

Chapter 2

SETTING UP STORAGE AREAS FOR HAZARDOUS MATERIALS

Whether checking in new products or maintaining current stock, hazardous materials (HM) must be properly stored to minimize hazards to personnel and property. HM can be stored in storage cabinets, storage rooms, warehouses, or racks. In addition, there are special guidelines for storing compressed gases.

WARNING!

DO NOT use or store non-ORARNG purchased hazardous materials

DO NOT store tools or personal items in any HM storage location.

DO NOT store materials, such as cardboard, paper, or rags, with flammable HMs.

DO NOT store HM in trailers and vehicles without secondary containment, personal wall lockers, near floor drains, or in areas with high foot or vehicle traffic.

DO NOT use wood to construct additional or replacement shelving.

DO NOT store or consume food in any HM storage location.

1. EXPLOSIVES

The receipt, storage, issue, care and preservation of ammunition and explosives at ORARNG facilities are beyond the scope of this regulation.

2. HAZARDOUS MATERIALS: GENERAL REQUIREMENTS

a. All containers of HM must be labeled, tagged, or marked with the identity of the material, appropriate hazard warnings and the name and address of the manufacturer.

b. In all occupied buildings, quantities of flammable and combustible liquids in excess of 10 gallons but less than 60 gallons will be stored in liquid storage cabinets. Quantities less than 10 gallons are allowed to be stored outside of a cabinet when in approved containers. Quantities greater than or equal to 60 gallons will be stored in a liquid storage room or liquid storage warehouse.

c. Fertilizers will not be stored in the same location as POLs.

d. Oily rags and similar materials shall be stored in metal or metal-lined containers equipped with tight fitting covers.

e. Maintenance and operating practices will control leakage and spillage. Provisions shall be made and maintained for the detection of leakage. Spills will be cleaned up promptly and reported in accordance with ORARNGR 210-6 Installation Spill Contingency Plan.

f. The storage of empty containers previously used for the storage of flammable

or combustible liquids, unless free from explosive vapors, shall be stored as required for filled containers. Containers when emptied shall have the covers or plugs immediately replaced in openings.

g. When processes or conditions exist where a flammable mixture could be ignited by static electricity, means shall be provided to prevent the accumulation of a static charge through bonding.

h. Incompatible materials stored or in use shall be separated when the materials are in containers having a capacity of more than 5 pounds or 1/2 gallon. Separation shall be accomplished by:

- (1) Segregating incompatible materials storage by a distance of not less than 20ft.
- (2) Isolating incompatible materials storage by a noncombustible partition.
- (3) Storing liquid and solid materials in hazardous materials storage cabinets.

i. Water reactive materials will not be stored in the same room with flammable or combustible liquids.

j. Spill control and secondary containment for hazardous materials liquids is required.

k. HM will be stored within their own compatibility group by Hazard Characteristic Code (HCC). See chapter 3 for additional information.

3. FLAMMABLE AND COMBUSTIBLE LIQUIDS STORAGE INDOORS

a. Flammable and combustible liquids/material shall not be stored in boiler rooms, mechanical rooms or electrical equipment rooms.

b. Storage in office spaces is prohibited except for what is required for maintenance and operation of the building and operation of equipment. Such storage, regardless of quantity, shall be kept in closed metal containers stored in a storage cabinet or in safety cans or in an inside storage room not having a door that opens into that portion of the building used by the public.

c. At least one portable fire extinguisher having a rating of not less than 12-B units shall be located outside of, but not more than 10 feet from, the door opening into any room used for storage.

d. At least one portable fire extinguisher having a rating of not less than 12-B units must be located not less than 10 feet, nor more than 25 feet, from any Class I or Class II liquid storage area located outside of a storage room but inside a building.

e. Storage of liquid and solid oxidizers is allowed when stored in hazardous materials storage cabinets and shall not contain other materials.

