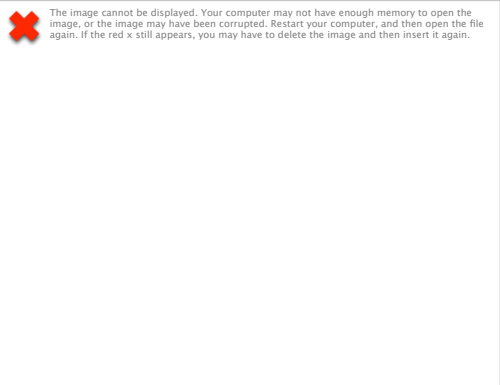
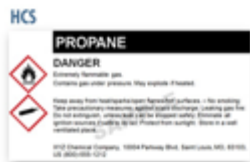


# Hazardous Materials Labeling and Storage

## Compliance & Worker Training Requirements



Diane K. Hale CEM, CSHEP, ASP, CHMM, ASP

820 S. Valley View Blvd. Las Vegas, NV 89107

702-897-4906 702-897-8210 FAX

dhale@swcsafety.com

# Learning Objectives

- **How to select Labels, Placards and Markings**
- **The “LAW” vs. “CONSENSUS” Labeling Standards**
- **Understand Basics of Labeling and Placards**
  - ✓ Regulations-DOT, EPA, OSHA
  - ✓ Consensus Standards-ANSI, HMIS, NFPA
- **Examples of What to Use**

# When and What Type to Use?



Diesel Fuel



Name of Material

<input type="checkbox"/>	<b>HEALTH</b>
<input type="checkbox"/>	<b>FLAMMABILITY</b>
<input type="checkbox"/>	<b>REACTIVITY</b>
<input type="checkbox"/>	<b>PROTECTIVE EQUIPMENT</b>



# Overlapping Regulations

**EPA**

**DOT**

**OSHA**

**Federal Agencies**

**State and Local Governments**

**RCRA**

USDA

FDA

NEPA

CERCLA

DOE

CAA

TSCA

P2

Historic Preservation Act

CWA

Antiquities Act

**Executive Orders**

SDA

FIFRA

EPCRA

Endangered Species

**International Treaties**

Marine and Fisheries

**CONSENSUS STANDARDS**

**Corporate Policy-Good Stewards**

# LAW vs. Consensus Standards

- **Federal Regulations are the Law**

- ✓ DOT-Hazardous Materials Transportation
- ✓ OSHA- Hazardous Chemicals
- ✓ EPA-Hazardous Waste Management



- **Consensus Standards**

- ✓ NFPA-Fire Department
- ✓ HMIS<sup>®</sup> - National Paint and Coating Association
- ✓ ANSI-American National Standards Institute

# National Fire Protection Association NFPA Standard 704

- To Protect and Inform Emergency Responders

- ✓ *Blue-Health*

- ✓ *Red-Flammability*

- ✓ *Yellow-Instability*

- White-Other Hazards OX, ALK, CRY, COR, other specific hazards, Dangerous When Wet

- Severity of Hazards Ranking 0-4, *4 Highest Hazard Rating*



**Consensus Standard for Fire Department!**

# NFPA HAZMAT Label Standard 704

## HAZARD NUMERICAL RATING

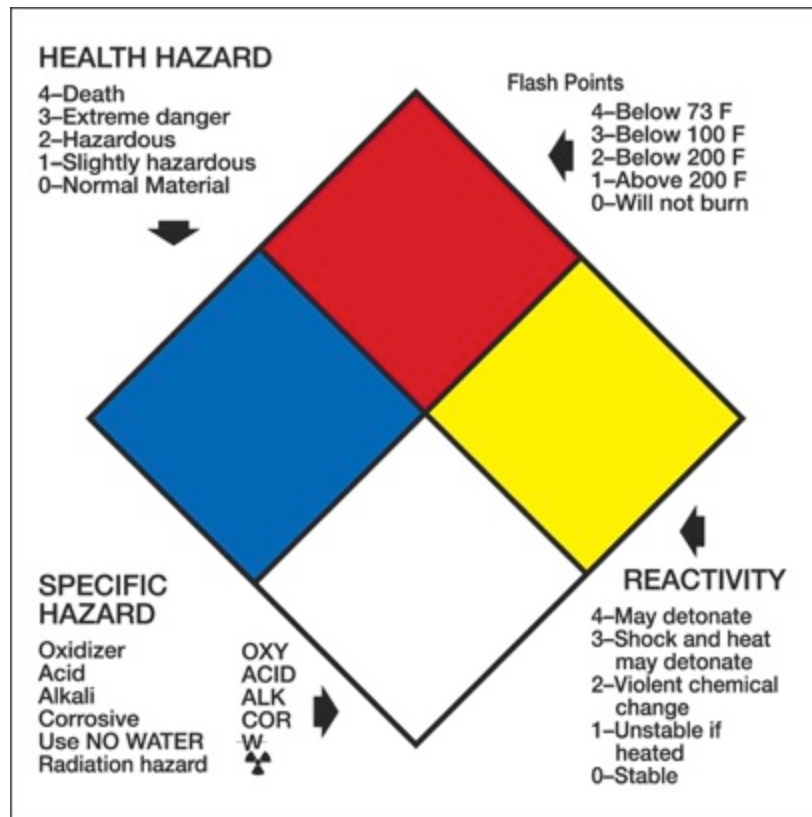
0=Minimal

1=Slight

2=Moderate

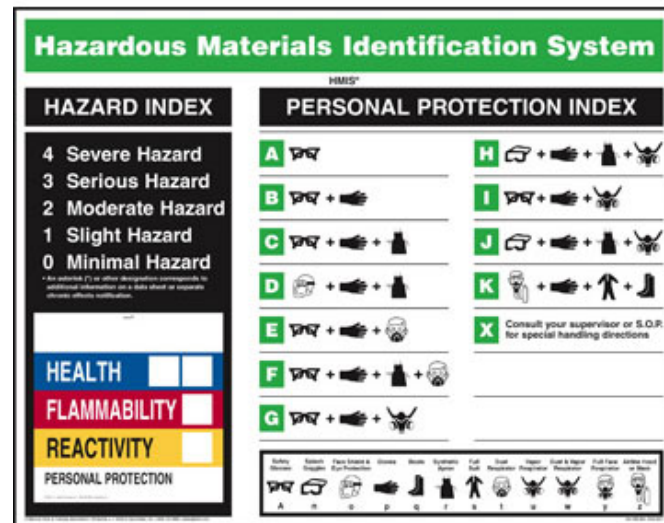
3=Serious

4=Severe or Death



# HMIS III System

- National Paint and Coating Association
- Hazardous Materials Identification System for workers
  - ✓ Hazard Assessment
  - ✓ Labeling
  - ✓ Safety Data Sheets, SDS
  - ✓ Employee Training
- Mostly Matches NFPA





# ANSI-Z535 Consensus Standard

- American National Standards Institute
- New Safety Sign Standard Adopted 2013
- Improved optional design elements GHS
- Better communicate workplace hazards
- Danger, Warning, Caution
- Safety Alert Symbol in Header



