

Section 8

NFPA, HMIS, and OSHA Labels and Placards

Purpose



To understand the uses and limits of NFPA, HMIS, and OSHA labels/placards in hazardous materials emergencies.



Section 8

**What you will find
in this section...**



| Page | Fact Sheet | Title |
|-------------|-------------------|---|
| 8-4 | --- | Task 1 |
| 8-5 | #1 | The NFPA Diamond |
| 8-7 | #2 | The NFPA Diamond - What the Numbers Mean |
| 8-8 | #3 | Pros and Cons of the NFPA Diamond |
| 8-9 | #4 | NFPA Ratings of Specific Chemicals |
| 8-11 | --- | Task 2 |
| 8-12 | #5 | Another Labeling System: HMIS |
| 8-15 | --- | Task 3 |
| 8-16 | #6 | OSHA Labels Give More Details |
| 8-18 | --- | Summary |

Section 8

NFPA, HMIS, & Placards

What Do All Those Letters Mean?

- NFPA** = National Fire Protection Association, a private group that develops recommendations.
- HMIS** = Hazardous Materials Identification System, developed by an industry trade association.
- OSHA** = Occupational Safety and Health Administration, the federal agency that regulates work place safety and health.

Task

1

- **Look at photos of NFPA placards.**
- **Figure out the hazards of the materials that are labeled.**

Look at the photos that will be passed around to each of the small groups. In the photo you will see a placard. Your task is to figure out the hazards of this material. **If the placard does not give you enough information to answer the question, write N/A for “not available.”**

The fact sheets in this section will help you understand the labels.

1. How much of a health hazard are the materials here?
2. What are the specific health effects of the material?
3. Are there long-term health effects from the material here?
4. How easy is it for the chemical here to catch on fire?
5. If this material spilled, how stable would it be?
6. What kind of protective gear should you wear around this chemical?
7. Is this the right gear for an emergency?
8. What other special information can you tell from this label/placard?
9. Does this placard give you information for emergency use, or for use when you work with a chemical on a day-to-day basis?



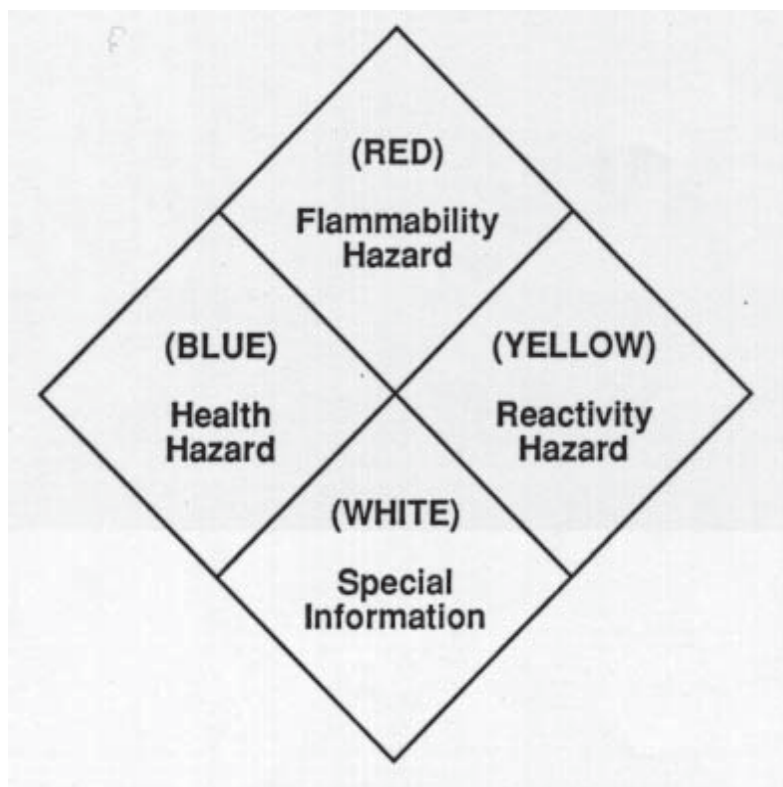
Fact Sheet #1

The NFPA Diamond

The National Fire Protection Association (NFPA), a private group, has also developed a way of labeling containers that hold hazardous materials. NFPA placards are used for labeling fixed containers such as storage tanks. The NFPA placard system was designed to give fire fighters quick information about hazards of a chemical.

