The Globally Harmonized System and OSHA Hazard Communication Revision

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Overview

- What is the GHS?
- The final OSHA Standard (Hazcom 2012)
- What are the hazards covered by the GHS?
- How this will change MSDS (SDS) and labels?
- How this will change your Hazcom program?
- When do I have to be in compliance?

What is GHS?

- GHS refers to the United Nations (UN) Globally Harmonized System of Classification and Labeling of Chemicals
- Initiated at the UN Conference on the Environment and Development in Rio de Janeiro in 1992
- Harmonize the classification and the hazard communication elements of chemicals (labeling and safety data sheets)
- GHS harmonizes most classification criteria for supply and transportation and is based on the intrinsic properties of substances
- Building Block Approach

Globally Harmonized System of Classification and Labeling of Chemicals

- Standardized approach to 3 basic elements:
  - Define health, physical and environmental hazard data (Hazard Data)
  - Classify hazards (Classification)
  - Communicate hazards in the workplace and beyond (Communication)
- Target audiences are:
  - Consumers
  - Workers
  - Transport workers
  - Emergency responders

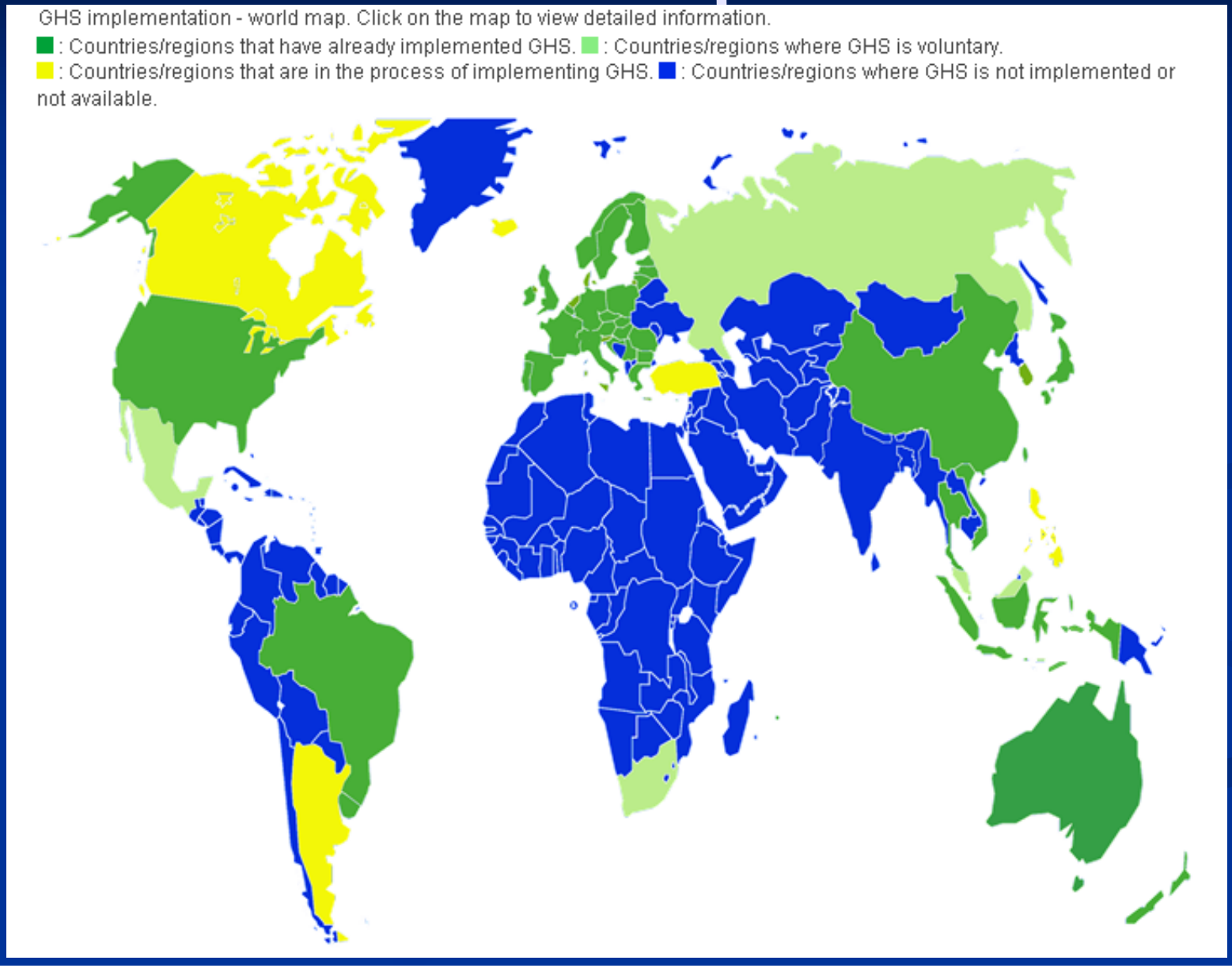
Benefits of the GHS

- Provides global benefits, as well as benefits to governments, industry, and chemical users (workers and consumers)
  - Enhances the protection of human health and the environment through the provision of harmonized chemical safety and health information
  - Reduces the need for duplicative testing of chemicals
  - Provides the informational infrastructure for chemical safety and health management programs
  - Increases efficiencies, reduces costs of compliance, etc.

Purple Book

- The first version became available in 2003 in the form of the so called "purple book" (compared to the orange book for transportation). Regular updates should take place every two years
- United Nations (UN) publication of the GHS
- Fourth edition (Rev. 4), 2011
- Outlines the provisions in four parts:
  - Introduction (scope, definitions, hazard communication)
  - Classification criteria for physical hazards
  - Classification criteria for health hazards
  - Classification of environmental hazards

GHS Adoption



Similarity to Other Systems

- Physical hazards similar to transport hazards
- Health hazards similar to current OSHA but with far more detailed criteria
- Environmental hazards similar to European Union (EU) and the International Maritime Dangerous Goods (IMDG) Code

Hazcom 2012 (OSHA)

- Published March 26, 2012
- Conform to the Globally Harmonized System for the classification and labeling of chemicals (GHS) Rev. 3