# ANSI vs OSHA

## New Format ANSI-Z535.2-2011 Standard



## Traditional OSHA Format



# Why are Labels or Placards Important?



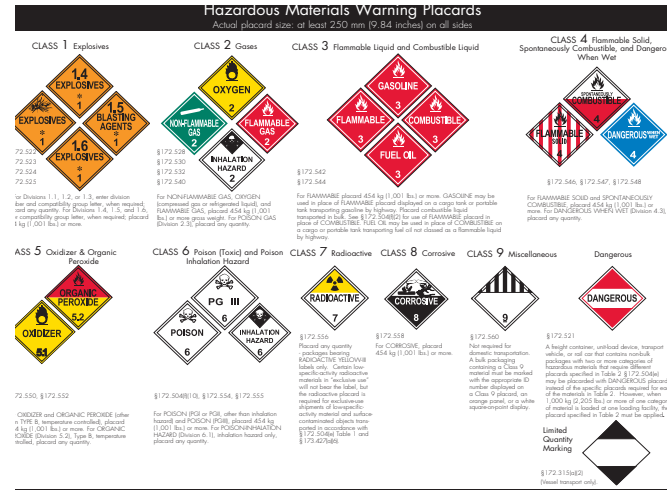
# DOT 49 CFR Labels and Placards

- Department of Transportation (FMCSA & PHMSA, Pipeline for Hazardous Materials Safety Administration 49 CFR 100-185
- ENGLISH and Visible
- Railcars, Boxes, tankers, drums, totes
- Three Shipping Regulations
  - ✓ Aviation
  - ✓ Road/Ground Freight
  - ✓ Marine Vessels



# DOT Placards

- Construction projects may use them for identification of chemicals on work site
- For large tankers or tanks
- Railcars must always be placarded even if empty unless no hazard is present
- Placard Vehicles on 4 sides



Identification Numbers May Be Displayed On Placards or Orange Panels

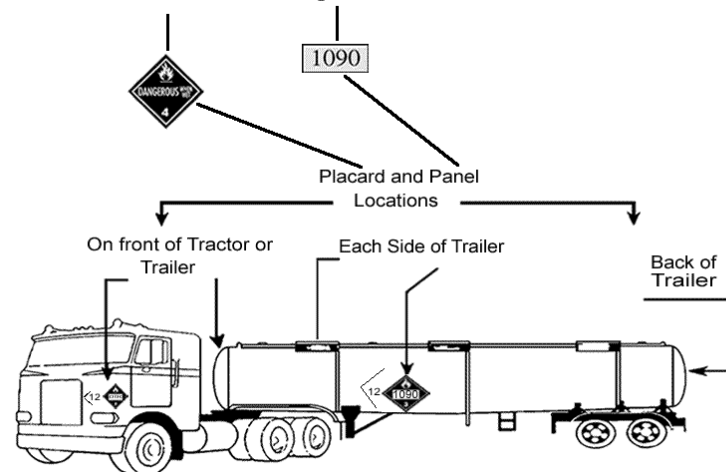


Figure 9-2 Placard and Panel Locations

# Hazmat Shipping

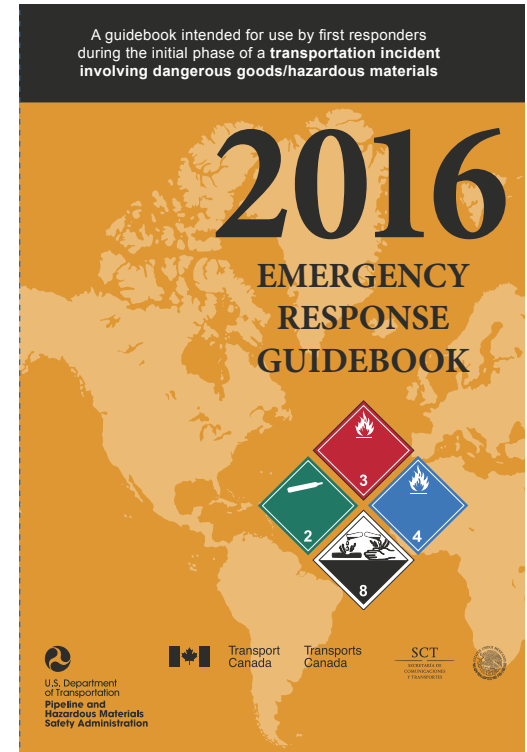


- DOT Labels external on packages, IBCs/totes or smaller tanks and Placards on Tanker Trucks
- English
- Use the DOT Placards for Shipping
- Use DOT “Approved” Containers ONLY
- Train Workers on Hazardous Materials
  - ✓ Labels and Placards
  - ✓ Provide Placards to transport company
  - ✓ Security



# DOT Hazmat Labels & Placards

- Updated 2016 & GHS Compliant
- Nine Hazard Classes
- Additional labels based on new items
- Labels and Placards may vary
- 4 Digit UN Number
  - ✓ Specific to a chemical or variety
  - ✓ ERG 2016





U.S. Department  
of Transportation  
Pipeline and  
Hazardous Materials  
Safety Administration

# DOT CHART 16

## Hazardous Materials Markings, Labeling and Placarding Guide

Refer to 49 CFR, Part 172:

Marking - Subpart D















Labeling - Subpart E

Placarding - Subpart F



**NOTE:** This document is for general guidance only and should not be used to determine compliance with 49 CFR, Parts 100-185.

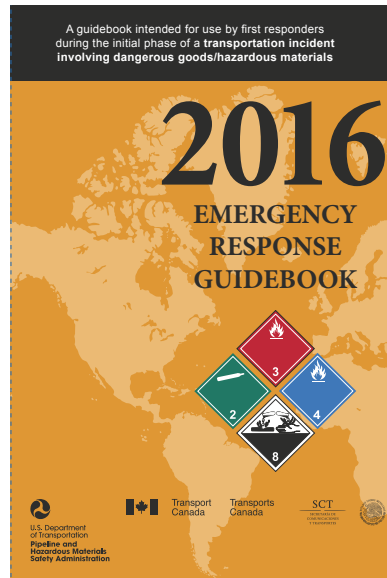
### HAZARDOUS MATERIALS MARKINGS

<p>Package Orientation (Red or Black)</p>  <p>§ 172.312(a)</p>	<p>Keep Away from Heat</p>  <p>§ 172.317</p>	<p>OVERPACK</p>  <p>§ 173.25(a)(4)</p>	<p>Fumigant Marking</p>  <p>§ 172.302(g) and § 173.9</p>	<p>INHALATION HAZARD</p>  <p>§ 172.313(a)</p>
<p>HOT</p>  <p>§ 172.325</p>	<p>Biological Substances, Category B</p>  <p>§ 172.332(a)</p>	<p>NEW Lithium battery handling marking, Transition December 31, 2018</p>  <p>§ 173.185</p>	<p>UN3373</p>  <p>§ 173.199 (a)(5)</p>	<p>Marine Pollutant</p>  <p>§ 172.322</p>
<p>Limited Quantity</p> <p>All other Modes</p>  <p>§ 172.315</p>	<p>ORM-D, Transition December 31, 2020</p> <p>ORM-D</p>  <p>§ 172.316</p>	<p>Excepted Quantity</p>  <p>§ 173.4a(g)</p>	<p>Marking of IBCs</p>  <p>§ 178.703(b)(7)(i)</p>	



# Emergency Responder Mobile Apps

- PHMSA DOT HAZMAT label/placard guide
- ERG 2016 at PHMSA for DOT HAZMATs
- WISER Nat. Library of Medicine NIH
- Cameo Chemicals at NOAA ORR



**DOT CHART 16**  
Hazardous Materials Markings,  
Labeling and Placarding Guide

U.S. Department of Transportation  
Pipeline and Hazardous Materials Safety Administration

Refer to 49 CFR, Part 172:  
Marking - Subpart D  
Labeling - Subpart E  
Placarding - Subpart F

**NOTE:** This document is for general guidance only and should not be used to determine compliance with 49 CFR, Parts 100-185.