The NFPA Diamond has four sections. The blue section on the left is for health hazards. The red section on top is for fire hazards. The yellow section on the right is for reactivity. The white section on the bottom is for special information on hazards. The 3 sections on top also have numbers from 0 to 4 to tell you the degree of the hazard. Zero (0) means “no hazard” and 4 means “very high hazard”.

If you see a “2” or higher in any section, the chemical is dangerous.

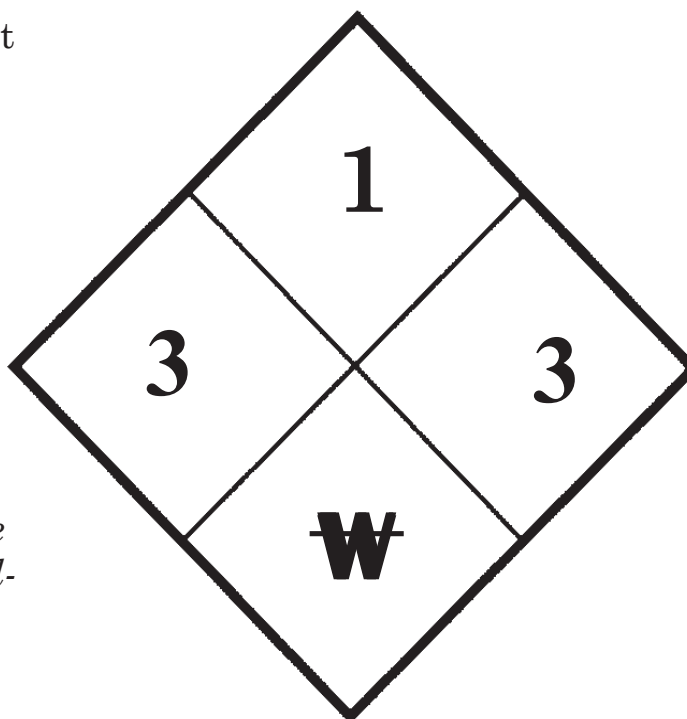


**NFPA 704 M
Hazard Identification
System**

Fact Sheet #1, continued

For example:

The diamond on this page would be on a storage tank holding toluene di-isocyanate, also called TDI. This chemical is commonly used to make foam for seat cushions. The sign tells you that TDI is very harmful to your health, (the “3” on the left), a low fire hazard (“1” on top), very reactive (“3” on right), and reacts with water.



The ratings for some specific chemicals are found in the NFPA’s book called *Fire Protection Guide on Hazardous Materials*.

| Special Information (White Diamond) The white diamond is for special information about the chemical. This diamond will show a special symbol or be left blank if there is no extra information to add. | | |
|--|--|----------------------|
| Symbol | Description | Example |
| W | Use no water because water will start a fire or explosion. | Sodium metal |
| OXY | Oxidizer | Calcium hypochlorite |

Fact Sheet #2

The NFPA Diamond – What the Numbers Mean

| Health Hazard Color Code: Blue | | Flammability Color Code: Red | | Reactivity (Stability) Color Code: Yellow | |
|-----------------------------------|--|---------------------------------|--|--|--|
| Type of Possible Injury | | How Easily Material Will Burn | | How Likely to Release Energy | |
| # | | # | | # | |
| 4 | Material that on very short exposure could cause death or major long-term injury. Cannot be approached without special protective equipment. | 4 | Material that will rapidly or completely vaporize at atmospheric pressure and normal temperature, or that is easily dispersed and will burn readily. | 4 | Material that in itself is readily capable of detonation or of explosive decomposition or reaction at normal temperatures and pressures. |
| 3 | Materials that on short exposure could cause serious temporary or long-term injury. Protect from contact with body. | 3 | Liquids and solids that can be ignited under almost all normal temperature conditions. | 3 | Material that in itself: a) is capable of detonation or explosive decomposition or reaction but requires a strong initiating source or; b) which must be heated under confinement before initiation or; c) which reacts explosively with water. |
| 2 | Material that on intense or continued but not chronic exposure could cause temporary incapacitation or long-term injury. Air-line respirator or SCBA needed. | 2 | Material that must be moderately heated or exposed to relatively high ambient temperature before ignition can occur. | 2 | Material that readily undergoes violent chemical change at raised temperatures and pressures or; which reacts violently with water, which may form an explosive mixture with water. |
| 1 | Material that on exposure would cause irritation but only minor long-term injury. Air-purifying respirator needed. | 1 | Material that must be pre-heated before ignition can occur. | 1 | Material that in itself is normally stable, but which can become unstable at raised temperatures and pressures. |
| 0 | Material that on exposure under fire conditions would offer no hazard beyond that of ordinary combustible material. No ppe needed. | 0 | Materials that will not burn. | 0 | Material that in itself is normally stable, even under fire exposure conditions, and which is not reactive with water. |

