HAZARD COMMUNICATION

Introduction to Hazard Communication

 In order to help employers and workers OSHA created Subpart Z, otherwise known as the Hazard Communication Standard. It's stated purpose being:

OSHA's Hazard Communication Standard

- The Hazard Communication Standard has requirements of employers to train their workers concerning hazardous chemicals and materials in the workplace.
 - ...is intended to address comprehensively the issue of classifying the potential hazards of chemicals, and communicating information concerning hazards and appropriate protective measures to employees

OSHA's Hazard Communication Standard

- Under it's Hazard Communication Standard OSHA requires that employers provide effective information and training to employees
 - ✓ at the time of initial assignment
 - ✓ when new chemical hazards arise the worker has not previously been trained about is introduced into their work area

OSHA mandates that employees be informed of:

- Any operations in their work area where hazardous chemicals are present
- ➤ The location and availability of the written hazard communication program
 - → Including the required list(s) of hazardous chemicals
 - → Safety Data Sheets required by this section

- Methods and observations that may be used to detect the presence or release of hazardous chemicals in the work area
 - e.g. monitoring conducted by the employer, continuous monitoring devices, visual appearance or odor of hazardous chemicals when being released

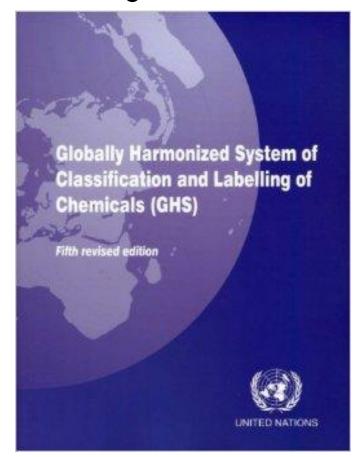
 The physical, health, simple asphyxiation, combustible dust, and pyrophoric gas hazards, as well as hazards not otherwise classified, of the chemicals in the work area

- The measures workers can take to protect themselves from these hazards, including specific procedures the employer has implemented to protect employees from exposure to hazardous chemicals, such as:
 - appropriate work practices,
 - emergency procedures, and
 - personal protective equipment to be used

- The details of the hazard communication program developed by the employer, including:
 - -- explanation of the labels received on shipped containers and the workplace labeling system used by their employer;
 - -- the **safety data sheet**, including the order of information and how employees can obtain and use the appropriate hazard information

GHS

 Globally Harmonized System of Classification & Labeling of Chemicals



GHS

- A system for standardizing and harmonizing the classification and labeling of chemicals
- Defines health, physical and environmental hazards of chemicals
- Communicates hazard information, as well as protective measures, on labels and Safety Data Sheets (SDS).

Mission Statement of GHS

- Enhance the protection of human health and the environment by providing an internationally comprehensible system
- Provide a recognized framework to develop regulations for those countries without existing systems
- Facilitate international trade in chemicals whose hazards have been identified on an international basis
- Reduce the need for testing and evaluation against multiple classification systems

Current Systems

Differences in systems within different countries and within different regulatory agencies within the same government can lead to inconsistent protection for those potentially exposed to the chemicals.

GHS

- □ The GHS itself is **not a regulation** or a standard
- Establishes agreed hazard classification and communication provisions with explanatory information on how to apply the system

Why Was **GHS** Developed?

 To provide sound management of chemicals that includes a system through which chemical hazards are identified and communicated to all who are potentially exposed

International Mandate

Adopted in the 1992 United Nations Conference on Environment and Development (UNCED), often called the "Earth Summit".

It was recognized that an internationally harmonized approach to classification and labeling would provide the foundation for all countries to develop comprehensive national programs to ensure the safe use of chemicals.

