

NFPA 704: Standard System for the Identification of the Hazards of Materials for Emergency Response

Frequently Asked Questions

1. What is NFPA 704?

NFPA 704 provides a simple, readily recognized, easily understood system for identifying the specific hazards of a material and the severity of the hazard that would occur during an emergency response. The system addresses the health, flammability, instability, and special hazards presented from short-term, acute exposures that could occur as a result of a fire, spill, or similar emergency. The Lake Havasu City Fire Department endorses this standard. Please read and use the information in this document along with the **NFPA 704 Warning Placard Requirements** document to properly mark your building/facility/premises. (See Question 14 for additional information)

2. How does the 704 label differ from other hazardous material labels?

There are several widely used systems for labeling hazardous materials. Each has a specific purpose and it is important to recognize the differences between each. Table 1 provides a brief summary of the purpose and use of three common labeling systems used for hazardous materials. Note that you may see more than one label on a container depending on the situation. (See Question 12 for additional information on the differences between OSHA HazCom 2012 classifications and NFPA 704 ratings)




Label Type	Purpose	Typical Label Location	Label Example
NFPA 704 Diamond www.nfpa.org/704	Provides information about hazards that occur during emergency response	Outside buildings, on doors, on tanks, visible to emergency responders during spill or fire	
DOT Placard www.dot.gov/	Provides information about hazards to transportation workers and emergency responders	Tank cars, cargo tanks, portable tanks, bulk packages, vehicles or containers containing non-bulk packages	
OSHA HazCom 2012 www.osha.gov/	Provides information about hazards to workers using chemicals under normal conditions of use	Pipes, drums, and containers of materials that are used in the workplace	

Table 1. NFPA, DOT and OSHA Placard and Pictograms

3. What information on the SDS do I use to rate my hazardous materials?

The ratings can be determined by using the information found on a HazCom 2012 compliant Safety Data Sheet (SDS), formerly known as MSDS, and comparing it to the criteria provided in NFPA 704. The following sections of the SDSs should be reviewed when determining the ratings:

Health – Sections 2, 4, 8, 9, 11

Flammability – Sections 2, 3, 9

Instability/Reactivity – Sections 5, 7, 10

Special Hazards – Sections 5, 9, 10, 11

Determine each material stored or used at the facility and its warning system category and rating. Refer to the MSDS/SDS for your building/facility. See **STEP ONE** in the **NFPA 704 WARNING PLACARD REQUIREMENTS** document. (See Question 14 for additional information).

Caution!! Do NOT use the hazard category numbers given in section 2 of HazCom 2012 compliant SDSs as hazard ratings to be placed on 704 labels! (See Question 12 for additional information).

4. When am I required to use the NFPA 704 rating system?

NFPA 704 labels are required when the Lake Havasu City Fire Department requires their use. NFPA 704 does not specify when a container, tank or facility must label with the 704 diamond. It tells you HOW to label when your building or premises is required to provide or maintain such labeling. To determine the need for placards, compare the total amount of materials with the same hazard category number to the amount requiring placards for each hazard category number. See **STEP TWO** in the **NFPA 704 WARNING PLACARD REQUIREMENTS** document.

5. Why should I use the NFPA 704 rating system?

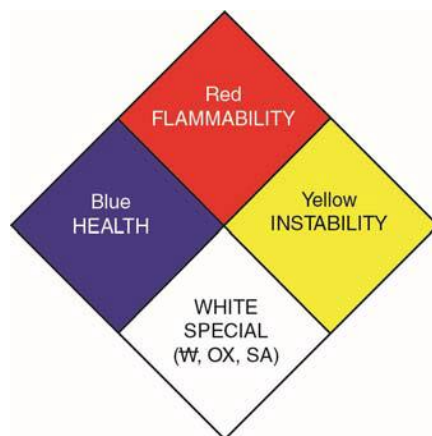
NFPA 704 labels provide an appropriate signal or alert for the protection of emergency response personnel, assist in planning for effective fire and emergency control operations, including cleanup. It can also assist all designated personnel, engineers, plant, and safety personnel in taking inventory and evaluating the relative hazards of materials in their facility

6. How is the rating displayed?

The system is characterized by the "diamond" that is actually a "square-on-point" shape. It identifies the hazards of a material and the degree of severity of the health, flammability, and instability hazards. Hazard severity is indicated by a numerical rating that ranges from zero (0) indicating a minimal hazard, to four (4) indicating a severe hazard. The hazards are arranged spatially as follows: Health at nine o'clock position, Flammability at twelve o'clock position, and Instability (Reactivity) at three o'clock position.