Fact Sheet #3

Pros and Cons of the NFPA Diamond

The NFPA system was developed for firefighters to provide limited but crucial information. Like all labeling systems, it has its strengths and weaknesses. The following list can help you decide how useful it is to first responders at your facility.

Advantages

- ◆ It is large enough to read from a safe distance (with binoculars).
- ◆ It gives you information on several types of hazards - acute health, fire, reactivity, and special hazards (for instance, when not to use water on a fire.)

Limitations

- ◆ The system was designed for fighting fires and spills, not for day-to-day use.
- ◆ The health information is based on the idea that an emergency responder will get a single, short exposure. It really focuses on acute health effects. In contrast, UAW members often work with chemicals at low levels for years — we're more concerned about chronic effects. This is why benzene is only ranked "2" by NFPA. But, we know that benzene causes leukemia, a kind of cancer, in people that have long-term exposure.
- ◆ Different employers may use different numbers for the same chemical, based on how dangerous they think the chemical is.
- ◆ Chemicals with low numbers may fool workers into thinking the chemical is safe. In fact, the material may have dangers not addressed by the NFPA diamond.

Note: *NFPA placards don't tell you about long-term (chronic) health hazards such as cancer.*

Fact Sheet #4**NFPA Ratings
of Specific Chemicals**

| Name of Chemical | Health Hazard | Fire Hazard | Reactivity |
|---|----------------------|--------------------|-------------------|
| Acetaldehyde polymerizes - Look for more information | 3 | 4 | 2 |
| Acetic Acid | 3 | 2 | 0 |
| Acetone | 1 | 3 | 0 |
| Acetylene | 0 | 4 | 3 |
| Ammonia, anhydrous* | 3 | 1* | 0 |
| Butyl Alcohol | 1 | 3 | 0 |
| Cellsolove (trade name) = Ethylene glycol monoethyl/ether (chemical name) | 2 | 2 | 0 |
| Carbon Monoxide | 3 | 4 | 0 |
| Cleaning Solvent, Stoddard Solvent | 0 | 2 | 0 |
| Diesel Fuel Oil | 0 | 2 | 0 |
| Diethanolamine (in cutting fluids) | 1 | 1 | 0 |
| Di-tert-butyl Peroxide | 1 | 3 | 4 |
| Ethylene oxide (Gas used in hospitals for sterilizing) | 3 | 4 | 3 |

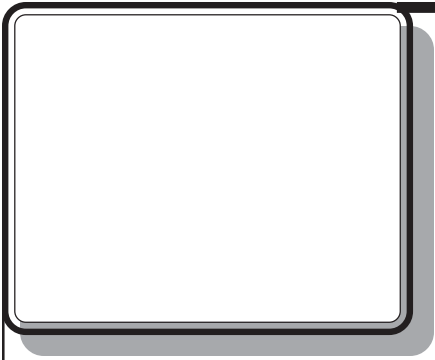
* This gas is rated 1 instead of 4 for fire hazard because it is hard to burn. But, it can be explosive in a confined space. It also reacts with acids and oxidizers to form explosive compounds. The NIOSH Pocket Guide says to treat this as a flammable gas.

