellant powder for firearms or rockets.
- 5) Any person who signs the application for a permit, either as an individual or as a representative of a corporation, firm, or association, shall be accountable for the explosives purchased under the terms of the permit.
- 6) A permit holder may purchase explosives for use on several different business locations or construction sites, if the person designated on the permit application is the central agent ordering the explosives, and is responsible for the security and disposition of the explosives at all sites.
- 7) If a single corporation or company has multiple business sites, each of which purchases explosives independently, each site shall obtain its own permit.

#### **Section 2. Incorporation by Reference**

- 1) Form "(EC-52)", (revised August 1996), is incorporated by reference.
- 2) It may be inspected, copied, or obtained from the Department for Natural Resources, 300 Sower Boulevard, Frankfort, KY 40601 during normal business hours, Monday through Friday, 8 a.m. to 4:30 p.m.

### **805 KAR 4:095 Loading of Explosives or Blasting Agents.**

- 1) Procedures that permit safe and efficient loading shall be established before loading is started.
- 2) All drill holes shall be sufficiently large to admit freely the insertion of the cartridges of explosives.
- 3) Tamping shall be done only with wood rods or plastic tamping poles without exposed metal parts, but non-sparking metal connectors may be used for jointed poles. Violent tamping shall be avoided. The primer shall never be tamped.
- 4) No holes shall be loaded except those to be fired in the next round of blasting. After loading, all remaining explosives and detonators shall be immediately returned to an authorized magazine.
- 5) Drilling shall not be started until all remaining butts of old holes are examined for unexploded charges, and if any are found, they shall be re-fired before work proceeds.
- 6) No person shall be allowed to deepen drill holes which have contained explosives or blasting agents.
- 7) No explosives or blasting agents shall be left unattended at the blast site.
- 8) Machines and all tools not used for drilling, loading and covering the blast shall be removed from the immediate location of holes before explosives are delivered.
- 9) No activity of any nature other than that which is required for blasting shall be permitted in a blast area.
- 10) Power lines and portable electric cables for equipment being used shall be kept a safe distance from explosives or blasting agents being loaded into drill holes. Cables in the proximity of the blast area shall be de-energized and locked out by the blaster.
- 11) Holes shall be checked prior to loading to determine the depth and conditions. Holes shall not be drilled where there is a danger of intersecting a charged or misfired hole.
- 12) When loading a long line of holes with more than one (1) loading crew, the crew shall be separated by practical distance consistent with efficient operation and supervision of crews.
- 13) No explosives shall be loaded or used underground in the presence of combustible gases or combustible dusts.
- 14) In underground blasting, explosives in Fume Class I, as set forth by the Institute of the Makers of Explosives, shall be used; provided, however, that Fume Class I explosives are not required when ventilation adequate to dissipate all fumes is provided and the workings are abandoned for a period of time sufficient to allow dissipation of all fumes.
- 15) All blast holes in open work shall be stemmed to the collar or to a point which will confine the charge.
- 16) Warning signs, indicating a blast area, shall be maintained at all approaches to the blast area. The warning sign lettering shall not be less than four (4) inches in height on a contrasting background. This subsection does not apply to surface mining.
- 17) A borehole shall never be sprung when it is adjacent to or near a hole that is loaded. Flashlight batteries shall not be used for springing holes.
- 18) Drill holes that have been sprung or chambered, and which are not water-filled, shall be allowed to cool before explosives are loaded.
- 19) No loaded holes shall be left unattended or unprotected.
- 20) The blaster shall keep an accurate, up-to-date record of explosives, blasting agents, and blasting supplies used in a blast and shall keep an accurate running inventory of all explosives and blasting agents stored on the operation.

## **Section 1.**

- 1) Transportation of explosives, blasting agents, and blasting supplies, shall be in accordance with the provisions of Department of Transportation regulations contained in 14 CFR 103.1 to 103.23, Air Transportation; 46 CFR 147.1 to 148.04-23, Water Carriers; 49 CFR 171.1 to 179.500-18, Highways and Railways; and 49 CFR 390.1 to 397.225, Motor Carriers.
- 2) Motor vehicles or conveyances transporting explosives shall only be driven by, and be in the charge of, a licensed driver who is physically fit, as defined in 49 CFR 391.41, subpart E. He shall be familiar with the local, state, and federal regulations governing the transportation of explosives.
- 3) A person shall not smoke, carry matches or any other flame-producing device, or carry firearms or loaded cartridges while in or near a motor vehicle or conveyance transporting explosives, blasting agents, and blasting supplies.
- 4) Explosives or blasting agents shall not be transported with other materials or cargoes in the same compartment. Flammable material shall not be carried on the same vehicle as explosives.
- 5) Explosives or blasting agents shall be transported in separate vehicles from detonators un-less:
  - a) The detonators are placed in a type 2 or type 3 magazine secured within the body of the truck;
  - b) The detonators and explosives are separated by four (4) inches of hardwood, and the detonators are totally enclosed or confined by the hardwood construction; or
  - c) The detonators are placed in suitable containers or compartments constructed in accordance with the Institute of Makers of Explosives Safety Library Publication No. 22.
- 6) Vehicles used for transporting explosives shall not exceed their cargo-carrying capacity, and shall be in good mechanical condition.
- 7) If high explosives or detonators are transported by a vehicle with an open body, a Class II magazine or original manufacturer's container shall be securely mounted within the bed to contain the cargo. Containers of explosives or detonators shall not be stacked higher than the sides or the tailgate of the vehicle. Blasting agents shall be loaded in a stable manner so that they cannot fall from the vehicle.
- 8) All vehicles used for the transportation of explosives shall have tight floors and any exposed spark-producing metal on the inside of the body shall be covered with wood, or other non-sparking material, to prevent contact with containers of explosives.
- 9) Every motor vehicle or conveyance used for transporting any quantity of explosive materials on public highways shall display all placards required by the U.S. Department of Transportation. Vehicles transporting high explosives in areas off highways shall be marked or placarded on both sides, front and rear, with either the word "explosives" in red letters not less than four (4) inches in height, on white background, or the appropriate U.S. Department of Transportation placards de-scribed in 49 CFR 172.504.
- 10) Every vehicle or conveyance transporting blasting agents in areas other than public highways shall be placarded on front, back, and both sides with the words "Blasting Agent" or the appropriate U.S. Department of Transportation placards described in 49 CFR 172.519 through 172.560.
- 11) Each motor vehicle used for transporting explosive materials shall be equipped with at least two (2) fire extinguishers in good condition, each with a rating of at least 4A:40BC. The driver shall be trained in the use of the extinguishers on his vehicle.

- 12) Fire extinguishers shall be designed and maintained to allow a visual determination that they are fully charged, and shall be located on or in the vehicle in a manner so that they are accessible for immediate use.
- 13) Motor vehicles or conveyances carrying explosives, blasting agents, or blasting supplies shall not be taken inside a garage or shop for repairs or servicing.
- 14) A motor vehicle transporting explosives shall not be left unattended.

## **Section 2. Incorporation by Reference**

- 1) The "Institute of Makers of Explosives Safety Library Publication No. 22, Recommendations for the Safe Transportation of Detonators in a Vehicle with Certain Other Explosive Materials", revised May, 1993 is incorporated by reference.
- 2) This material may be inspected, copied, or obtained, subject to applicable copyright law, at the Department for Natural Resources, 300 Sower Boulevard, Frankfort, Kentucky 40601, Monday through Friday, 8 a.m. to 4:30 p.m.

## **805 KAR 4:105 Underground Transportation or Explosives.**

- 1) Underground Transportation of Explosives (Non-coal). (1) All explosives or blasting agents in transit underground shall be taken to the place of use or storage without delay.
- 2) The quantity of explosives or blasting agents taken to an underground loading area shall not exceed the amount estimated to be necessary for the blast.
- 3) Explosives in transit shall not be left unattended.
- 4) The hoist operator shall be notified before explosives or blasting agents are transported in a shaft conveyance.
- 5) Trucks used for the transportation of explosives underground shall have the electrical system checked weekly to detect any failures which may constitute an electrical hazard. A written record of such inspections shall be kept on file.
- 6) The installation of auxiliary lights on truck beds, which are powered by the truck's electrical system, shall be prohibited.
- 7) Explosives and blasting agents shall be hoisted, lowered, or conveyed in a powder car. No other materials, supplies or equipment shall be transported in the same conveyance at the same time.
- 8) No one, except the operator, his helper, and the powder man, shall be permitted to ride on a conveyance transporting explosives and blasting agents.
- 9) No person shall ride in any shaft conveyance transporting explosives and blasting agents.
- 10) No explosives or blasting agents shall be transported on any locomotive. At least two (2) car lengths shall separate the locomotive from the powder car.
- 11) No explosives or blasting agents shall be transported on a man-haul trip.
- 12) The car or conveyance containing explosives or blasting agents shall be pulled, not pushed, whenever possible.
- 13) The powder or car or conveyance especially built for the purpose of transporting explosives or blasting agents shall bear a reflected sign on each side with the word "Explosives" in letters, not less than four (4) inches in height, upon a background of sharply contrasting color.
- 14) Compartments for transporting detonators and explosives in the same car or conveyance shall be physically separated by a distance of twenty-four (24) inches or by a solid partition at least four (4) inches thick.