- Changes to:
  - Definition of hazardous chemical
  - Classification
  - Label content
  - Safety data sheet content (mandatory 16 section SDS, % required)

OSHA HCS 2012 Effective Dates

- The final rule was effective 60 days following publication in the Federal Register (May 25, 2012)
- Employers must train employees of the new labels and SDS format by December 1, 2013
- Manufacturers/Importers/Distributor and Employers must comply by June 1, 2015
- Distributors cannot ship containers without compliant labels after December 1, 2015
- Employers must update hazcom program and provide additional training for new hazards by June 1, 2016

Hazcom 2012

- No changes to:
  - Scope and exemptions
  - Written Hazcom program
  - Labeling requirement
  - MSDS (SDS) distribution and availability in the workplace
  - Employee information and training (other than training on new labels and SDSs by December 1, 2013)
  - Trade secrets (except to include percentage)

OSHA's Approach

- Maintain the basic requirements of the current standard
  - Only change those provisions that need to be changed to adopt the GHS
  - "Right to Know" to "Right to Understand"
- Maintain or enhance the level of protection provided by the HCS
  - Scope of chemicals, hazards, information availability and workplace requirements

Format of the Standard

(a) Purpose

(b) Scope and Application

(c) Definitions

(d) Hazard Classification

(e) Written Hazard Communication Program

(f) Labels and Other Forms of Warning

(g) Safety Data Sheets

(h) Employee Information and Training

(i) Trade Secrets

(j) Effective Dates

Appendix A, Health Hazard Criteria (Mandatory)

Appendix B, Physical Hazard Criteria (Mandatory)

Appendix C, Allocation of Label Elements (Mandatory)

Appendix D, Safety Data Sheets (Mandatory)

Appendix E, Definition of "Trade Secret" (Mandatory)

Appendix F, Guidance for Hazard Classifications re: Carcinogenicity (Non-Mandatory)

Scope and Application (b)

- No change except for reference to Appendix E which is removed
- Still applies to all chemicals known to be present in the workplace in such a manner that employees may be exposed to them under normal conditions of use or in a foreseeable emergency
- All labeling and full exemptions retained
- Laboratory and warehouse coverage remains unchanged (b)(3) and (b)(4)

Labeling exemptions (b)(5)

- Pesticides
- Toxic Substances Control Act (TSCA) regulated chemicals
- Food, food additives, color additives, drugs, cosmetics, medical/veterinary devices, alcoholic beverages
- Consumer products when labeled in accordance with the Consumer Product Safety Commission (CPSC)
- Seeds treated with pesticides if labeled under US Department of Agriculture (USDA)