GHS History

- GHS formally adopted by the UN Committee of Experts - The Transport of Dangerous Goods and GHS in December 2002
- □ OSHA in 2006 & 2009

GHS History

OSHA revised the Hazard Communication
 Standard, aligning it with the GHS March 26, 2012
 (60 days)

Estimated to prevent 43 fatalities and 521 injuries& illnesses annually

Implementation

- □ Employers had to complete all **training** regarding new label elements and SDS format by Dec 1, 2013
- Required compliance with all provisions for preparation of new labels and SDS by June 1, 2015
- Distributors can't ship containers unless they have a
 GHS label by Dec 1, 2015
- Employers given an additional year, June 1, 2016 to update their Hazard Communication programs or any other workplace signs, if applicable

Overall Benefits of GHS

□ To ensure that employers, employees and the public are provided with adequate, practical, reliable and comprehensible information on the hazards of chemicals, so that they can take effective preventive and protective measure for their health and safety

Benefits to Workers/Public

- Improved safety for workers and others through consistent and simplified communications on chemical hazards and practices to follow for safe handling and use,
- Greater awareness of hazards, resulting in safer
 use of chemicals in the workplace and in the home

Classification

 Classification is the starting point for hazard communication

 Involves the identification of the hazard(s) of a chemical or mixture by assigning a category of hazard/danger using defined criteria

Hazard Classes

- □ 16 classes of physical hazards
- □ 10 classes of health hazards
- 3 classes of environmental hazards

GHS Physical Hazards

- Explosives
- Flammable Gases
- Flammable Aerosols
- Oxidizing Gases
- Gases Under Pressure
- Flammable Liquids
- Flammable Solids
- Self-Reactive Substances

- Substances which, in contact with water emit flammable gases
- Oxidizing Liquids
- Oxidizing Solids
- Organic Peroxides
- Corrosive to Metals

GHS Health Hazards

- Acute Toxicity
- Skin Corrosion/Irritation
- Serious Eye Damage/Eye Irritation
- Respiratory or Skin Sensitization
- Germ Cell Mutagenicity
- Carcinogenicity
- Reproductive Toxicology
- Target Organ Systemic Toxicity Single Exposure
- Target Organ Systemic Toxicity Repeated Exposure
- Aspiration Toxicity

GHS Hazard Communication

Once a chemical has been classified, the hazard(s)
 must be communicated to workers

 Labels and Safety Data Sheets are the main tools for chemical hazard communication

GHS Label Elements

- Signal Word (Danger, Warning)
- Hazard Statement (for each hazard class and category)
- □ Pictogram(s)
- Precautionary Statement (for each hazard class and category)
- □ Name, Address and Tele. # of chemical manufacturer

Signal Words

"Danger" or "Warning" are used to emphasize hazards and indicate the relative level of severity of the hazard, assigned to a GHS hazard class and category.

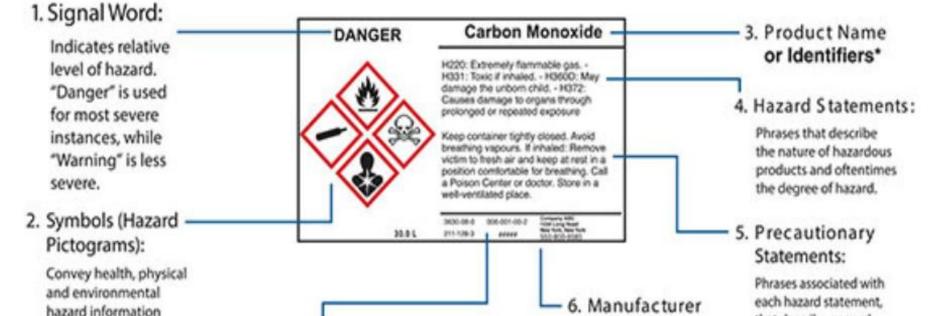
- "Danger" for the more severe hazards
- "Warning" for the less severe hazards.

Hazard Statement

- Hazard statements are standardized and assigned phrases that describe the hazard(s) as determined by hazard classification
 - "Causes eye irritation"
 - "Toxic if inhaled"
 - "Flammable aerosol"
 - "May cause cancer"
 - "May cause respiratory irritation"
 - "Harmful to aquatic life"
 - "Contains gas under pressure; may explode if heated"

Symbols/Pictograms

 Convey health, physical and environmental hazard information, assigned to a GHS hazard class and category.



Additional Product

Identifiers

with red diamond

five symbols.

pictograms. May use a

combination of one to

that describe general

storage or disposal

precautions.

preventative, response,

Information:

Company name, address

& telephone number.

