Report of the Committee on
Combustible Metals and Metal Dusts

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Alternates

(Lalt. to D. L. Oberholtzer)
Larry J. Moore, FM Global, CO [I]
(Voting Alt. to FM Global Rep.)

Nonvoting

Thomas J. Matesic, Reactive Metals & Alloys Corporation, PA
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Committee Scope: This Committee shall have primary responsibility for documents on safeguards against fire and explosion in the manufacturing, processing, handling, and storage of combustible metals, powders, and dusts.

This list represents the membership at the time the Committee was balloted on the text of this edition. Since that time, changes in the membership may have occurred. A key to classifications is found at the front of this book.

The Technical Committee on Combustible Metals and Metal Dusts is presenting six Reports for adoption, as follows:


NFPA 481 has been submitted to letter ballot of the Technical Committee on Combustible Metals and Metal Dusts, which consists of 12 voting members; of whom 9 voted affirmatively and 3 ballots were not returned (Klima, McConaghie, Moore.)


NFPA 482 has been submitted to letter ballot of the Technical Committee on Combustible Metals and Metal Dusts, which consists of 12 voting members; of whom 8 voted affirmatively and 4 ballots were not returned (Klima, Laporte, McConaghie, Moore.)


NFPA 484 is a compilation and redesignation of NFPA 480, NFPA 481, NFPA 482, NFPA 483, and NFPA 651.

NFPA 484 has been submitted to letter ballot of the Technical Committee on Combustible Metals and Metal Dusts, which consists of 12 voting members; of whom 8 voted affirmatively and 4 ballots were not returned (Christman, Klima, McConaghie, Moore.)


NFPA 485 has been submitted to letter ballot of the Technical Committee on Combustible Metals and Metal Dusts, which consists of 12 voting members; of whom 9 voted affirmatively and 3 ballots were not returned (Klima, McConaghie, Moore.)


NFPA 651 has been submitted to letter ballot of the Technical Committee on Combustible Metals and Metal Dusts, which consists of 12 voting members; of whom 9 voted affirmatively and 3 ballots were not returned (Klima, McConaghie, Moore.)
Chapter 8 Storage of Magnesium Solids