- 15) Explosives, blasting agents, or blasting supplies shall not be transported with other materials.
- 16) Explosives or blasting agents, not in original containers, shall be placed in a suitable container when transported manually.
- 17) Detonators, primers, and other explosives shall be carried in separate containers when transported manually.

**805 KAR 4:110 Initiation of Explosive Charges; Electric Blasting.**

- 1) Electric blasting caps shall not be used where sources of extraneous electricity make the use of electric blasting caps dangerous. Blasting cap leg wires shall be kept short-circuited (shunted) until they are connected into the circuit for firing.
- 2) Before adopting any system of electrical firing, the blaster shall conduct a thorough survey for extraneous currents, and all dangerous currents shall be eliminated before any holes are loaded.
- 3) In any single blast using electric blasting caps, all caps shall be of the same style or function, and of the same manufacture.
- 4) Electric blasting shall be carried out by using blasting circuits or power circuits in accordance with the electric blasting cap manufacturer's recommendations, or those of an approved contractor or his designated representative.
- 5) When firing a circuit of electric blasting caps, care shall be exercised to insure that an adequate quantity of delivered current is available, in accordance with the manufacturer's recommendations.
- 6) Connecting wires and lead wires shall be insulated single solid wires of sufficient current-carrying capacity. In addition, the lead wire shall be of sufficient length to allow the blast to be detonated from a safe distance and location.
- 7) Bus wires shall be solid single wires of sufficient current-carrying capacity.
- 8) When firing electrically, the insulation on all firing lines shall be adequate and in good condition.
- 9) A power circuit used for firing electric blasting caps shall not be grounded.
- 10) In underground operations, when firing from a power circuit, a safety switch shall be placed in the permanent firing line at intervals. This switch shall be made so it can be locked only in the "off" position and shall be provided with a short-circuiting arrangement of the firing lines to the cap circuit.
- 11) In underground operations there shall be a "lightning" gap of at least five (5) feet in the firing system ahead of the main firing switch; that is, between this switch and the source of power. This gap shall be bridged by a flexible jumper cord immediately before firing the blast.
- 12) When firing from a power circuit, the firing switch shall be locked in the open or "off" position at all times, except when firing. It shall be so designed that the firing lines to the cap circuit are automatically short-circuited when the switch is in the "off" position. Keys to this switch shall be entrusted only to the blaster.
- 13) Blasting machines shall be in good condition and the efficiency of the machine shall be tested periodically to make certain that it can deliver power at its rated capacity.
- 14) When firing with blasting machines, the connections shall be made as recommended by the manufacturer of the electric blasting caps used.
- 15) The number of electric blasting caps connected to a blasting machine shall not be in excess of

its rated capacity. Furthermore, a series circuit shall contain no more caps than the limits recommended by the manufacturer of the electric blasting caps in use.

- 16) The blaster shall be in charge of the blasting machines and no other person shall connect the leading wires to the machine except under the direction of the blaster.
- 17) Blasters shall test all electric blasting caps and electric blasting cap circuits by using only a blasting galvanometer, blasting ohmmeter, or blasting multimeter, designed specifically for the purpose of testing individual electric blasting caps and circuits containing electric blasting caps. Such instruments shall be clearly marked as being designed for such purposes, and shall be used in accordance with the manufacturer's recommendations.
- 18) Whenever the possibility exists that a leading line or blasting wire might be thrown over a live power line by the force of an explosion, care shall be taken to see that the total length of wires are kept too short to hit the lines, or that the wires are securely anchored to the ground. If neither of these requirements can be satisfied, a nonelectric system shall be used.
- 19) Leading wires shall remain shorted and not be connected to the blasting machine or other source of current until the charge is to be fired.
- 20) After firing an electric blast from a blasting machine, the leading wires shall be immediately disconnected from the machine and short-circuited.
- 21) All blasting machines, other than rack-bar and twist type generators, shall have a normally open firing switch equipped with a spring device or other self-returning mechanism that automatically returns it to the non-firing position after the shot has been detonated.
- 22) Due precautions shall be taken to prevent accidental discharge of electric blasting caps or explosives from current induced by radar, radio transmitters, lightning, adjacent powder lines, dust storms, or other sources of extraneous electricity. These precautions shall include:
  - a) The shunting or short-circuiting of detonators in holes which have been primed until wired into the blasting circuit.
  - b) The suspension of all blasting operations and removal of persons from the blasting area during the approach and progress of an electric storm.
  - c) The prominent display of adequate signs, warning against the use of mobile radio transmitters, on all roads within 1,000 feet of blasting operations. Whenever adherence to the 1,000-foot distance would create an operational handicap, this distance may be modified so long as the modification is adequately designed in compliance with paragraph (e) of this subsection to prevent any premature firing of electric blasting caps. Specimens of signs which satisfy these requirements are as follows:

Blasting Zone 1,000-ft. about 48" X 48"	Turn Off 2-Way Radio about 42" X 36"
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This paragraph shall not apply to surface mining operations.

- d) Mobile radio transmitters which are less than 100 feet away from electric blasting caps in other than original containers may be left "on" for receiving purposes, but may only be used to transmit if in compliance with paragraph (e) of this subsection.

- e) Compliance with the recommendations of the Institute of Makers of Explosives with regard to blasting in the vicinity of radio transmitters as stipulated in "Safety Guide for the Prevention of Radio Frequency Radiation Hazards in the Use of Commercial Electric Detonators," IME Publication No. 20, December 1988, incorporated herein by reference. This document may be reviewed or copied at the Department for Natural Resources, 300 Sower Boulevard, Frankfort, KY 40601 during normal business hours from 8 a.m. to 4:30 p.m.
- 23) All electric blasts shall be fired with an electric blasting machine or power source designed specifically for detonating electric blasting caps.
- 24) In parallel blasting circuits, the circuit shall be wired so that the resistances in all series are balanced.
- 25) When blasting electrically, a blasting galvanometer, blasting ohmmeter, or blasting multimeter shall be used to test:
  - a) Resistance of individual caps, series of caps, or the resistance of multiple balanced series to be connected in parallel prior to their connection to the blasting line;
  - b) Continuity of blasting lines prior to the connection of electric blasting cap series; and
  - c) Total blasting circuit resistance prior to connection in the power source.
- 26) Immediately after the blast has been fired, the firing line shall be disconnected from the blasting machine, or where power switches are used, they shall be locked open or in the "off" position.

#### **805 KAR 4:115 Safety Fuses.**

- 1) The use of a fuse that has been hammered or injured in any way shall be forbidden.
- 2) The hanging of a fuse on nails or other projections which will cause a sharp bend to be formed in the fuse is prohibited.
- 3) Before capping safety fuse, a short length shall be cut from the end of the supply reel so as to assure a fresh cut end in each blasting cap.
- 4) Only a cap crimper of approved design shall be used for attaching blasting caps to safety fuse. Crimpers shall be kept in good repair and accessible to use.
- 5) No unused cap or short capped fuse shall be placed in any hole to be blasted; such unused detonators shall be removed from the working place and destroyed. This prohibition shall not apply to surface mining operations.
- 6) No fuse shall be capped or primer made up, in any magazine or near any possible source of ignition.
- 7) No one shall be permitted to carry detonators or primers of any kind on his person.
- 8) The minimum length of safety fuse to be used in blasting shall be as required by state law, but shall not be less than thirty (30) inches.
- 9) At least two (2) men shall be present when multiple cap and fuse blasting is done by hand lighting methods.
- 10) Not more than twelve (12) fuses shall be lighted by each blaster when hand lighting devices are used. However, when two (2) or more safety fuses in a group are lighted as one (1) by means of igniting cord or other similar fuse lighting devices, they may be considered as one (1) fuse.
- 11) The so-called "drop fuse" method of dropping or pushing a primer or any explosive with a lighted fuse attached is forbidden.
- 12) Cap and fuse shall not be used for firing mud-cap charges unless charges are separated

sufficiently to prevent one (1) charge from dislodging other shots in the blast.

- 13) When blasting with safety fuses consideration shall be given to the length and burning rate of the fuse. Sufficient time, with a margin of safety, shall always be provided for the blaster to reach a place of safety.

