Hazard Communication: Incorporating GHS into OSHA’s Hazcom Standard

June 2012
This training is intended to be educational and should not be construed as legal guidance. It is provided as a courtesy to our customers and others who may benefit from the information contained herein. New Pig Corporation assumes no responsibility for misuse or mishandling of our information or products.
Acronyms

**GHS** – Globally Harmonized System of Classification and Labeling of Chemicals
**HCS** – Hazard Communication Standard
**SDSs** – Safety Data Sheets
Right to Know

OSHA's Hazard Communication Standard (HCS), 29 CFR 1910.1200, gives employees working around hazardous chemicals the *right to know* of possible dangers and how to protect themselves.
Right to Know


Since then:
- the global market has changed significantly
- there are fewer barriers to materials in commerce
- demographics of the American workforce have changed
Right to Know

OSHA has chosen to incorporate the **Globally Harmonized System of Classification and Labeling of Chemicals (GHS)** into the HCS to:

- Account for changes in the workforce
- Adapt to globalization
- Increase worker safety

These changes were published in the Federal Register on March 26, 2012.
Right to Know

- GHS enhances HCS by specifying formats for chemical labeling and safety data sheets (SDSs)
- Much of the “old” HCS has not changed
Right to Know

By adopting GHS for labeling:

• Every chemical supplier will use the same verbiage, pictograms and messages on their labels to convey hazards
• Workers will be better able to understand information on labels
Adopting GHS for SDS creates more useful and accurate tools for:

• Workers
• Safety Officers
• Healthcare Professionals
• Emergency Responders
Right to Know

In summary, incorporating GHS into HCS:

- Helps to eliminate confusion created by conflicting national and international requirements
- Standardizes the format for SDSs
- Improves chemical labeling
- Reduces trade barriers
- Improves worker safety
Right to Know

“With the new, globally harmonized standard, workers are now getting the right to understand. That means not only knowing about potential hazards, but also better understanding what the warning means, what to do if exposed and how to protect one's self.”

David Michaels
OSHA Assistant Secretary
Right to Know

The modifications to HCS include:

- Revised criteria for classification of chemical hazards
- Revised labeling provisions
- A specified format for safety data sheets
- Revisions to definitions of terms used in the standard
- Requirements for employee training on labels and safety data sheets
Right to Know

The HCS requires:

• Chemical manufacturers or importers to classify the hazards of chemicals

• Chemical distributors to provide information to employers

• Employers to provide employees with information about hazardous chemicals, labels, safety data sheets (SDSs) and training
Right to Know – Compliance Dates

December 1, 2013
All employees must be trained on new GHS labeling elements and SDS format.

June 1, 2015
Chemical manufacturers, importers, distributors and employers must be in compliance with all elements of the new rule (except that chemicals with “old” labeling may be shipped until December 1, 2015.)
Right to Know – Compliance Dates

December 1, 2015
All chemicals shipped from manufacturers or distributors must have GHS labeling.

June 1, 2016
Employers must update alternative workplace labeling and hazard communication programs as necessary, and provide additional employee training for newly identified physical or health hazards.

During the transition period, employers may comply with either the current Hazcom standard or the new final rule.
Because GHS does not include requirements for a written hazard communication program, the final rule does not make many changes to the existing HCS requirements for a written hazard communication program.
Hazard Communication

Hazcom

- GHS covers all hazardous chemicals
- The term “chemical” is used broadly to include substances, products, mixtures, preparations or any other terms that may be used by existing systems
- There are no complete exemptions from the scope of the GHS for a particular type of chemical or product
Pharmaceuticals, food additives, cosmetics and pesticide residues in food are not covered by the GHS at the point of consumption, but are covered where workers may be exposed (workplaces), and in transport.

Similarly, foods are generally not labeled under the existing HCS.
Hazard Communication

Hazcom

Employers who have employees that are exposed to hazardous chemicals must:

• Develop a hazard communication program
• Make sure that exposed employees are provided with labels and access to Safety Data Sheets (SDSs)
• Train employees on the hazardous chemicals in their workplace
Three key components to effective Hazcom Programs

- **Labels**: Provide hazard information at the point where the chemical is being used.
- **SDS**: Provide detailed technical information and are a reference source for exposed employees, industrial hygienists, safety and healthcare professionals, emergency responders, and other interested parties.
- **Employee training**: Ensures that employees understand the chemical hazards in their workplace and are aware of protective measures to follow.
Hazard Classification
Hazard Classification

Chemical manufacturers and importers are required to determine the hazards of the chemicals they produce or import.

This was part of the old HCS, but there were no defined parameters on how a chemical was to be classified or what verbiage was needed to communicate a hazard.
Classification is the starting point for hazard communication.

