

**OREGON OCCUPATIONAL SAFETY AND HEALTH DIVISION
DEPARTMENT OF CONSUMER AND BUSINESS SERVICES**

PROGRAM DIRECTIVE

Program Directive: A-286
Issued: March 27, 2012
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- SUBJECT:** Explosive Materials and Pyrotechnics: Compliance Policy for Manufacture, Storage, Sale, Handling, Use and Display
- PURPOSE:** To provide a comprehensive compliance policy for the inspection of workplaces involved in the manufacturing, storage, sale, handling, use and display of pyrotechnics and all other explosive materials. This program directive provides guidance to Compliance Safety and Health Officers (CSHOs) on how to conduct safety and health inspections of facilities and operations that may have explosive materials.
- BACKGROUND:** In 1986, Federal OSHA issued a Compliance Policy Instruction, CPL 02-00-073 - CPL 2.73, Fireworks Manufacturer: Compliance Policy, which provided guidelines to inspect fireworks manufacturing facilities under a National Emphasis Program. At that time, OSHA did not have a standard that specifically addressed the manufacturing of pyrotechnics.
- In 1992, OSHA published the Process Safety Management (PSM) standard, 1910.119, which established requirements to prevent catastrophic consequences from the release of certain highly hazardous chemicals, including fires and explosions that may result during pyrotechnics manufacturing. Additionally, OSHA’s standard, 1910.109, Explosives and Blasting Agents, which outlines requirements for explosives, applies to the manufacture, keeping, having, storage, sale, transportation, and use of explosives, blasting agents, and pyrotechnics, but does not apply to the sale and public display of fireworks. The term “pyrotechnics” used in this directive includes but is not limited to, fireworks (consumer and display) and articles pyrotechnic.
- Although Oregon OSHA does not have specific standards covering the hazards associated with the display of fireworks (both before public and proximate audience), the State Fire Marshal has specific regulations. In addition, the Oregon Safe Employment Act, commonly referred to as the General Duty Clause, requires employers to furnish a safe and healthful place of employment.

The Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF) has storage regulations. This directive clarifies situations in which Oregon OSHA may issue citations for hazards related to pyrotechnics and other explosive materials.

SCOPE: This instruction applies to all Oregon OSHA

REFERENCES: Oregon OSHA Program Directive [A-177, National Emphasis Program \(NEP\): Process Safety Management of Highly Hazardous Chemicals](#)

Oregon OSHA Program Directive [A-150, Hazard Communication](#)

Oregon OSHA Program Directive [A-266, Medical Records Access by Oregon OSHA](#)

Oregon OSHA Program Directive [A-233, Respiratory Protection: General Guidelines](#)

Oregon OSHA Program Directive [A-268, National Emphasis Program \(NEP\): Combustible Dust](#)

[Oregon OSHA Technical Manual](#) (OTM) Section I, Chapter 4, Sample Shipping and Handling

16 CFR [1500](#) and [1507](#), U.S. Consumer Product Safety Commission

[27 CFR 555](#), U.S. Department of Justice, the Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF)

[49 CFR 171-180](#), U.S. Department of Transportation

National Fire Protection Association (NFPA) 499, Recommended Practice for the Classification of Combustible Dusts and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas (2008 Edition)

NFPA 1123, Code for Fireworks Display (2010 Edition)

NFPA 1124, Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnic Articles (2006 Edition)

NFPA 1126, Standard for the Use of Pyrotechnics before a Proximate Audience (2011 Edition)

NFPA 2113, Standard on Selection, Care, Use, and Maintenance of Flame-Resistant Garments for Protection of Industrial Personnel against Flash Fire (2007 Edition)

[APA Standard 87-1](#), Standard for Construction and Approval for Transportation of Fireworks, Novelties, and Theatrical Pyrotechnics (2001 Edition)

DEFINITIONS: Most definitions below are taken from ATF's 27 CFR part 555 regulations. Some references from 1910.109 are also incorporated in the document. **Note:** NFPA definitions should be used when its provisions are used.