#### **805 KAR 4:120 Detonating Cords.**

- 1) The blaster shall select a detonating cord consistent with the type and physical condition of the borehole and stemming and the type of explosives used.
- 2) Detonating cord shall be handled and used with the same respect and care given other explosives.
- 3) The line of detonating cord extending out of a borehole or from a charge shall be cut from the supply spool before loading the remainder of the borehole or placing additional charges.
- 4) Detonating cords shall be handled and used with care to avoid damaging or severing the cord during and after loading and hooking-up.
- 5) Detonating-cord connections shall be competent and positive in accordance with approved and recommended methods. Knot type or other cord-to-cord connections shall be made only with detonating cords in which the explosive core is dry.
- 6) All detonating-cord trunk lines and branch lines shall be free of loops, sharp kinks, or angles that direct the cord back toward the oncoming line of detonation.
- 7) All detonating-cord connections shall be inspected before firing the blast.
- 8) When detonating-cord millisecond-delay connectors or short-interval-delay electric blasting caps are used with detonating cords, such use shall conform strictly with the manufacturer's recommendations.
- 9) When connecting a blasting cap or an electric blasting cap to a detonating cord, the cap shall be taped or otherwise attached securely along the side or the end of the detonating cord, with the end of the cap containing the explosive charge pointed in the direction in which the detonation is to proceed.
- 10) Detonators for firing the trunk line shall not be attached to the detonating cord until everything else is in readiness for the blast.
- 11) All trunk lines of detonating cord shall be covered if located within 800 feet of any public highway, dwelling house, public building, school, church, commercial or institutional building.
- 12) When the use of detonating cord would cause severe concussion, the department may cause all trunk lines to be covered by a minimum of six (6) inches of loose earth.

#### **805 KAR 4:125 Firing the Blast.**

- 1) A code of blasting signals equivalent to Table U-1 shall be posted at one (1) or more conspicuous places at the operations, and all employees shall be required to familiarize

themselves with the code and conform to it. The blaster shall ensure that this code is communicated clearly to all persons who may enter the danger zone surrounding the blast area. Danger signs shall be placed at all entrances to the blast area.

**TABLE U-1**

**WARNING SIGNAL** - A one (1) minute series of long blasts five (5) minutes prior to the blast signal.

**BLAST SIGNAL** - A series of short blasts one (1) minute prior to the detonation.

**ALL CLEAR SIGNAL** - A prolonged blast following the inspection of the blast area.

- 2) The device used to issue the warning signals shall be loud enough to be heard by all persons in the danger zone around the blast, and shall have a sound distinctive enough to be readily identified. Ordinary truck and automobile horns shall not be used as warning signals.
- 3) Before a blast is fired, the blaster in charge shall:
  - a) Make certain that all surplus explosives are in a safe place;
  - b) Make certain that all persons, vehicles, and equipment are at a safe distance or under sufficient cover; and
  - c) Give a loud warning signal.
- 4) No person shall remain in an area within the danger zone after being requested to leave by the blaster in charge or by a state explosives and blasting inspector.
- 5) Flagmen shall be safely stationed on highways which pass through the danger zone to stop traffic during blasting operations.
- 6) It shall be the duty of the blaster to fix the time of blasting and to determine the area constituting the danger zone around the blast within which the warning signals shall be audible.
- 7) If necessary for public safety, the department may require the blaster to submit a written plan describing the warning signals, notification procedures, and access control methods to be used on a particular blast site.
- 8) Before firing an underground blast, warning shall be given, and all possible entries into the blasting area and any entrances to any working place where a drift, raise or other opening is about to hole through, shall be carefully guarded. The blaster shall make sure that all persons are out of the blast area before detonating a blast.

**805 KAR 4:130 Underwater Blasting.**

- 1) A blaster shall conduct all blasting operations, and no shot shall be fired without his approval.
- 2) Loading tubes and casings of dissimilar metals shall not be used because of possible electric transient currents from galvanic action of the metals and water.
- 3) Only water-resistant blasting caps and detonating cords shall be used for all marine blasting. Loading shall be done through a nonsparking metal loading tube when tube is necessary.
- 4) No blast shall be fired while any vessel under way is closer than 1,500 feet to the blasting area. Those on board vessels or crafts moored or anchored within 1,500 feet shall be notified before the blast is fired.
- 5) No blast shall be fired while any swimming or diving operations are in progress in the vicinity of the blasting area. If such operations are in progress, signals and arrangements shall be agreed upon to assure that no blast shall be fired while any person is in the water.

- 6) Blasting flags shall be displayed.
- 7) The storage and handling of explosives aboard vessels used in underwater blasting operations shall be according to the provisions outlined herein on handling and storing explosives.
- 8) When more than one (1) charge is placed underwater, a float device shall be attached to an element of each charge in such a manner that it will be released by the firing. Misfires shall be handled in accordance with the requirements of 805 KAR 4:140.

**805 KAR 4:140 Misfires.**

- 1) If a misfire is found, the blaster shall guard the blasting area and exclude all employees from the danger zone.
- 2) No other work shall be done except that necessary to remove the hazard of the misfire and only those employees necessary to do the work shall remain in the danger zone.
- 3) No attempt shall be made to extract explosives from any charged or misfired hole; a new primer shall be put in and the hole re-blasted. If re-firing on the misfired hole presents a hazard, the explosives may be removed by washing out with water or, if the misfire is under water, blown out with air.
- 4) If there is a misfire while using cap and fuse, all employees shall remain away from the charge for at least one (1) hour.
- 5) If electric blasting caps have been used, employees shall not return to misfired holes for at least fifteen (15) minutes.
- 6) If a completely nonelectric initiation system, other than safety fuse, has been used, persons shall not return to a misfired hole for at least fifteen (15) minutes.
- 7) Drilling, digging, or picking shall not be permitted until all missed holes have been detonated or the authorized representative has approved that work can proceed.
- 8) A misfire shall be handled under the direction of the blaster in charge. All connections shall be carefully traced and a search made for unexploded charges

**805 KAR 4:145 Inspection After Blasting.**

- 1) Immediately after the blast has been fired, the firing line shall be disconnected from the blasting machine, or where power switches are used, they shall be locked open or in the "off" position.
- 2) Sufficient time shall be allowed, not less than fifteen (15) minutes in tunnels, for the smoke and fumes to leave the blasted area before returning to the shot. An inspection of the area and the surrounding rubble shall be made by the blaster to determine if all charges have been exploded before employees are allowed to return to the operation

**805 KAR 4:150 Variances.**

- 1) The commissioner may grant variances From 805 KAR 4:010 to 805 KAR 4:150 if it can be demonstrated said variance improves safety conditions; or that said variance will provide such safe conditions as those which would prevail if there was compliance with the standard.
- 2) Such a variance may be modified or revoked by the commissioner.

**805 KAR 4:155 Ground Vibration Standards for Surface Coal Mines.**

- 1) The maximum allowable peak particle velocity for ground vibration measured at the location of the nearest dwelling, public building, church or commercial building shall not exceed the limits

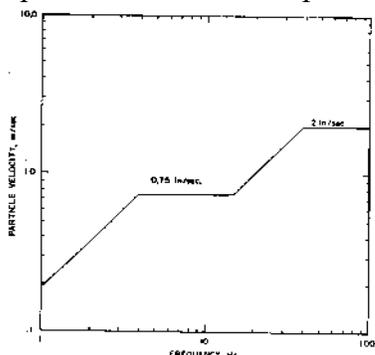
established in Table 1 as follows:

TABLE 1. PEAK PARTICLE VELOCITY	
Distance from blasting site in feet	Maximum peak particle velocity in inches/second
0 to 300	1.25
301 to 5000	1.0
5001 and beyond	0.75

- 2) The peak particle velocity specified in this section shall be measured in three (3) mutually perpendicular directions, and the maximum allowable limits shall apply to each of these measurements.
- 3) The ground vibration limits shall not apply to property owned by the coal mine, or to property on which the owner gives a written waiver to exceed the maximum allowable limits.

**Section 2.**

- 1) In place of the limits established in Section 1 of this administrative regulation, a blaster may elect to comply with the following graph limiting peak particle velocity based upon the frequency content of the blast vibration. If this criterion is chosen to limit vibration levels, the method of monitoring the vibrations and calculating the frequency content shall be approved by the department before its implementation by the blaster.



- 2) Unless the blaster uses a seismograph on every blast to demonstrate compliance with the maximum allowable limits established in section 1, or has been granted a modified scale distance factor by the department, he must comply with the scale distance equations in Table 2 as follows:

TABLE 2. SCALE DISTANCE EQUATIONS

Distance from blasting site in feet 0 to 300	Scale distance equations $W = (D/50)^2$
301 to 5000	$W = (D/55)^2$
5001 and beyond	$W = (D/65)^2$

Where:

W = the maximum weight of explosives that can be detonated per delay period.