4. FLAMMABLE AND COMBUSTIBLE LIQUIDS STORAGE OUTDOORS

a. These requirements do not apply to flammable or combustible paints, oils, varnishes, or similar mixtures used for painting or maintenance when not kept for a period in excess of 30 days.

b. Storage of containers or portable tanks will have a 12-foot wide fire apparatus access road within 200 feet of each container or portable tank. The storage area shall be protected against tampering or trespassers where necessary and shall be kept free of weeds, debris and other combustible materials not necessary to the storage. The area surrounding an exterior storage area shall be kept clear of such materials for a minimum distance of 15 feet.

c. Spill control - The storage area shall be graded in a manner to divert possible spills away from buildings or other exposures or shall be surrounded by a curb at least 6 inches high. When curbs are used, provisions shall be made for draining of accumulations of ground or rainwater or spills of flammable or combustible liquids. Drains shall terminate at a safe location and shall be accessible to operation under fire conditions.

d. Secondary containment for outdoor storage areas shall be designed to contain a spill from the largest individual vessel. If the area is open to rainfall, secondary containment shall be designed to include the volume of a 24-hour rainfall as determined by a 25-year storm and provisions shall be made to drain accumulations of groundwater and rainwater.

e. Suitable fire control devices, such as small hose or portable fire extinguishers, shall be available at locations where flammable or combustible liquids are stored.

5. FLAMMABLE AND COMBUSTIBLE LIQUIDS SPRAYING AREAS AND PAINT STORAGE ROOMS

a. **NO SMOKING** and **NFPA 704** warning signs shall be posted in storage rooms or areas.

b. **Conspicuous signs with the following warning** will be posted in the vicinity of spraying areas and paint storage rooms:

NO WELDING

The use of welding or cutting equipment in or near this area is dangerous because of fire and explosion hazards. Welding and cutting shall be done only under the supervision of the person in charge.

c. Secondary containment for indoor storage areas shall be designed to contain a spill from the largest vessel.

6. LIQUID STORAGE CABINETS

a. The combined quantity of Class I and II liquids in a cabinet will not exceed 60 gallons and the total quantities of all liquids will not exceed 120 gallons.

Maximum Size of Containers					
Container Type	Flammable Liquids			Combustible Liquids	
	Class IA	Class IB	Class IC	Class II	Class III
Glass (1)	1 pt	1 qt	1 gal	1 gal	1 gal
Metal (other than DOT drums) or listed approved plastic (2)	1 gal	5 gal	5 gal	5 gal	5 gal
Approved plastic (2)	0 gal	0 gal	0 gal	0 gal	5 gal
Safety cans	2 gal	5 gal	5 gal	5 gal	5 gal
Metal drums (DOT specifications)	60 gal	60 gal	60 gal	60 gal	60 gal

1. Class I-A and I-B liquids are allowed to be stored in glass containers of not more than 1-gallon capacity if the required liquid purity, such as American Chemical Society analytical reagent grade or higher, would be affected by storage in metal containers or if the liquid would cause excessive corrosion of a metal container.

2. Plastic containers shall not be used for storage of Class I or II liquids unless such containers are listed and approved for such storage or the containers are stored in liquid storage rooms or liquid storage warehouses.

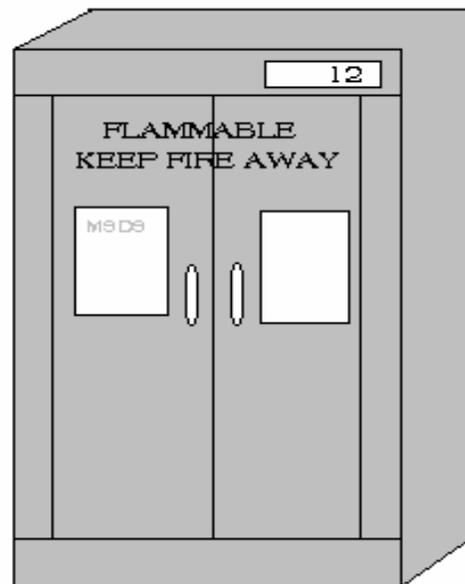
- b. Doors shall be well fitted, self-closing and equipped with a latch.
- c. The bottom of the cabinet shall be liquid tight to a height of at least 2 inches.
- d. Cabinets shall be constructed of metal and approved by the Fire Chief.

TO SET UP A LIQUID STORAGE CABINET

Use storage cabinets in the work area to store daily amounts of commonly used HMs, such as grease tubes, quart oilcans, aerosol cans, etc. Cabinets must be approved by the NFPA. The color of the cabinet depends on the HM being stored:

HM Type	Cabinet Color
Flammables	Yellow/Red
Corrosives	Blue
Oxidizers	no special color

Be sure to keep your cabinets clean and orderly and to maintain all structural integrity and hardware, including doors, hinges, and shelves. Do not remove the door or ventilation bungs, penetrate the wall, modify ventilation, or otherwise modify the locker. Keep cabinet doors closed when materials are not being transferred.