Health Hazard



- Carcinogen
- Mutagenicity
- Reproductive Toxicity
- Respiratory Sensitizer
- □ Target Organ Toxicity
- Aspiration Toxicity

Environment

□ Aquatic toxicity



Exclamation Mark



- Irritant (skin and eye)
- □ Skin Sensitizer
- □ Acute Toxicity
- Narcotic Effects
- Respiratory TractIrritant
- Hazardous to Ozone Layer (Non-Mandatory)

Skull & Crossbones



Acute toxicity (fatal or toxic)

Gas Cylinder

□ Gases Under Pressure



Corrosion



- □ Skin Corrosion/Burns
- □ Eye Damage
- □ Corrosive to Metals

Exploding Bomb



- Explosives
- □ Self-Reactives
- □ Organic Peroxides

Flame Over Circle



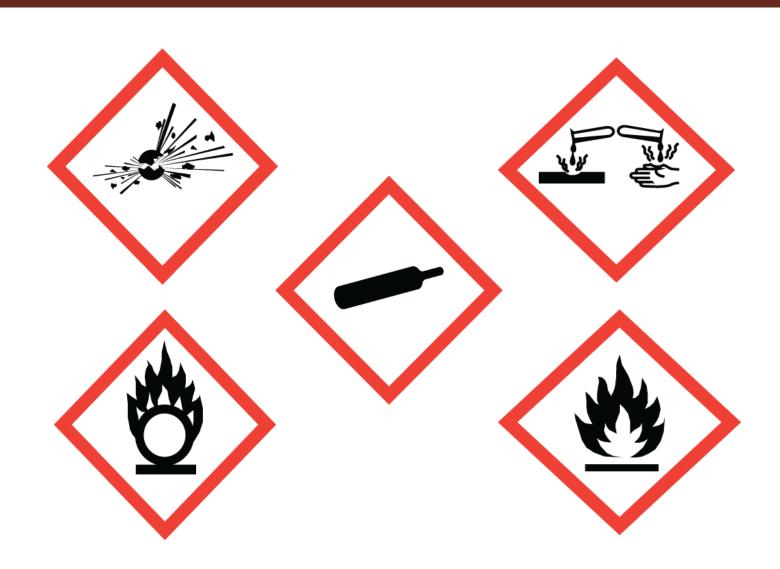
Oxidizers

Flame



- □ Flammables
- Pyrophorics
- Self-Heating
- □ Emits Flammable Gas
- □ Self-Reactives
- □ Organic Peroxides

Physical Hazard Pictograms



Health Hazard Pictograms



Precautionary Statements

- Precautionary Statements are standardized explanations of the measures to be taken to minimize or prevent adverse effects
 - Prevention
 - "Wear protective gloves"
 - Response
 - "If inhaled remove person to fresh air"
 - Storage
 - "Store in well ventilated place"
 - Disposal
 - "Waste must be disposed of in accordance with federal, state and local environmental control regulations"

Label Example



1 Sulfuric Acid

3 Danger! May be harmful if swallowed.
Causes sever skin burns and eye
d damage. Fatal if inhaled. Harmful to
aquatic life.



Do not breathe dust/fume/gas/mist/vapors/spray. Wear protective gloves/protective clothing/eye protection/face protection. Wear respiratory protection.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/physician.

In case of fire Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

See Material Safety Data Sheet for further details regarding safe use of this product.



Sigma-Aldrich 3050 Spruce Street SAINT LOUIS MO 63103 USA Telephone: +18003255832

- <mark>1</mark> P
 - **Product Identifier**
- <mark>2</mark> 1
 - Pictograms
- **3** S
 - Signal word, "Danger!"

4

Hazard Statements

5

Precautionary Statements

6

Supplier Information

Label Example

GHS Label

GHS Material Danger! Toxic If Swallowed, Flammable Liquid and Vapor





Do not eat, drink or use tobacco when using this product. Wash hands thoroughly after handling.

Keep container tightly closed. Keep away from heat/sparks/open flame – No smoking. Wear protective gloves and eye/face protection. Ground container and receiving equipment. Use explosion-proof electrical equipment. Take precautionary measures against static discharge. Use only non-sparking tools.