D = the distance in feet from the blast to the nearest dwelling, public building, school, church, commercial or institutional building.

- 3) If a blaster considers the table of scale distance equations in subsection (2) of this section too conservative, he may petition the department for a modified table for blasting operations at a particular site. Such a petition shall include seismograph reports demonstrating that any modified scale distance equations would not cause the predicted ground vibration to exceed the peak particle velocity limits established in Section 1 of this administrative regulation.

#### **805 KAR 4:160 Airblast.**

- 1) Maximum allowable airblast at any dwelling, public building, school, church, commercial or institutional building shall not exceed 129 decibels when measured by an instrument having a flat frequency response (+/- 3 decibels) over a range of at least 6 to 200 hertz. If the airblast is measured with an instrument having a flat frequency response (+/- 3 decibels) over a range of at least 2 to 200 hertz, the corresponding limit is 133 decibels.
- 2) If the department believes that the airblast from a blasting operation is exceeding or threatening to exceed the limits in subsection (1), it may require that the blaster monitor the air airblast for a specified period.
- 3) The blaster shall take precautions, including the adequate confinement of all explosive materials, to ensure that the airblast limits in subsection (1) of this section are met.
- 4) The department may require lower limits than those specified in subsection 1 in the vicinity of buildings with increased susceptibility to damage from airblast, such as those with large plate glass windows, or in areas where excessive airblast could be deemed unacceptable, such as near hospitals or schools.

#### **805 KAR 4:165 Use of Nonelectric Initiation Systems**

- 1) All nonelectric initiation systems and components of these systems shall be used in accordance with their manufacturer's recommendations and instructions.
- 2) All members of the blasting crew shall be instructed in the safe use of the initiation system and its components. It shall be the duty of the blaster in charge to provide adequate on-the-job training and supervision in the safe use of such system.
- 3) No tool shall be used to pry on any component containing a detonator, nor shall any tool be used to open, close, fasten, or clean out any connector containing a detonator or detonating device.
- 4) Components of any initiating system shall be used as originally manufactured; no one shall attempt to modify or alter any component of an initiation system. Components, which are

defective, damaged, or incompatible, shall not be used, but should be returned to the manufacturer or properly destroyed.

- 5) When using surface components which detonate and throw shrapnel, such components shall be covered with adequate amounts of earth or other materials to prevent cut-offs and misfires.
- 6) All blasting operations shall cease during the approach and progress of a thunderstorm, regardless of the type of initiation system in use.
- 7) All detonators shall be completely embedded inside the primer cartridge, and securely fastened in a manner to prevent excessive tension or bending of the cord or tube.
- 8) When an explosive bulk truck or other vehicle is operated on a blast site, care shall be taken to ensure that the vehicle is not driven over the tubing, connectors of any surface delay component. Precautions shall be made to protect these elements before the vehicle is operated on the blast site.
- 9) When using a system with surface delays or detonators, any row of holes near a highwall where there is a danger of falling rocks shall be connected into the shot last.
- 10) In multiple row blasts, the initiation system shall not be connected from row to row until all drilling and loading have been completed. In single row blasts, the components shall not be connected from hole to hole until all drilling and loading are completed.

**APPENDIX A**  
**Electronic Code of Federal Regulations (e-CFR), Title 27,**  
**Subpart K-Storage**

**§ 555.201 General.**

(a) Section 842(j) of the Act and § 555.29 of this part require that the storage of explosive materials by any person must be in accordance with the regulations in this part. Further, section 846 of this Act authorizes regulations to prevent the recurrence of accidental explosions in which explosive materials were involved. The storage standards prescribed by this subpart confer no right or privileges to store explosive materials in a manner contrary to State or local law.

(b) The Director may authorize alternate construction for explosives storage magazines when it is shown that the alternate magazine construction is substantially equivalent to the standards of safety and security contained in this subpart. Any alternate explosive magazine construction approved by the Director prior to August 9, 1982, will continue as approved unless notified in writing by the Director. Any person intending to use alternate magazine construction shall submit a letter application to the Director, Industry Operations for transmittal to the Director, specifically describing the proposed magazine. Explosive materials may not be stored in alternate magazines before the applicant has been notified that the application has been approved.

(c) A licensee or permittee who intends to make changes in his magazines, or who intends to construct or acquire additional magazines, shall comply with § 555.63.

(d) The regulations set forth in §§ 555.221 through 555.224 pertain to the storage of display fireworks, pyrotechnic compositions, and explosive materials used in assembling fireworks and articles pyrotechnic.

(e) [Reserved]

(f) Any person who stores explosive materials shall notify the authority having jurisdiction for fire safety in the locality in which the explosive materials are being stored of the type, magazine capacity, and location of each site where such explosive materials are stored. Such notification shall be made orally before the end of the day on which storage of the explosive materials commenced and in writing within 48 hours from the time such storage commenced.

**§ 555.202 Classes of Explosive Materials.**

For purposes of this part, there are three classes of explosive materials. These classes, together with the description of explosive materials comprising each class, are as follows:

(a) **High explosives.** Explosive materials which can be caused to detonate by means of a blasting cap when unconfined, (for example, dynamite, flash powders, and bulk salutes).

(b) **Low explosives.** Explosive materials which can be caused to deflagrate when confined (for example, black powder, safety fuses, igniters, igniter cords, fuse lighters, and “display fireworks” classified as UN0333, UN0334, or UN0335 by the U.S. Department of Transportation regulations at 49 CFR 172.101, except for bulk salutes).

(c) **Blasting agents.** (For example, ammonium nitrate-fuel oil and certain water-gels (see also § 555.11)).

**§ 555.203 Types of Magazines.**

For purposes of this part, there are five types of magazines. These types, together with the classes of explosive materials, as defined in § 555.202, which will be stored in them, are as follows:

**(a) Type 1 magazines.** Permanent magazines for the storage of high explosives, subject to the limitations prescribed by §§ 555.206 and 555.213. Other classes of explosive materials may also be stored in type 1 magazines.

**(b) Type 2 magazines.** Mobile and portable indoor and outdoor magazines for the storage of high explosives, subject to the limitations prescribed by §§ 555.206, 555.208(b), and 555.213. Other classes of explosive materials may also be stored in type 2 magazines.

**(c) Type 3 magazines.** Portable outdoor magazines for the temporary storage of high explosives while attended (for example, a “day-box”), subject to the limitations prescribed by §§ 555.206 and 555.213. Other classes of explosives materials may also be stored in type 3 magazines.

**(d) Type 4 magazines.** Magazines for the storage of low explosives, subject to the limitations prescribed by §§ 555.206(b), 555.210(b), and 555.213. Blasting agents may be stored in type 4 magazines, subject to the limitations prescribed by §§ 555.206(c), 555.211(b), and 555.213. Detonators that will not mass detonate may also be stored in type 4 magazines, subject to the limitations prescribed by §§ 555.206(a), 555.210(b), and 555.213.

**(e) Type 5 magazines.** Magazines for the storage of blasting agents, subject to the limitations prescribed by §§ 555.206(c), 555.211(b), and 555.213.

#### **§ 555.204 Inspection of Magazines.**

Any person storing explosive materials shall inspect his magazines at least every seven days. This inspection need not be an inventory, but must be sufficient to determine whether there has been unauthorized entry or attempted entry into the magazines, or unauthorized removal of the contents of the magazines.

#### **§ 555.205 Movement of Explosive Materials.**

All explosive materials must be kept in locked magazines meeting the standards in this subpart unless they are:

**(a)** In the process of manufacture;

**(b)** Being physically handled in the operating process of a licensee or user;

**(c)** Being used; or

**(d)** Being transported to a place of storage or use by a licensee or permittee or by a person who has lawfully acquired explosive materials under § 555.106.

#### **§ 555.206 Location of Magazines.**

**(a)** Outdoor magazines in which high explosives are stored must be located no closer to inhabited buildings, passenger railways, public highways, or other magazines in which high explosives are stored, than the minimum distances specified in the table of distances for storage of explosive materials in § 555.218.

**(b)** Outdoor magazines in which low explosives are stored must be located no closer to inhabited buildings, passenger railways, public highways, or other magazines in which explosive materials are stored, than the minimum distances specified in the table of distances for storage of low explosives in § 555.219, except that the table of distances in § 555.224 shall apply to the storage of display fireworks. The distances shown in § 555.219 may not be reduced by the presence of barricades.

**(c)(1)** Outdoor magazines in which blasting agents in quantities of more than 50 pounds are stored must be located no closer to inhabited buildings, passenger railways, or public highways than the minimum distances specified in the table of distances for storage of explosive materials in § 555.218.