In addition to the spatial orientation that can be used to distinguish the hazards, they are also color-coded as follows: **blue for health**, **red for flammability**, and **yellow for instability/reactivity**. The shades of red, blue and yellow are not regulated, but should be contrasting colors. The hazard ratings may have colored backgrounds with contrasting colored numerals or colored numerals with a white background.

The six o'clock position on the symbol represents special hazards and has a white background. The special hazards in use include W, OX and SA. W, indicates unusual reactivity with water and is a caution about the use of water in either firefighting or spill control response. OX, indicates that the material is an oxidizer. SA, indicates that the material is a simple asphyxiant gas (nitrogen, helium, neon, argon, krypton or xenon.)



7. What other symbols can go in the special hazards quadrant of the "diamond"?

The only authorized symbols are the W, OX, and SA symbols described above. The number of symbols is kept to a minimum for emergency visibility and simplicity reasons. Many people ask about placing additional symbols such as "corr" for corrosive or "acid" for acids, but these hazards are already taken into account in the health rating that is located in the blue section of the symbol.

8. Who provides NFPA 704 ratings and can I find those ratings in the Standard?

While the system is simple in application, the hazard evaluation should be performed by persons who are technically competent and experienced in the interpretation of the hazard criteria as set forth in Chapters 5-8 of the NFPA 704 standard. A qualified individual can determine the ratings for a material by comparing data from the Manufacturer-supplied Safety Data Sheets (**MSDS / SDSs**) to the criteria located in NFPA 704. Though it is not required, some SDSs include the NFPA 704 diamond symbol with ratings, and some SDS provide the NFPA 704 rating numbers within text of the SDS. While the criteria are located in NFPA 704, the actual ratings for specific chemicals are not included in the document. Ultimately the user is responsible for rating materials using the SDS and the criteria located in the latest edition of NFPA 704.

9. Where should I post the NFPA 704 placards at my facility and how many placards should I use?

It is important to note that the placard is meant to provide quick hazard information for emergency responders. It should be visible in case of an emergency where the responders are likely to enter. If there are numerous areas where the responders could enter the facility, there should be numerous placards. The placement and quantity should be decided using a facility's best judgment coupled with the advice from your Lake Havasu City Fire Official. At a minimum the placards should be posted on the two exterior walls of a facility or building, each access to a room or area, or each principal means of access to an exterior storage area. **See STEP THREE in the NFPA 704 WARNING PLACARD REQUIREMENTS document.**

10. What size placard is required for NFPA 70?

Building Facility Placards must be **15 inches by 15 inches** with each category diamond 7.5 inches by 7.5 inches. Each category diamond on the placard must have the proper background color. The numbers must be 6.0 inches in height with a 0.75-inch stroke, and the number must be centered within its diamond. The numbers may be either white or black, providing sufficient contrast is made against the background color in each category. **Subdivision Placards** used for rooms or control areas within a building may be smaller, typically **8.0 inches x 8.0 inches**.

Placards shall be affixed to buildings or areas within the facility on each side where entry can be made at an appropriate height to be easily seen from approaching emergency equipment. A placard must be placed at the property line on a facility gate or post if a placarded building or area within a facility cannot be easily seen when approaching the property. Affix subdivision placards next to access points into the subdivisions. These placards must be visible when doors into subdivisions are opened or closed. **See STEP THREE in the NFPA 704 WARNING PLACARD REQUIREMENTS document.**

11. If I have many chemicals in a storage room or if I have mixtures of chemicals, what ratings should I use on the NFPA 704 placard?

Section 4.2.3.3 of NFPA 704 provides three different methods to rate multiple chemicals. In addition, professional judgment must still be used to increase or decrease the rating to more accurately assess the degree of hazard, perhaps due to quantities, or synergistic effects of the chemicals, etc. The ratings for a chemical that contains multiple ingredients should be obtained from data for the mixture as presented on the SDS.

