Guidance

Hazard Communication and the Globally Harmonized System of Classification and Labeling

July 2014

Work Zone Safety Consortium

This material is based upon work supported by the Federal Highway Administration Grant Agreement DTFH61-11-H-00029
Preface

The original Hazard Communication Standard (HCS) of 1987 was promulgated by the U.S. Occupational Safety and Health Administration (U.S. Department of Labor) to provide workers with the ‘right to know’ the hazards and identities of the chemicals they are exposed to while working, as well as the measures they can take to protect themselves and others. Besides having what OSHA considers to be an inherent ‘right to know’ about hazardous chemicals in their workplaces, exposed employees also have a need to know this information as they are at significant risk of experiencing adverse health or physical effects in the absence of such knowledge.

Chemicals pose a myriad of hazards to exposed workers, from mild health effects, such as irritation, to death. Some chemicals cause or contribute to chronic diseases, such as heart disease, kidney disease, sterility, or cancer.

Numerous chemicals pose physical hazards by contributing to accidents like fires and explosions. Such events not only cause injury and/or death to road industry workers but damage to company property and the infrastructure, as well as posing serious danger to the motoring public.

Examples of chemicals found in road construction include asphalt, cement, cement admixtures, gasoline, diesel, deicers, solvents, additives, and cleaning products.

The purpose of the HCS is to ensure that the hazards of all chemicals produced or imported are evaluated, and that information concerning their hazards is transmitted to employers and employees. In broad outline, the HCS achieves its purpose by an integrated three-pronged system. First, chemical manufacturers and importers must review available scientific evidence concerning the physical and health hazards of the chemicals they produce or import to determine if they are hazardous. Second, for every chemical found to be hazardous, the chemical manufacturer or importer must develop comprehensive Safety Data Sheets (SDSs) and warning labels for containers and send both downstream along with the chemicals. Third, all employers must develop a written hazard communication program and provide information and training to employees about the hazardous chemicals in their workplace.

Objectives

This document summarizes available guidance on the revised Hazard Communication Standard, known as HCS 2012, that aligns with the United Nations’ Globally Harmonized System of Classification and Labeling of Chemicals. The purpose of this document is to help companies, managers, and supervisors in the road building industry understand the HCS 2012 requirements and to provide guidance on meeting those requirements.

This document is organized into the following sections which explain the major requirements of the standard:

* Background - How the UN Globally Harmonized System (GHS) has been integrated into the U.S. OSHA HCS 2012
* Improved Labeling - How new labeling requirements improve effectiveness of product labels
* New Pictograms - What these are and how they communicate hazards in all languages
* Examples of old labeling systems to be replaced - Images of labels made obsolete by HCS 2012
* Safety Data Sheets (SDS) - The required sections of the new Safety Data Sheets
* Training and Information Resources - Help for employers in meeting the HCS training requirements

Refer to [http://www.workzonesafety.org](http://www.workzonesafety.org) for a copy of this document.

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Hazard Communication 2012 and the Globally Harmonized System of Classification and Labeling of Chemicals

Background

In 2012, the Occupational Safety and Health Administration (OSHA) updated its Hazard Communication Standard, 29 Code of Federal Regulations 1901.1200, known as HCS 2012. The Hazard Communication Standard (HCS 2012) is now aligned with the United Nations’ Globally Harmonized System of Classification and Labeling of Chemicals (GHS). This system is an international approach to communicating hazards and training employees to use pictures or images that symbolize hazardous materials.

The new standard updates and changes the Safety Data Sheet (formerly known as the Material Safety Data Sheet), improves labeling, and for the first time, uses pictorials or symbols to visualize a potential hazard. One of OSHA’s stated goals with the update is to evolve from a worker’s “right to know” to a worker’s “right to understand.” As manufacturers, importers, and distributors transition from Material Safety Data Sheets to the Safety Data Sheet (SDS), employees will increasingly see GHS-compliant labels as well as historic labels that comply with previous OSHA requirements.