8-1 Storage of Pigs, Ingots, and Billets
8-1.1 Aisle widths shall be minimum of 10 ft (3 m). The pile height shall not exceed 20 ft (6.1 m).
8-1.2 Industrial buildings or separate storage areas in which magnesium is being stored in quantities greater than 500 lb (227 kg), or where magnesium is the primary hazard, should be labeled in accordance with NFPA 704, Standard System for the Identification of the Fire Hazards of Materials. This serves as a warning to fire fighters of the potential risk in the event of an emergency.
8-1.3 Yard (Outdoor) Storage
8-1.3.1 Magnesium ingots shall be carefully piled on firm and generally level areas to prevent tilting or toppling. Storage areas and yard pavements shall be well drained. The storage areas shall be kept free of grass, weeds and accumulations of combustible materials.
8-1.3.2 Readily combustible material shall not be stored within a distance of 25 ft (7.6 m) from any pile of magnesium.
8-1.3.3 An open space equal to the height of the piles plus 10 ft (3 m) shall be provided between the stored magnesium and adjoining property lines where combustible material or buildings are exposed or where the adjacent occupancy can provide fire exposure to the magnesium.
8-1.3.4 No cutting or burning shall be permitted without operating management approval.
8-1.4 Indoor Storage
8-1.4.1 Combustible flooring shall not be used under piles of ingots.
8-1.4.2 Storage should be on the first or ground floor. Basements or depressions below the magnesium storage area into which water or molten metal can flow should be avoided.
8-1.4.3 Automatic sprinkler systems are permitted only if the storage area is separate from areas of molten metal handling and processing.
8-1.4.4 Magnesium storage should be segregated from combustible materials.
8-2 Storage of Heavy Castings.
8-2.1 Combustible flooring shall not be used under piles of castings.
8-2.2 Storage should be on the first or ground floor. Basements or depressions below the magnesium storage area into which water or molten metal can flow should be avoided.
8-2.3 Aisle widths shall be a minimum of 10 ft (3 m). The pile height shall not exceed 20 ft (6.1 m). Aisles shall be maintained to permit inspection and effective use of fire protection and fighting equipment.
8-2.4 All magnesium castings shall be clean and free of chips or fine particles of magnesium when being stored.
8-2.5 Automatic sprinkler systems are permitted only if the storage area is separate from areas of molten metal handling and processing.
8-2.6 Industrial buildings or separate storage areas in which magnesium is being stored in quantities greater than 500 lb (227 kg), or where magnesium is the primary hazard, should be labeled in accordance with NFPA 704, Standard System for the Identification of the Fire Hazards of Materials. This serves as a warning to fire fighters of the potential risk in the event of an emergency.
8-3 Storage of Light Castings
8-3.1 Yard (Outdoor) Storage
8-3.1.1 Magnesium ingots shall be carefully piled on firm and generally level areas to prevent tilting or toppling. Storage areas and yard pavements shall be well drained. The storage areas shall be kept free of grass, weeds and accumulations of combustible materials.
8-3.1.2 Readily combustible material shall not be stored within a distance of 25 ft (7.6 m) from any pile of magnesium.
8-3.1.3 An open space equal to the height of the piles plus 10 ft (3 m) shall be provided between the stored magnesium and adjoining property lines where combustible material or buildings are exposed or where the adjacent occupancy can provide fire exposure to the magnesium.
8-3.1.4 No cutting or burning shall be permitted without operating management approval.
8-3.2 Indoor Storage
8-3.2.1 Combustible flooring shall not be used under piles of ingots.
8-3.2.2 Storage should be on the first or ground floor. Basements or depressions below the magnesium storage area into which water or molten metal can flow should be avoided.
8-3.2.3 Aisle widths shall be a minimum of 10 ft (3 m). The pile height shall not exceed 20 ft (6.1 m). Aisles shall be maintained to permit inspection and effective use of fire protection and fighting equipment.
8-3.2.4 All magnesium castings shall be clean and free of chips or fine particles of magnesium when being stored.
8-3.2.5 Automatic sprinkler systems are permitted only if the storage area is separate from areas of molten metal handling and processing.
8-3.3 Aisle widths shall be a minimum of 10 ft (3 m). The pile height shall not exceed 20 ft (6.1 m). Aisles shall be maintained to permit inspection and effective use of fire protection and fighting equipment. Light castings shall be segregated from other combustible materials and kept away from flames or sources of heat capable of causing ignition.
8-3.4 All magnesium castings shall be clean and free of chips or fine particles of magnesium when being stored.
8-3.5 Automatic sprinkler systems are permitted only if the storage area is separate from areas of molten metal handling and processing.