Articles pyrotechnic – Pyrotechnic devices for professional use similar to consumer fireworks in chemical composition and construction but not intended for consumer use. Such articles meeting the weight limits for consumer fireworks but not labeled as such and classified by U.S. Department of Transportation regulations in 49 CFR 172.101 as UN0431 or UN0432.

Blasting agent – Any material or mixture, consisting of a fuel and oxidizer, intended for blasting, not otherwise classified as an explosive and in which none of the ingredients are classified as an explosive, provided that the finished product, as mixed and packaged for use or shipment, cannot be detonated by means of a No. 8 test blasting cap when unconfined. (Defined in 1910.109)

Bulk salute – Salute components prior to final assembly into aerial shells, and finished salute shells held separately prior to being packed with other types of display fireworks.

Note: At present, the above definition could be problematic because a carton containing even 99% salute shells and only one percent non-salute shell would not be considered bulk salutes. Unfortunately, a carton packed in this manner would likely mass-detonate in the same fashion as a case containing 100% salute shells. Therefore, ATF has initiated rulemaking to amend this definition. The threshold proportion of salute shells to non-salute shells was proposed to be 50%, which is in line with industry standards.

Consumer fireworks – Any small firework device designed to produce visible effects by combustion and which must comply with the construction, chemical composition, and labeling regulations of the U.S. Consumer Product Safety Commission, as set forth in title 16, Code of Federal Regulations, parts 1500 and 1507. Some small devices designed to produce audible effects are included, such as whistling devices, ground devices containing 50 mg or less of explosive materials, and aerial devices containing 130 mg or less of explosive materials. Consumer fireworks are classified as fireworks UN0336 and UN0337 by the U.S. Department of Transportation at 49 CFR 172.101. This term does not include fused set pieces containing components which together exceed 50 mg of salute powder.

Note: ATF considers explosive materials in the above definition to be flash powder.

Display fireworks – Large fireworks designed primarily to produce visible or audible effects by combustion, deflagration, or detonation. This term includes, but is not limited to, salutes containing more than 2 grains (130 mg) of explosive materials, aerial shells containing more than 40 grams of pyrotechnic compositions, and other display pieces which exceed the limits of explosive materials for classification as “consumer fireworks.” Display fireworks are classified as fireworks UN0333, UN0334 or UN0335 by the U.S. Department of Transportation at 49 CFR 172.101. This term also includes fused set pieces containing components which together exceed 50 mg of salute powder.

Note: ATF considers explosive materials in the above definition to be flash powder.

Explosive – Any chemical compound, mixture, or device, the primary or common purpose of which is to function by explosion, i.e., with substantially instantaneous release of gas and heat, unless such compound, mixture, or device is otherwise specifically classified by the U.S. Department of Transportation; see 49 CFR Chapter I. The term “explosives” shall include all material which is classified as Class A, Class B, and Class C explosives by the U.S. Department of Transportation, and includes, but is not limited to dynamite, black powder, pellet powders, initiating explosives, blasting caps, electric blasting caps, safety fuse, fuse lighters, fuse igniters, squibs, cordeau detonant fuse, instantaneous fuse, igniter cord, igniters, small arms ammunition, small arms ammunition primers, smokeless propellant, cartridges for propellant-actuated power devices, and cartridges for industrial guns. Commercial explosives are those explosives which are intended to be used in commercial or industrial operations. (Defined in 1910.109)

Explosive materials – Explosives, blasting agents, water gels and

detonators. Explosive materials include, but are not limited to, all items in the List of Explosive Materials provided for in 27 CFR 555.23.

Fireworks – Any composition or device designed to produce a visible or an audible effect by combustion, deflagration, or detonation, and which meets the definition of “consumer fireworks” or “display fireworks” as defined by this section.

Fireworks mixing building – Any building or area used for mixing and blending pyrotechnic compositions except wet sparkler mix.

Fireworks non-process building – Any office building or other building or area in a fireworks plant where no fireworks, pyrotechnic compositions or explosive materials are processed or stored.