Full Exemptions (b)(6)

- Hazardous waste
- Hazardous substances at a CERCLA remediation site
- Tobacco
- Wood and wood products which will not be processed and only present a fire hazard
- Articles
- Food and alcoholic beverages sold, used or prepared in retail establishments or intended for personal consumption

Full Exemptions (b)(6)

- Drugs, in solid, final form for direct administration to patient, or packaged for sale, or for consumption by employees
- Cosmetics packaged for sale or for use by employees
- Consumer products if used only in consumer manner
- Nuisance particulates
- Radiation (ionizing and non-ionizing)
- Biological hazards

Coverage of Pesticides

- Pesticide producers requested exemptions based on potential conflicts between GHS SDS and FIFRA labels
- EPA has disseminated guidance on preparing SDS that will not conflict with FIFRA
- Pesticides are covered as in the previous standard (exempted from additional labeling, covered for SDS and training where OSHA has jurisdiction)

Definitions (c)

- All physical hazard definitions removed – now in Appendix B
- Definitions for flashpoint, hazard warning, identity, material safety data sheets deleted
- Some definitions are revised to be GHS-consistent: Chemical; chemical name; hazardous chemical; health hazard; label; mixture; physical hazard and trade secret
- New definitions for: Classification; hazard category; hazard class; hazard statement; label elements; pictogram; precautionary statement; product identifier; safety data sheet; signal word; substance; and hazards not otherwise classified, pyrophoric gas, simple asphyxiant

New Definition - Hazard Classification

- To identify the relevant data regarding the hazards of a chemical
  - Review those data to ascertain the hazards associated with the chemical; and decide whether the chemical will be classified as hazardous according to the definition of hazardous chemical in this section
  - Also, classification for health and physical hazards includes the determination of the degree of hazard, where appropriate, by comparing the data with the criteria for health and physical hazards.

OSHA Defined Hazards

- "Pyrophoric gas" – a chemical in a gaseous state that will ignite spontaneously in air at a temperature of 130 degrees F (54.4 degrees C) or below
- "Simple asphyxiant" – a substance or mixture that displaces oxygen in the ambient atmosphere, and can thus cause oxygen deprivation in those who are exposed, leading to unconsciousness and death
- Combustible dust – no definition but label elements specified

"Hazard Not Otherwise Classified"- (HNOC) New Definition

- An adverse physical or health effect identified through evaluation of scientific evidence during the classification process that does not meet the specified criteria for the physical and health hazard classes addressed in this section
  - This does not extend coverage to adverse physical and health effects for which there is a hazard class addressed in this section, but the effect either falls below the cut-off value/concentration limit of the hazard class
  - Does not extend to others that is under a GHS hazard category that has not been adopted by OSHA (e.g., acute toxicity Category 5)
- Not required on the label

Hazard Classification (d)

- Introduces the concept of classification based on detailed criteria that appears in Appendix A and B
- Mixture rules vary for the different hazard classes – no more 1% rule
- No "floor" of hazardous chemicals as in the current standard

GHS/Hazcom 2012 Physical Hazards

- Explosives
- Flammable gases
- Flammable aerosols
- Oxidizing gases
- Gases under pressure
- Flammable liquids
- Flammable solids
- Self-reactive substances and mixtures
- Pyrophoric liquids
- Pyrophoric solids
- Self-heating substances and mixtures
- Substances and mixtures which in contact with water, emit flammable gases
- Oxidizing liquids
- Oxidizing solids
- Organic peroxides
- Corrosive to metals
- Pyrophoric gases (OSHA)
- Combustible Dusts (OSHA)

GHS/Hazcom 2012 Health Hazards

- Acute toxicity
  - Poisons that cause serious, immediate effects via inhalation, ingestion or dermal contact at fairly low doses
- Skin corrosion/irritation
  - (Irreversible/reversible effects)
- Serious eye damage/eye irritation
  - (Irreversible/reversible effects)
- Respiratory or skin sensitization
- Germ cell mutagenicity
  - Cause heritable mutations in germ cells

GHS/Hazcom 2012 Health Hazards

- Carcinogenicity
- Reproductive toxicity
  - Effects on fertility, development of offspring, effects on or via lactation
- Specific target organ toxicity
  - Single and repeated exposure
- Aspiration hazard
  - Low viscosity hydrocarbons that cause lung damage when ingested
- Simple asphyxiants (OSHA)