**HAZARDOUS MATERIALS MARKINGS**

Package Orientation (Red or Black)	Freeze Avoidance Mark	Overpack	Transport Markings	Shipping Labels
§172.203a	§172.204b	§172.204a	§172.202g and §172.219	§172.203a
§172.203b	§172.204c	§172.204d	§172.202h and §172.219	§172.203b
§172.203c	§172.204e	§172.204f	§172.202i	§172.203c
§172.203d	§172.204g	§172.204h	§172.202j	§172.203d
§172.203e	§172.204i	§172.204j	§172.202k	§172.203e
§172.203f	§172.204k	§172.204l	§172.202l	§172.203f

# Hazardous Materials Warning Labels

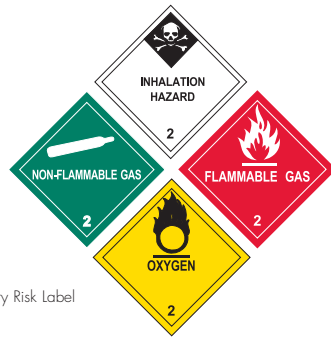
Actual label size: at least 100 mm (3.9 inches) on all sides

**CLASS 1 Explosives:**  
Divisions 1.1, 1.2, 1.3, 1.4, 1.5, 1.6



§172.411

**CLASS 2 Gases:**  
Divisions 2.1, 2.2, 2.3



§172.405(b), §172.415, §172.416, §172.417

**CLASS 3 Flammable Liquid**



§172.419

**CLASS 4 Flammable Solid, Spontaneously Combustible, and Dangerous When Wet:**  
Divisions 4.1, 4.2, 4.3



§172.420, §172.422, §172.423

**CLASS 5 Oxidizer, Organic Peroxide:** Divisions 5.1 and 5.2



§172.426, §172.427

\* Include compatibility group letter.

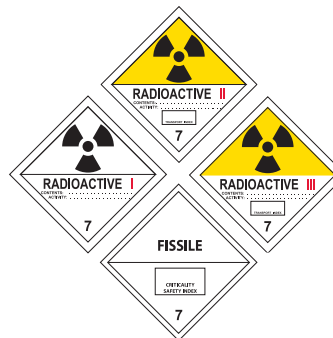
\*\* Include division number and compatibility group letter.

**CLASS 6 Poison (Toxic), Poison Inhalation Hazard, Infectious Substance:** Divisions 6.1 and 6.2



§172.323, §172.405(c), §172.429, §172.430, §172.432

**CLASS 7 Radioactive**



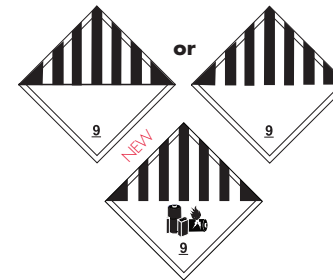
§172.436, §172.438, §172.440, §172.441

**CLASS 8 Corrosive**



§172.442

**CLASS 9 Miscellaneous Hazardous Material**



§§172.446, §172.447

**Cargo Aircraft Only**



§172.448

**Empty Label**

**EMPTY**

§172.450

For Regulated Medical Waste (RMW), an Infectious Substance label is not required on an outer packaging if the OSHA Biohazard marking is used as prescribed in 29 CFR 1910.1030(g). A bulk package of RMW must display a BIOHAZARD marking.

Effective January 2019, the NEW Class 9 lithium battery handling label must be used for lithium battery shipments.

# PHMSA Placards 2016

## Hazardous Materials Warning Placards

Actual placard size: at least 250 mm (9.84 inches) on all sides

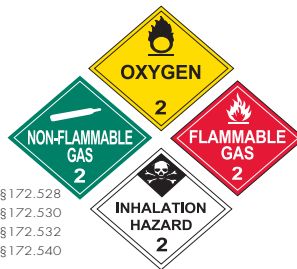
### CLASS 1 Explosives



72.522  
72.523  
72.524  
72.525

or Divisions 1.1, 1.2, or 1.3, enter division letter and compatibility group letter, when required; and any quantity. For Divisions 1.4, 1.5, and 1.6, r compatibility group letter, when required; placard 1 kg (1,001 lbs.) or more.

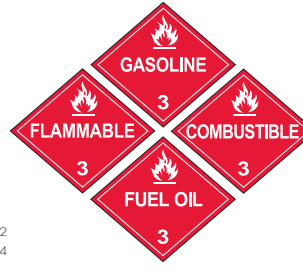
### CLASS 2 Gases



§ 172.528  
§ 172.530  
§ 172.532  
§ 172.540

For NON-FLAMMABLE GAS, OXYGEN [compressed gas or refrigerated liquid], and FLAMMABLE GAS, placard 454 kg (1,001 lbs.) or more gross weight. For POISON GAS [Division 2.3], placard any quantity.

### CLASS 3 Flammable Liquid and Combustible Liquid



§ 172.542  
§ 172.544

For FLAMMABLE placard 454 kg (1,001 lbs.) or more. GASOLINE may be used in place of FLAMMABLE placard displayed on a cargo tank or portable tank transporting gasoline by highway. Placard combustible liquid transported in bulk. See § 172.504(f)(2) for use of FLAMMABLE placard in place of COMBUSTIBLE. FUEL OIL may be used in place of COMBUSTIBLE on a cargo or portable tank transporting fuel oil not classed as a flammable liquid by highway.

### CLASS 4 Flammable Solid, Spontaneously Combustible, and Dangerous When Wet



§ 172.546, § 172.547, § 172.548

For FLAMMABLE SOLID and SPONTANEOUSLY COMBUSTIBLE, placard 454 kg (1,001 lbs.) or more. For DANGEROUS WHEN WET [Division 4.3], placard any quantity.

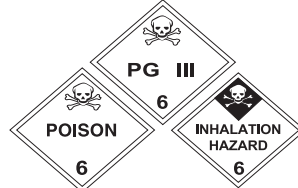
### CLASS 5 Oxidizer & Organic Peroxide



72.550, § 172.552

OXIDIZER and ORGANIC PEROXIDE (other than TYPE B, temperature controlled), placard 4 kg (1,001 lbs.) or more. For ORGANIC PEROXIDE [Division 5.2], Type B, temperature controlled, placard any quantity.

### CLASS 6 Poison (Toxic) and Poison Inhalation Hazard



§ 172.504(f)(10), § 172.554, § 172.555

For POISON [PGI or PGII, other than inhalation hazard] and POISON [PGIII], placard 454 kg (1,001 lbs.) or more. For POISON INHALATION HAZARD [Division 6.1], inhalation hazard only, placard any quantity.

### CLASS 7 Radioactive



§ 172.556

Placard any quantity - packages bearing RADIOACTIVE YELLOW-III labels only. Certain low specific-activity radioactive materials in "exclusive use" will not bear the label, but the radioactive placard is required for exclusive-use shipments of low-specific-activity material and surface-contaminated objects transported in accordance with § 172.504(e) Table 1 and § 173.427(a)(6).

### CLASS 8 Corrosive



§ 172.558

For CORROSIVE, placard 454 kg (1,001 lbs.) or more.

### CLASS 9 Miscellaneous



§ 172.560

Not required for domestic transportation. A bulk packaging containing a Class 9 material must be marked with the appropriate ID number displayed on a Class 9 placard, an orange panel, or a white square-on-point display.

### Dangerous



§ 172.521

A freight container, unit-load device, transport vehicle, or rail car that contains non-bulk packages with two or more categories of hazardous materials that require different placards specified in Table 2 § 172.504(e) may be placarded with DANGEROUS placard instead of the specific placards required for each of the materials in Table 2. However, when 1,000 kg (2,205 lbs.) or more of one category of material is loaded at one loading facility, the placard specified in Table 2 must be applied.

Limited Quantity Marking



§ 172.315(a)(2)  
(Vessel transport only).