Fireworks plant – All land and buildings used for or in connection with the assembly or processing of fireworks, including warehouses used with or in connection with fireworks plant operations.

Fireworks plant warehouse – Any building or structure used exclusively for the storage of materials which are neither explosive materials nor pyrotechnic compositions used to manufacture or assemble fireworks.

Fireworks process building – Any mixing building; any building in which pyrotechnic compositions or explosive materials are pressed or otherwise prepared for finishing and assembly; or any finishing or assembly building.

Fireworks shipping building – A building used for the packing of assorted display fireworks into shipping cartons for individual public displays and for the loading of packaged displays for shipment to purchasers.

Flash powder – An explosive material intended to produce an audible report and a flash of light when ignited which includes but is not limited to oxidizers such as potassium chlorate or potassium perchlorate, and fuels such as sulfur or aluminum powder.

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).

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).

Magazine – Any building, structure, or container, other than an explosives manufacturing building, approved for the storage of explosive materials.

Manufacturing of Explosives – Includes mixing, blending, extruding, synthesizing, assembling, disassembling and other activities involved in the making of a chemical compound, mixture or device which is intended to explode.

Pyrotechnic – Any combustible or explosive compositions or manufactured articles designed and prepared for the purpose of producing audible or visible effects which are commonly referred to as fireworks. (Defined in 1910.109)

Pyrotechnic composition – A chemical mixture which, upon burning and without explosion, produces visible, brilliant displays, bright lights, or sounds.

Salute – An aerial shell, classified as a display firework that contains a charge of flash powder and is designed to produce a flash of light and a loud report as the pyrotechnic effect.

OREGON OSHA VS. ATF JURISDICTION (some overlaps may occur)

A. Oregon OSHA

Oregon OSHA currently regulates working conditions in the storage, sale, transportation, manufacture, and use of explosives (1910.109, 1910.119, and 1926 Subdivision U). 1910.109(k)(1) states, “this section applies to the manufacture, keeping, having, storing, sale, transportation, and use of explosives, blasting agents, and pyrotechnics. This section does not apply to the sale and use (public display) of pyrotechnics, commonly known as fireworks, nor to the use of explosives in the form prescribed by the official U.S. Pharmacopeia.” (This does not apply to fireworks stands focused on sales to the public.)

Explosive materials that are staged for active use in the manufacturing or assembly process are not considered to be in “storage,” and may be covered by Oregon OSHA’s PSM standard. However, prior to issuing citations for any violations associated with the staging areas, CSHOs should consult with the local ATF office to clarify any ambiguities on whether or not a specific staging area falls under ATF’s authority. Also check with state and local fire authorities.

Pyrotechnic storage of consumer fireworks or articles pyrotechnic (in finished state) which are labeled as 1.4 explosives (formerly “Class C”), fall under Oregon OSHA’s authority. There may be some overlap with state and local fire authority.

B. Alcohol, Tobacco, Firearms and Explosives (ATF)

ATF covers the import, manufacture, distribution, and storage of explosives (27 CFR Part 555). Its regulations require all manufacturers, importers, and dealers in explosives to obtain a federal license from ATF and require anybody transporting and/or receiving explosives to obtain a federal permit from ATF.

Explosive storage: The Agency regulates the storage of explosives under [27 CFR 555, Subpart K, Storage](#).

Pyrotechnics storage: ATF's explosives regulations require all persons or companies to store display fireworks and other pyrotechnic materials (used in the manufacturing or assembly process) in conformity with 27 CFR 555, Subpart K, Storage. Those finished explosives classified as consumer fireworks (UN0336 & UN0337) and articles pyrotechnic (UN0431 & UN0432) are not required to be stored in ATF-compliant storage magazines.

ATF's explosives regulations also require individuals or companies manufacturing or assembling display fireworks, consumer fireworks, or articles pyrotechnic to comply with the requirements set forth in [27 CFR 555.221 through 555.223](#). These requirements, in part, designate the net explosive weight that is permitted in a process building or area, as well as establish distance requirements from the process building or area to surrounding exposed sites. In addition, allowable storage quantities may be outlined in state and local fire codes.

