

1.3g Display Fireworks Magazine Checklist

(Board of Pyrotechnic Safety)

NFPA 1124 (2006)

GENERAL REQUIREMENTS:

- 5.1.1 Are display fireworks, pyrotechnic articles, salute powder, pyrotechnic and explosive compositions, and Black Powder stored in magazines at all times, except during manufacture, packaging, transportation, or use?
 - 5.1.1.1 Are bulk salute and bulk salute powder stored only in Type 1 or Type 2 magazines?
 - 5.1.1.2 Are display fireworks that are not bullet sensitive stored only in Type 1, Type 2, or Type 4 magazines?
 - 5.1.1.2 Are pyrotechnic articles categorized as Explosives 1.3, other than bulk salute and bulk salute powder stored only in Type 1, Type 2, or Type 4 magazines?
 - 5.1.1.2 Is black powder stored only in Type 1, Type 2, or Type 4 magazines?
- 5.1.2 Are magazines containing display fireworks and pyrotechnic articles that are not classified as Explosives 1.4 separated from inhabited buildings, passenger railways, and public highways by the distances specified in Table 4.6.4.1 or Table 4.6.4.4?
- 5.1.3 Are magazines containing display fireworks and pyrotechnic articles that are not classified as Explosives 1.4 separated from other magazines by the distances specified in Table 4.6.4.1 or Table 4.6.4.4 and from other plant buildings by the distances specified in Table 4.6.3, Table 4.6.4.1, or Table 4.6.6 as applicable?
- 5.1.4 Are magazines containing Black Powder separated from inhabited buildings, passenger railways, public highways, and other magazines by the distances specified in Table 4.6.4.7?

Magazine Construction - General

- 5.2.1.2 Is the ground around magazines graded so that water drains away from the magazine?
- 5.2.1.3 Is there exposed ferrous metal on the interior of the magazine where it might contact material stored within?

Magazine Construction - Heating

- 5.2.2.1 Is the area between the heating unit and the magazine cleared of all combustible materials?
- 5.2.2.2 Are magazines requiring heat heated by either hot-water radiant heating within the magazine building or by indirect warm-air heating?
- 5.2.2.3 Is indirect warm air heat provided by either hot-water coils or low-pressure [gauge pressure of 15 psi (103 kPa) or less] steam coils located outside the magazine building?

- 5.2.2.4 (1) When provided, are radiant heating coils within the building installed so that explosive materials or their containers cannot contact the coils and so that air is free to circulate between the coils and the explosives?
- 5.2.2.4 (2) When provided, is the surface temperature of radiant heating coils less than or equal to 165°F (74°C)?
- 5.2.2.4 (3) When provided, are heating ducts installed so that the hot air discharge from the ducts is not directed against explosive materials or their containers?
- 5.2.2.4 (4) When provided, is the heating system shall be controlled so that the ambient temperature of the magazine does not exceed 130°F (54°C)?
- 5.2.2.4 (5) When provided, is any electric fan or pump used in the heating system located outside the magazine, separated from the magazine walls, and grounded?
- 5.2.2.4 (6) When provided, does any electric motor and any controls for electric heating devices used to heat water or produce steam have overload devices and disconnects that comply with NFPA 70, National Electrical Code?
- 5.2.2.4 (7) When provided, is all electrical switchgear located at least 25 ft (7.6 m) from the magazine?
- 5.2.2.4 (8) When provided, is any fuel-fired heating source for the hot water or steam separated from the magazine by a distance of not less than 25 ft (7.6 m)?
- 5.2.2.4 (9) When heating is provided, is explosive materials stored in magazines arranged so that uniform circulation of air is ensured?

Magazine Construction - Lighting

- 5.2.3.1 Where lighting is necessary within the magazine, is only the following sources of lighting provided?
 - (1) Electric safety flashlights
 - (2) Electric safety lanterns
 - (3) Chemiluminescent lighting
 - (4) Electric light source outside the magazine that is aimed at the entrance
- 5.2.3.2 (1) Where electrical lighting is used within the magazine, are junction boxes containing fuses or circuit breakers and electrical disconnects shall be located at least 25 ft (7.6 m) from the magazine?
- 5.2.3.2 (2) Where electrical lighting is used within the magazine, are junction boxes located within the magazine without openings and equipped with close-fitting covers?
- 5.2.3.2 (3) Where electrical lighting is used within the magazine, are disconnects, fuses, and circuit breakers protected by a voltage surge arrester capable of handling 2500 amperes for 0.1 second?