Important Dates in Transition to HCS 2012

<table>
<thead>
<tr>
<th>Date</th>
<th>Requirement</th>
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<tbody>
<tr>
<td>December 1, 2013</td>
<td>All employees must be trained to the new standard, new labels, and SDS format.</td>
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<tr>
<td>June 1, 2015</td>
<td>All manufacturers, importers, and employers must implement all provisions except products shipped by distributors.</td>
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<tr>
<td>December 1, 2015</td>
<td>Manufacturers, importers, and distributors must have new HCS 2012 labels on containers.</td>
</tr>
<tr>
<td>June 1, 2016</td>
<td>Employers must implement HCS 2012 programs and complete new training.</td>
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The December 1, 2013 deadline was designed to help workers understand the new labels and SDSs that they will increasingly see during the transition period that will end on June 1, 2016. By June 1, 2015, all manufacturer labels and SDSs will have to be fully in line with the HCS 2012. Distributors have another six months, until December 1, 2015, to comply.
“During the transition period, employers would be required to be in compliance with either the existing HCS or the revised HCS, or both. OSHA recognizes that hazard communication programs will go through a period of time where labels and SDSs under both standards will be present in the workplace. This will be considered acceptable, and employers are not required to maintain two sets of labels and SDSs for compliance purposes.” – OSHA.gov.

**Improved Labeling:**

The goal of the new label is to provide an employee with standardized and easy-to-read manufacturers’ labeling that will be found on all containers.

New labels are designed to communicate dangerous and hazardous material as indicated by OSHA’s updated Hazard Communication regulation. The standard incorporates Globally Harmonized System (GHS) requirements, including the use of specified pictogram formats for labeling. If the hazardous material is removed from its original container and placed in another container, employers may use words and/or symbols to portray the information about the hazards of the material in the new container whether it is a bottle, tank, or drum.

As of June 1, 2015, all labeling of chemicals must have the following six elements, which also will be found on the new GHS Safety Data Sheet (SDS):

- product identifier,
- pictogram(s),
- signal word,
- hazard statement(s),
- precautionary statements, and
- name, address, and phone number of the responsible party.

The following provides an overview of what a worker is likely to see when viewing a label. Each element of a label is defined with easy to follow language and pictograms:

### HCS 2012 Label Elements

**PAINT (METHYL FLAMMALINE, LEAD CHROMOMIUM)**

**DANGER**

Causes damage to the liver and kidneys through prolonged or repeated exposure to the skin.
Keep away from food and drink.
Wash hands thoroughly are use and before eating.
Highly flammable liquid and vapor.
Keep away from heat and ignition sources.

**FIRST AID**

Call emergency medical care.
Wash affected area of body thoroughly with soap and fresh water.

Great Lake Paints, Inc., Columbus, Ohio, USA.
Telephone 999 999 9999

Pictograms
- Convey specific information about the hazard(s) of a chemical

Product Identifier
- Chemical name or number to identify the chemical

Signal Word
- Alerts level of severity of hazard

Hazard Statement(s)
- Describes the nature of hazard(s) associated with a chemical

Precautionary Statement(s)
- Recommended measures to take to prevent adverse effects

First Aid Statement(s)
- Emergency care information

Supplier Information
- Name, address, and phone number of the chemical manufacturer, importer, or other responsible party
There are nine new pictograms. The eight required for labels under OSHA are displayed below and on the next page. The ninth pictogram represents chemicals that may cause environmental/ecotoxicological damage. Under HCS 2012, pictograms on labels must either be the title of the pictograms, (e.g., Flame or Exploding Bomb) or the accepted symbol of the pictogram, which is a diamond shape with a solid red outline and a white background, and the image must be in black-and-white. When applicable, these pictograms will be located on labels and also on SDSs of hazardous chemicals that have been classified through HCS 2012’s hazard classification process. There are a few instances where chemicals will not have a pictogram on the label or SDS after being classified.

New Pictograms: There are a total of nine new pictograms. Only eight are required for labels under OSHA.

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Exploding Bomb
“An Explosive, like dynamite – in liquid or solid form. Some chemicals can explode, even without air. Others produce gas at such pressure, temperature, and speed that the explosion can cause damage to the surrounding area.”

Corrosion
“Irreversible damage to the skin after being on the skin for up to 4 hours. Skin will show ulcers, bleeding, bloody scabs. After two weeks, skin discoloration, loss of hair and scars.”

Flame Over Circle
“Remember the ring and think ‘O’ – an oxidizer. Either liquid or solid, an ‘oxidizer’ can cause another material to combust or burn. The product itself is not flammable.”

Gas Cylinder
Gases under pressure
OSHA understands that HMIS (Hazardous Materials Information System) and the NFPA 704 (National Fire Prevention Association) labels will be still be listed on labels and SDSs. These voluntary additions to labels are NOT required by the HCS but are often used to convey hazard information to emergency responders.

Training employees to recognize and understand labels during the transition period, and even after, will be critically important.

NFPA 704 Hazard Rating goes from 0 - 4, with 0=minimal hazard and 4=severe hazard. HMIS uses a combination of numerical ratings and letters to indicate the level of personal protective equipment needed when using the chemical. See below.