**ENFORCEMENT
GUIDELINES:**

CSHOs should become familiar with ATF requirements contained in 27 CFR 555, Subpart K – Storage, which contain provisions for storage of display fireworks, pyrotechnic compositions and explosive materials used in assembling fireworks if involved in an explosives related inspection. If apparent violations of ATF requirements are found during an inspection, referrals should be made to the local [ATF office](#) as soon as practicable.

Note: Most of these guidelines reference Division 2 rules. Other Division rules may be applicable depending on the inspection circumstances.

A. **Enforcement of [1910.119](#), the Process Safety Management (PSM) standard.**

The PSM standard is the Oregon OSHA standard addressing the hazards associated with pyrotechnics at pyrotechnics manufacturing facilities and explosive materials in other manufacturing facilities. The PSM standard applies to manufacturing of pyrotechnics and other explosive materials regardless of their quantities. Citations may be issued for any violations of this standard.

ATF's regulations require explosive materials to be stored in a magazine unless they are in the process of manufacture, being handled in the operating process, being used, or being transported. This exception includes those explosive materials staged within a process building or area such that they are being actively used in the manufacturing or assembly process. Contact ATF on a case-by-case basis if questions arise regarding ATF's authority over the manufacturing or assembly process.

B. **Activities outside the scope of the PSM standard**

Activities outside the scope of the manufacturing of explosives would not be covered by the PSM standard if those activities: occur in a separate, non-production research or test area or facility; and do not have the potential to cause or contribute to a release or interfere with mitigating the consequences of a catastrophic release from the explosive manufacturing process. Activities considered outside the scope include:

- Product testing and analysis which is not part of any in-production sampling and testing of the explosive manufacturing process;
- Chemical and physical property analysis of explosives and propellants and pyrotechnics formulations;
- Scale-up research chemical formulations to develop production quantity formulations;
- Analysis of age tests conducted on finished products;
- Failure analysis tests conducted on pre-manufactured or finished products;
- X-raying;
- Quality assurance testing (not including the extraction of samples from an active explosive manufacturing (production process));evaluating environmental effects, such

as hot, cold, jolt, jumble, drop, vibration, high altitude, salt, and fog; and

- Assembly of engineering research and development models.

These activities are subject to the requirements of Oregon OSHA regulations found in 1910.109, Explosives and Blasting Agents because the activities involve keeping, having, or storing explosives or pyrotechnics (1910.109(k)(1)).

C. Enforcement of 1910.109, Explosives and Blasting Agents.

1. **Display Fireworks.** As noted under Jurisdiction, any potential violations associated with the storage of display fireworks, pyrotechnic compositions, and explosive materials used in assembling fireworks and articles pyrotechnic fall under ATF's authority, and, therefore, should be referred to ATF.
2. **Consumer Fireworks and Articles Pyrotechnic.** Since ATF does not regulate consumer fireworks or articles pyrotechnic (UN0336, UN0337, UN0431, or UN0432) in their finished state, Oregon OSHA has the authority to enforce the 1910.109 standard (noted under Jurisdiction) on these finished products.

Hazards associated with storage of consumer fireworks and articles pyrotechnic in their finished state may be cited under 1910.109(b)(1). When issuing citations under 1910.109(b)(1), Chapter 6 of NFPA 1124, 2006 edition or a later version may be one source (not the only source) as a basis for documenting the industry practice and in addressing the hazards associated with storage of finished articles pyrotechnic and/or consumer fireworks at manufacturing and distribution facilities. It is important to document why there is an undue hazard. Improper storage will not automatically create an undue hazard.

3. Hazards (such as hazards from ignition sources including static charges) associated with storage and handling of explosive materials and pyrotechnic compositions not covered by ATF may be cited under 1910.109(b)(1), whenever possible.