STEP 7. Inspect, extend, or turn in any chemicals that are out of shelf life compliance IAW Chapter 3.

STEP 8. Ensure all chemicals in the cabinet are compatible IAW Chapter 3.

STEP 9. Organize the cabinet. Ensure materials within the cabinet are orderly and that no containers within are open.

STEP 10. Mark each MSDS with the complete product identification number as determined in STEP 2.

STEP 11. Indicate location of MSDS with a sign on cabinet door.

STEP 12. Complete a HM Inventory Form (AGO Form 200-1-3 IAW Chapter 7) and place it in a plastic sleeve on the outside of the cabinet door and inside the MSDS binder.

7. SHELF STORAGE

a. Shelving shall be of substantial construction, adequately braced and anchored to prevent tipping during normal usage or during periods of seismic activity.

b. Shelves shall be of sufficient depth and provided with a lip or guard to prevent individual containers from being easily displaced. Exception: Shelves in storage cabinets designed for such use.

c. Shelf storage of flammable and combustible liquids shall be maintained in an orderly manner.

d. Combustible commodities shall not be stored above flammable or combustible liquids.

8. STORAGE ROOMS AND WAREHOUSES

Keep rooms and warehouses clean and orderly, and maintain all structural integrity and hardware including doors, hinges, and shelves. Do not remove doors, penetrate walls, modify ventilation, or otherwise modify the room or warehouse.

TO SET UP STORAGE ROOMS AND WAREHOUSES

STEP 1. Inspect the location before use.

STEP 2. Provide primary and secondary containment. Secondary containment must equal the capacity for the largest container stored within the area plus 10%.

STEP 3. Ensure appropriately rated fire extinguisher and spill response equipment are located nearby.

STEP 4. Assign a two-digit number (i.e., 01) to the room or warehouse and mark it on all doors.

Each room or warehouse must have a unique number designator. Do not use designators more than once in any building. If you share your building with another activity, coordinate numbers so as not to use the same designator.

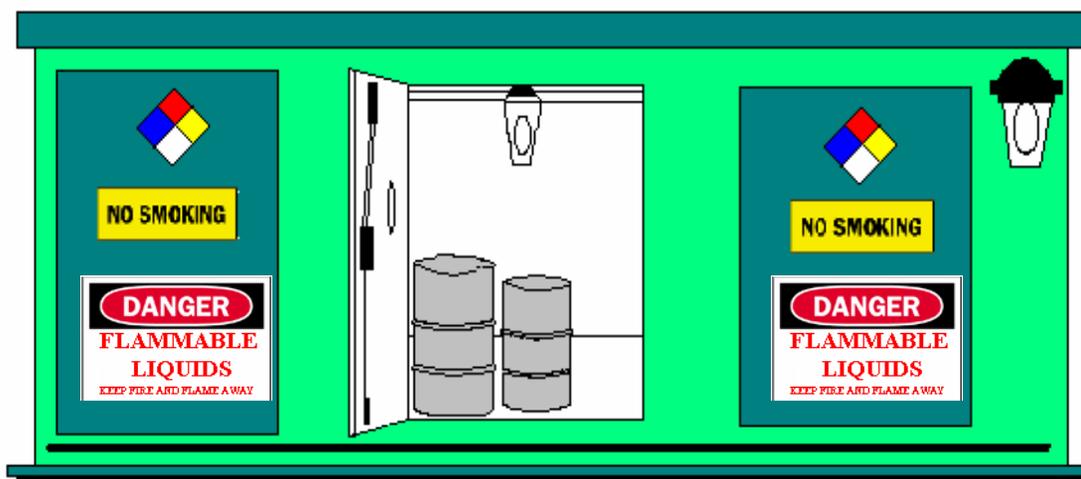
STEP 5. Post the following signs:

NFPA 704

NO SMOKING

DANGER - FLAMMABLE LIQUIDS KEEP FIRE AND FLAME AWAY

Do not place unauthorized signs, labels, stickers or marking on the room or warehouse.



STEP 6. Using the inventory information, obtain an MSDS for each HM stored in the storage room or warehouse.

STEP 7. Inspect, extend, or turn in any chemicals that are out of shelf life compliance IAW Chapter 3.

STEP 8. Ensure all chemicals in the storage area are compatible IAW Chapter 3.

STEP 9. Organize the room or warehouse:

STEP 9-1. Ensure containers over 30-gallon capacity are not stacked on each other.