12. How do OSHA's Hazard Communication Classification Numbers differ from NFPA 704 Ratings?

The NFPA 704 standard and OSHA's Hazard Communication standard were developed for different purposes. Now that OSHA has adopted GHS both systems involve numbers leading to many questions about how the two numbers systems relate.

The NFPA 704 standard is widely used and recognized by fire and emergency responders and safety personnel for identifying the hazards of short term/acute exposure to materials under conditions of fire, spill, or similar emergencies. OSHA's Hazard Communication Standard (HCS) provides information for workers exposed to materials primarily under normal conditions of use.

With OSHA's recent incorporation of the **Globally Harmonized System (GHS)** into its HCS, it is important to realize that the GHS numbers are not relative ratings of hazards but rather used for the purpose of classifying hazards into categories for proper labeling and training information. These GHS numbers **ARE NOT** relative hazard ratings and in fact have an inverse number systems with 1 being the most hazardous and 4 being the least hazardous. It is important to understand the differences between the two systems.

For more information, NFPA and OSHA have developed a **"Quick Card"** to explain the two systems and their differences.

The downloadable card can be found at:

https://www.nfpa.org/Assets/files/AboutTheCodes/704/NFPA704_HC2012_QCard.pdf.

13. Where can I get NFPA 704 related materials?

The 2012 edition of NFPA 704 can be accessed for **free** by going to www.nfpa.org/704. In addition NFPA 704 and the *Fire Protection Guide to Hazardous Materials*, 2010 edition can be purchased by clicking on the Products and Training tab at the www.nfpa.org/704 page or by calling (800) 344-3555.

14. What are the LHCDF NFPA 704 Warning Placard Requirements (also available online). Ask your LHCDF fire inspector for a copy of these requirements.

NFPA 704 Warning Placard Requirements

Introduction

Whenever large amounts of hazardous materials are being stored and used within Lake Havasu City, warning placards are required. These placards act as an immediate warning system for emergency service personnel, helping them identify the kinds of materials present and the dangers they pose^{1, 2}.

¹The placard design is based on the hazard identification system described in Recommended System for the Identification of the Fire Hazards of Materials, National Fire Protection Association (NFPA) 704.

² For more information, see *ES&H Manual, Chapter 37, "Emergency Management."*

Hazard Categories

The diamond-shaped placards use these four color-coded categories to give at a glance a general idea of the hazards present:

- Health: blue, at the left. Injury hazard from burning materials
- Flammability: red, at the top. Susceptibility of materials to burning
- Reactivity: yellow, at the right. Susceptibility of materials to release energy
- Special hazards: white, at the bottom for hazards important to emergency response personnel; additional special hazards in rectangular white boxes below the placard

Hazard Rankings

The numbers in each box give the order of severity in emergency conditions such as spills, leaks, and fires, from four, indicating severe hazard or extreme danger, to zero, indicating no required warning.

Determining Warning System Placarding Requirements

Follow these steps to determine whether placards are required.

Step One: Select Rating Numbers

Determine each material stored or used at the facility and its warning system category and rating. Refer to the material safety data sheets (MSDS) for your building/facility. Use these criteria:

Hazard Category	Rating Number	Description
Health (Blue)	4	Materials that under emergency conditions can be lethal
	3	Materials that under emergency conditions can cause serious injury
	2	Materials that under emergency conditions can cause temporary incapacitation or residual injury
	1	Materials that under emergency conditions can cause significant irritation
	0	Materials that offer no hazard beyond that of ordinary combustible material
Flammability (Red)	4	All liquids and gases with a flash point below 73°F and a boiling point below 100°F
	3	All liquids and gases with flash points at or below 73°F and a boiling point at or above 100°F and those liquids having flash point at or above 73°F and below 100°F
	2	All liquids with a flash at or above 100°F and below 200°F or solids that readily give off vapors
	1	All liquids, solids, and semi solids with flash points at or above 200°F
	0	Materials that will not burn, including any material that will not burn in air when exposed to a temperature of 1500 for a period of 5 minutes
Reactivity (Yellow)	4	Materials readily capable of detonation or explosive reaction at normal temperatures and pressures. Includes materials that are very sensitive to heat, shock, or light. Examples would include explosives A & B and organic peroxides
	3	Materials which when heated and under confinement are capable of detonation and which may react violently with water. A "W" should appear as a special hazard if an explosive reaction with water can be expected. Examples would include blasting agents, fireworks, and ammonium nitrate fertilizer
	2	Materials which will undergo a violent chemical change at elevated temperatures and pressures but do not detonate. A="W" should appear as a special hazard if contact with water may cause a violent reaction or may cause potentially explosive mixtures to be formed. Examples would include combustible metals and water reactive corrosive materials
	1	Materials which are normally stable but may become unstable in combination with other materials or at elevated temperatures and pressures. A "W" should appear as a special hazard if a vigorous but not violent reaction with water may take place. Examples would include most common corrosive and oxidizing materials
	0	Materials that in themselves are normally stable, even under fire conditions
Special Hazards (White)		Note: Refer to the MSDS for the NFPA symbol for each hazard category. Special hazard symbols, such as W (water reactive), OX (oxidizing material), CR (corrosive material), C (poisonous material), or the radiation warning symbol, must be added to the white bottom section of the placard when available information indicates that one of these special hazards exist. When multiple special hazards exist, add white panels below the placard to list the additional special hazards that apply.



Special Hazards

Step Two: Determine the Need for Placards

Compare the total amount of materials with the same hazard category number to the amount requiring placards for each hazard category number. Note: Placards will not be required for underground storage of motor fuel

Building/Facility Placards

Facility and building placards identify the highest hazard rating in each category based on the combined materials in a category rating exceeding threshold quantities. Placards will be required when the following amounts of materials are stored or used at a facility:

Hazard Category	Rating Number	Amount Requiring Placarding on a Building or within a Facility (Aggregate Totals of Weight or Volume)
Health (Blue)	4	> 100 lbs or 10 gals or 50 cu ft
	3	> 100 lbs or 10 gals or 50 cu ft
	2	> 500 lbs or 55 gals or 1000 cu ft
Flammability (Red)	4	> 1000 lbs or 110 gals or 200 cu ft
	3	> 500 lbs or 55 gals or 1000 cu ft
	2	> 1000 lbs or 110 gals or 2000 cu ft
Reactivity (Yellow)	4	> 2000 lbs or 220 gals or 4000 cu ft
	3	> 100 lbs or 10 gals or 50 cu ft
	2	> 100 lbs or 10 gals or 50 cu ft
	1	> 500 lbs or 55 gals or 1000 cu ft
	1	> 500 lbs or 55 gals or 1000 cu ft

Subdivision Placards

Subdivisions (rooms or compartments) of buildings or areas within a facility will be placarded to indicate the greatest possible hazards within those subdivisions. Placards will be required when the following amounts of materials are stored or used in a subdivision:

Hazard Category	Rating Number	Amount Requiring Placarding on a Building or within a Facility (Aggregate Totals of Weight or Volume)
Health (Blue)	4	Any amount
	3	Any amount
	2	> 100 lbs or 10 gals or 50 cu ft
Flammability (Red)	4	> 500 lbs or 55 gals or 1000 cu ft
	3	> 100 lbs or 10 gals or 50 cu ft
	2	> 100 lbs or 10 gals or 50 cu ft
Reactivity (Yellow)	4	> 500 lbs or 55 gals or 1000 cu ft
	3	> 1000 lbs or 110 gals or 2000 cu ft
	2	Any amount
	1	Any amount
	1	Any amount

Step Three: Make and Place the Placards

Building facility placards must be 15 inches by 15 inches, with each category diamond 7.5 inches by 7.5 inches. Each category diamond on the placard must have the proper background color. The numbers must be 6.0 inches in height with a 0.75-inch stroke, and the number must be centered within its diamond. The numbers may be either white or black, providing sufficient contrast to made against the background color in each category. Subdivision placards may be smaller, typically 8.0 in & 8.0 inches.

Placards shall be affixed to buildings or areas within the facility on each side where entry can be made at an appropriate height to be easily seen from approaching emergency equipment. A placard must be placed at the property line on a facility gate or post if a placarded building or area within a facility cannot be easily seen when approaching the property. Affix subdivision placards next to access points into the subdivisions. These placards must be visible when doors into subdivisions are opened or closed.