The HCS 2012 Hazard Classifications are numbers that are used through the classification process to create the label and information for the SDS. The Hazard Classification hazard categories will not appear on the label but will be highlighted in Section 2 of the SDS.

<table>
<thead>
<tr>
<th>Flame</th>
<th>Skull and Crossbones</th>
<th>Exclamation Point</th>
<th>Health Hazard</th>
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<tbody>
<tr>
<td>“A gas, liquid or solid product that can burst into flames. Some are unstable and can explode even without air. Some solid or liquid products can “self-heat” and explode. Others will ignite only when in large amounts after hours or days.”</td>
<td>Poison - Acute toxicity (fatal or toxic)</td>
<td>“I” is “Harmful to your Health!” Some products are harmful if swallowed. Others are harmful if inhaled. A product can irritate the skin and cause an allergic reaction after skin contact. Some products can cause drowsiness, headaches and nausea. Lungs can be affected: coughing, pain, choking and breathing difficulties.</td>
<td>“Can cause or increase the “incidence of cancer.” Can harm specific organs. Can cause adverse effects on sexual function and fertility in men and women – and on developing offspring. Can change your genes and can pass along changes to offspring.”</td>
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Examples of old labeling systems to be replaced in the transition to GHS:

**WHMIS - Canada (Obsolete)**

**Acetone**

Keep away from heat, sparks, and flames. Avoid contact with eyes, skin, and clothing. Keep container closed. Use with adequate ventilation. Wash thoroughly after use.

**FIRST AID:**
- IMMEDIATELY CALL POISON CONTROL CENTER OR EMERGENCY ROOM
- IF CONTACTED ... etc.
- IF INHALED ... etc.
- IF SWALLOWED ... etc.

**HCL**

**ACETONE** (Dymethyl Ketone CAS 67-64-1)

DANGER! EXTREMELY FLAMMABLE

Acute: CAUSES IRRITATION OF EYES, SKIN, AND MUCOUS MEMBRANES

Chronic: EXPOSURE TO LIQUID MAY CAUSE DERMATITIS

Keep away from heat, sparks, and flame. Avoid contact with eyes, skin, and clothing. Keep container closed. Use with adequate ventilation. Wash thoroughly after use.

**FIRST AID:**
- IMMEDIATELY CALL POISON CONTROL CENTER OR EMERGENCY ROOM
- IF CONTACTED ... etc.
- IF INHALED ... etc.
- IF SWALLOWED ... etc.
An SDS is a formal document providing safety information about a product. Employers must have the SDS in the workplace, make sure that each chemical has an SDS, and make sure that these documents are readily available to workers.

In restrictive or confined spaces like a roadway work zone, it is important for employees to understand the hazards of materials with which they work. The new SDS format relays well-organized information about a material's hazard so that workers can protect themselves. For example, paving crews may use liquid cleanup and release agents that require the use of specified gloves or other protective gear. Even when the hazards of paving materials are well recognized, the SDS also provides needed information such as first aid considerations for overexposure to materials like hot asphalt.

As of June 1, 2015, HCS 2012 will require that all SDSs be in a uniform style and contain the following 16-section format.

**Section 1: Identification.** Included in this section are the product identifier (product name and relevant supplier information), emergency phone number, recommended use, and any restrictions on the use of the material.

**Section 2: Hazard(s) identification.** Of new importance, this section will include the hazard classification as well as new pictogram(s) that convey specific information about the hazards of the chemical. It will also include the signal word, either “Danger” or “Warning” which alerts the worker to the severity level of the hazard. This section will also list the hazards not otherwise classified (HNOC) and any information if a mixture has a component of unknown toxicity.

**Section 3: Composition/information on ingredients.** Provides information on the chemical components, including CAS# (Chemical Abstracts Service Number) or ingredients and the percent present in the material. It includes information on substances and mixtures listed as trade secret ingredients. If any trade secret claims are made – they can be found in this section.

**Section 4: First-aid measures.** This section includes important symptoms/effects, acute or delayed. It includes descriptions of necessary measures, subdivided according to the different routes of entry (i.e., through the eyes and skin contact, ingestion, and inhalation. This section also lists any special treatment required.

**Section 5: Fire-fighting measures.** This section covers the procedures needed when extinguishing a fire caused by the chemical. It must contain the correct extinguishing material and equipment and if there are any situations where certain materials or equipment should not be used. This section must also include any combustion issues with the chemical, such as any hazardous gases that may be produced when the chemical burns at certain temperatures or in certain situations.