Store in a cool/well-ventilated place.

IF SWALLOWED: Immediately call a POISON CONTROL CENTER or doctor/physician. Rinse mouth.

In case of fire, use water fog, dry chemical, CO2, or "alcohol" foam.

Consult corresponding MSDS for ingredients and handling instructions SiteHawk®, 709 Nissan Drive, Smyrna TN 37167 (615) 459-0064

Secondary Containers

- Employers must ensure that each container of hazardous chemicals in the workplace is labeled, tagged, or marked with either the information specified under (i) through (v) for labels on shipped containers
 - □ (i) Product identifier;
 - □ (ii) Signal word;
 - (iii) Hazard statement(s);
 - □ (iv) Pictogram(s);
 - (v) Precautionary statement(s);



Secondary Containers

□ Product identifier and words, pictures, symbols, or combination thereof, which provide at least general information regarding the hazards of the chemicals, and which, in conjunction with the other information immediately available to employees under the hazard communication program, will provide employees with the specific information regarding the physical and health hazards of the hazardous chemical.

OSHA HazCom GHS-Style Label Elements

1 Irrisolvent

2 Warning

May cause respiratory irritation May cause drowsiness or dizziness Suspected of causing cancer



Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Avoid breathing fume/vapor. Use only outdoors or in a well-ventilated area. Wear protective gloves and eye protection. If exposed or concerned: Get medical attention.

- Wear protective gloves and eye protection. If exposed or concerned: Get medical attention.

 If inhaled: Remove person to fresh air and keep comfortable for breathing. Call a poison center if you feel unwell. Store locked up in a well-ventilated place. Keep container tightly closed. Dispose of contents and container to the proper waste facility in accordance with local, regional, national, and international waste regulations.
- 6 U. R. Chemical, Inc., 123 Main Street, Solvent City, KS 01234, US, 1-123-555-0101

Product Identifier

Name, number, or unique identifier used for a hazardous chemical on the label and SDS.

Signal Word

When required, the signal word alerts the worker to the relative level of severity of the hazard of the chemical - "Danger" for more severe and "Warning" for less severe.

Hazard Statement(s)

Standardized phrases that describe the nature of the hazard(s).

Pictogram(s)

A black symbol on a white background within a red square border set on point. Each pictogram conveys information about the hazards of a chemical.

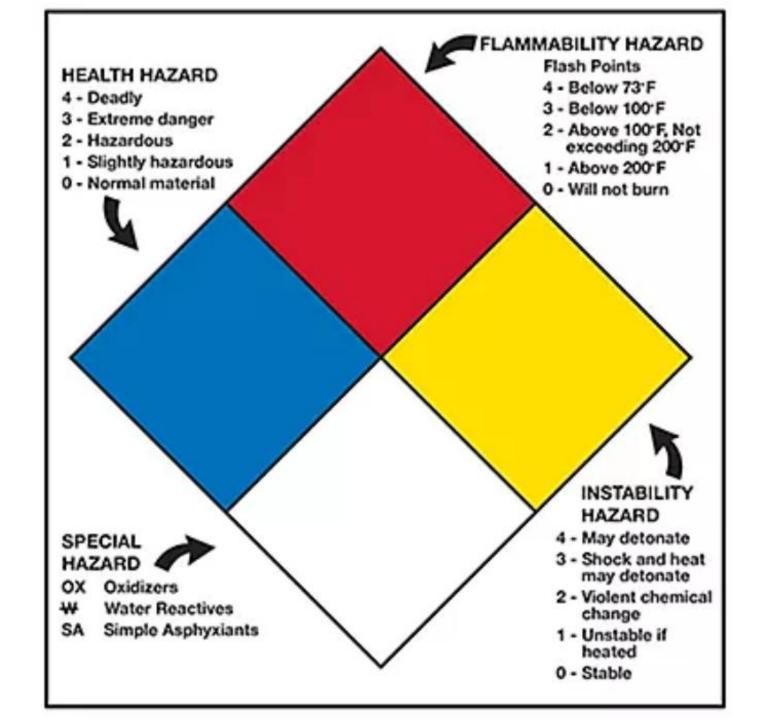
Precautionary Statement(s)

Standardized phrases that describe recommended measures that should be taken to minimize or prevent adverse effects that result from exposure to the chemical, or from improper handling or storage.