It involves identifying the hazard(s) of a chemical or mixture by assigning a category of hazard using defined criteria.
Hazard Classification

Hazard Classification includes the following steps:

- Identifying data related to the hazards of a chemical, and reviewing it to ascertain hazards
- Determining that the chemical is hazardous (based on physical, health or other hazards)
- Identifying the hazard class(es) for the chemical
- Identifying the hazard category for each hazard class
Hazard Classification

GHS has three broad categories of hazards:

- Health Hazards (found in 29 CFR 1910.1200 Appendix A)
- Physical Hazards (found in 29 CFR 1910.1200 Appendix B)
- Environmental Hazards
Hazard Classification

A chemical is also considered hazardous if it is a:

- Simple asphyxiate
- Combustible dust
- Pyrophoric gas
- Hazard “not otherwise classified”
Hazard Communication

Hazard Classification – Health Hazards

- Acute Toxicity
- Skin Corrosion/Irritation
- Serious Eye Damage/Eye Irritation
- Respiratory or Skin Sensitization
- Germ Cell Mutagenicity
- Carcinogenicity
- Reproductive Toxicity
- Target Organ Systemic Toxicity; Single Exposure
- Target Organ Systemic Toxicity; Repeated Exposure
- Aspiration Toxicity
Hazard Classification — Physical Hazards

- Explosives
- Flammable Gases
- Flammable Aerosols
- Oxidizing Gases
- Oxidizing Solids
- Self-Reactive Substances
- Pyrophoric Liquids
- Pyrophoric Solids
- Self-Heating Substances
- Substances, which on Contact with Water, Emit Flammable Gasses
- Substances Corrosive to Metal
- Gases Under Pressure
- Flammable Liquids
- Flammable Solids
- Oxidizing Liquids
Hazard Classification — Environmental Hazards

Hazardous to the Aquatic Environment:

- Acute aquatic toxicity
- Chronic aquatic toxicity
  - Bioaccumulation potential
  - Rapid degradability
Labeling
Labeling

“It's a whole new system — one in which everyone is using the same underlying criteria to classify chemicals.”

David Michaels
OSHA Assistant Secretary
Hazard Communication

Labeling

• OSHA has updated the requirements for labeling of hazardous chemicals under its Hazard Communication Standard (HCS)

• Prior to the adoption of GHS, OSHA did not have any specifications for container labeling

• NFPA and HMIS were two common labeling methods used to communicate hazards
Labeling

Labels are intended to provide an immediate visual reminder of chemical hazards. As of June 1, 2015, all labels will be required to have:

• The product identifier
• Supplier information
• Pictogram(s)
• A signal word
• Hazard and precautionary statements
Labeling

Before a product can be labeled, it must be classified into one of 28 types of hazards.

Within each of these hazard types are multiple categories related to the degree of danger they present.
## Hazard Categories

- Acute Toxicity - Inhalation
- Acute Toxicity - Dermal
- Acute Toxicity - Oral
- Aspiration Hazard
- Carcinogenicity
- Corrosive to Metals
- Explosives
- Eye Damage/Irritation
- Flammable Aerosols
- Flammable Gases
- Flammable Liquids
- Flammable Solids
- Gases Under Pressure
- Germ Cell Mutagenicity
- Organic Peroxides
- Oxidizing Gases
Hazard Categories, continued

- Oxidizing Liquids
- Oxidizing Solids
- Pyrophoric Liquids
- Pyrophoric solids
- Self-heating Substances and Mixtures
- Sensitization – Respiratory
- Sensitization – Skin
- Skin Corrosion/Irritation
- Specific Target Organ Toxicity (repeated exposure)
- Specific Target Organ Toxicity (single exposure)
- Substances and mixtures which, in contact with water, emit flammable gases
- Toxic to Reproduction
Label Elements
This sample from 29 CFR 1910.1200, Appendix C, shows the required pictogram, signal words, hazard statements and precautionary statements for a hazardous chemical that is classified as a flammable liquid. Appendix C contains charts for each hazard category. Chemical manufacturers or distributors use this information to create labels.