**Section 6: Accidental release measures, such as spills and leaks.** This section will recommend specific containment and cleanup practices. If needed, there will be information distinguishing the responses to small or large spills. This section will also provide information on personal protective equipment and methods and materials used in cleanup and emergency procedures.

**Section 7: Handling and storage.** If applicable, this section will provide information on handling incompatible chemicals to ensure no cross contamination or hazardous combinations. It will also detail any hygiene practices that are required when handling this material (for example, no eating or smoking). There is also information regarding specific storage requirements such as ventilation.

**Section 8: Exposure controls/personal protection.** This section will contain any exposure limits, engineering controls, and personal protective measures. Types of information may include the OSHA Permissible Exposure Limit (PEL) and the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs). Recommendations appear here for any personal protective equipment (PPE) required that will protect workers from illness or injury when handling the chemical. This section also recommends specialized PPE such as respirators or a particular type of glove (for example, nitrile rubber gloves).

**Section 9: Physical and chemical properties.** This section will provide information on odor, pH, melting point, freezing point, boiling point, flash point, evaporation point, flammability (solid/gas), vapor pressure, exposure limits to name a few. If no information is found for a particular item, a notation will be provided to that effect.
Section 10: Stability and reactivity. This section will provide information on the stability of the chemical or mixture by letting the user know if it is stable under normal ambient temperatures and conditions both during handling and storage. It will also provide important information on the handling of the materials if the product changes in physical appearance. Under the reactivity section, any specific test data is provided discussing any anticipated hazards. This section can also include information on hazardous reactions such as polymerization (which could release excess pressure or heat). It can also provide a description of the conditions where hazardous reactions may occur. If applicable, there will be a list of all conditions that should be avoided, for example, flame, vibrations or static discharge.

Section 11: Toxicological Information. This is the area where information on the toxicological and health effects for the chemical or mixture is found. Information includes any routes of exposure (inhalation, ingestion, skin or eye contact) as well as any delayed or chronic conditions related to the material. There will be a description of the symptoms from the smallest to the most severe exposure. If the chemical is listed on the National Toxicology Program (NTP) Report on Carcinogens or has been found to be a potential cancer causing material by either the International Agency for Research on Cancer (IARC) Monograph Process or OSHA, then this will be indicated in this section.

Sections 12 - 15 are enforced through other regulatory agencies. These include 12: ecological information such as persistence and degradability, bioaccumulation, mobility in soil, and adverse effects such as hazards to the ozone layer; 13: disposal considerations, waste residues, and safe handling of disposing of a chemical; 14: transport information, DOT, and UN classifications; and 15: regulatory information.

Section 16: Other information. This includes the date of the last revision.

Training Resources: The HCS 2012 training requirements are similar to those under OSHA's previous Hazard Communication regulation, so the documentation should be similarly addressed.

Employers must train in the language the workers understand. Labels and SDSs are in English, although they may be in other languages as well. The required training must adequately explain the label and SDS systems to employees.

Employees must understand the SDS headings and the sequence of information provided. Employees must also understand the standardized label elements (pictograms, signal words, etc.).

By June 1, 2016, the transition to GHS must be completed. During the transition, the challenge for employers will be to make sure that:

- all employees receive the initial training,
- labeling is compliant with the HCS 2012 labeling system, and
- any required MSDS sheets are updated to the required 16-section Safety Data Sheet format.

OSHA has a wide range of training materials available for use by employers and trainers. Training materials include a HazCom wallet card, quick cards, and fact sheets – perfect for toolbox talks, weekly safety meetings and paycheck stuffers. Employers and employees alike can also find a helpful section of frequently asked questions. All of these materials can be found at https://www.osha.gov/dsg/hazcom/index.html.

OSHA's Quick Cards on pictograms and the SDS are shown on the following pages and be downloaded in PDFs at https://www.osha.gov/dsg/hazcom/ghsquickcards.html.

Other organizations offer comprehensive training presentations at no charge, such as:
World of Asphalt http://www.worldofasphalt.com/Education/General/BeyondCompliance/Handouts/Carl%20Thiesen.pdf
Center for Construction Research and Training http://www.cpwr.com/training/hazard-communication.
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:

U.S. Department of Labor
www.osha.gov (800) 321-OSHA (6742)

Download complete printable Quick Cards in English and Spanish at https://www.osha.gov/dsg/hazcom/ghsquickcards.html.
References


This material is based upon work supported by the Federal Highway Administration under Grant Agreement No. DTFH61-II-H-00029.

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Together, we represent all segments of the roadway construction industry.

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http://www.hmtri.org/ccchst/ccchst_index.html

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www.asphaltpavement.org

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http://www.nltapa.org

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