Supplier Identification

Name, U.S. address, and U.S. telephone number of the chemical manufacturer, importer, or other responsible party.







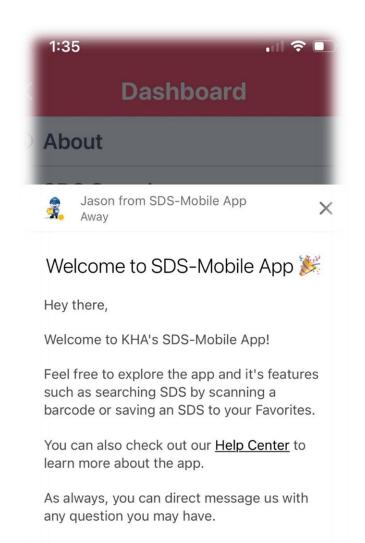
REVIEW! WHAT DOES SDS STAND FOR?

Information that is **required** on a SDS:

- 1. Identification of the substance or mixture and of the supplier
- 2. Hazards identification
- 3. Composition/information on ingredients
- First aid measures
- 5. Firefighting measures
- Accidental release measures
- 7. Handling and storage
- 8. Exposure controls/personal protection
- Physical and chemical properties
- 10. Stability and reactivity
- 11. Toxicological information
- 12. Ecological information
- 13. Disposal considerations
- 14. Transport information
- 15. Regulatory information
- Other information including information on preparation and revision of the SDS

SDS's





Section 1 — Substance & Supplier Identification

Identifies the chemical on the SDS as well as the recommended uses. It also provides the essential contact information of the supplier:

- Product identifier used on the label and any other common names or synonyms by which the substance is known.
- Name, address, phone number of the manufacturer, importer, or other responsible party, and emergency phone number.

Section 2- Hazards Identification

Identifies the hazards of the chemical presented on the SDS and the appropriate warning information associated with those hazards:

- The hazard classification of the chemical
- Signal word.
- Hazard statement(s).
- Pictograms
- Precautionary statement(s)
- Description of any hazards not otherwise classified

Section 3 – Composition/Information on Ingredients

Identifies the ingredient(s) contained in the product. This section includes information on substances, mixtures, and all chemicals where a trade secret is claimed:

- Chemical name
- Common name and synonyms
- For mixtures, the chemical name and concentration (i.e., exact percentage) of all ingredients which are classified as health hazards
- Chemical Abstracts Service (CAS) number and other unique identifiers.

Section 4 – First Aid Measures

Describes the initial care that should be given by untrained responders to an individual who has been exposed to the chemical:

- Necessary first-aid instructions by relevant routes of exposure (inhalation, skin and eye contact, and ingestion).
- Description of the most important symptoms or effects, and any symptoms that are acute or delayed.
- Recommendations for immediate medical care and special treatment needed, when necessary.

Section 5 – Fire Fighting Measures

Provides recommendations for fighting a fire caused by the chemical:

- Recommendations of suitable extinguishing equipment, and information about extinguishing equipment that is not appropriate for a particular situation.
- Advice on specific hazards that develop from the chemical during the fire, such as any hazardous combustion products created when the chemical burns.
- Recommendations on special protective equipment or precautions for firefighters.

Section 6 – Accidental Release Measures

Provides recommendations on the appropriate response to spills, leaks, or releases, including containment and cleanup practices to prevent or minimize exposure to people, properties, or the environment:

- Use of personal precautions and protective equipment
- Emergency procedures, and appropriate protective clothing
- Methods and materials used for containment
- □ Cleanup procedures (e.g., appropriate techniques for neutralization, decontamination, cleaning or vacuuming; adsorbent materials; and/or equipment required for containment/clean up)

Section 7 – Handling & Storage

Provides guidance on the safe handling practices and conditions for safe storage of chemicals:

- Precautions for safe handling, including recommendations for handling incompatible chemicals, minimizing the release of the chemical into the environment, and providing advice on general hygiene practices (e.g., eating, drinking, and smoking in work areas is prohibited)
- Recommendations on the conditions for safe storage, including any incompatibilities

Section 8 – Exposure Controls/Personal Protection

Indicates the exposure limits, engineering controls, and personal protective measures that can be used to minimize worker exposure:

- OSHA Permissible Exposure Limits (PELs), American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs), and any other exposure limit used or recommended by the chemical manufacturer
- Appropriate engineering controls
- Recommendations for personal protective measures to prevent illness or injury from exposure to chemicals
- Any special requirements for PPE, protective clothing or respirators

Section 9 — Physical & Chemical Properties

Identifies physical and chemical properties associated with the substance or mixture including but not limited to the following:

- Appearance (physical state, color, etc.)
- Upper/lower flammability or explosive limits
- Odor
- Vapor pressure
- Vapor density
- pH
- Flash point

Section 10 – Stability & Reactivity

Describes the reactivity hazards of the chemical and the chemical stability information:

- Description of the specific test data for the chemical(s)
- Indication of whether the chemical is stable or unstable under normal ambient temperature and conditions while in storage and being handled
- List of all conditions that should be avoided and all classes of incompatible materials with which the chemical could react to produce a hazardous situation.

Section 11 - Toxicological Information

Identifies toxicological and health effects information or indicates that such data are not available:

- Information on the likely routes of exposure
- Description of the delayed, immediate, or chronic effects from shortand long-term exposure
- The numerical measures of toxicity (e.g., acute toxicity estimates such as the LD50 (median lethal dose))
- Description of the symptoms
- Indication of whether the chemical is listed in the National Toxicology Program (NTP), International Agency for Research on Cancer (IARC) Monographs or found to be a potential carcinogen by OSHA

Section 12 – Ecological Information

Provides information to evaluate the environmental impact of the chemical(s) if it were released to the environment:

- Data from toxicity tests performed on aquatic organisms
- Whether there is a potential for the chemical to persist and degrade in the environment
- Results of tests of bioaccumulation potential
- The potential for a substance to move from the soil to the groundwater
- Other adverse effects

Section 13 – Disposal Considerations

Provides guidance on proper disposal practices, recycling or reclamation of the chemical(s) or its container, and safe handling practices:

- Description of appropriate disposal containers to use.
- Recommendations of appropriate disposal methods to employ.
- Description of the physical and chemical properties that may affect disposal activities.
- Language discouraging sewage disposal.
- Any special precautions for landfills or incineration activities

Section 14 – Transport Information

Provides guidance on classification information for shipping and transporting of hazardous chemical(s) by road, air, rail, or sea:

- UN number
- UN proper shipping name
- Transport hazard class(es)
- Packing group number
- Any special precautions which an employee should be aware of or needs to comply with, in connection with transport or conveyance either within or outside their premises

Section 15 – Regulatory information

Identifies the safety, health, and environmental regulations specific for the product that is not indicated anywhere else on the SDS

 Any national and/or regional regulatory information of the chemical or mixtures (including any OSHA, Department of Transportation, Environmental Protection Agency, or Consumer Product Safety Commission regulations)

Section 16 - Other information

Indicates when the SDS was prepared or when the last known revision was made. Other useful information also may be included here

Resources

For more assistance contact:

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This presentation was adapted from the OSHA website.

- https://www.osha.gov/dsg/hazcom/pictograms/index.html
 - The designed new pictograms for download and use
- https://www.osha.gov/dsg/hazcom/global.html
 - The GHS standard with frequently used documents
- https://www.osha.gov/dsg/hazcom/
 - OSHA's guidance on we now use GHS
- □ https://ulm.louislibraries.org:6803/uhtbin/cgisirsi/X/0/0/123/
 - The library has electronic copies of the UN document
- □ https://www.youtube.com/watch?v=FSw71nxDtlk
 - Flinn Chemical presents this GHS Introduction video
- □ https://www.youtube.com/watch?v=RvQNf1Y7E84
 - OSHA training video Labeling
- □ https://www.youtube.com/watch?v=vCl7XXExs7s
 - Osha Training video Safety Data Sheets