NFPA 1124, 2006 edition or a later version may be used while documenting the industry practice and in addressing hazards associated with the storage and handling of pyrotechnics and explosives and while issuing citations under

1910.109(b)(1). Check with your state and local fire authorities. Review 437-002-0109 for additional requirements.

D. Enforcement of Housekeeping Violations.

1. Oregon OSHA's housekeeping standards, [1910.22](#)(a)(1), (2) and (3) may be cited whenever an accumulation of dusts (such as explosives or pyrotechnic composition) in the process buildings, due to poor housekeeping, can be documented. These standards may be grouped when cited.
2. Only those CSHOs who are trained in proper collection techniques and in storage of samples may collect these dust samples. Additionally, CSHOs may consult with the Oregon OSHA lab for shipping instructions and with the Program Directive on Combustible Dusts A-268.
3. The employer may be asked to immediately clean up and remove any spills of explosives or pyrotechnic compositions, and to take corrective measures in destroying such material in accordance with its manufacturer's instructions. The CSHO must advise the employer on proper techniques to be used. The CSHO may determine, based on the type of clean up required, whether or not to identify the incident as an imminent danger.

E. Enforcement of Electrical Violations

1. Oregon OSHA's electrical standard at [1910.307](#)(c) requires that equipment, wiring methods, and installations of equipment in hazardous (classified) locations must be:
 - a. Intrinsically safe,
 - b. Approved for the hazardous (classified) location, or
 - c. Safe for the hazardous (classified) location.

Note: ATF has requirements pertaining to lighting in magazines (27 CFR 555.217).

2. Verify that equipment, wiring methods, and installations of equipment in the process buildings are suitable for use in Class II, Division 1 or Division 2 locations, as may be applicable. (See note below.)
3. Enforce the requirements of 1910.307 whenever explosive or pyrotechnic dusts are present in a building, Citations under 1910.307(c) can be issued if equipment in buildings

is not approved or safe for Class II Division 1 or Division 2 locations.

4. Citations issued for electrical violations must be adequately documented in the case file. Include the location and type of electric equipment, the type of building, and information indicating that the equipment is not approved or safe for the location in your documentation.

Additionally, the PSM standard at 1910.119(d)(3)(i)(C), requires the employer to have process safety information related to the electrical classification of the manufacturing process. This electrical classification information will designate the approved types of electric equipment which can be utilized based on the materials and the locations within the process building. If employers use electric equipment which is not approved for use, as per their electrical classification process safety information, they would not be in compliance with the recognized and generally accepted good engineering practices required by 1910.119(d)(3)(ii).

In addition to citing under 1910.307(c), also cite 1910.119(d) requirements when electrical violations associated with the PSM covered process are noted. When citing more than one violation using the same set of facts, consult with your manager to determine if they should be citing “in the alternative.”

Note: Since fireworks manufacturing facilities normally handle metal (conductive) dusts, including aluminum, magnesium, and their commercial alloys, such conductive dusts are classified as Group E dusts, and electric equipment in areas handling Group E dusts must be classified for Class II, Division 1, Group E locations. (See NEC Article 502 and NFPA 499.)

F. **Enforcement of PPE Violations**

1. Citations under [OAR 437-002-0134](#) may be issued if employees working at or supervising mixing, pressing and loading operations areas are not wearing 100% cotton or similar protective clothing.
2. Citations may be issued if worker exposure to potential burn injuries can be documented due to lack of flame resistant clothing. This also applies to pyrotechnics display operations. (See note below for additional information).

Note: It has been recognized as industry practice to require flame-resistant clothing when workers may be exposed to flash fire hazards. NFPA 2113 – Standard on Selection, Care, Use and Maintenance of Flame-Resistant Garments for Protection of Industrial Personnel Against Flash Fire is a national consensus standard which applies to, among others, chemical, refining, and terminal facilities with flash fire hazards. Among other standards, NFPA 2113 has requirements for when flame-resistant garments/flame-resistant clothing must be used by industrial personnel exposed to flash fire hazards. See Chapter 4 of NFPA 2113 for discussion on selection of flame-resistant clothing.