# What if you saw this Truck Smoking?













# OSHA-GHS Hazcom Standard

- Protection of Worker's Health and Safety
- Right to Understand Law
- International standard established for hazard identification and classification
- Nine Pictograms for Hazards



# GHS by Hazards



GHS – Hazard Pictograms and correlated exemplary Hazard Classes				
Physical Hazards				
				
Explosives	Flammable Liquids	Oxidizing Liquids	Compressed Gases	Corrosive to Metals
Health Hazards				Env. Hazards
				
Acute Toxicity	Skin Corrosion	Skin Irritation	CMR <sup>1)</sup> , STOT <sup>2)</sup> , Aspiration Hazard	Hazardous to the Aquatic Environment

1) carcinogenic, germ cell mutagenic, toxic to reproduction / 2) specific target organ toxicity

# NFPA and GHS Comparison



## Comparison of NFPA 704 and HazCom 2012 Labels

	 NFPA 704	 HazCom 2012
Purpose	Provides basic information for emergency personnel responding to a fire or spill and those planning for emergency response.	Informs workers about the hazards of chemicals in workplace under normal conditions of use and foreseeable emergencies.
Number System: NFPA Rating and OSHA's Classification System	0-4 0-least hazardous 4-most hazardous	1-4 1-most severe hazard 4-least severe hazard • The Hazard category numbers are NOT required to be on labels but are required on SDSs in Section 2. • Numbers are used to CLASSIFY hazards to determine what label information is required.
Information Provided on Label	<ul style="list-style-type: none"> <li>• Health-Blue</li> <li>• Flammability-Red</li> <li>• Instability-Yellow</li> <li>• Special Hazards*-White</li> </ul> *OX Oxidizers W Water Reactives SA Simple Asphyxiants	<ul style="list-style-type: none"> <li>• Product Identifier</li> <li>• Signal Word</li> <li>• Hazard Statement(s)</li> <li>• Pictogram(s)</li> <li>• Precautionary statement(s); and</li> <li>• Name address and phone number of responsible party.</li> </ul>
Health Hazards on Label	Acute (short term) health hazards ONLY. Acute hazards are more typical for emergency response applications. Chronic health effects are not covered by NFPA 704.	Acute (short term) and chronic (long term) health hazards. Both acute and chronic health effects are relevant for employees working with chemicals day after day. Health hazards include acute hazards such as eye irritants, simple asphyxiants and skin corrosives as well as chronic hazards such as carcinogens.
Flammability/Physical Hazards on Label	NFPA divides flammability and instability hazards into two separate numbers on the label. Flammability in red section Instability in yellow section	A broad range of physical hazard classes are listed on the label including explosives, flammables, oxidizers, reactives, pyrophorics, combustible dusts and corrosives.
Where to get information to place on label	Rating system found in NFPA Fire Protection Guide to Hazardous Materials OR NFPA 704 Standard System for Identification of the Hazards of Materials for Emergency Response 2012 Edition. Tables 5.2, 6.2, 7.2 and Chapter 8 of NFPA 704	OSHA Hazard Communication Standard 29 CFR 1910.1200 (2012). 1) Classify using Appendix A (Health Hazards) and Appendix B (Physical Hazards) 2) Label using Appendix C
Other	The hazard category numbers found in section 2 of the HC2012 compliant SDSs are NOT to be used to fill in the NFPA 704 diamond.	Supplemental information may also appear on the label such as any hazards not otherwise classified, and directions for use.
website	<a href="http://www.nfpa.org/704">www.nfpa.org/704</a>	<a href="http://www.osha.gov">www.osha.gov</a> OR <a href="http://www.osha.gov/dsg/hazcom/index.html">www.osha.gov/dsg/hazcom/index.html</a>

For more information:



# OSHA SDS Quick Cards



## Hazard Communication Safety Data Sheets

The Hazard Communication Standard (HCS) requires chemical manufacturers, distributors, or importers to provide Safety Data Sheets (SDSs) (formerly known as Material Safety Data Sheets or MSDSs) to communicate the hazards of hazardous chemical products. As of June 1, 2015, the HCS will require new SDSs to be in a uniform format, and include the section numbers, the headings, and associated information under the headings below:

**Section 1, Identification** includes product identifier; manufacturer or distributor name, address, phone number; emergency phone number; recommended use; restrictions on use.

**Section 2, Hazard(s) identification** includes all hazards regarding the chemical; required label elements.

**Section 3, Composition/information on ingredients** includes information on chemical ingredients; trade secret claims.

**Section 4, First-aid measures** includes important symptoms/effects, acute, delayed; required treatment.

**Section 5, Fire-fighting measures** lists suitable extinguishing techniques, equipment; chemical hazards from fire.

**Section 6, Accidental release measures** lists emergency procedures; protective equipment; proper methods of containment and cleanup.

**Section 7, Handling and storage** lists precautions for safe handling and storage, including incompatibilities.

*(Continued on other side)*



## Hazard Communication Safety Data Sheets

**Section 8, Exposure controls/personal protection** lists OSHA's Permissible Exposure Limits (PELs); ACGIH Threshold Limit Values (TLVs); and any other exposure limit used or recommended by the chemical manufacturer, importer, or employer preparing the SDS where available as well as appropriate engineering controls; personal protective equipment (PPE).

**Section 9, Physical and chemical properties** lists the chemical's characteristics.

**Section 10, Stability and reactivity** lists chemical stability and possibility of hazardous reactions.

**Section 11, Toxicological information** includes routes of exposure; related symptoms, acute and chronic effects; numerical measures of toxicity.

Section 12, Ecological information\*

Section 13, Disposal considerations\*

Section 14, Transport information\*

Section 15, Regulatory information\*

**Section 16, Other information**, includes the date of preparation or last revision.

\*Note: Since other Agencies regulate this information, OSHA will not be enforcing Sections 12 through 15 (29 CFR 1910.1200(g)(2)).

**Employers must ensure that SDSs are readily accessible to employees.**

See Appendix D of 29 CFR 1910.1200 for a detailed description of SDS contents.



# Number Ranking Confusion?

- **Different Labeling Systems**
  - ✓ NFPA/HMIS vs OSHA (LAW)
- **When do we use each one?**
- **Numerical Ratings Defined Differently**
  - ✓ NFPA vs HMIS Flammability
  - ✓ **OSHA Numerical GHS Hazard Ratings are Backwards**

Comparison of HMIS III/NFPA 704 Rating Systems & GHS Hazard Categories			
HMIS/NFPA 704 Rating System		GHS Hazard Categories	
<b>0</b>	Minimal	<b>5</b>	Minimal
<b>1</b>	Slight	<b>4</b>	Slight
<b>2</b>	Moderate	<b>3</b>	Moderate
<b>3</b>	Serious	<b>2</b>	Serious
<b>4</b>	Severe	<b>1</b>	Severe