Fact Sheet #4, continued

NFPA Ratings of Specific Chemicals

| Name of Chemical | Health Hazard | Fire Hazard | Reactivity |
|-------------------------------------|---------------|-------------|------------|
| Ethyl Alcohol (Ethanol) | 0 | 3 | 0 |
| Formaldehyde | 3 | 4 | 0 |
| Gasoline | 1 | 3 | 0 |
| Hydrogen Sulfide (Sewer gas) | 4 | 4 | 0 |
| Isopropyl alcohol (Rubbing alcohol) | 1 | 3 | 0 |

Source: Fire protection Guide to Hazardous Materials, 11th edition, National Fire protection Association, 1994.



Task 2

- **From information on HMIS labels, answer the questions below.**

The instructors will now give your group a different type of label. Answer the questions below using information you get by reading the label. Fact Sheet #5 will help you figure out what the label means. **Remember, if the HMIS label does not give you enough information to answer the question, write N/A.**

1. How serious is the health hazard of this material?
2. What are the specific health effects caused by this chemical?
3. Are there long-term (chronic) health effects from this material?
4. How easily will this chemical catch on fire?
5. If spilled, how stable would this material be ?
6. What kind of protective gear should you wear around this chemical?
7. Is this the right gear for an emergency?
8. What else, if anything, does this label tell you?
9. Is this label better for emergency use? Or is it better in telling you how to protect yourself during day-to-day use of this chemical?

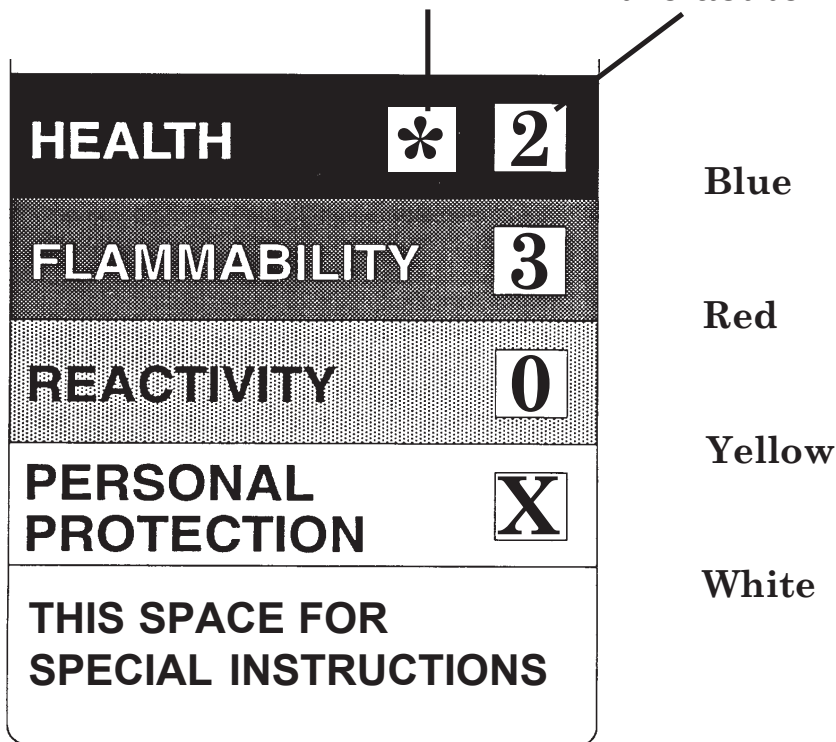
Fact Sheet #5

Another Labeling System: HMIS

The Hazardous Materials Identification System (HMIS) is another version of labels for containers. This system uses color coding for different types of hazards and numbers to show the degree of hazard. The HMIS label adds letters for different types of personal protective equipment to use when working with a specific chemical. The HMIS label does not tell you what to do or wear in an emergency.

The * means the product is a chronic health hazard.

The number tells you about the acute health hazard.



The HMIS system was developed by an industry trade group, the National Paint and Coatings Association, to help employers comply with OSHA's Hazard Communication Standard.



































