Hazard Communication and GHS

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Terracon Consultants, Inc.
# Deadlines

<table>
<thead>
<tr>
<th>Effective Completion Date</th>
<th>Requirement(s)</th>
<th>Who</th>
</tr>
</thead>
<tbody>
<tr>
<td>December 1, 2013</td>
<td>Train employees on the new label elements and safety data sheet (SDS) format.</td>
<td>Employers</td>
</tr>
<tr>
<td>June 1, 2015 - December 1, 2015</td>
<td>Compliance with all modified provisions of this final rule, except: The distributor shall not ship containers labeled by the chemical manufacturer or importer unless it has a GHS label</td>
<td>Chemical manufacturers, importers, distributors and employers</td>
</tr>
<tr>
<td>June 1, 2016</td>
<td>Update alternative workplace labeling and hazard communication program as necessary, and provide additional employee training for newly identified physical or health hazards.</td>
<td>Employers</td>
</tr>
</tbody>
</table>
Major Changes

- **Hazard classification**: The definitions have been changed to provide specific criteria for classification of health and physical hazards.

- **Labels**: Must include a harmonized signal word, pictogram, and hazard statement for each hazard class and category. Precautionary statements must also be provided.

- **Safety Data Sheets**: Specified 16-section format.
Definitions

Added
- Classification,
- Hazard category,
- Hazard class,
- **Hazard not otherwise classified**, 
- Hazard statement,
- Label elements,
- Pictogram,
- Precautionary statement,
- Product identifier,
- Pyrophoric gas,
- Safety data sheet,
- Signal word,
- **Simple asphyxiant**, and
- Substance

Deleted
- **Combustible liquid**, 
- **Compressed gas**, 
- Explosive,
- **Flammable**, 
- **Flashpoint**, 
- Hazard warning,
- Identity,
- Material safety data sheet,
- Organic peroxide,
- Oxidizer,
- Pyrophoric,
- Unstable (reactive), and
- Water-reactive

Also covered
- **Combustible dust**
Hazardous Chemical

- Any chemical which is classified as a physical hazard or a health hazard, a simple asphyxiant, combustible dust, pyrophoric gas, or hazard not otherwise classified
- Specific criteria to address health and physical hazards as well as classification of chemical mixtures
Physical Hazards

- Explosive;
- Flammable (gases, aerosols, liquids, or solids);
- Oxidizer (liquid, solid or gas);
- Self-reactive;
- Pyrophoric (liquid or solid);
- Self-heating;
- Organic peroxide;
- Corrosive to metal;
- Gas under pressure; or
- Emits flammable gas in contact with water
Health Hazards

- Acute toxicity (any route of exposure);
- Skin corrosion or irritation;
- Serious eye damage or eye irritation;
- Respiratory or skin sensitization;
- Germ cell mutagenicity;
- Carcinogenicity;
- Reproductive toxicity;
- Specific target organ toxicity (single or repeated exposure); or
- Aspiration hazard
Labels

- Product identifier;
- **Signal word**;
- Hazard statement(s);
- **Pictogram(s)**;
- Precautionary statement(s); and,
- Name, address, and telephone number of the chemical manufacturer, importer, or other responsible party.
Label Elements

- Harmonized signal word
  - Warning
  - Danger
- Hazard statement
  - Nature of hazard
  - Degree of hazard
- Precautionary statement
  - Preventive measures
Pictograms

- Flammables
  - Pyrophorics
  - Self-heating
  - Emits flammable gas
  - Self-reactives
  - Organic peroxides

- Oxidizers

- Explosives
  - Self-reactives
  - Organic peroxides

- Gases under pressure

- Skin corrosion/burns
  - Eye damage
  - Corrosive to metals
Pictograms

- Irritant (skin and eye)
- Skin sensitizer
- Acute toxicity (harmful)
- Narcotic effects
- Respiratory tract irritant
- Hazardous to ozone layer (non-mandatory)

- Carcinogen
- Mutagenicity
- Reproductive toxicity
- Respiratory sensitizer
- Target organ toxicity
- Aspiration toxicity

- Acute toxicity (fatal or toxic)

- Aquatic toxicity (non-mandatory)
Keep container tightly closed. Store in a cool, well-ventilated place that is locked. Keep away from heat/sparks/open flame. No smoking. Only use non-sparking tools. Use explosion-proof electrical equipment. Take precautionary measures against static discharge. Ground and bond container and receiving equipment. Do not breathe vapors. Wear protective gloves. Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling. Dispose of in accordance with local, regional, national, international regulations as specified.