# GHS Labeling Simplified

- Pictograms take the guess work out
- Labels include hazards and what to do

**1** Product Identifier

EPICHLOROHYDRIN

UN No. 2023  
CAS No. 106-89-8

**2** Signal Word

**DANGER**

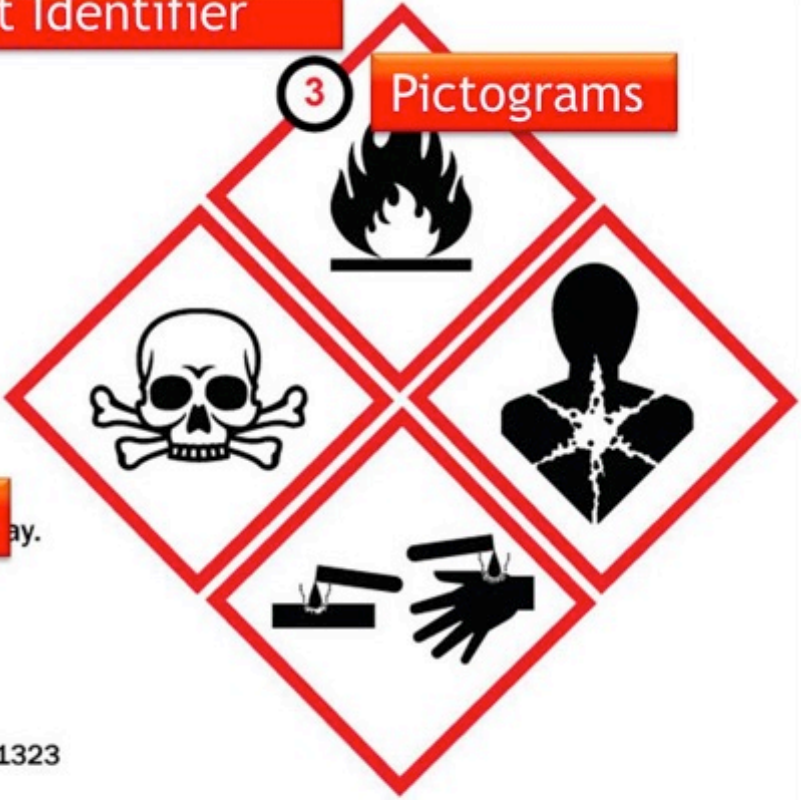
**3** Pictograms

**4** Hazard Statements

Flammable liquid, highly flammable. Toxic in contact with skin. Causes severe skin burns and eye damage. May cause an allergic skin reaction. May cause cancer.

**5** Precautionary Statements

Do not breathe vapors. Wear protective gloves/protective clothing/eye protection.



Fill Weight: 18.52 lbs. Lot Number: A0323111323  
Gross Weight: 20 lbs Fill Date: 1/15/2012  
Expiration Date: 1/15/2018

**6** Supplier Information



JACKSON CHEMICAL COMPANY - City of Industry, Los Angeles, California, USA (800)-444-456-8989

# HAZCOM NEW GHS LABELS

You might see the intermediate labeling  
This label is missing the precautionary statement

## DEGREASEALINE

**DANGER**

**HAZARD STATEMENTS:**  
Highly flammable liquid and vapor.  
May be harmful if swallowed and enters airways.

**PRECAUTIONARY STATEMENTS:**  
Keep container tightly closed. Do not breathe vapors. Suspected of causing cancer by inhalation. Wear respiratory protection, gloves and coveralls. Store in a well ventilated place. Keep Cool. Keep away from heat/sparks/open flame. No smoking. Dispose of contents/container in accordance with local regulations. **FIRST AID:** If exposed seek immediate medical attention.

**EMERGENCY: 1-800-234-5678**  
ABC Fine Chemicals, 1234 Over There St., Any Town  
Tel: (123) 456-7890



**CONTACT US FOR MORE INFORMATION**  
800-656-9476  
www.reliance-label.com

## GlobaLabel GL1250





**DANGER! ATTENTION! PERIGO! GEVAAR! PERICOLO!**

Keep out of reach of children. Read label before use.  
Tenir hors de portée des enfants. Lire l'étiquette avant utilisation.  
Manter fora do alcance das crianças. Leia a etiqueta antes da utilização.  
Buiten bereik van kinderen. Lees het etiket voor gebruik.  
Tenere fuori dalla portata dei bambini. Leggere l'etichetta prima dell'uso.

**R13** - Irritating to skin.  
**R50/53** - Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.  
**S23** - Do not breathe gas/fumes/vapors/ spray  
**S24** - Avoid contact with skin.  
**S29** - Do not empty into drains.  
**S67** - Use appropriate containment to avoid environmental contamination.  
**S65** - Avoid release to the environment. Refer to special instructions/safety data sheet.

**R38** - Irritant pour la peau.  
**R50/53** - Très toxique pour les organismes aquatiques, peut entraîner des effets néfastes à long terme pour l'environnement aquatique.  
**S23** - Ne pas respirer les gaz/fumées/vapeurs/aérosols (émettre(s) approprié(s) à indiquer par le fabricant)  
**S24** - Éviter le contact avec la peau.  
**S29** - Ne pas jeter les résidus à l'égout.  
**S67** - Utiliser un récipient approprié pour éviter toute contamination du milieu ambiant.  
**S65** - Éviter le rejet dans l'environnement. Consulter les instructions spéciales/la fiche de données de sécurité.

**R38** - Reizt de Haut.  
**R50/53** - Sehr giftig für Wasserorganismen, kann in Gewässern langfristig schädliche Wirkungen haben.  
**S23** - Gas/Rauch/Dampf/Aerosol nicht einatmen (geeignete Bezeichnungen) vom Hersteller anzugeben)  
**S24** - Berührung mit der Haut vermeiden.  
**S29** - Nicht in die Kanalisation gelangen lassen.  
**S67** - Zur Vermeidung einer Kontamination der Umwelt geeigneten Behälter verwenden.  
**S65** - Freisetzung in die Umwelt vermeiden. Besondere Anweisungen enthalten/Sicherheitsdatenblatt zu Rate ziehen.

**R38** - Irita la piel.  
**R50/53** - Muy tóxico para los organismos acuáticos, puede provocar a largo plazo efectos negativos en el medio ambiente acuático.  
**S23** - No respirar los gases/humos/vapores/aerosoles (denominación(es) adecuada(s) a especificar por el fabricante)  
**S24** - Evitar el contacto con la piel.  
**S29** - No tirar los residuos por el desagüe.  
**S67** - Utilícese un envase de seguridad adecuado para evitar la contaminación del medio ambiente.  
**S65** - Evitar su liberación al medio ambiente. Resáltense instrucciones específicas de la ficha de datos de seguridad.

**R38** - Irritante per la pelle.  
**R50/53** - Altamente tossico per gli organismi acquatici, può provocare a lungo termine effetti negativi per l'ambiente acquatico.  
**S23** - Non respirare i gas/fumi/vapori/aerosoli (termini(s) appropriati) da precisare da parte del produttore)  
**S24** - Evitare il contatto con la pelle.  
**S29** - Non gettare i residui nelle fognature.  
**S67** - Usare contenitori adeguati per evitare l'inquinamento ambientale.  
**S65** - Non disperdere nell'ambiente. Rifarsi alle istruzioni specialistiche informative in materia di sicurezza.



1

# HYDROGEN SULFIDE

UN1053  
CAS #: 7783-06-4

2



5

## PRECAUTIONS

- Keep away from heat, sparks, open flames or hot surfaces. - No smoking.
- Do not breathe gas, vapours.
- Avoid release to the environment.
- Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
- Eliminate all ignition sources if safe to do so.
- Store in a well-ventilated place.
- Store locked up.

## FIRST AID

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor/physician. Specific treatment is urgent: maintain adequate ventilation and consider administration of 100% oxygen. Sodium nitrite may be a useful antidote.

6

Safety Sam's Hazardous Chemical Liquidators  
123 Toxic Lane • Tempe, AZ, 85281 • (602) 639-4802

## DANGER

Extremely flammable gas  
Contains gas under pressure.  
May explode if heated.  
Contains poisonous hydrogen sulfide gas.  
Fatal if inhaled.  
May cause respiratory irritation.  
Very toxic to aquatic life.  
Causes eye irritation.

3

4

# What is Required by Law?

- OSHA GHS Label for Workers
- Shipping Hazmat – DOT labels/placards
- EPA Hazardous Waste Label



**ACETONE**  
(1910.1200(f)(1)(i))

**DANGER** (1910.1200(f)(1)(ii))  
Highly flammable liquid & vapor  
Causes severe eye irritation  
May cause respiratory irritation, drowsiness or dizziness  
(1910.1200(f)(1)(iii))

**Precautionary statements** (1910.1200(f)(1)(v))

**Prevention**  
Keep away from heat, sparks, open flames, hot surfaces - No smoking.  
Keep containers tightly closed.  
Use explosion-proof electrical, ventilating, lighting equipment.  
Use non-sparking tools.  
Take precautionary measures against static discharge.  
Wear protective gloves, eye protection, face protection.  
Wash hands thoroughly after handling.  
Avoid breathing fumes.  
Use only outdoors or in a well-ventilated area.