- 5.2.3.2 (4) Where electrical lighting is used within the magazine, is all wiring from switches, both inside and outside the magazine, installed in rigid conduit?
- 5.2.3.2 (5) Where electrical lighting is used within the magazine, is wiring from switches located inside and outside the magazine that leads into the magazine installed underground?
- 5.2.3.2 (6) Where electrical lighting is used within the magazine, are conduit and light fixtures inside the magazine protected from physical damage by guards or by location?
- 5.2.3.2 (7) Where electrical lighting is used within the magazine, are light fixtures enclosed to prevent sparks or hot metal from falling on the floor or onto material stored in the magazine?
- 5.2.3.2 (8) When electrical lighting is used within the magazine, are lights inside magazines left off when the magazine is unattended?

Magazine Construction - Venting

- 5.2.4.2 Is stored materials placed so that they do not interfere with ventilation?
- 5.2.4.2 Is contact with walls, steel, or other ferrous metal prevented by means of a nonsparking lattice or equivalent lining?

Magazine Construction - Type 1 Magazines

- 5.3.1 Is the Type 1 magazine a permanent structure, such as a building or igloo, that is bullet resistant, fire resistant, theft resistant, weather resistant, and ventilated?
- 5.3.1 (1) Are walls and doors bullet resistant and constructed in accordance with any of the specifications in Annex B?
- 5.3.1 (2) Is the roof constructed of any type of structurally sound material that is or has been made fire resistant on the exterior?
- 5.3.1 (3) Where the natural terrain around a Type 1 magazine makes it possible for a bullet to be shot through the roof and ceiling at such an angle that the bullet can strike the explosive materials within, is either the roof or the ceiling of bullet-resistant construction?
- 5.3.1 (4) Is the foundation enclosed completely?
- 5.3.1. (4)(a) If a wood foundation enclosure is provided, is it covered on the exterior with not less than 26 gauge metal (except that openings provided for cross ventilation on the exterior of a wood foundation enclosure shall not be required to be covered with 26 gauge metal) ?
- 5.3.1 (5) Is the floor constructed of wood or other equivalent material?
- 5.3.1 (6) If floors are constructed of materials that can cause sparks, are they covered with a nonsparking surface or is the packages of explosive material packed on pallets of nonsparking material?

- 5.3.1 (7) Type 1 magazines shall be ventilated to prevent dampness or heating of explosives?
- 5.3.1 (7) (a) Are ventilation openings screened to prevent entrance of sparks?
- 5.3.1 (7) (b) Are ventilators in sidewalls offset or shielded?
- 5.3.1 (7)(c)(d) Do magazines with foundation and roof ventilators, with air circulating between the sidewalls and floor and between the sidewalls and ceiling, have a wood-lattice lining or equivalent means to prevent packages from being stacked against the sidewalls and blocking air circulation?
- 5.3.1 (7) (d) Are magazines with foundation and roof ventilators with air circulating between the sidewalls and floor and between the sidewalls and ceiling provided with 2 in. (51 mm) air space between the sidewalls and the floor.
- 5.3.1 (8) Is each door of the magazine equipped with one of the following locking systems:
- (a) Two mortise locks
 - (b) Two padlocks in separate hasps and staples
 - (c) A mortise lock and a padlock
 - (d) A mortise lock that needs two keys to be opened
 - (e) A three-point lock or an equivalent lock that secures the door to the frame at more than one point
- 5.3.1 (9) Do padlocks comply with all of the following requirements:
- (a) They shall be made of steel.
 - (b) They shall have at least five tumblers.
 - (c) They shall have at least a 3/8 in. (9.5 mm), casehardened shackle.
 - (d) They shall be protected by steel hoods installed to discourage the insertion of bolt cutters.
- 5.3.1 (10) Are doors secured by an internal bolt shall not require additional locking devices?
- 5.3.1 (11) Are hinges and hasps shall be fastened securely to the magazine?
- 5.3.1 (12) Is all locking hardware secured to the door frame?

Magazine Construction - Type 2 Magazines

- 5.3.2.1 Is the Type 2 magazine a portable or mobile structure, such as a box, skid-magazine, trailer, or semitrailer that is fire resistant, theft resistant, weather resistant, and ventilated?
- 5.3.2.2 Is the Type 2 magazine bullet resistant if used for outdoor storage?