**(2)** Ammonium nitrate and magazines in which blasting agents are stored must be located no closer to magazines in which high explosives or other blasting agents are stored than the minimum distances specified in the table of distances for the separation of ammonium nitrate and blasting agents in § 555.220. However, the minimum distances for magazines in which explosives and blasting agents are stored from inhabited buildings, etc., may not be less than the distances specified in the table of distances for storage of explosives materials in § 555.218.

### **§ 555.207 Construction of Type 1 Magazines.**

A type 1 magazine is a permanent structure: a building, an igloo or “Army-type structure”, a tunnel, or a dugout. It is to be bullet-resistant, fire-resistant, weather-resistant, theft-resistant, and ventilated.

**(a) Buildings.** All building type magazines are to be constructed of masonry, wood, metal, or a combination of these materials, and have no openings except for entrances and ventilation. The ground around building magazines must slope away for drainage or other adequate drainage provided.

**(1) Masonry wall construction.** Masonry wall construction is to consist of brick, concrete, tile, cement block, or cinder block and be not less than 6 inches in thickness. Hollow masonry units used in construction must have all hollow spaces filled with well-tamped, coarse, dry sand or weak concrete (at least a mixture of one part cement and eight parts of sand with enough water to dampen the mixture while tamping in place). Interior walls are to be constructed of, or covered with, a non-sparking material.

**(2) Fabricated metal wall construction.** Metal wall construction is to consist of sectional sheets of steel or aluminum not less than number 14-gauge, securely fastened to a metal framework. Metal wall construction is either lined inside with brick, solid cement blocks, hardwood not less than four inches thick, or will have at least a six inch sand fill between interior and exterior walls. Interior walls are to be constructed of, or covered with, a non-sparking material.

**(3) Wood frame wall construction.** The exterior of outer wood walls is to be covered with iron or aluminum not less than number 26-gauge. An inner wall of, or covered with non-sparking material will be constructed so as to provide a space of not less than six inches between the outer and inner walls. The space is to be filled with coarse, dry sand or weak concrete.

**(4) Floors.** Floors are to be constructed of, or covered with, a non-sparking material and shall be strong enough to bear the weight of the maximum quantity to be stored. Use of pallets covered with a non-sparking material is considered equivalent to a floor constructed of or covered with a non-sparking material.

**(5) Foundations.** Foundations are to be constructed of brick, concrete, cement block, stone, or wood posts. If piers or posts are used, in lieu of a continuous foundation, the space under the buildings is to be enclosed with metal.

**(6) Roof.** Except for buildings with fabricated metal roofs, the outer roof is to be covered with no less than number 26-gauge iron or aluminum, fastened to at least 7/8 inch sheathing.

**(7) Bullet-resistant ceilings or roofs.** Where it is possible for a bullet to be fired directly through the roof and into the magazine at such an angle that the bullet would strike the explosives within,

the magazine is to be protected by one of the following methods:

(i) A sand tray lined with a layer of building paper, plastic, or other nonporous material, and filled with not less than four inches of coarse, dry sand, and located at the tops of inner walls covering the entire ceiling area, except that portion necessary for ventilation.

(ii) A fabricated metal roof constructed of 3/16-inch plate steel lined with four inches of hardwood. (For each additional 1/16 inch of plate steel, the hardwood lining may be decreased one inch.)

(8) Doors. All doors are to be constructed of not less than 1/4 inch plate steel and lined with at least two inches of hardwood. Hinges and hasps are to be attached to the doors by welding, riveting or bolting (nuts on inside of door). They are to be installed in such a manner that the hinges and hasps cannot be removed when the doors are closed and locked.

(9) Locks. Each door is to be equipped with (i) two mortise locks; (ii) two padlock fastened in separate hasps and staples; (iii) a combination of a mortise lock and a padlock; (iv) a mortise lock that requires two keys to open; or (v) a three-point lock. Padlocks must have at least five tumblers and a casehardened shackle of at least 3/8 inch diameter. Padlocks must be protected with not less than 1/4 inch steel hoods constructed so as to prevent sawing or lever action on the locks, hasps, and staples. These requirements do not apply to magazine doors that are adequately secured on the inside by means of a bolt, lock, or bar that cannot be actuated from the outside.

(10) Ventilation. Ventilation is to be provided to prevent dampness and heating of stored explosive materials. Ventilation openings must be screened to prevent the entrance of sparks. Ventilation openings in side walls and foundations must be offset or shielded for bullet-resistant purposes. Magazines having foundation and roof ventilators with the air circulating between the side walls and the floors and between the side walls and the ceiling must have a wooden lattice lining or equivalent to prevent the packages of explosive materials from being stacked against the side walls and blocking the air circulation.

(11) Exposed metal. No sparking material is to be exposed to contact with the stored explosive materials. All ferrous metal nails in the floor and side walls, which might be exposed to contact with explosive materials, must be blind nailed, countersunk, or covered with a nonsparking lattice work or other nonsparking material.

(b) **Igloos, "Army-type structures", tunnels, and dugouts.** Igloo, "Army-type structure", tunnel, and dugout magazines are to be constructed of reinforced concrete, masonry, metal, or a combination of these materials. They must have an earthmound covering of not less than 24 inches on the top, sides and rear unless the magazine meets the requirements of paragraph (a)(7) of this section. Interior walls and floors must be constructed of, or covered with, a nonsparking material. Magazines of this type are also to be constructed in conformity with the requirements of paragraph (a)(4) and paragraphs (a)(8) through (11) of this section.

#### **§ 555.208 Construction of Type 2 Magazines.**

A type 2 magazine is a box, trailer, semitrailer, or other mobile facility.

##### **(a) Outdoor magazines -**

(1) General. Outdoor magazines are to be bullet-resistant, fire-resistant, weather-resistant, theft-resistant, and ventilated. They are to be supported to prevent direct contact with the ground and, if less than one cubic yard in size, must be securely fastened to a fixed object. The ground around outdoor magazines must slope away for drainage or other adequate drainage provided.

When unattended, vehicular magazines must have wheels removed or otherwise effectively immobilized by kingpin locking devices or other methods approved by the Director.

**(2) Exterior construction.** The exterior and doors are to be constructed of not less than 1/4-inch steel and lined with at least two inches of hardwood. Magazines with top openings will have lids with water-resistant seals or which overlap the sides by at least one inch when in a closed position.

**(3) Hinges and hasps.** Hinges and hasps are to be attached to doors by welding, riveting, or bolting (nuts on inside of door). Hinges and hasps must be installed so that they cannot be removed when the doors are closed and locked.

**(4) Locks.** Each door is to be equipped with (i) two mortise locks; (ii) two padlocks fastened in separate hasps and staples; (iii) a combination of a mortise lock and a padlock; (iv) a mortise lock that requires two keys to open; or (v) a three-point lock. Padlocks must have at least five tumblers and a case-hardened shackle of at least 3/8-inch diameter. Padlocks must be protected with not less than 1/4-inch steel hoods constructed so as to prevent sawing or lever action on the locks, hasps, and staples. These requirements do not apply to magazine doors that are adequately secured on the inside by means of a bolt, lock, or bar that cannot be actuated from the outside.

**(b) Indoor Magazines -**

**(1) General.** Indoor magazines are to be fire-resistant and theft-resistant. They need not be bullet-resistant and weather-resistant if the buildings in which they are stored provide protection from the weather and from bullet penetration. No indoor magazine is to be located in a residence or dwelling. The indoor storage of high explosives must not exceed a quantity of 50 pounds. More than one indoor magazine may be located in the same building if the total quantity of explosive materials stored does not exceed 50 pounds. Detonators must be stored in a separate magazine (except as provided in § 555.213) and the total quantity of detonators must not exceed 5,000.

**(2) Exterior construction.** Indoor magazines are to be constructed of wood or metal according to one of the following specifications:

**(i)** Wood indoor magazines are to have sides, bottoms and doors constructed of at least two inches of hardwood and are to be well braced at the corners. They are to be covered with sheet metal of not less than number 26-gauge (.0179 inches). Nails exposed to the interior of magazines must be countersunk.

**(ii)** Metal indoor magazines are to have sides, bottoms and doors constructed of not less than number 12-gauge (.1046 inches) metal and be lined inside with a non-sparking material. Edges of metal covers must overlap sides at least one inch.

**(3) Hinges and hasps.** Hinges and hasps are to be attached to doors by welding, riveting, or bolting (nuts on inside of door). Hinges and hasps must be installed so that they cannot be removed when the doors are closed and locked.