G. Enforcement of Material Handling Violations in Pyrotechnic and Explosive Material Locations.

1. When inspecting facilities where forklifts are being used the operators should be properly trained as required by [1910.178](#)(1).
2. Forklifts used in these facilities must be of appropriate designation. (See 1910.178(b) and (c) for designations and locations).
3. Forklifts must be authorized for use in Class II, Group E locations.
4. Materials which could cause hazardous reactions must be kept segregated in storage and marked with appropriate warning signs. (Subdivision N, [OAR 437-002-0221](#)(4)(d)).

H. Enforcement of Health-Related Violations.

The potential health hazards to which workers may be exposed range from nuisance dust to highly toxic dusts and fumes; and also hazardous noise (for example, pyrotechnics display workers).

1. **The Hazard Communication Standard, [1910.1200](#)** covers employees exposed to hazardous chemicals, including exposures to airborne gases, dusts, vapors, or fumes; and those potentially exposed to skin or eye contact.

Paragraph (e)(1) of the Hazard Communication Standard requires employers to develop and implement a written hazard communication program that provides for employee training; and, paragraph (h)(1) requires employers to provide training regarding the hazards of chemicals present at the worksite at the time of initial assignment and if a new chemical hazard is introduced.

Paragraph (f)(1) requires the chemical manufacturer, importer, or distributor to ensure containers of hazardous chemicals are labeled with appropriate hazard warnings, and paragraph (g)(1) requires the manufacturer and importer to obtain or develop a safety data sheet (SDS) for each hazardous chemical they produce or import.

Paragraph (f)(6) requires the employer, with minor exceptions, to provide secondary container labeling.

- a. In the absence of required information on an SDS regarding the content hazardous ingredients of a chemical used at the facility, collect a representative bulk or wipe sample, and send it for analysis to the Oregon OSHA lab. Depending upon the nature of the sample, special shipping and labeling requirements may need to be employed. Consult with the Oregon OSHA lab prior to the collection and shipment of the sample.

Note: Before bulk sampling for *explosibility* analysis, refer to the Combustible Dust program directive, the Oregon OSHA Technical Manual Section I, Chapter 4, Sample Shipping and Handling and the Oregon OSHA lab.

- b. For complete inspection procedures on the Hazard Communication Standard, refer to Program Directive A-150 Hazard Communications.
2. Air sampling should only be performed if there is a reasonable presumption that a significant inhalation hazard exists to workers and no other information regarding employee exposure is available. Carefully examine MSDSs, Department of Transportation (DOT) sample analysis records, or any other information available from the employer to determine if the manufacturing process contains hazardous chemicals.
 - a. Ask the employer for any existing air sampling records. The employer may use empirical or historical data if such data adequately demonstrates that no airborne hazard exists.
 - b. Ask employees if they have experienced any health effects or symptoms of hazardous exposures. The employer must provide appropriate employees with medical surveillance, when required. Ask employees

if they were offered medical examinations by their employer. You may need to ask the employer for copies of written medical records. Whenever reviewing medical records, the compliance officer should follow Program Directive A-266 Medical Records Access by Oregon OSHA.

- c. Within a manufacturing facility, only intrinsically safe sampling pumps must be used. Grounding and bonding of all components of the sampling train including the tubing and sample cassette must be ensured. Bonding of the sampling train including the pump to the worker must also be established. An ohmmeter can be used to verify that an effective ground and bond has been established. Use of wristlets and conductors that do not interfere with worker duties can be used to bond the pump and the worker.

Coordinate any sampling protocol with the facility's safety representative. Contact Oregon OSHA's lab for further guidance. Over exposures to Oregon OSHA Air Contaminant exposure limits may be issued.

- d. In areas of visible airborne dust levels within a manufacturing facility, immediately exit the area to a safe location and advise the employer of the visible levels.
- e. Where employees in manufacturing facilities are required to wear respiratory protection, follow Program Directive A-233 Respiratory Protection: General Guidelines. Citations related to 1910.134 Respiratory Protection may be appropriate.