**Response**  
If on skin or hair take off immediately all contaminated clothing. Rinse skin with water and/or shower.  
In case of fire use carbon dioxide, dry chemical powder or foam to extinguish.  
If in eyes, rinse cautiously with water for several minutes. Remove contact lenses, if present and easy-to-do.  
Continue rinsing.  
If eye irritation persists, get medical attention.  
If inhaled, remove person to fresh air and keep comfortable for breathing.  
Call medical personnel if you feel unwell.

**Storage**  
Store in a well-ventilated place. Keep cool.  
Keep container tightly closed.  
Store locked up.

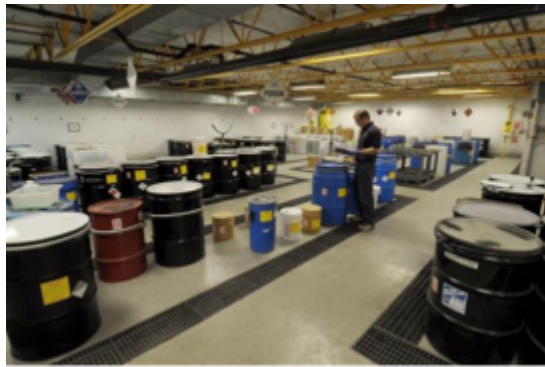
**Disposal**  
Dispose of contents and containers according to EPA CFR Part 260 The Hazardous Waste Management System, Part 261 Identification of Hazardous Wastes, Part 262 Standards Applicable to Generators of Hazardous Wastes or in accordance with local, regional, national and international regulations.  
ABC Corp., 555 Main St., Anytown, PA 19530, (555) 555-1212 (1910.1200(f)(1)(vi))



**Fire Department (AHJ) NFPA**

# Hazardous Chemical Management

1. Use an OSHA and/or hazards label
2. Labels in English
3. Segregate containers according to hazard
4. Keep a current SDS onsite or accessible
5. Store chemicals inside that are temperature or sunlight sensitive
6. Keep containers in good condition
7. AHJ Requires secondary containment >110%



# EPA-Hazardous Waste Labels

- **Hazardous Waste Management**

- ✓ Protective of Environment
- ✓ Encourages Reuse/Recycle

- **EPA-RCRA 40 CFR 260-282**

- ✓ Universal Wastes
- ✓ Hazardous Wastes
  - LISTED (F, K, P, U)
  - Characteristic (Ignitable, corrosive, reactive, toxic)
- ✓ Non-Hazardous Wastes

A blue rectangular label with white text. At the top, it reads "NON-RCRA REGULATED WASTE" in large, bold, white letters. Below this, in smaller white text, it says "THIS WASTE IS NOT REGULATED BY THE U.S. ENVIRONMENTAL PROTECTION AGENCY AND SHOULD BE MANAGED IN ACCORDANCE WITH FEDERAL, STATE, OR LOCAL REGULATIONS." Underneath is a section titled "GENERATOR INFORMATION (optional)" with fields for "SHIPPER", "ADDRESS", "CITY, STATE, ZIP", "PROPER U.S.T. SHIPPING DATE", "ON OR SA IN", and "TELEPHONE". At the bottom, it repeats "NON-RCRA REGULATED WASTE" in white text on a blue background.

A purple rectangular label with white text. At the top, it reads "UNIVERSAL WASTE" in large, bold, white letters. Below this, it has fields for "SHIPPER", "ADDRESS", "CITY, STATE, ZIP", "CONTENTS", and "ACCUMULATION START DATE".

A yellow rectangular label with a red border and black text. At the top, it reads "HAZARDOUS WASTE" in large, bold, black letters. Below this, it says "FEDERAL LAW PROHIBITS IMPROPER DISPOSAL. IF FOUND, CONTACT THE NEAREST POLICE OR PUBLIC SAFETY AUTHORITY OR THE U.S. ENVIRONMENTAL PROTECTION AGENCY." Underneath is a section titled "GENERATOR INFORMATION" with fields for "NAME", "ADDRESS", "PHONE", "CITY", "STATE", "ZIP", "EPA HAZARDOUS WASTE ID NO. / DOCUMENT NO.", "ACCUMULATION START DATE", and "EPA WASTE NO.". At the bottom, it says "HANDLE WITH CARE!" in bold black letters.

Do not use WASTE if not HAZARDOUS

# Multiple Labels

- DOT Shipping
- EPA HAZ-Waste





# Hazardous Waste Drums

- Hazardous Waste Label
- DOT Shipping Label



# What Needs to be Changed?



Remove dried plant needles




DOT / NFPA 704 Sign

GHS Labels / Pictograms




Spill kit / fire extinguisher

Inspect Integrity

**! DANGER**  
**GASOLINE**  
**EXTREMELY FLAMMABLE LIQUID AND VAPOR!**  
May be fatal if swallowed and enters airways. Causes skin irritation. Causes eye irritation. May cause drowsiness or dizziness. May cause damage to liver, kidneys and nervous system through prolonged or repeated exposure. Suspected of causing cancer. Keep away from heat, sparks and flame - no smoking. Do not breathe vapors.

Protective gloves, eye/face protection and vapor respirator are required in this area.

**! DANGER**



**GASOLINE**

 NO SMOKING  
 NO OPEN FLAMES



# What needs to be changed?



# What needs to be changed?



Use highest number one sign

[www.nfpa.org](http://www.nfpa.org) Go to NFPA 704

# Hazardous Materials Training

- Label Types, SDS, Pictograms
- EPA, DOT, OSHA are the Law
- Before Exposure or they handle the chemicals
- EAP, Emergency Action Plan, Evacuation Plan, Spill Response and Fire Prevention Procedures
- When and how to report a spill and whether the release of chemicals is a HAZCOM or a HAZWOPER for clean up
- **NOW YOU KNOW THE DIFFERENCE!**



# Summary

## **DOT, OSHA, EPA Standards = LAW**

- DOT is for transportation of HAZMAT in Commerce
- OSHA is for worker safety (pictograms, SDS, labels)
- EPA is for hazardous waste management

## **Consensus Standards = BEST MGT**

- NFPA is for emergency responders (NFPA label)
  - HMIS is general hazmat rating system
  - ANSI (awareness of hazards signage)
- **Train Workers on ALL LABEL METHOD Systems!**



# Further Information

[www.SWCSafety.com](http://www.SWCSafety.com)

- ✓ Go to Tri-State Link Page (Online until Oct. 2019)
- ✓ Copy of Presentation and List of resources
  - OSHA Fact Sheets and Compliance Directives
  - DOT placard handout
  - EPA and other fact sheets for chemicals
  - OSHA GHS website links

**Diane K. Hale CEM, ASP, CHMM, ASP**

**820 S. Valley View Blvd. Las Vegas, NV 89107**

**702-897-4906 702-897-8210 FAX**

**dhale@swcsafety.com**

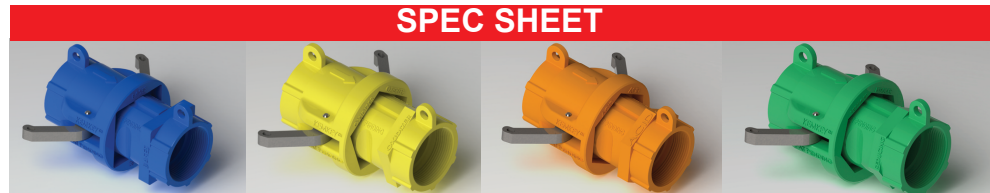


# Neat but not compliant.



# Alternative methods-KEMKEY

- Color coded and Physical shape fittings



Through the use of different shapes, colors, and markings, KemKey™ couplings, when used with an acceptable safety processes, will make the chance of chemical cross-contamination during transfers virtually impossible.