**(4) Locks.** Each door is to be equipped with (i) two mortise locks; (ii) two padlocks fastened in separate hasps and staples; (iii) a combination of a mortise lock and a padlock; (iv) a mortise lock that requires two keys to open; or (v) a three-point lock. Padlocks must have at least five tumblers and a case-hardened shackle of at least 3/8-inch diameter. Padlocks must be protected with not less than 1/4-inch steel hoods constructed so as to prevent sawing or lever action on the locks, hasps, and staples. Indoor magazines located in secure rooms that are locked as provided in this subparagraph may have each door locked with one steel padlock (which need

not be protected by a steel hood) having at least five tumblers and a case-hardened shackle of at least 3/8-inch diameter, if the door hinges and lock hasp are securely fastened to the magazine. These requirements do not apply to magazine doors that are adequately secured on the inside by means of a bolt, lock, or bar that cannot be actuated from the outside.

**(c) Detonator boxes.** Magazines for detonators in quantities of 100 or less are to have sides, bottoms and doors constructed of not less than number 12-gauge (.1046 inches) metal and lined with a non-sparking material. Hinges and hasps must be attached so they cannot be removed from the outside. One steel padlock (which need not be protected by a steel hood) having at least five tumblers and a case-hardened shackle of at least 3/8-inch diameter is sufficient for locking purposes.

#### **§ 555.209 Construction of Type 3 Magazines.**

A type 3 magazine is a “day-box” or other portable magazine. It must be fire-resistant, weather-resistant, and theft-resistant. A type 3 magazine is to be constructed of not less than number 12-gauge (.1046 inches) steel, lined with at least either 1/2-inch plywood or 1/2-inch Masonite-type hardboard. Doors must overlap sides by at least one inch. Hinges and hasps are to be attached by welding, riveting or bolting (nuts on inside). One steel padlock (which need not be protected by a steel hood) having at least five tumblers and a case-hardened shackle of at least 3/8-inch diameter is sufficient for locking purposes. Explosive materials are not to be left unattended in type 3 magazines and must be removed to type 1 or 2 magazines for unattended storage.

#### **§ 555.210 Construction of Type 4 Magazines.**

A type 4 magazine is a building, igloo or “Army-type structure”, tunnel, dugout, box, trailer, or a semitrailer or other mobile magazine.

##### **(a) Outdoor magazines -**

**(1) General.** Outdoor magazines are to be fire-resistant, weather-resistant, and theft-resistant. The ground around outdoor magazines must slope away for drainage or other adequate drainage be provided. When unattended, vehicular magazines must have wheels removed or otherwise be effectively immobilized by kingpin locking devices or other methods approved by the Director.

**(2) Construction.** Outdoor magazines are to be constructed of masonry, metal-covered wood, fabricated metal, or a combination of these materials. Foundations are to be constructed of brick, concrete, cement block, stone, or metal or wood posts. If piers or posts are used, in lieu of a continuous foundation, the space under the building is to be enclosed with fire-resistant material. The walls and floors are to be constructed of, or covered with, a non-sparking material or lattice work. The doors must be metal or solid wood covered with metal.

**(3) Hinges and hasps.** Hinges and hasps are to be attached to doors by welding, riveting, or bolting (nuts on inside of door). Hinges and hasps must be installed so that they cannot be removed when the doors are closed and locked.

**(4) Locks.** Each door is to be equipped with (i) two mortise locks; (ii) two padlocks fastened in separate hasps and staples; (iii) a combination of a mortise lock and a padlock; (iv) a mortise lock that requires two keys to open; or (v) a three-point lock. Padlocks must have at least five tumblers and case-hardened shackle of at least 3/8 inch diameter. Padlocks must be protected with not less than 1/4 inch steel hoods constructed so as to prevent sawing or lever action on the locks, hasps, and staples. These requirements do not apply to magazine doors that are adequately secured on the inside by means of a bolt, lock, or bar that cannot be actuated from

the outside.

**(b) Indoor magazine -**

**(1) General.** Indoor magazines are to be fire-resistant and theft-resistant. They need not be weather-resistant if the buildings in which they are stored provide protection from the weather. No indoor magazine is to be located in a residence or dwelling. The indoor storage of low explosives must not exceed a quantity of 50 pounds. More than one indoor magazine may be located in the same building if the total quantity of explosive materials stored does not exceed 50 pounds. Detonators that will not mass detonate must be stored in a separate magazine and the total number of electric detonators must not exceed 5,000.**(2) Construction.** Indoor magazines are to be constructed of masonry, metal-covered wood, fabricated metal, or a combination of these materials. The walls and floors are to be constructed of, or covered with, a nonsparking material. The doors must be metal or solid wood covered with metal.**(3) Hinges and hasps.** Hinges and hasps are to be attached to doors by welding, riveting, or bolting (nuts on inside of door). Hinges and hasps must be installed so that they cannot be removed when the doors are closed and locked.

**(4) Locks.** Each door is to be equipped with (i) two mortise locks; (ii) two padlocks fastened in separate hasps and staples; (iii) a combination of a mortise lock and padlock; (iv) a mortise lock that requires two keys to open; or (v) a three-point lock. Padlocks must have at least five tumblers and a case-hardened shackle of at least 3/8 inch diameter. Padlocks must be protected with not less than 1/4 inch steel hoods constructed so as to prevent sawing or lever action on the locks, hasps, and staples. Indoor magazines located in secure rooms that are locked as provided in this subparagraph may have each door locked with one steel padlock (which need not be protected by a steel hood) having at least five tumblers and a case-hardened shackle of at least 3/8 inch diameter, if the door hinges and lock hasp are securely fastened to the magazine. These requirements do not apply to magazine doors that are adequately secured on the inside by means of a bolt, lock, or bar that cannot be actuated from the outside.

**§ 555.211 Construction of Type 5 Magazines.**

A type 5 magazine is a building, igloo or “Army-type structure”, tunnel, dugout, bin, box, trailer, or a semitrailer or other mobile facility.

**(a) Outdoor magazines -**

**(1) General.** Outdoor magazines are to be weather-resistant and theft-resistant. The ground around magazines must slope away for drainage or other adequate drainage be provided. When unattended, vehicular magazines must have wheels removed or otherwise be effectively immobilized by kingpin locking devices or other methods approved by the Director.

**(2) Construction.** The doors are to be constructed of solid wood or metal.

**(3) Hinges and hasps.** Hinges and hasps are to be attached to doors by welding, riveting, or bolting (nuts on inside of door). Hinges and hasps must be installed so that they cannot be removed when the doors are closed and locked.

**(4) Locks.** Each door is to be equipped with (i) two mortise locks; (ii) two padlocks fastened in separate hasps and staples; (iii) a combination of a mortise lock and a padlock; (iv) a mortise lock that requires two keys to open; or (v) a three-point lock. Padlocks must have at least five tumblers and a case-hardened shackle of at least 3/8 inch diameter. Padlocks must be protected with not less than 1/4 inch steel hoods constructed so as to prevent sawing or lever action on the locks, hasps, and staples. Trailers, semitrailers, and similar vehicular magazines may, for

each door, be locked with one steel padlock (which need not be protected by a steel hood) having at least five tumblers and a case-hardened shackle of at least 3/8 inch diameter, if the door hinges and lock hasp are securely fastened to the magazine and to the door frame. These requirements do not apply to magazine doors that are adequately secured on the inside by means of a bolt, lock, or bar that cannot be actuated from the outside.

**(5) Placards.** The placards required by Department of Transportation regulations at 49 CFR part 172, subpart F, for the transportation of blasting agents shall be displayed on all magazines.

**(b) Indoor magazines -**

**(1) General.** Indoor magazines are to be theft-resistant. They need not be weather-resistant if the buildings in which they are stored provide protection from the weather. No indoor magazine is to be located in a residence or dwelling. Indoor magazines containing quantities of blasting agents in excess of 50 pounds are subject to the requirements of § 555.206 of this subpart.

**(2) Construction.** The doors are to be constructed of wood or metal.

**(3) Hinges and hasps.** Hinges and hasps are to be attached to doors by welding, riveting, or bolting (nuts on inside). Hinges and hasps must be installed so that they cannot be removed when the doors are closed and locked.

**(4) Locks.** Each door is to be equipped with (i) two mortise locks; (ii) two padlocks fastened in separate hasps and staples; (iii) a combination of a mortise lock and a padlock; (iv) a mortise lock that requires two keys to open; or (v) a three-point lock. Padlocks must have at least five tumblers and a case-hardened shackle of at least 3/8 inch diameter. Padlocks must be protected with not less than 1/4 inch steel hoods constructed so as to prevent sawing or lever action on the locks, hasps, and staples. Indoor magazines located in secure rooms that are locked as provided in this subparagraph may have each door locked with one steel padlock (which need not be protected by a steel hood) having at least five tumblers and a case-hardened shackle of at least 3/8 inch diameter, if the door hinges and lock hasps are securely fastened to the magazine and to the door frame. These requirements do not apply to magazine doors that are adequately secured on the inside by means of a bolt, lock, or bar that cannot be actuated from the outside.