### C.4.15 FLAMMABLE LIQUIDS
(Classified in Accordance with Appendix B.6)

<table>
<thead>
<tr>
<th>Hazard category</th>
<th>Signal word</th>
<th>Hazard statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Danger</td>
<td>Extremely flammable liquid and vapor</td>
</tr>
<tr>
<td>2</td>
<td>Danger</td>
<td>Highly flammable liquid and vapor</td>
</tr>
<tr>
<td>3</td>
<td>Warning</td>
<td>Flammable liquid and vapor</td>
</tr>
</tbody>
</table>

#### Precautionary statements

<table>
<thead>
<tr>
<th>Prevention</th>
<th>Response</th>
<th>Storage</th>
<th>Disposal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keep away from heat/sparks/open flames/hot surfaces... No smoking. Chemical manufacturer, importer, or distributor to specify applicable ignition source(s). Keep container tightly closed. Ground/Road container and receiving equipment - If electronically ignitable material or for repacking - If product is volatile to or to generate hazardous atmosphere. Use explosion-proof electrical/ventilating/lighting/equipment... Chemical manufacturer, importer, or distributor to specify other equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Wear protective gloves/eye protection face protection Chemical manufacturer, importer, or distributor to specify type of equipment.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. In case of fire: Use dry chemical, foam, or alcohol-resistant foam. Chemical manufacturer, importer, or distributor to specify appropriate media. - If water present: use wet chemical.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Store in a well-ventilated place. Keep cool.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dispose of contents/container to... in accordance with local/regional/national/international regulations (to be specified).</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Product Identifier

A product identifier (name) used on a GHS label should match the product identifier used on the SDS.

The product identifier lists the chemical identity of the hazardous substance.
Supplier Identification

The name, address and telephone number of the manufacturer or supplier of the product must be provided on the label.
Hazard Communication

Pictograms

- Quickly convey specific information
- Make warnings more noticeable and easier for employees to understand.

The specific pictograms that are required on a particular label are determined by the hazard classification.

Labels may not have blank (unfilled) squares.
<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</td>
</tr>
<tr>
<td>Respiratory Sensitizer</td>
<td>Emissions 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 Peroxide</td>
<td>Hazardous to Ozone Layer (Non-Mandatory)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gas Cylinder</td>
<td>Corrosion</td>
<td>Exploding Bomb</td>
</tr>
<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>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flame Over Circle</td>
<td>Environment (Non-Mandatory)</td>
<td>Skull and Crossbones</td>
</tr>
<tr>
<td>Oxidizers</td>
<td>Aquatic Toxicity</td>
<td>Acute Toxicity (fatal or toxic)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
One of these two signal words must appear on labels:

- **DANGER** – for the more severe hazard categories
- **WARNING** for less serious hazards

The appropriate signal word is chosen from the chart in Appendix C.

**Note:** if the word “DANGER” appears on the label, the word “WARNING” will not appear.
Hazard Communication

Hazard Statements

- Based on the hazard classification of the chemical
- Describe the hazard associated with the chemical
- A statement should be present for each type of hazard
- Multiple, similar statements may be combined.
- Hazard statements are specified from Appendix C
Precautionary Statements

- Based on the hazard classification of the chemical
- Describe recommended measures that should be taken to protect against hazardous exposures, or improper storage or handling of a chemical
- Includes first aid procedures
Supplementary Information

- Non-harmonized information that is not required or specified under the GHS
- Information that may be required by a competent authority
- Additional information provided at the discretion of the manufacturer

GHS provides guidance to ensure that supplemental information does not lead to wide variation in information or contradict or undermine the GHS information.
Safety Data Sheets (SDSs)
Safety Data Sheets

SDS information enables the employer to develop:

- An active program of worker protection measures
- Training which is specific to the individual workplace
- Protective measures that may be necessary to protect the environment
Safety Data Sheets

Information in an SDS also provides a source of information for other target audiences, such as:

- Transporters of dangerous goods
- Emergency responders
- Healthcare professionals
- Poison centers
Safety Data Sheets

- GHS establishes a standardized 16-section SDS format with a prescribed sequence of information and consistent section headings
- Customers must still be provided with SDS prior to or at the time of initial shipment
- Customers must still be provided with an updated/revised SDS when information changes
- Employers are still not required to classify chemicals. They may continue to rely upon information supplied by chemical manufacturers/importers
Safety Data Sheets

Standardizing SDS:
• Simplifies employee training
• Makes it easier for users to locate and understand the information they are seeking
• Improves the utility of SDSs
• Improves the accuracy of the information
• Segregates technical sections of the document from more basic elements
• Facilitates computerized information retrieval
Safety Data Sheets

Information not regulated by OSHA and not mandatory for compliance with the HCS:

- Section 12. Ecological information
- Section 13. Disposal considerations
- Section 14. Transport information
- Section 15. Regulatory information
Safety Data Sheets

Section 1 – Identification
• The product identifier used on the label
• Other means of identification
• Manufacturer or distributor name, address, phone number
• Emergency phone number
• Recommended uses of the chemical
• Restrictions on use
Section 2 – Hazard(s) identification

- Hazard classifications
- Signal words, hazard statements, symbols and precautionary statements
- Any hazards not elsewhere classified
Safety Data Sheets

Section 3 – Composition/Information on ingredients

• Information on chemical ingredients such as chemical name and synonym
• CAS numbers and other unique identifiers
• For mixtures, chemical names and percentages
• Trade secret claims
Safety Data Sheets