STEP 9-2. Mark a unique shelf ID number on the shelf.

STEP 10. Mark each MSDS with the complete product identification number as determined in STEP 4.

STEP 11. Indicate location of MSDS with a sign on the inside of the storage area.

STEP 12. Complete a HM Inventory Form IAW Chapter 7 and place in a plastic sleeve on the inside of the storage area.

9. STORAGE FOR COMPRESSED GASES

This section does not apply to fire extinguishers or aerosol spray cans.

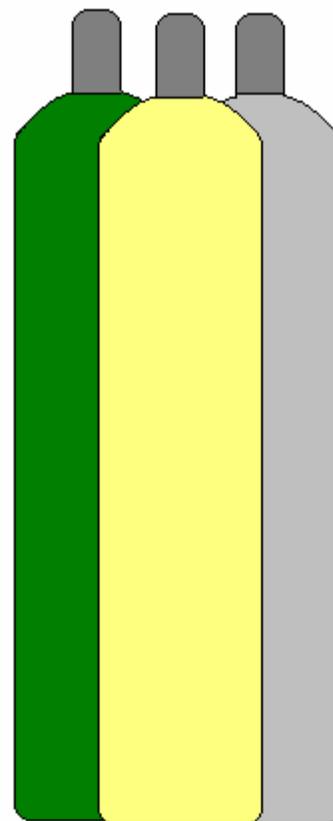
a. If you are storing compressed gases, there are additional guidelines to follow. A compressed gas is a gas that is packaged under charged pressure. Because compressed gases are under pressure, handle such gases with extreme care, particularly the flammable and explosive gases. Keep the following guidelines in mind when storing compressed gases:

DO NOT use cylinders as rollers or supports, or for any other unintended purpose.

DO NOT accept, issue, or use a cylinder unless the contents are identified.

DO NOT use cylinders that are not properly marked (unmarked).

b. Flammable and oxidizing gases including gas cylinders not exceeding 250 cubic feet at normal temperature and pressure are allowed to be stored indoors when used for maintenance purposes or operation of equipment.



TO SET UP STORAGE FOR COMPRESSED GASES

STEP 1. Select a safe area:

- Ensure all electrical installations are properly grounded; ensure cylinders are not used for grounding.
- Ensure shelves, racks, and floors of storage areas are of noncombustible or limited-combustible materials. Ensure they will support the weight of the cylinders.
- Ensure a complete change of air at least six times each hour.

If you are storing gas cylinders outdoors, follow these guidelines:

- Ensure security is adequate. Store gas cylinders in a roofed, open-sided shed with an above-grade concrete slab.
- Ensure sheds are of a noncombustible material.
- Do not heat sheds.
- Ensure storage facilities are at least 50 feet from other buildings.
- Ensure a complete change of air at least six times each hour.
- Keep storage areas clear of dry vegetation and combustible materials for at least 15 feet.
- Keep cylinders out of the sun, off the ground and away from surfaces where water can

accumulate.

- Protect storage areas from vehicle traffic.

STEP 2. Use locks and signs to secure the area:

- Lock storage areas to prevent unauthorized entry.
- Place an **NFPA 704** sign where it can easily be seen
- Post "**NO SMOKING**" signs. Do not allow open flames within 20 feet.
- Place hazard identification signs such as "**COMPRESSED GAS**" at all entrances.

STEP 2A. Stationary compressed gas containers, cylinders and tanks on welding carts only require the following:

- Place an **NFPA 704** sign on the cylinder
- Post "**NO SMOKING**" sign on the cylinder.

STEP 3. Tag and label filled cylinders with the proper name and stock number for the gas.

DO NOT alter or remove labels applied by the gas manufacturer or mark on cylinders.

STEP 4. Place cylinders carefully:

- Secure cylinders being used or stored so they do not fall over.
- Store liquefied flammable gas cylinders upright or so the pressure relief valve directly communicates with the vapor space of the cylinder.
- DO NOT place cylinders where they could become part of an electrical circuit.
- DO NOT drop cylinders or permit them to strike against each other violently.
- Separate all cylinders by compatibility and away from combustible materials:
- Segregate incompatible or combustible materials by at least 20 feet OR
- Isolate incompatible or combustible materials with a barrier of noncombustible material at least 5 feet high and with a minimum fire resistance rating of 30 minutes.