**§ 555.212 Smoking and Open Flames.**

Smoking, matches, open flames, and spark producing devices are not permitted:

- (a)** In any magazine;
- (b)** Within 50 feet of any outdoor magazine; or
- (c)** Within any room containing an indoor magazine.

**§ 555.213 Quantity and Storage Restrictions.**

**(a)** Explosive materials in excess of 300,000 pounds or detonators in excess of 20 million are not to be stored in one magazine unless approved by the Director.

**(b)** Detonators are not to be stored in the same magazine with other explosive materials, except under the following circumstances:

- (1)** In a type 4 magazine, detonators that will not mass detonate may be stored with electric squibs, safety fuse, shock tube, igniters, and igniter cord.
- (2)** In a type 1 or type 2 magazine, detonators may be stored with delay devices and any of the items listed in paragraph (b)(1) of this section.

**§ 555.214 Storage Within Types 1, 2, 3, and 4 Magazines.**

- (a) Explosive materials within a magazine are not to be placed directly against interior walls and must be stored so as not to interfere with ventilation. To prevent contact of stored explosive materials with walls, a nonsparking lattice work or other nonsparking material may be used.
- (b) Containers of explosive materials are to be stored so that marks are visible. Stocks of explosive materials are to be stored so they can be easily counted and checked upon inspection.
- (c) Except with respect to fiberboard or other nonmetal containers, containers of explosive materials are not to be unpacked or repacked inside a magazine or within 50 feet of a magazine, and must not be unpacked or repacked close to other explosive materials. Containers of explosive materials must be closed while being stored.
- (d) Tools used for opening or closing containers of explosive materials are to be of nonsparking materials, except that metal slitters may be used for opening fiberboard containers. A wood wedge and a fiber, rubber, or wooden mallet are to be used for opening or closing wood containers of explosive materials. Metal tools other than nonsparking transfer conveyors are not to be stored in any magazine containing high explosives.

#### **§ 555.215 Housekeeping.**

Magazines are to be kept clean, dry, and free of grit, paper, empty packages and containers, and rubbish. Floors are to be regularly swept. Brooms and other utensils used in the cleaning and maintenance of magazines must have no spark-producing metal parts, and may be kept in magazines. Floors stained by leakage from explosive materials are to be cleaned according to instructions of the explosives manufacturer. When any explosive material has deteriorated it is to be destroyed in accordance with the advice or instructions of the manufacturer. The area surrounding magazines is to be kept clear of rubbish, brush, dry grass, or trees (except live trees more than 10 feet tall), for not less than 25 feet in all directions. Volatile materials are to be kept a distance of not less than 50 feet from outdoor magazines. Living foliage which is used to stabilize the earthen covering of a magazine need not be removed.

#### **§ 555.216 Repair of Magazines.**

Before repairing the interior of magazines, all explosive materials are to be removed and the interior cleaned. Before repairing the exterior of magazines, all explosive materials must be removed if there exists any possibility that repairs may produce sparks or flame. Explosive materials removed from magazines under repair must be (a) placed in other magazines appropriate for the storage of those explosive materials under this subpart, or (b) placed a safe distance from the magazines under repair where they are to be properly guarded and protected until the repairs have been completed.

#### **§ 555.217 Lighting.**

- (a) Battery-activated safety lights or battery-activated safety lanterns may be used in explosives storage magazines.
- (b) Electric lighting used in any explosives storage magazine must meet the standards prescribed by the "National Electrical Code," (National Fire Protection Association, NFPA 70-81), for the conditions present in the magazine at any time. All electrical switches are to be located outside of the magazine and also meet the standards prescribed by the National Electrical Code.
- (c) Copies of invoices, work orders or similar documents which indicate the lighting complies with the National Electrical Code must be available for inspection by ATF officers.

**§ 555.218 Table of distances for storage of explosive materials.**

Quantity of explosives		Distances in feet							
Pounds over	Pounds not over	Inhabited buildings		Public highways with traffic volume of 3000 or fewer vehicles/day		Passenger railways—public highways with traffic volume of more than 3,000 vehicles/day		Separation of magazines	
		Barri-caded	Unbarricaded	Barri-caded	Unbarricaded	Barri-caded	Unbarricaded	Barri-caded	Unbarricaded
0	5	70	140	30	60	51	102	6	12
5	10	90	180	35	70	64	128	8	16
10	20	110	220	45	90	81	162	10	20
20	30	125	250	50	100	93	186	11	22
30	40	140	280	55	110	103	206	12	24
40	50	150	300	60	120	110	220	14	28
50	75	170	340	70	140	127	254	15	30
75	100	190	380	75	150	139	278	16	32
100	125	200	400	80	160	150	300	18	36
125	150	215	430	85	170	159	318	19	38
150	200	235	470	95	190	175	350	21	42
200	250	255	510	105	210	189	378	23	46
250	300	270	540	110	220	201	402	24	48
300	400	295	590	120	240	221	442	27	54
400	500	320	640	130	260	238	476	29	58
500	600	340	680	135	270	253	506	31	62
600	700	355	710	145	290	266	532	32	64
700	800	375	750	150	300	278	556	33	66
800	900	390	780	155	310	289	578	35	70
900	1,000	400	800	160	320	300	600	36	72
1,000	1,200	425	850	165	330	318	636	39	78
1,200	1,400	450	900	170	340	336	672	41	82
1,400	1,600	470	940	175	350	351	702	43	86
1,600	1,800	490	980	180	360	366	732	44	88
1,800	2,000	505	1,010	185	370	378	756	45	90
2,000	2,500	545	1,090	190	380	408	816	49	98
2,500	3,000	580	1,160	195	390	432	864	52	104
3,000	4,000	635	1,270	210	420	474	948	58	116
4,000	5,000	685	1,370	225	450	513	1,026	61	122
5,000	6,000	730	1,460	235	470	546	1,092	65	130
6,000	7,000	770	1,540	245	490	573	1,146	68	136
7,000	8,000	800	1,600	250	500	600	1,200	72	144
8,000	9,000	835	1,670	255	510	624	1,248	75	150
9,000	10,000	865	1,730	260	520	645	1,290	78	156
10,000	12,000	875	1,750	270	540	687	1,374	82	164
12,000	14,000	885	1,770	275	550	723	1,446	87	174
14,000	16,000	900	1,800	280	560	756	1,512	90	180
16,000	18,000	940	1,880	285	570	786	1,572	94	188
18,000	20,000	975	1,950	290	580	813	1,626	98	196
20,000	25,000	1,055	2,000	315	630	876	1,752	105	210
25,000	30,000	1,130	2,000	340	680	933	1,866	112	224
30,000	35,000	1,205	2,000	360	720	981	1,962	119	238
35,000	40,000	1,275	2,000	380	760	1,026	2,000	124	248
40,000	45,000	1,340	2,000	400	800	1,068	2,000	129	258
45,000	50,000	1,400	2,000	420	840	1,104	2,000	135	270
50,000	55,000	1,460	2,000	440	880	1,140	2,000	140	280
55,000	60,000	1,515	2,000	455	910	1,173	2,000	145	290
60,000	65,000	1,565	2,000	470	940	1,206	2,000	150	300
65,000	70,000	1,610	2,000	485	970	1,236	2,000	155	310
70,000	75,000	1,655	2,000	500	1,000	1,263	2,000	160	320
75,000	80,000	1,695	2,000	510	1,020	1,293	2,000	165	330
80,000	85,000	1,730	2,000	520	1,040	1,317	2,000	170	340
85,000	90,000	1,760	2,000	530	1,060	1,344	2,000	175	350
90,000	95,000	1,790	2,000	540	1,080	1,368	2,000	180	360
95,000	100,000	1,815	2,000	545	1,090	1,392	2,000	185	370
100,000	110,000	1,835	2,000	550	1,100	1,437	2,000	195	390
110,000	120,000	1,855	2,000	555	1,110	1,479	2,000	205	410
120,000	130,000	1,875	2,000	560	1,120	1,521	2,000	215	430
130,000	140,000	1,890	2,000	565	1,130	1,557	2,000	225	450
140,000	150,000	1,900	2,000	570	1,140	1,593	2,000	235	470
150,000	160,000	1,935	2,000	580	1,160	1,629	2,000	245	490
160,000	170,000	1,965	2,000	590	1,180	1,662	2,000	255	510
170,000	180,000	1,990	2,000	600	1,200	1,695	2,000	265	530
180,000	190,000	2,010	2,010	605	1,210	1,725	2,000	275	550
190,000	200,000	2,030	2,030	610	1,220	1,755	2,000	285	570