8-4 Storage in Racks or Bins
8-4.1 Racks shall be permitted to be extended along walls in original lengths. Aisle spaces in front of racks shall be equal to the height of the racks. All aisle spaces shall be kept clear.
8-4.2 Combustible rubbish, spare crates, and separators shall not be permitted to accumulate within the rack space. Separators and metal sheets shall not be stacked on edge and leaned against racks as they will prevent heat from a small fire from activating automatic sprinklers and act as shields against sprinkler discharge.
8-5 Storage of Scrap Magnesium
8-5.1 This section shall apply to the storage of scrap magnesium in the form of chips, turnings, swarf, or other fine particles.
8-5.2 Buildings shall be of noncombustible construction.
8-5.3 Dry magnesium scraps shall be kept well separated from other combustible materials. Scraps shall be kept in covered steel or other noncombustible containers and shall be kept in such manner or locations that they will not become wet. Outside storage of magnesium fines shall be permitted if such storage is separated from buildings or personnel and great care is exercised to avoid the fines forming wet becoming.
8-5.4* Wet magnesium scrap (chips, fines, swarf, or sludge) shall be kept under water in covered and vented steel containers in an outside location. Sources of ignition shall be kept away from the drum vent and top. Containers shall not be stacked.
8-5.5* Storage in quantities greater than 50 cu ft (1.4 cu m) (six 208 L drums) shall be kept separate from other occupancies by fire-resistant construction without windows opening to human or other combustible or reactive metals. Magnesium scrap storage areas shall be well ventilated to avoid the accumulation of hydrogen in the event that the scrap becomes wet.
8-5.6 Solid magnesium scrap, such as clippings and castings, shall be stored in noncombustible bins or containers pending salvage.
8-5.7 Oily rags, packing materials, and similar combustibles shall not be permitted in storage bins or areas storing solid magnesium scrap.
8-5.8 Automatic sprinkler systems in scrap magnesium storage buildings or areas shall be prohibited.
8-5.9 Fire extinguishing agents and systems compatible for the hazards present shall be readily available in magnesium scrap storage areas.
8-6 Storage of Magnesium Powder
8-6.1 Buildings used to store magnesium powder shall be one noncombustible single story construction.
8-6.2 Automatic sprinkler systems in such buildings are strictly prohibited.
8-6.3 Magnesium powder shall be kept well separated from other combustible or reactive metals.
8-6.4 Magnesium powder shall be stored in closed steel drums or other closed noncombustible containers.
8-6.5* Magnesium powder storage areas shall be dry and checked for water leakage.
8-6.6 Fire extinguishing agents and systems compatible for the hazards present shall be readily available.
8-6.7 Where magnesium powder in drums is stacked for storage, the maximum height shall not exceed 18 ft (5.5 m). Stacked storage shall be done in such a manner so as to ensure stability. Under no circumstance shall containers be permitted to topple over. No stacking is recommended.
8-7 Storage of Other Magnesium Products
8-7.1 This section shall apply to the storage of other magnesium products in warehouses, wholesale facilities and retail outlets in which magnesium makes up the major portion of the articles on a volumetric basis.
8-7.2 Combustible flooring shall not be used under piles of ingots.
8-7.3 Aisle widths shall be a minimum of 8 ft (2 m). Storage height shall not exceed 20 ft (6.1 m)
8-7.4 Automatic sprinkler systems are required where buildings are of combustible construction or the magnesium products are packed in combustible crates or cartons, or there is other combustible storage within 30 ft (9 m) of the magnesium.
8-7.5. Industrial buildings or separate storage areas in which magnesium is being stored in quantities greater than 500 lb (227 kg), or where magnesium is the primary hazard, should be labeled in accordance with NFPA 704, Standard System for the Identification of the Fire Hazards of Materials. This serves as a warning to fire fighters of the potential risk in the event of an emergency.

SUBSTANTIATION: Insurance carriers and underwriters use NFPA 480 as a guide in qualifying warehouses for the storage of magnesium. Lacking an understanding of the metal and the industry, the standard should be written in such a way as to avoid confusion in the storage of material.

Concerns include a definition of “aisle”. If an aisle is the area between a group or rows, limiting the size of a “pile” to a number of pounds is not practical or realistic. If an aisle is space around a group of rows, or around all four sides of a group of rows, again it is not practical in as much as warehouses and consumers will use space in the most efficient manner possible.

Without referring to NFPA’s definition of noncombustible as tested per ASTM E136 and assuming that wooden pallets would fall in this definition, again it is not practical as producers and commercial warehouses may store and ship magnesium pigs, ingots, and billets on wooden pallets. This would occur with wrought products.

Commercial warehouses are commonly protected by sprinkler systems. Storage of pigs, ingots and billets in sprinkler protected warehouses should be allowed.

COMMITTEE ACTION: Reject.

COMMITTEE STATEMENT: This proposal was made to a document that is being withdrawn. The document being withdrawn is being incorporated into anew standard, NFPA, Standard for Combustible Metals, Metal Powders, and Metal Dusts. The committee will review this proposal after NFPA 484 is issued to determine whether the proposal would require any changes to NFPA 484.

NFPA 482

482-1 - (Entire Document): Accept

SUBMITTER: Technical Committee on Combustible Metals & Metal Dusts

RECOMMENDATION: This proposal was made to a document that is being withdrawn. The document being withdrawn is being incorporated into anew standard, NFPA, Standard for Combustible Metals, Metal Powders, and Metal Dusts. The committee will review this proposal after NFPA 484 is issued to determine whether the proposal would require any changes to NFPA 484.

NFPA 484

484-1 - (Entire Document): Accept

SUBMITTER: Technical Committee on Combustible Metals & Metal Dusts

RECOMMENDATION: This proposal was made to a document that is being withdrawn. The document being withdrawn is being incorporated into anew standard, NFPA, Standard for Combustible Metals, Metal Powders, and Metal Dusts. The committee will review this proposal after NFPA 484 is issued to determine whether the proposal would require any changes to NFPA 484.

Larry Ditscheit, West Bend Mutual Ins. Co.