- 3. The Occupational Noise Exposure Standard, 1910.95, may be cited for excessive noise levels. Only intrinsically safe sampling equipment must be used.

I. Display and Retail Sale of Pyrotechnics: General Duty Clause Violations

- 1. 1910.109 does not apply to the sale and use (public display) of pyrotechnics, commonly known as fireworks, nor to the use of explosives in the form prescribed by the official U.S. Pharmacopeia
- 2. Citations under [OAR 437-001-0760](#) Rules for all Workplaces, may be issued for worker exposure to fire and

explosion hazards that could result from handling and use of the pyrotechnics for display before a public or proximate audience and when used for special effects. NFPA 1123, Code for Fireworks Display, 2010 edition or a later version, and NFPA 1126, Standard for the Use of Pyrotechnics Before a Proximate Audience, 2011 edition or a later version, may be referenced to support the citations.

3. Hazards associated with the retail sales of consumer fireworks may be cited and referenced with Chapter 7 of NFPA 1124, 2006 edition or a later version to support the citations.

INSPECTION PROCEDURES

- A. **Pre-inspection Preparation.** Field Office Managers should make arrangements with the local ATF office for a joint site inspection, if possible, and may include the State Fire Marshal's office. ATF generally inspects facilities once every three years, and the inspection is typically within a year of renewal.

CSHOs who have received PSM training, specific training in hazards of explosives and pyrotechnics (including sampling techniques, grounding, bonding, etc.), and have knowledge of 27 CFR 555 Subpart K, should be assigned to inspect these workplaces. CSHOs inspecting pyrotechnic facilities should have knowledge of NFPA 1123, NFPA 1124, and NFPA 1126.

- B. **Previous Case Files.** Review any previous case files on the facility to be inspected prior to going to the site. If possible, discuss conditions at the site with the local ATF officers and State or local enforcement authorities having knowledge of the particular site scheduled for inspection. Any such authorities contacted must be discreetly reminded of Oregon OSHA's statutory restrictions on advance notice.

- C. **Clothing and Equipment for Site Visit.** In addition to the normally required personal protective equipment, clothing must be worn and equipment used as follows:
 - 100% cotton outer garments; e.g., coveralls with nonferrous snaps, buttons or zippers;
 - Flame-resistant clothing, as may be appropriate;
 - Intrinsically safe flashlight;
 - Electrostatic dissipative footwear;

- Nonsparking measuring tape; and
- Wooden ruler.

D. **Prohibited Clothing and Equipment.** Take particular care to neither wear improper clothing, nor to carry inappropriate equipment during the inspection. Prohibited clothing and equipment include:

- Wool, silk, nylon or synthetic blend outer and inner garments;
- Cell phones and pagers;
- Lighters;
- Laptops;
- Spark-producing jewelry;
- Matches;
- Metal pens and pencils;
- Leather-soled shoes, and metal tapes or exposed nails in or on shoes and
- Equipment that is **not** intrinsically safe.

E. **The Use of Cameras and Video Cameras.** Prior to taking pictures, consult with the employer regarding their policy on taking pictures and videos at their facility. Photographs and videos may be taken only in the absence of suspended dust. If there are exposed explosive materials or pyrotechnic powders, you must not take photographs. In such situations, a camera or a video camera with a telephoto lens should be used to take pictures and videos from a safe distance. If additional light is needed, intrinsically safe lighting must be used.

F. **Pre-Site Visit Precautions.** Observe the following precautions before entering a location to conduct the opening conference:

- Recheck personal safety procedures; e.g., clothing, shoes, and safety equipment;
- Remove all spark producing equipment/tools or potential sources of ignition; e.g., lighters, cell phones, pagers, laptops, cigarettes, matches, metal clipboards, metal pens and pencils, spark-producing jewelry; and
- In the event that an electrical storm appears to be imminent,

terminate the inspection until weather conditions improve.