Magazine Construction - Type 2 Outdoor Magazines

- 5.3.2.3 (1) Are walls and doors bullet resistant and constructed in accordance with any of the specifications in Annex B?

- 5.3.2.3 (1) Is the roof constructed of any type of structurally sound material that is or has been made fire resistant on the exterior?
- 5.3.2.3 (1) Where the natural terrain around a Type 1 magazine makes it possible for a bullet to be shot through the roof and ceiling at such an angle that the bullet can strike the explosive materials within, is either the roof or the ceiling of bullet-resistant construction?
- 5.3.2.3 (2) Are the doors constructed as follows:
 - (a) They shall be made of metal, and shall be bullet resistant and constructed in accordance with any of the specifications in Annex B.
 - (b) They shall have a metal exterior with an inner door and shall be bullet resistant and constructed in accordance with any of the specifications in Annex B.
- 5.3.2.3 (3) Are floors constructed of ferrous metal shall be covered with a nonsparking surface?
- 5.3.2.3 (4) Does a top-opening magazine shall have a lid that overlaps the sides by at least 1 in. (25.4 mm) when in the closed position?
- 5.3.2.3 (5) Is the magazine supported so that its floor does not contact the ground directly?
- 5.3.2.3 (6) Are magazines less than 3 ft³ (0.77 m³) in size fastened securely to a fixed object to prevent theft of the entire magazine?
- 5.3.2.3 (7) Do hinges, hasps, locks, and locking hardware comply with the following, excluding padlocks on vehicular magazines, which are not required to be protected by steel hoods?
 - (a) They shall be made of steel.
 - (b) They shall have at least five tumblers.
 - (c) They shall have at least a 3/8 in. (9.5 mm), casehardened shackle.
 - (d) They shall be protected by steel hoods installed to discourage the insertion of bolt cutters.
- 5.3.2.3 (8) If a vehicular magazine is left unattended, is one of the following actions taken:
 - (a) The wheels shall be removed.
 - (b) The kingpins shall be locked.
 - (c) The vehicular magazine shall be otherwise immobilized.

Magazine Construction - Type 2 Indoor Magazines

- 5.3.2.4 (1) Does the magazine have substantial wheels or casters to facilitate its removal from the building in case of emergency?
- 5.3.2.4 (2) Does the cover of the magazine have substantial strap hinges, and a means for locking as follows:
 - (a) The magazine shall be kept locked with a five-tumbler padlock or its equivalent.
 - (b) The magazine shall be permitted to be unlocked during the placement or removal of explosive materials.
- 5.3.2.4 (3) Is the magazine painted red, and does the top bear the words in white letters at least 3 in. (76 mm) high, "Explosives - Keep Fire Away" ?

- 5.3.2.4 (4) If the magazine is constructed of wood does it meet the following requirements:
- (a) It shall have sides, bottoms, and covers or doors of 2 in. (51 mm) hardwood that are braced at the corners.
 - (b) It shall be covered with sheet metal of not less than 26 gauge.
 - (c) Nails exposed to the interior of the magazines shall be countersunk.
- 5.3.2.4 (5) Do magazines constructed of metal meet the following requirements:
- (a) They shall be of 12 gauge sheet metal.
 - (b) They shall be lined with a nonsparking material.
 - (c) The edges of metal covers shall overlap the sides by at least 1 in. (25 mm).

Magazine Construction - Type 3 Magazines

- 5.3.3 Is the Type 3 magazine (day box) a portable structure that is fire resistant, theft resistant, and weather resistant?
- 5.3.3 (1) Is the magazine equipped with a five-tumbler padlock?
- 5.3.3 (2) Do magazines constructed of wood meet the following requirements:
- (a) They shall have sides, bottoms, and covers or doors of 4 in. (102 mm) hardwood that are braced at the corners.
 - (b) They shall be covered with sheet metal of not less than 26 gauge.
 - (c) Nails exposed to the interior of the magazine shall be countersunk.
- 5.3.3 (3) Do magazines constructed of metal meet the following requirements:
- (a) They shall be of 12 gauge sheet metal.
 - (b) They shall be lined with a nonsparking material.
 - (c) The edges of metal covers shall overlap the sides by at least 1 in. (25 mm).

Magazine Construction - Type 4 Magazines

- 5.3.4 Is the Type 4 magazine a permanent, portable, or mobile structure such as a building, igloo, box, semitrailer, or other mobile container that is fire resistant, theft resistant, and weather resistant?