STEP 5. If you must move cylinders, note the following precautions:

- Close cylinder valves before moving cylinders
- DO NOT lift cylinders by the valve protection cap
- DO NOT lift cylinders by cranes or mechanical lifts unless fastened in proper containers, racks, and cradles. Do not use rope and chain slings or electromagnets to lift cylinders.
- Only handle, ship, or store cylinders if they have valve protection caps.

Exceptions are:

- small cylinders of less than 40-pound capacity
- "ram-bottom" type cylinders
- cylinders with less than 625 cubic inches of volumetric capacity, such as medical gases

STEP 6. You must include cylinders in the hazardous materials inspection program (see Chapter 7). When you inspect cylinders, check for the following items:

- Ensure the valve outlet connectors of both full and empty cylinders have an authorized dust cap.
- Ensure oxygen cylinders are free from grease and oil
- Tag empty cylinders as "EMPTY" and store them with the valves closed and away from full cylinders.

STEP 7. Complete a HM Inventory Form IAW Chapter 7 and place in a plastic sleeve on the inside of the storage area.

10. PORTABLE TANKS and TANK & PUMP UNITS (TPU)

a. Tanks over 100 gallons in capacity permanently installed or mounted shall bear a label or placard that identifies its contents. Storage areas for TPUs shall be marked with a visible hazard identification sign (**NFPA 704**) and a **NO SMOKING** warning sign.

b. Portable and semi portable tanks are allowed to be temporarily used in conjunction with the dispensing of Class I, II or II-A liquids into the fuel tanks of motor vehicles or other motorized equipment on premises not normally accessible to the public when approved by the local fire chief.

c. The storage of empty tanks previously used for the storage of flammable or combustible liquids, unless free from explosive vapors, shall be stored as required for filled tanks. Tanks when emptied shall have the covers or plugs immediately replaced in openings.

d. Storage areas for portable tanks shall be provided with spill control and secondary containment.

11. TANK VEHICLES (HEMET) and REFUELERS

a. Tank vehicles **shall not** be used as storage tanks.

b. Tank vehicles shall bear a label or placard that identifies its contents. Storage areas for tank vehicles shall be marked with a visible hazard identification sign (**NFPA 704**) and a **NO SMOKING** warning sign.

c. Liquids used as fuels may be transferred from tank vehicles into the tanks of motor vehicles provided:

- (1) The dispensing line does not exceed 50 feet in length.
- (2) The dispensing nozzle is an approved type.

(3) Tank vehicle dispensing equipment is operated only by designated personnel who are trained to handle and dispense motor fuels, and;

(4) Provisions are made for controlling and mitigating unauthorized discharges.

d. Dispensing from tank vehicles shall be conducted at least 50 feet from structures or combustible storage.

e. Smoking by tank vehicle drivers, helpers or other personnel is prohibited while they are driving, making deliveries, filling or making repairs to tank vehicles.

f. Storage areas for tank vehicles shall be provided with spill control and secondary containment.

12. ABOVEGROUND STORAGE TANKS (AST) FLAMMABLE AND COMBUSTIBLE LIQUIDS

a. Secondary containment on aboveground storage tanks shall be monitored either visually or automatically.

b. Guard posts or other approved means will be provided to protect storage tanks and connected piping, valves and fittings; dispensing areas; and use areas subject to vehicular damage.

c. A spill container having a capacity of not less than 5 gallons shall be provided for each fill connection. For tanks with a top fill connection, spill containers shall be noncombustible and shall be fixed to the tank and equipped with a manual drain valve which drains into the primary tank. For tanks with a remote fill connection, a portable spill container shall be provided.

d. Tank vehicles shall not be parked within 25 feet of an AST except for when the tank is being filled from the tank vehicle.

e. The following signs are required to be posted on the AST: **NO SMOKING, NFPA 704, DANGER - FLAMMABLE LIQUIDS KEEP FIRE AND FLAME AWAY.**

f. USED OIL AST will have the following signs posted on the AST: **NO SMOKING, NFPA 704,** and the words **USED OIL.**

13. SPECIAL REQUIREMENTS FOR AIRCRAFT

a. Flammable and combustible liquids shall not be dispensed into or removed from the fuel system of an aircraft within an aircraft hangar.

b. Aircraft, engines and parts of aircraft shall not be cleaned with a flammable liquid in

an aircraft hangar or within 50 feet of another aircraft, building or hangar. Aircraft hangars shall be equipped and maintained with metal drip pans under the engines of aircraft stored or parked therein.

c. Combustible materials and other HM stored in an aircraft hangar shall be stored in flammable storage cabinets in compatible containers. The area shall be posted **NO SMOKING, FLAMMABLE-KEEP FIRE AWAY**, and an **NFPA 704**.

d. Portable fire extinguishers at aircraft fuel dispensing stations shall be located within 75 feet of pumps or dispensers.