Fact Sheet #5, continued













HMIS Hazard Rating Index: What the Numbers Mean

| Health Hazard Color Code: Blue | | Flammability Color Code: Red | | Reactivity (Stability) Color Code: Yellow | |
|-----------------------------------|--|---------------------------------|---|--|---|
| # | Degree of Hazard | # | Degree of Hazard | # | Degree of Hazard |
| 4 | Extreme: Highly toxic. May be fatal on short-term exposure. Special protective equipment required. | 4 | Extreme: Extremely flammable gas or liquid. Flash Point below 73 degrees F. | 4 | Extreme: Explosive at room temperature. |
| 3 | Serious: Toxic - Avoid inhalation or skin contact. | 3 | Serious: Flammable. Flash point 73 degrees to 100 degrees F. | 3 | Serious: May explode if shocked, heated under confinement or mixed with water |
| 2 | Moderate: Moderately toxic - May cause slight irritation. | 2 | Moderate: Combustible. Requires moderate heating to ignite. Flash Point 100 to 200 degrees F. | 2 | Moderate: Unstable, may react with water. |
| 1 | Slight: Slightly toxic. May cause slight irritation. | 1 | Slight: Slightly combustible. Needs strong heating to ignite. | 1 | Slight: May react if heated or mixed with water |
| 0 | Minimal: All chemicals have some degree of toxicity. | 0 | Minimal: Will not burn under normal conditions. | 0 | Minimal: Normally stable, does not react with water. |

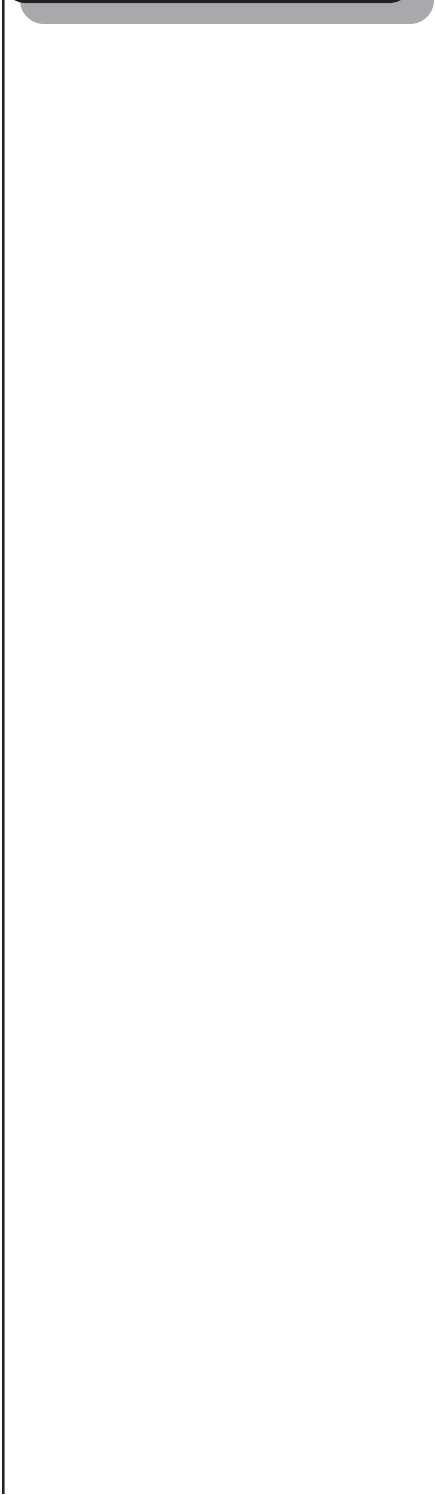
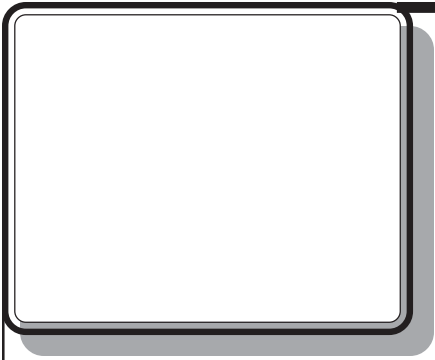
Fact Sheet #5, continued

Personal Protective Equipment Index

| | |
|--|---|
| A  | H  +  +  +  |
| B  +  | I  +  +  |
| C  +  +  | J  +  +  +  |
| D  +  +  | K  +  +  +  |
| E  +  +  | X Consult your supervisor or S.O.P. for special handling directions |
| F  +  +  +  | |
| G  +  +  | |

| Safety Glasses | Splash Goggles | Face Shield & Eye Protection | Gloves | Boots | Synthetic Apron | Full Suit | Dust Respirator | Vapor Respirator | Dust & Vapor Respirator | Full Face Respirator | Airline Hood or Mask |
|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  |  |  |  |  |  |  |  |  |
| A | n | o | p | q | r | s | t | u | w | y | z |