Magazine Construction - Type 4 Outdoor Magazines

- 5.3.4.1 (1) Is the magazine constructed of the following:
- (a) Masonry
 - (b) Wood covered with sheet metal, fabricated metal, or a combination of these materials
- 5.3.4.1 (2) Are doors metal or wood covered with metal.
- 5.3.4.1 (3) Is the magazine is permanent, is the foundation enclosed completely?
- 5.3.4.1 (3) If the magazine is permanent, and if a wood foundation enclosure is provided, is it covered on the exterior with not less than 26 gauge metal (except that openings provided for cross ventilation on the exterior of a wood foundation enclosure shall not be required to be covered with 26 gauge metal) ?

- 5.3.4.1 (3) If the magazine is permanent, is each door of the magazine equipped with one of the following locking systems:
- (a) Two mortise locks
 - (b) Two padlocks in separate hasps and staples
 - (c) A mortise lock and a padlock
 - (d) A mortise lock that needs two keys to be opened
 - (e) A three-point lock or an equivalent lock that secures the door to the frame at more than one point
- 5.3.4.1 (4) If the magazine is vehicular, do hinges, hasps, locks, and locking hardware comply with the following, excluding padlocks on vehicular magazines, which are not required to be protected by steel hoods?
- (a) They shall be made of steel.
 - (b) They shall have at least five tumblers.
 - (c) They shall have at least a 3/8 in. (9.5 mm), casehardened shackle.
- 5.3.4.1 (4) If a vehicular magazine is left unattended, is one of the following actions taken:
- (a) The wheels shall be removed.
 - (b) The kingpins shall be locked.
 - (c) The vehicular magazine shall be otherwise immobilized.

Magazine Construction - Type 4 Indoor Magazines

- 5.3.4.2 Does the magazine have substantial wheels or casters to facilitate its removal from the building in case of emergency?
- 5.3.4.2 Does the cover of the magazine have substantial strap hinges, and a means for locking as follows:
- (a) The magazine shall be kept locked with a five-tumbler padlock or its equivalent.
 - (b) The magazine shall be permitted to be unlocked during the placement or removal of explosive materials.
- 5.3.4.2 Is the magazine painted red, and does the top bear the words in white letters at least 3 in. (76 mm) high, "Explosives - Keep Fire Away" ?
- 5.3.4.2 If the magazine is constructed of wood does it meet the following requirements:
- (a) It shall have sides, bottoms, and covers or doors of 2 in. (51 mm) hardwood that are braced at the corners.
 - (b) It shall be covered with sheet metal of not less than 26 gauge.
 - (c) Nails exposed to the interior of the magazines shall be countersunk.
- 5.3.4.2 Do magazines constructed of metal meet the following requirements:
- (a) They shall be of 12 gauge sheet metal.
 - (b) They shall be lined with a nonsparking material.
 - (c) The edges of metal covers shall overlap the sides by at least 1 in. (25 mm).

Storage Within Magazines

- 5.4.1 Are magazines supervised at all times by a competent person at least 21 years old who shall be responsible for enforcing all safety precautions?
- 5.4.2 Are all magazines containing explosives inspected at intervals not exceeding 7 days to determine whether there has been unauthorized or attempted entry or whether there has been unauthorized removal of the magazines?
- 5.4.3 Are magazine doors kept closed and kept locked at all times when the facility is not in operation?
- 5.4.4 Are magazine doors required to be closed and locked except during placement or removal of explosive materials or during inspection?
- 5.4.5 Are Containers of explosive materials piled in a stable manner and laid flat with top side up?
- 5.4.6 (1) Are containers not opened, unpacked, or repacked inside of or within 50 ft (15.2 m) of a magazine or in close proximity to other explosives except that fiberboard containers shall be permitted to be opened, unpacked or repacked inside of or within 50 ft (15.2 m) of a magazine?
- 5.4.7 Are tools used for opening containers of explosive materials nonsparking, unless they are metal slitters used for opening fiberboard containers?
- 5.4.8 Are magazines used exclusively for the storage of explosive and pyrotechnic materials?
- 5.4.8.2 Are metal tools other than nonferrous conveyors and ferrous metal conveyor stands protected with a coat of paint prohibited from being stored in magazines?
- 5.4.9 Are magazine floors swept regularly and kept clean, dry, and free of grit, paper, empty packing materials, and rubbish?
 - 5.4.9.1 Are brooms and other cleaning utensils free of spark-producing metal parts.
 - 5.4.9.2 Are sweepings from magazine floors disposed of in accordance with the manufacturer's instructions?
- 5.4.10 Is the manufacturer contacted for assistance when any explosive or pyrotechnic material has deteriorated to the extent that it has become unstable or dangerous?
- 5.4.11 Before repairs are made to the interior of a magazine, are all explosive or pyrotechnic material removed, and is the interior cleaned?
- 5.4.12 Before repairs are made to the exterior of a magazine where there is a possibility of causing sparks or fire, are all explosive and pyrotechnic material removed?
- 5.4.13 Are explosive or pyrotechnic material removed from a magazine undergoing repair stored as follows:

- (1) The material shall be either placed in another magazine or placed a safe distance from the magazine, where it shall be guarded and protected properly.
- (2) Upon completion of the repairs, the material shall be returned promptly to the magazine.

Miscellaneous Safety Precautions.

- 5.5.1 Are the following prohibited inside of or within 50 ft (15 m) of a magazine:
- (1) Smoking
 - (2) Matches
 - (3) Open flames
 - (4) Spark-producing devices
 - (5) Firearms, other than firearms carried by authorized security personnel
- 5.5.2 Is the area around a magazine shall be kept clear of brush, dried vegetation, leaves, and similar combustibles for a distance of at least 25 ft (7.6 m)?
- 5.5.3 Are combustible materials prohibited from being stored within 50 ft (15.2 m) of a magazine?

Requirements for Shipping Buildings for Display Fireworks.

- 5.6.1 Are shipping buildings separated from process buildings in accordance with the distances specified in Table 4.6.3?
- 5.6.2 Are shipping buildings separated from inhabited buildings, passenger railroads, public highways, and magazines in accordance with the distances specified in Table 4.6.4.1?
- 5.6.3 Are separation distances for shipping buildings for storage of display fireworks in accordance with Table 4.6.4.1 or Table 4.6.4.4, as appropriate, with a maximum of 50,000 lb (22,680 kg) net weight of display fireworks permitted to be stored.
- 5.6.4 Are separation distances for shipping buildings for the storage of finished salutes shall be in accordance with Table 4.6.4.4, with a maximum of 500 lb (227 kg) net weight of finished salutes permitted to be stored?
- 5.6.5 Are all electrical equipment and fixtures in a shipping building compliant with the requirements for hazardous locations in accordance with NFPA 70, National Electrical Code.
- 5.6.6 Are display fireworks awaiting packing and shipping permitted to be stored in a shipping building overnight, provided that the building is fire resistant and theft resistant?
- 5.6.6.1 Is the building locked when not in operation?
- 5.6.6.2 Are windows guarded with bars or similar protection?

Shipping Buildings.

- 5.7.1 Are shipping buildings used for storage compliant with requirements as magazines for the methods and types of construction, quantity limitations, and tables of distances?

- 5.7.2 Do shipping buildings not used for storage meet the same requirements as process buildings for the methods and types of construction, and the same quantity limitations and tables of distances as magazines?
- 5.7.3 For the purposes of applying Table 4.6.4.1, a shipping building for display fireworks shall be considered a magazine.
- 5.7.4 Are shipping buildings used as process buildings?
- 5.7.5 Are display fireworks, consumer fireworks, pyrotechnic articles, pyrotechnic devices, pyrotechnic materials, pyrotechnic special effects, pyrotechnics, fuses, electric matches, igniters, igniter cord, nondetonating fuse, fuses, black match, quick match, and other pyrotechnic devices and compositions prohibited from being stored in shipping buildings unless the shipping building complies with 5.7.1?
- 5.7.6 Do pyrotechnic or explosive compositions in shipping buildings remain in sealed containers?
- 5.7.7 Are loose pyrotechnic or explosive compositions prohibited in shipping buildings?
- 5.7.8 Are fireworks and other pyrotechnic or explosive devices in shipping buildings in open cartons or bins, or both, secured so they will not roll or fall?
- 5.7.10 Are tools and equipment used in shipping buildings made of or covered with non-spark-producing materials?
- 5.7.12 Are housekeeping requirements for magazines shall applied to shipping buildings?
- 5.7.13 Are security requirements for magazines applied to shipping buildings used for storage?