14. MOTOR VEHICLE FUEL-DISPENSING STATIONS

a. All portions of the vehicle being fueled shall be on the premises of the motor vehicle fuel-dispensing station.

b. Unsupervised dispensing is allowed when the owner or operator provides, and is accountable for, daily site visits, regular equipment inspection and maintenance, conspicuously posted instructions for the safe operation of dispensing equipment, and posted telephone numbers for the owner or operators. **A sign shall be posted in a conspicuous location reading:**

<p>IN CASE OF FIRE, SPILL OR RELEASE</p> <p>1. Use emergency pump shutoff!</p> <p>2. Report the accident!</p> <p style="padding-left: 20px;">AGI-ENV 503-584-3863/3914, during normal working hours</p> <p style="padding-left: 20px;">OMD Staff Duty Officer, 503-584-3980, after normal hours</p> <p style="padding-left: 20px;">Fire Department Telephone No. _____</p> <p style="padding-left: 20px;">Facility Address _____</p> <p style="padding-left: 20px;">_____</p>
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c. In addition to the sign above the following signs must be conspicuously posted within sight of each fuel dispenser:

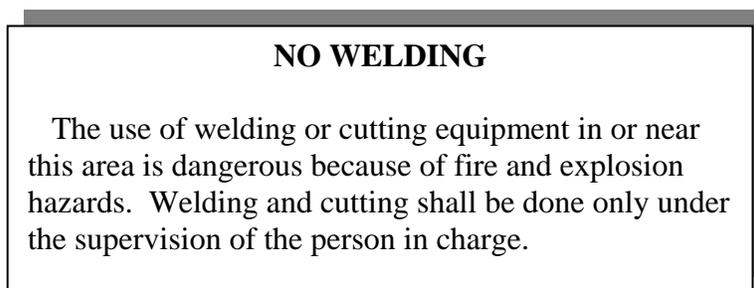
NO SMOKING
DANGER - FLAMMABLE LIQUIDS KEEP FIRE AND FLAME AWAY,
STOP VEHICLE ENGINES
WARNING - It is unlawful and dangerous to dispense gasoline into unapproved containers

d. During hours of operation, stations having unsupervised dispensing shall be provided with a fire alarm transmitting device.

e. Portable fire extinguishers shall be provided.

15. DIP/SOLVENT TANKS CONTAINING FLAMMABLE OR COMBUSTIBLE LIQUIDS

- a. Areas in the vicinity of dip/solvent tanks shall be kept as clear of combustible materials as practical and shall be kept entirely free of combustible debris.
- b. Dip/solvent tanks shall be located away from floor drains and floor cracks.
- c. Dip/solvent tanks located in a building used for assembly of personnel, shall be located in a room designed for the purpose, protected with an approved automatic sprinkler system.
- d. Waste or rags used in connection with dipping operations will be placed in approved metal waste cans with lids immediately after use.
- e. Weekly inspections of all dip/solvent tanks will be made, including covers, overflow pipe inlets, and discharge bottom drains and valves, electrical wiring and grounding connections documented using AGO Form 200-1-8 which is contained in ORARNG Pam 200-1 Chapter 8.
- f. **NO SMOKING** signs will be conspicuously posted in the vicinity of dip/solvent tanks.
- g. Areas in the vicinity of dip/solvent tanks shall be provided with manual fire extinguishers suitable for flammable and combustible liquid fires.
- h. Covers shall be kept closed when tanks are not in use.
- i. **Conspicuous signs with the following warning shall be posted in the vicinity of dipping operations.**



- j. In addition to the signs above the following will be posted in the area: **NFPA 704** and **DANGER FLAMMABLE LIQUIDS KEEP FIRE AND FLAME AWAY.**

16. AEROSOL PRODUCTS

- a. Aerosol products in storage shall be packaged in cartons.

- b. Shelf storage shall be of substantial construction, adequately braced and anchored.
- c. Aerosol products shall not be stored in basements.
- d. Aerosol containers are considered a reactive hazardous waste by DEQ until they have been fully aspirated and the container punctured.
- e. Comply with the HCC for storage location.

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