**In Case of Fire:** Use dry chemical (BC) or Carbon Dioxide (CO2) fire extinguisher to extinguish.

**First Aid**
If exposed, call Poison Center. If on skin or hair, take off immediately any contaminated clothing. Rinse skin with water.

**Supplemental Information**

**Directions for Use**

**Fill weight:** ________  **Lot Number:** ________

**Gross weight:** ________  **Fill Date:** ________

**Expiration Date:** ________
Safety Data Sheet

Section 1. Identification
Section 2. Hazard(s) identification
Section 3. Composition/information on ingredients
Section 4. First-aid measures
Section 5. Fire-fighting measures
Section 6. Accidental release measures
Section 7. Handling and storage
Section 8. Exposure controls/personal protection
Section 9. Physical and chemical properties
Section 10. Stability and reactivity
Section 11. Toxicological information
Section 12. Ecological information
Section 13. Disposal considerations
Section 14. Transport information
Section 15. Regulatory information
Section 16. Other information, including date of preparation or last revision
Hazard Categories

- GHS Hazard Categories
  - Cat. 1 ~ ‘Severe Hazard’
  - Cat. 2 ~ ‘Serious Hazard’
  - Cat. 3 ~ ‘Moderate Hazard’
  - Cat. 4 ~ ‘Slight Hazard’
  - Cat. 5 ~ ‘Minimal Hazard’

- HMIS/NFPA Hazard Ratings
  - 0 = Minimal Hazard
  - 1 = Slight Hazard
  - 2 = Moderate Hazard
  - 3 = Serious Hazard
  - 4 = Severe Hazard
Appendix A. Table A.1.1: Acute toxicity hazard categories and acute toxicity estimate (ATE) values defining the respective categories

<table>
<thead>
<tr>
<th>Exposure route</th>
<th>Category 1</th>
<th>Category 2</th>
<th>Category 3</th>
<th>Category 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Oral</strong> (mg/kg bodyweight)</td>
<td>≤ 5</td>
<td>&gt;5 and ≤ 50</td>
<td>&gt;50 and ≤ 300</td>
<td>&gt;300 and ≤ 2000</td>
</tr>
<tr>
<td>see:</td>
<td>Note (a)</td>
<td>Note (b)</td>
<td>Note (c)</td>
<td></td>
</tr>
<tr>
<td><strong>Dermal</strong> (mg/kg bodyweight)</td>
<td>≤ 5</td>
<td>&gt;50 and ≤ 200</td>
<td>&gt;200 and ≤ 1000</td>
<td>&gt;1000 and ≤ 2000</td>
</tr>
<tr>
<td>see:</td>
<td>Note (a)</td>
<td>Note (b)</td>
<td>Note (c)</td>
<td></td>
</tr>
<tr>
<td><strong>Inhalation - Gases</strong> (ppmV)</td>
<td>≤ 100</td>
<td>&gt;100 and ≤ 500</td>
<td>&gt;500 and ≤ 2500</td>
<td>&gt;2500 and ≤ 20000</td>
</tr>
<tr>
<td>see:</td>
<td>Note (a)</td>
<td>Note (b)</td>
<td>Note (c)</td>
<td></td>
</tr>
<tr>
<td><strong>Inhalation - Vapors</strong> (mg/l)</td>
<td>≤ 0.5</td>
<td>&gt;0.5 and ≤ 2.0</td>
<td>&gt;2.0 and ≤ 10.0</td>
<td>&gt;10.0 and ≤ 20.0</td>
</tr>
<tr>
<td>see:</td>
<td>Note (a)</td>
<td>Note (b)</td>
<td>Note (c)</td>
<td></td>
</tr>
<tr>
<td><strong>Inhalation – Dusts and Mists</strong> (mg/l)</td>
<td>≤ 0.05</td>
<td>&gt;0.05 and ≤ 0.5</td>
<td>&gt;0.5 and ≤ 1.0</td>
<td>&gt;1.0 and ≤ 5.0</td>
</tr>
<tr>
<td>see:</td>
<td>Note (a)</td>
<td>Note (b)</td>
<td>Note (c)</td>
<td></td>
</tr>
</tbody>
</table>
Appendix B. Table B.6.1: Criteria for flammable liquids