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Task 3

- **Using Labels for OSHA's Haz Com Standard, answer the questions below.**

Your instructors will give your group a third (and final) label. Answer the questions below using the information on the label. Fact Sheet #6 will help you figure out what must be on this label by law. **Write N/A if the OSHA label doesn't provide enough for you to answer the question**

1. How serious is the health hazard of this material?
2. What are the specific health effects caused by this chemical?
3. Are there long-term (chronic) health effects from this material? If yes, what are they?
4. How easily will this chemical catch on fire?
5. If spilled, how stable would this material be?
6. What kind of protective gear should you wear around this chemical?
7. Is this the right gear for an emergency?
8. What else, if anything, does this label tell you?
9. Is this label better for emergency use? Or is it better in telling you how to protect yourself during day-to-day use of this chemical?

OSHA Labels Give More Details

DOT, NFPA, and HMIS labels give quick information to local fire departments and other people who respond to emergencies. But, they provide very limited information. That's why OSHA requires companies to label containers of hazardous materials in all workplaces. These labels give more details for people that work with the materials every day.

What's on an OSHA Label?

OSHA's **Hazard Communication Standard** — what we call the Worker Right To Know standard — says a label has to have:

1. The *name* of the product (which has to match the name on the Material Safety Data Sheet for that product).
2. *Specific health and safety hazards* of the product, including the target organs that may be affected in the long-term.
3. Name and address of the *manufacturer or supplier* — where you can get more information.

Which containers have to be labeled?

All containers that hold hazardous materials have to be labeled — bags, buckets, barrels, cylinders, even process containers such as plating tanks or degreasers. The only exception is piping. OSHA says that workers have to be informed of what's in pipes in some way.

Fact Sheet #6, continued

The UAW recommends that pipes be clearly labeled, too. Labeling pipes could have saved Mitchell Todd Guffey's life, a worker at Freightliner Company, UAW Local 5285. He died after hooking his airline respirator into a pipe carrying pure argon. Contractors had mistakenly hooked the in-plant air system to the wrong pipe.

Tricks to watch for:

- ➔ Just because OSHA requires it doesn't mean that all labels have the information they are supposed to. Request more complete labels if you work with a product that does not have useful labels.
- ➔ The label is your link to the right MSDS. The label may list a brand name or a chemical name. That's allowed if it matches the name on the MSDS. If the label says "Safety Solve," the MSDS must also.
- ➔ Vague words are often used rather than listing specific symptoms and health effects. You might see "avoid skin contact or inhalation." It should say "Breathing this product may cause headache, dizziness, unconsciousness, death."
- ➔ Although not required, all labels should include an emergency phone number.

DOT, NFPA, and HMIS labels do not satisfy OSHA's labeling standard. All containers must have a label with the product name, the hazards (including target organs), and the manufacturer or supplier.

Summary

NFPA, HMIS, & OSHA Labels

- 1 The NFPA Diamond is designed for use by emergency responders. It tells you about the immediate hazards of a material. If any number is "2" or higher, the material is dangerous!
- 2 The NFPA Diamond is not designed to tell you about long-term health hazards. Some cancer-causing chemicals have low health ratings, but they are dangerous, too.
- 3 HMIS labels can give you quick information that is helpful in an emergency, such as the fire rating. But the protective equipment listed is not for use during an emergency!
- 4 OSHA labels are not designed for emergency use, but they do give you the best information about health effects. None of the other labels (DOT, NFPA, or HMIS labels) meet all of OSHA's requirements for labels. They don't include enough on health effects, especially target organs, or the chemical manufacturer.
- 5 **Read the MSDS on a product to get more information on the hazards of a chemical, no matter what labeling system is used.**
- 6 **Your employer is responsible for training you so that you understand the labeling systems in your work place.**

Summary

continued

NFPA, HMIS, & OSHA Labels

- 7 Make sure that all hazardous materials containers in your workplace are properly labeled with clear and accurate warnings. OSHA's Hazard Communication Standard requires this labeling. Large labels that can be seen from a distance will help you to quickly identify the products involved in an emergency.