#### **SCOPE**

- KemKey™ couplings are shaped so that each class of hazardous chemicals has its own shape.

Acids – hexagon; Bases – square;  
Reducing agents – heptagon (7 sides)  
Oxidizers – variations on the pentagon;  
Poisons (biocides, herbicides, pesticides, etc.) – nonagons (9 sided),  
Non-hazardous - oval

- KemKey™ couplings have specific colors so that every class of hazardous chemicals will have its own color.

Acids – orange; Bases - blue; Oxidizers – yellow;  
Poisons – purple; Reducers - green; Non-hazardous - teal

- KemKey™ couplings have markings on both the male and female ends that say exactly what the particular fitting is designed to transfer.

- KemKey™ will work with each customer to verify that an acceptable safety process is in place to make sure the entire process is as safe as possible.
- KemKey™ fittings have the correct seals for the class of chemical installed when they ship to make sure there are no questions about the seal compatibility.
- KemKey™ seals are the most technologically advanced seals available on the market.

#### **USES:**

Virtually all water-soluble chemicals as well as some specialty chemicals.  
All chemicals that pass through a polypropylene KemKey™ fitting should be compatible with polypropylene. It is the users responsibility to verify that the fitting is acceptable for the chemical being transferred.

#### **SPEC SHEET**

#### **MATERIAL/SIZES**

KemKey™ fittings are made of polypropylene that is reinforced with 30% fiberglass. When customers are verifying chemical compatibility always refer to polypropylene compatibility tables. Current available sizes are 1" and 2" NPT female thread fittings.

#### **PRESSURES:**

KemKey™ fittings are designed to meet or exceed all specifications of standard cam-locking fittings. Therefore, it is recommended that you never exceed 125 psi on the fittings.  
Maximum pressure — 125 psi at 70 degrees Fahrenheit  
Temperature range — 0 to 180 degrees Fahrenheit

#### **QUALITY:**

KemKey™ fittings have been tested by an independent testing company to compare the new design with standard cam-lock fittings.  
KemKey™ fittings met or exceeded the performance of the standard cam-lock fitting in all tests. KemKey™ fittings held approximately twice the water pressure of the standard cam-lock fitting before leakage.  
KemKey™ fittings withstood an average of 8 times the vertical torque before the seal broke and the fitting began to leak.  
The KemKey™ fittings broke (were destroyed) at an average of 3 times the vertical torque of the standard cam-lock fitting.

#### **WARRANTY:**

KemKey™ fittings are guaranteed for 5 years from date of purchase. If the fittings fail due to any manufacturing flaw contact KemKey™ and it will be replaced at no cost.

# Example of Propane Labels

DOT



NFPA

**PROpane**

**MFH HAZARD RATING**

HEALTH HAZARD	4	FIRE HAZARD	0
	2		0

4 — Severe  
3 — Serious  
2 — Moderate  
1 — Slight  
0 — Minimal

REACTIVITY

1 — Slight  
0 — Minimal

CONSULT CORRESPONDING MSDS FOR FURTHER INFORMATION AND INSTRUCTIONS

MSDS TO ALL APPLICABLE CONTAINERS USED BY COMMERCIAL CUSTOMERS

—Extremely Flammable Gas  
—Heavier than Air  
—Simple Asphyxiant  
—Does not to make of its presence  
—Contact with Liquid will cause Freezing of Tissue  
—PEL: 100 PPM  
—Store container outside and keep cool (under 130°F)  
—Turn off container valve when not in use

PERSONAL PROTECTION

Goggles Gloves

HMIS

HMIS®	
<b>HEALTH</b>	<b>1</b>
<b>FLAMMABILITY</b>	<b>4</b>
<b>PHYSICAL HAZARD</b>	<b>0</b>
PERSONAL PROTECTION	
<b>B</b>	
HMIS® 00001 NPCA • JKA 305-HMIS-8997	

Consumer

**Propane Gas**  
dimethylmethane; liquefied propane; n-propane; propyl hydride

**DANGER! FLAMMABLE!**

**Emergency Overview:**  
Colorless, odorless gas, may have additives to smell like rotten eggs. Irritating to eyes/respiratory tract. Stored as a compressed gas which can cause fire/explosion. Also causes asphyxiation (reduced oxygen available for breathing). Flammable.

**Precautionary Measures:** Avoid exposure to skin. Wear protective clothing. Goggles. Gloves. Apron.

**First Aid Procedures:** Inhalation: Remove to fresh air and support breathing as needed. Eyes/Skin: For irritate, immerse skin in tepid (104°F) water until completely rewarmed. Flush eyes with tepid water. Ingestion: Unlikely.

**Fire Procedures:** Flammable. Use dry chemical, carbon dioxide, or water spray. Allow small amount of gas to remain burning. Burns with a luminous, smoky flame making it easy to ascertain when all is burned. This will prevent build-up of explosive levels.

**Spill Procedures:** Notify safety personnel, isolate and ventilate area. Shut off heat and ignition sources. Stop leaking cylinder or remove to safe outdoor location or turn head and empty slowly. Tag as defective, close valve, and return to supplier.

HCS

**PROPANE**

**DANGER**

Extremely flammable gas.  
Contains gas under pressure. May explode if heated.

Keep away from heat/sparks/open flames/hot surfaces. — No smoking:  
Take precautionary measures against static discharge; Leaking gas fire:  
Do not extinguish, unless leak can be stopped safely; Eliminate all  
ignition sources if safe to do so; Protect from sunlight. Store in a well  
ventilated place.

XYZ Chemical Company, 10004 Parkway Blvd, Saint Louis, MO, 63103,  
US (800)-555-1212

# GHS Labels



## Acetone

**Danger! Highly flammable liquid and vapor  
Causes severe eye irritation**



**Keep away from heat, sparks and flame – No smoking. Take precautionary measures against static discharge. Keep from direct sunlight. Keep container closed when not in use. Store in a cool/low temperature, well-ventilated place away from heat and ignition sources. Use only in a well-ventilated area. Avoid contact with eyes, skin and clothing. Wear appropriate personal protective equipment, avoid direct contact. Flush eyes with water for at least 15 minutes while holding eyelids open.**

All-Chem Supply Company  
353 Water Street  
Maplewood, NJ 01234  
Tel: 973-555-4321

# Metal Safety Can-OSHA/NFPA

- **Metal containers for flammables**

- ✓ Maximum Quantity 5 gallons
- ✓ Yellow-Diesel
- ✓ Red-Gasoline Fuels
- ✓ Spring-closing lid vs. Flash arrestor
- ✓ Spout Cover
- ✓ Approved Safety Cans or DOT