- G. **Opening Conference.** Explain the inspection procedure fully to employers during the opening conference. Before beginning the walkaround inspection:
- Review a diagram of the plant layout, if any;
 - Determine what operations are currently ongoing;
 - Gather information regarding the presence of static/spark/shock sensitive materials and areas;
 - Review documentation pertaining to the facility's PSM program;
 - Review SDSs of the chemicals used at the facility; and
 - Review any required licenses and permits for display.
- H. **Walkaround Inspection.** During the walkaround, examine the areas for any unsafe conditions, such as residue powders on the floor, spillage, deteriorated explosive materials, or suspended dust. In areas where airborne dust levels are visible, or when unsafe conditions are observed, immediately exit the area to a safe location.
- I. **Closing Conference.** In addition to the usual elements of the closing conference, discuss and recommend that the employer follow the safe practices specified in NFPA 1124, Code for the Manufacture, Transportation, and Storage of Fireworks, 2006 edition or a later version. Refer employers to other appropriate NFPA standards, such as NFPA 77, Recommended Practice on Static Electricity; NFPA 780, Standard for the Installation of Lightning Protection Systems; and other NFPA standards as applicable.

History: Issued 3-27-2012 Revised 12-20-2016

Appendix A
Standard Pyrotechnics Chemicals
Including but not limited to the following:

This Appendix contains a list of standard pyrotechnics chemicals. The basic component of pyrotechnics is black powder -- a mix of 75 percent potassium nitrate, 15 percent charcoal, and 10 percent sulfur. Several metal salts can be added to cause colorful luminescence upon combustion. In general, barium is used to obtain a green colored flame, strontium for red, copper for blue, and sodium for yellow. Many other chemicals are added as fuels and oxidizers, such as the highly reactive chemicals, ammonium perchlorate and red phosphorous; potassium dichromate, which is a hexavalent chromium compound (1910.1026); and aluminum powder, which has been linked to pulmonary fibrosis among workers in pyrotechnics plants.

Chemical	Typical Use
Aluminum	Fuel
Ammonium Perchlorate	Oxygen Donor
Antimony	Fuel
Antimony Sulfide	Fuel
Barium Carbonate	Neutralizer
Barium Nitrate	Oxygen Donor
Barium Sulfate	Oxygen Donor
Bismuth Oxide	Oxygen Donor
Boric Acid	Neutralizer
Calcium Carbonate	Neutralizer
Calcium Sulfate	Oxygen Donor
Carbon or Charcoal	Fuel
Copper Metal	Color Agent
Copper Oxide	Oxygen Donor/Color Agent
Copper Salts (except Copper Chlorate)	Color Agent
Dextrine	Fuel/Binder
Hexamine	Fuel
Iron and Iron Alloys	Fuel
Iron Oxide	Oxygen Donor
Magnalium (Magnesium/Aluminum)	Fuel
Magnesium (in display fireworks and theatrical pyrotechnics only)	Fuel
Magnesium Carbonate	Neutralizer
Magnesium Sulfate	Oxygen Donor
Nitrocellulose	Binder
Nitrocellulose Based Lacquers	Binder
Phosphorus, Red	Fuel
Potassium or Sodium Benzoate	Whistle
Potassium Bichromate (not to exceed 5% of formulation)	Oxygen Donor

Chemical	Typical Use
Potassium Chlorate	Oxygen Donor
Potassium Hydrogen Phthalate	Whistle
Potassium Nitrate	Oxygen Donor
Potassium Perchlorate	Oxygen Donor
Potassium Sulfate	Oxygen Donor
Silicon	Fuel
Sodium Bicarbonate	Neutralizer
Sodium Nitrate	Oxygen Donor
Sodium Salicylate	Whistle
Strontium Salts (except Strontium Chlorate)	Color Agent
Strontium Sulphate	Oxygen Donor
Strontium Carbonate	Color Agent
Strontium Nitrate	Oxygen donor
Strontium Salts (except Strontium Chlorate)	Color Agent
Strontium Sulfate	Oxygen Donor
Sulfur	Fuel

History: Issued 3-27-2012 Revised 12-20-2016