**§ 555.219 Table of Distances for Storage of Low Explosives.**

Pounds	From inhabited building distance (feet)	From public railroad and highway	From above ground magazines (feet)
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		distance (foot)		
Over	Not over			
0	1,000	75	75	50
1,000	5,000	115	115	75
5,000	10,000	150	150	100
10,000	20,000	190	190	125
20,000	30,000	215	215	145
30,000	40,000	235	235	155
40,000	50,000	250	250	165
50,000	60,000	260	260	175
60,000	70,000	270	270	185
70,000	80,000	280	280	190
80,000	90,000	295	295	195
90,000	100,000	300	300	200
100,000	200,000	375	375	250
200,000	300,000	450	450	300

**§ 555.220 Table of separation distances of ammonium nitrate and blasting agents from explosives or blasting agents.**

Donor Weight (Pounds)		Minimum separation distance of acceptor from donor when barricaded (feet)		Minimum thickness of artificial barricades (inches)
Over	Not over	Ammonium nitrate	Blasting agent	
0	100	3	11	12
100	300	4	14	12
300	600	5	18	12
600	1,000	6	22	12
1,000	1,600	7	25	12
1,600	2,000	8	29	12
2,000	3,000	9	32	15
3,000	4,000	10	36	15
4,000	6,000	11	40	15
6,000	8,000	12	43	20
8,000	10,000	13	47	20
10,000	12,000	14	50	20
12,000	16,000	15	54	25
16,000	20,000	16	58	25
20,000	25,000	18	65	25
25,000	30,000	19	68	30

30,000	35,000	20	72	30
35,000	40,000	21	76	30
40,000	45,000	22	79	35
45,000	50,000	23	83	35
50,000	55,000	24	86	35
55,000	60,000	25	90	35
60,000	70,000	26	94	40
70,000	80,000	28	101	40
80,000	90,000	30	108	40
90,000	100,000	32	115	40
100,000	120,000	34	122	50
120,000	140,000	37	133	50
140,000	160,000	40	144	50
160,000	180,000	44	158	50
180,000	200,000	48	173	50
200,000	220,000	52	187	60
220,000	250,000	56	202	60
250,000	275,000	60	216	60
275,000	300,000	64	230	60

**§ 555.221 Requirements for display fireworks, pyrotechnic compositions, and explosive materials used in assembling fireworks or articles pyrotechnic.**

(a) Display fireworks, pyrotechnic compositions, and explosive materials used to assemble fireworks and articles pyrotechnic shall be stored at all times as required by this Subpart unless they are in the process of manufacture, assembly, packaging, or are being transported.

(b) No more than 500 pounds (227 kg) of pyrotechnic compositions or explosive materials are permitted at one time in any fireworks mixing building, any building or area in which the pyrotechnic compositions or explosive materials are pressed or otherwise prepared for finishing or assembly, or any finishing or assembly building. All pyrotechnic compositions or explosive materials not in immediate use will be stored in covered, non-ferrous containers.

(c) The maximum quantity of flash powder permitted in any fireworks process building is 10 pounds (4.5 kg).

(d) All dry explosive powders and mixtures, partially assembled display fireworks, and finished display fireworks shall be removed from fireworks process buildings at the conclusion of a day's operations and placed in approved magazines.

**§ 555.222 Table of distances between fireworks process buildings and between fireworks process and fireworks nonprocess buildings.**

Net weight of fireworks <sup>1</sup> in (pounds)	Display fireworks <sup>2</sup> (feet)	Consumer fireworks <sup>3</sup> (feet)
0 to 100	57	37
101 - 200	69	37

201 - 300	77	37
301 - 400	85	37
401 - 500	91	37
Above 500	Not permitted 4, 5	Not permitted 4, 5

**§ 555.223 Table of distances between fireworks process buildings and other specified areas.**

Net weight of fireworks <sup>1</sup> in (pounds)	Display fireworks <sup>1</sup> (feet)	Consumer fireworks <sup>2</sup> (feet)
0 to 100	200	25
101 - 200	200	50
201 - 300	200	50
301 - 400	200	50
401 - 500	200	50
Above 500	Not permitted	Not permitted

**§ 555.224 Table of distances for the storage of display fireworks (except bulk salutes).**

Net weight of fireworks <sup>1</sup> (pounds)	Distance between magazine and inhabited building, passenger railway, or public highway <sup>3 4</sup> (feet)	Distance between magazines <sup>2 3</sup> (feet)
0 to 1000	150	100
1001 - 5000	230	150
5001 – 10,000	300	200
Above 10,000	Use Table 55.218	

## **APPENDIX B**

### **UNIFORM MUNICIPAL CODE FOR THE MANUFACTURE, TRANSPORTATION, STORAGE, AND USE OF EXPLOSIVES**

**RECOMMENDED BY  
THE OFFICE OF MINE SAFETY AND LICENSING**

**Article 1: AUTHORITY AND SCOPE**

1.01 This Code shall apply to the manufacture, possession, storage, sale, transportation, and use of explosives and blasting agents.

1.02 This Code shall not apply to:

(a) explosives or blasting agents while in the course of transportation via railroad, water, highway, or air when the explosives and blasting agents are being moved under the jurisdiction of, and in conformity with, regulations adopted by any Federal or State department or agency.

(b) the transportation and use of explosives or blasting agents in the normal and emergency operation of State or Federal agencies nor to municipal fire and police departments, providing they are acting in their official capacity and in the proper performance of their duties.

(c) small arms ammunition and components thereof, which are subject to the Gun Control Act of 1968 (Title

18, Chapter 44 U.S. Code) and regulations promulgated thereunder.

(d) blasting standards KRS 351.315 through, 351.370 and Regulations 805 KAR 4:010 through 4:060.

(e) explosives or blasting agents being used on the site of Federal or State projects.

#### **Article 2: STORAGE, TRANSPORTATION, AND USE**

2.01 All activities within the scope of this Code shall conform to the regulations of the Kentucky Department of Mines and Minerals 805 KAR 4:010 through 805 KAR 4:165.

#### **Article 3: BLASTING PERMITS**

3:01 No person or corporation shall conduct a blasting operation without the (governmental unit's jurisdiction) without first obtaining a permit from the (authority).

3:02 The fee for a blasting permit or permit renewal shall be (\_\_\_\_\_).

3:03 No person or corporation shall be issued a permit to blast on public property unless the person to be in charge of the blasting holds a valid Kentucky Blasters License.

3:04 No person or corporation shall be issued a permit to blast on private property with more than five (5) pounds of explosives unless the person in charge of the blasting holds a valid Kentucky Blasters License.

3:05 The blasting permits shall specify the location of the blasting to be permitted.

3:06 In the event that a project is not completed, blasting permits must be renewed annually upon the applicant's payment of the renewal fee.

3:07 A permit allowing blasting shall be issued upon application but, on public property, shall not become valid until seven (7) days after its issuance.

3:08 If unanticipated blasting is required, the permit may become valid as soon as the (authority) notifies all required agencies.

3:09 On any contract issued by an agency of the (governmental unit), blasting permits shall be issued by the (authority) unless otherwise specified in said contract.

3:10 False statements, made for the purpose of obtaining a permit, shall render the permit null and void from the time of issue.

3:11 Copies of the blasting permit shall be distributed by the (authority) to the following required agencies: (police, fire, municipal engineer, utilities, etc.).

#### **Article 4: MANUFACTURE AND SALE**

4.01 No person or corporation shall operate a business establishment where explosives are maintained for the sale, or manufacture for sale, of explosives in (governmental unit's jurisdiction) without first obtaining a permit from the (authority).

4.02 The fee for this permit is (\_\_\_\_\_).

#### **Article 5: PENALTIES**

5.01 Any person or corporation violating the procedures of this Code shall be fined not less than (\_\_\_\_\_) nor more than (\_\_\_\_\_), and/or shall be imprisoned up to, but no more than (\_\_\_\_) days.

#### **CITIES HAVING ADOPTED THE UNIFORM MUNICIPAL CODE**

**CITY**

**AUTHORITY**

Anchorage	City Engineer
Ashland	City Building Inspector
Berea	Codes Inspector
Crestview Hills	City Building Inspector
Crofton	City of Crofton
Frankfort	Fire Inspector
Highland Heights	City Coordinator
Indian Hills	Director of Public Works
La Grange	Director of the Public Works Department
Lawrenceburg	Building Inspector
London	City Building Inspector
Madisonville	Fire Chief
Newport	Housing Code Enforcement Administrator
Paris	City Engineer
Pewee Valley	Chief of Police
Prestonsburg	Fire Marshall
Providence	City Codes Inspector
Southgate	City Building Inspector
Wilder	City Clerk