# OSHA INSTRUCTION

U.S. DEPARTMENT OF LABOR

Occupational Safety and Health Administration

DIRECTIVE NUMBER: **CPL 02-02-079** EFFECTIVE DATE: **July 9, 2015**

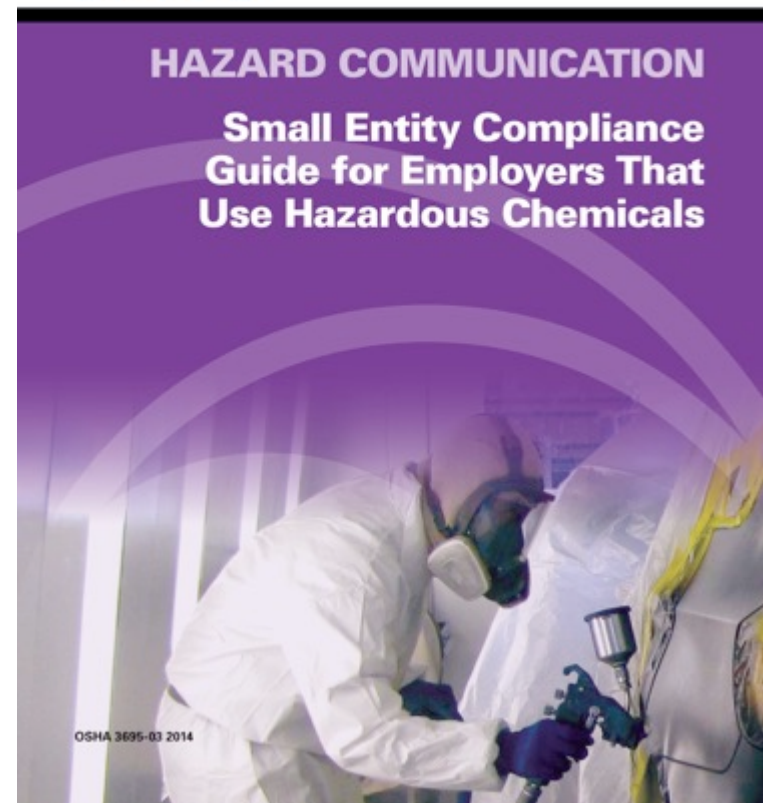
SUBJECT: Inspection Procedures for the Hazard Communication Standard (HCS 2012)

## ABSTRACT

- Purpose:** This Instruction establishes policies and procedures to ensure uniform enforcement of the Hazard Communication standard (HCS).
- Scope:** This Instruction applies OSHA-wide.
- References:** [Hazard Communication, 29 CFR 1910.1200 \[HCS 1994\]](#).  
[Hazard Communication, Final Rule, Federal Register, Vol. 77, No. 58, pgs 17574-17896, March 26, 2012 \[HCS or HCS 2012\]](#).  
OSHA Instruction, [CPL-02-00-150, Field Operations Manual \(FOM\), April 22, 2011](#).  
OSHA Instruction, [CPL 02-00-124, Multi-Employer Citation Policy, December 10, 1999](#).  
OSHA Instruction, [CPL 03-00-008, Combustible Dust National Emphasis Program, March 11, 2008](#).
- Cancellations:** OSHA Instruction, CPL 02-02-038, Inspection Procedures for the Hazard Communication Standard, March 20, 1998.  
OSHA Instruction, CPL 02-02-039, Sample Material Safety Data Sheet, March 27, 1986.  
OSHA Memorandum, Enforcement Guidance for the Hazard Communication Standard's (HCS) June 1, 2015 Effective Date, February 9, 2015.  
OSHA Memorandum, Interim Enforcement Guidance for the Hazard Communication (HCS 2102) June 1, 2015 Effective Date, May 29, 2015.

ABSTRACT-1

# Employers



## Comparison of NFPA 704 and HazCom 2012 Labels

	NFPA 704	HazCom 2012
Purpose	Provides basic information for emergency personnel responding to a fire or spill and those planning for emergency response.	Informs workers about the hazards of chemicals in workplace under normal conditions of use and foreseeable emergencies.
Number System: NFPA Rating and OSHA's Classification System	0-4 0-least hazardous 4-most hazardous	1-4 1-most severe hazard 4-least severe hazard • The Hazard category numbers are NOT required to be on labels but are required on SDSs in Section 2. • Numbers are used to CLASSIFY hazards to determine what label information is required.
Information Provided on Label	<ul style="list-style-type: none"> <li>Health-Blue</li> <li>Flammability-Red</li> <li>Instability-Yellow</li> <li>Special Hazards*-White</li> </ul> *OX Oxidizers W Water Reactives SA Simple Asphyxiants	<ul style="list-style-type: none"> <li>Product Identifier</li> <li>Signal Word</li> <li>Hazard Statement(s)</li> <li>Pictogram(s)</li> <li>Precautionary statement(s); and</li> <li>Name address and phone number of responsible party.</li> </ul>
Health Hazards on Label	Acute (short term) health hazards ONLY. Acute hazards are more typical for emergency response applications.  Chronic health effects are not covered by NFPA 704.	Acute (short term) and chronic (long term) health hazards. Both acute and chronic health effects are relevant for employees working with chemicals day after day. Health hazards include acute hazards such as eye irritants, simple asphyxiants and skin corrosives as well as chronic hazards such as carcinogens.
Flammability/ Physical Hazards on Label	NFPA divides flammability and instability hazards into two separate numbers on the label.  Flammability in red section Instability in yellow section	A broad range of physical hazard classes are listed on the label including explosives, flammables, oxidizers, reactives, pyrophorics, combustible dusts and corrosives.
Where to get information to place on label	Rating system found in NFPA Fire Protection Guide to Hazardous Materials OR NFPA 704 Standard System for Identification of the Hazards of Materials for Emergency Response 2012 Edition, Tables 5.2, 6.2, 7.2 and Chapter 8 of NFPA 704	OSHA Hazard Communication Standard 29 CFR 1910.1200 (2012). 1) Classify using Appendix A (Health Hazards) and Appendix B (Physical Hazards) 2) Label using Appendix C
Other	The hazard category numbers found in section 2 of the HC2012 compliant SDSs are NOT to be used to fill in the NFPA 704 diamond.	Supplemental information may also appear on the label such as any hazards not otherwise classified, and directions for use.
website	www.nfpa.org/704	www.osha.gov OR www.osha.gov/dsg/hazcom/index.html

For more information:



National Fire Protection Association  
www.nfpa.org | 800.344.3555



Occupational Safety and Health Administration  
U.S. Department of Labor  
www.osha.gov | 800.321.OSHA (6742)

The substance: "NOMIXUP 7042012"

### To create an OSHA label per HazCom 2012:

**Step 1:** Perform the classification in accordance with Appendix A: Health Hazards & Appendix B Physical Hazards of 29 CFR 1910.1200 - this is where you find the criteria for each hazard class and hazard category.

Class: Flammable Gas, Category 1

Class: Carcinogen, Category 1B

Class: Specific Target Organ Toxicity (Single Exposure), Category 3

Class: Substances and Mixtures Which, in Contact with Water, Emit Flammable Gases, Category 3

**Step 2:** Gather labeling information (Pictograms, Signal Word, Hazard Statements) from Appendix C of 29 CFR 1910.1200 based on the chemical's hazard class and category.

**Step 3:** Create the Label



### To Create NFPA 704 label:

**Step 1:** Collect information on hazards from applicable sections of SDS. Some SDSs may provide the NFPA diamond symbol with hazard rating numbers filled in already. **Note: Do NOT use the hazard category numbers given in section 2 of HazCom 2012 compliant SDS on 704 label!**

If the diamond is not provided on the SDS you can obtain the information under the following sections of the SDS. Note that additional information may be provided in other sections of the SDS.

- Health hazard information under Section 11
- Flammability information under Section 9
- Instability information under Section 10
- Special information under Section 9, 10, 11

**Step 2:** Obtain current edition copy of NFPA 704 or view on line at [www.nfpa.org/704](http://www.nfpa.org/704). Compare the criteria on the SDS sections as shown above with the criteria shown in Tables 5.2 (Health), 6.2 (Flammability), 7.2 (Instability) and 8.2 (Special Hazards)

**Step 3:** Place numbers for the degree of hazard associated with the criteria obtained in Step 2 in the correct quadrant of NFPA 704 placard.

NFPA Label for NOMIXUP 7042012



For more information:



National Fire Protection Association  
www.nfpa.org | 800.344.3555



Occupational Safety and Health Administration  
U.S. Department of Labor  
www.osha.gov | 800.321.OSHA (6742)