<table>
<thead>
<tr>
<th>Category</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Flash point &lt; 23°C (73.4°F) and initial boiling point ≤ 35°C (95°F)</td>
</tr>
<tr>
<td>2</td>
<td>Flash point &lt; 23°C (73.4°F) and initial boiling point &gt; 35°C (95°F)</td>
</tr>
<tr>
<td>3</td>
<td>Flash point ≥ 23°C (73.4°F) and ≤ 60°C (140°F)</td>
</tr>
<tr>
<td>4</td>
<td>Flash point &gt; 60°C (140°F) and ≤ 93°C (199.4°F)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NFPA Category</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Flash point ≥93.4°C (200°F)</td>
</tr>
<tr>
<td>2</td>
<td>Flash point ≥37.8°C (100°F) and below 93.4°C (200°F)</td>
</tr>
<tr>
<td>3</td>
<td>Flash point &lt;22.8°C (73°F) and boiling point ≥37.8°C (100°F) and Flash point ≥22.8°C (73°F) and below 37.8°C (100°F)</td>
</tr>
<tr>
<td>4</td>
<td>Flash point &lt;22.8°C (73°F) and boiling point &lt;37.8°C (100°F)</td>
</tr>
</tbody>
</table>
Changes to Other Standards

- Flammable liquids are defined differently and definitions do not include combustible liquids. Standards that cover flammable liquids have been revised to reflect the new definitions and sign and label requirements.
  - 1910.106 Flammable liquids (significant change)
  - 1910.107 Spray finishing using flammable and combustible materials
  - 1910.123-126 Dipping and coating operations
  - 1910.1450 Occupational exposure to hazardous chemicals in laboratories
Changes to Other Standards

- Sign and label requirements in chemical-specific standards such as:
  - Asbestos,
  - Lead, and
  - Hexavalent chromium

- Revised to include signal words and standard hazard statements.

- Hazard communication requirements in these standards have also been revised to align with HCS.
Changes to Other Standards

- 1910.119 Process safety management
- 1910.120 Hazardous waste operations
- 1910.252 General requirements for welding, cutting, and brazing
- 1915 Maritime standards
- 1926 Construction standards
Resources

- Final rule (federal register) - https://www.federalregister.gov/articles/2012/03/26/2012-4826/hazard-communication
Hazard Communication Standard Pictogram

As of June 1, 2015, the Hazard Communication Standard (HCS) will require pictograms on labels to alert users of the chemical hazards to which they may be exposed. Each pictogram consists of a symbol on a white background framed within a red border and represents a distinct hazard(s). The pictogram on the label is determined by the chemical hazard classification.

**HCS Pictograms and Hazards**

<table>
<thead>
<tr>
<th>Health Hazard</th>
<th>Flame</th>
<th>Exclamation Mark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carcinogen</td>
<td>Flammables</td>
<td>Irritant (skin and eye)</td>
</tr>
<tr>
<td>Mutagenicity</td>
<td>Pyrophorics</td>
<td>Skin Sensitizer</td>
</tr>
<tr>
<td>Reproductive Toxicity</td>
<td>Self-Heating</td>
<td>Acute Toxicity (harmful)</td>
</tr>
<tr>
<td>Respiratory Sensitizer</td>
<td>Emits Flammable Gas</td>
<td>Narcotic Effects</td>
</tr>
<tr>
<td>Target Organ Toxicity</td>
<td>Self-Reactives</td>
<td>Respiratory Tract Irritant</td>
</tr>
<tr>
<td>Aspiration Toxicity</td>
<td>Organic Peroxides</td>
<td>Hazardous to Ozone Layer (Non-Mandatory)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gas Cylinder</th>
<th>Corrosion</th>
<th>Exploding Bomb</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gases Under Pressure</td>
<td>Skin Corrosion/ Burns</td>
<td>Explosives</td>
</tr>
<tr>
<td></td>
<td>Eye Damage</td>
<td>Self-Reactives</td>
</tr>
<tr>
<td></td>
<td>Corrosive to Metals</td>
<td>Organic Peroxides</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Flame Over Circle</th>
<th>Environment (Non-Mandatory)</th>
<th>Skull and Crossbones</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxidizers</td>
<td>Aquatic Toxicity</td>
<td>Acute Toxicity</td>
</tr>
</tbody>
</table>

For more information:

OSHA®
Occupational Safety and Health Administration
U.S. Department of Labor
www.osha.gov  (800) 321-OSHA (6742)
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.

For more information:

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U.S. Department of Labor
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