Section 4 – First-aid measures

- Includes important symptoms/effects (acute, delayed); required treatment
- Description of necessary measures, subdivided according to the different routes of exposure
- Indication of immediate medical attention and special treatment, if necessary
Safety Data Sheets

Section 5 – Firefighting measures

- Lists suitable and unsuitable extinguishing techniques and equipment for chemical hazards from fire
- Specific hazards arising from the chemical, e.g.: nature of any hazardous combustion products
- Special protective equipment and precautions for firefighters
Safety Data Sheets

Section 6 – Accidental release

- Lists emergency procedures, protective equipment and proper methods of containment and cleanup
Safety Data Sheets

Section 7 – Handling and storage measures

• Lists precautions for safe handling and storage, including incompatibilities
Safety Data Sheets

Section 8 – Exposure controls/personal protection

- OSHA's Permissible Exposure Limits (PELs)
- Threshold Limit Values (TLVs)
- Appropriate engineering controls
- Personal protective equipment (PPE)
Section 9 – Physical and chemical properties

Lists the chemical's characteristics such as:

- Appearance
- Odor
- Odor threshold
- pH
- Melting point
- Freezing point
- Flash point
- Evaporation rate
- Flammability
- Vapor pressure
- Vapor density

- Relative density
- Solubility(ies)
- Viscosity
- Initial boiling point and boiling range
- Upper/lower flammability or explosive limits
- Partition coefficient: n-octanol/water
- Auto-ignition temperature
- Decomposition temperature
Safety Data Sheets

Section 10 – Stability and reactivity

- Chemical stability
- Reactivity
- Possibility of hazardous reactions
- Conditions to avoid, e.g.: static discharge, shock or vibration
- Incompatible materials
- Hazardous decomposition products
Section 11 – Toxicological information

- Likely routes of exposure – inhalation, ingestion, skin and eye contact
- Symptoms related to the physical, chemical and toxicological characteristics
- Delayed and immediate effects
- Chronic effects from short- and long-term exposure
- Numerical measures of toxicity, such as acute toxicity estimates
- If a hazardous chemical is listed in the National Toxicology Program (NTP) Report on Carcinogens (latest edition) or has been found to be a potential carcinogen in the International Agency for Research on Cancer (IARC) Monographs (latest edition), or by OSHA
Safety Data Sheets

Section 12 – Ecological information (non-mandatory)
- Ecotoxicity – aquatic and terrestrial, where available
- Persistence and degradability
- Bioaccumulative potential
- Mobility in soil
- Other adverse effects, such as hazardous to the ozone layer
Safety Data Sheets

Section 13 – Disposal considerations (non-mandatory)

- Description of waste residues and information on their safe handling and methods of disposal, including the disposal of any contaminated packaging
Safety Data Sheets

Section 14 – Transport information (non-mandatory)

- UN number
- UN proper shipping name
- Transport hazard class(es)
- Packing group, if applicable
- Environmental hazards, e.g.: Marine pollutant (yes/no)
- Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
- Special precautions which a user needs to be aware of, or needs to comply with, in connection with transport or conveyance either within or outside their premises
Safety Data Sheets

Section 15 – Regulatory information (non-mandatory)

- Safety, health and environmental regulations specific for the product in question
Safety Data Sheets

Section 16 – Other information

• The date of preparation or last revision
• Any other information not included elsewhere
Employee Training
Employee Training

“Training users of hazard information is an integral part of hazard communication. Systems should identify the appropriate education and training for GHS target audiences who are required to interpret label and/or SDS information and to take appropriate action in response to chemical hazards.”

The Globally Harmonized System of Classification and Labeling of Chemicals (“The Purple Book”)
Employee Training

- Employee training is one of the three core components of a comprehensive hazard communication program.
- The final rule spells out requirements for employers to train employees on the new label elements and SDS format.
- Although the HCS and GHS discuss the importance of training, neither lists training requirements or provides outlines.
Employee Training

- Training helps to ensure that employees understand the chemical hazards in their workplace and are aware of the protective measures they need to follow.
- Training requirements should be appropriate for and commensurate with the nature of the work or exposure.
HCS in the Workplace
Safer Workplaces

- OSHA estimates that the Hazard Communication Standard is in use in over five million workplaces in the United States
- Incorporating GHS standards makes hazard information clearer and more consistent
- Clear, consistent product labeling and SDSs enhance workers safety
More HCS Changes on the Horizon?

- The UN reviews and makes changes to the GHS document approximately every two years.
- As amendments are made to this document, future changes may need to be made to the HCS to keep the standards in alignment.
- OSHA maintains a web page with news, information and resources for employers, chemical manufacturers and employees.
Thank You!