GHS Environmental Hazards/NOT Hazcom 2012

- Aquatic toxicity
  - Acute aquatic toxicity
  - Chronic aquatic toxicity
- Hazardous to the ozone layer

Hazard Classes Adopted

- All physical hazard classes and categories
- All health hazard classes but does not adopt the following categories
  - Acute toxicity category 5
  - Skin corrosion category 3
  - Aspiration category 2
- OSHA will not adopt environmental hazards (has no jurisdiction)

Hazard Criteria, Class and Category

- Appendix A – Health Hazard Criteria
- Appendix B – Physical Hazard Criteria
- Hazard Class – The nature of the physical or health hazard
- Hazard Category – The division of the criteria within each hazard class
  - Categories compare hazard severity within the class

Hazard Classification

- Data on the chemical is compared to criteria in the Hazcom 2012
- All hazard classes must be considered
- Hazard classes have categories that reflect the degree of hazard
- Chemicals can have multiple hazard classes/categories
- Generally, categories = transport packing groups (where covered by transport)

Criteria for Flammable Liquids

Category	Criteria
1	Flash point < 23°C and initial boiling point ≤ 35°C
2	Flash point < 23°C and initial boiling point > 35°C
3	Flash point ≥ 23°C and ≤ 60°C
4	Flash point > 60°C and ≤ 93°C

Criteria for Acute Toxicity

Acute Toxicity	Cat. 1	Cat. 2	Cat. 3	Cat. 4	Cat. 5 (not Hazcom 2012)
Oral (mg/kg)	≤5	>5 - ≤50	>50 - ≤300	>300 - ≤2000	Criteria: ≤5000 • ≤5000 • Anticipated significant effects in human • Any mortality at class 4 • Significant clinical signs at class 4 • Indications from other studies
Dermal (mg/kg)	≤50	>50 - ≤200	>200- ≤1000	>1000- ≤2000	
Gases (ppm)	≤100	>100 - ≤500	>500- ≤2500	>2500- ≤20000	
Vapours (mg/l)	≤0.5	>0.5- ≤2.0	>2 - ≤10	>10 - ≤20	
Dust and mists (mg/l)	≤0.05	>0.05- ≤0.5	>0.5- ≤1.0	>1.0 - ≤5	

Criteria for Carcinogens

- Category 1: Known or presumed human carcinogen
  - Category 1A: Known to have carcinogenic potential for humans, largely based on human evidence
  - Category 1B: Presumed to have carcinogenic potential for humans, largely based on animal evidence
- Category 2: Suspected human carcinogens (based on human or animal evidence but less convincing)
- Hazcom 2012 allows manufacturers/importers to use classification by International Agency for Research on Cancer (IARC), National Toxicology Program (NTP) or OSHA instead of applying criteria
  - Regardless, the positive classifications must be noted on the SDS

Mixture Classification

- Classify based on data for the mixture as a whole
  - Generally all physical hazards
- Follow bridging principles
  - Dilution, batching, concentration, interpolation, substantially similar mixtures, aerosols
- Use additivity formulas
  - Only certain hazard classes
- Cut-off values – Hazard class specific

Acute Toxicity - Mixture Calculation

$$\frac{100}{ATE_{mix}} = \sum_{n=i} \frac{C_i}{ATE_i}$$

- Where:
  - Ci = concentration of ingredient i
  - ATEi = Acute Toxicity Estimate of ingredient i
  - ATEmix = Acute Toxicity Estimate of mixture
  - n ingredients in the mixture and i runs from 1 to n
- Formula adjusted if >10% unknown toxicity

Skin Corrosion/Irritation – Mixtures Additivity

Sum of ingredients classified as:	Concentration triggering Classification of a mixture as:		
	Skin		
	Corrosive	Irritant	
	Category 1	Category 2	Category 3
Skin Category 1	≥ 5%	≥ 1% but < 5%	
Skin Category 2		≥ 10%	≥ 1% but < 10%
Skin Category 3			≥ 10%
(10 x Skin Category 1) + Skin Category 2		≥ 10%	≥ 1% but < 10%
(10 x Skin Category 1) + Skin Category 2 + Skin Category 3			≥ 10%

Carcinogen / Cut-off values

Mixture classified as a carcinogen when at least one carcinogen has been classified as a Category 1 or 2 carcinogen and is present at or above the cut-off value/concentration limit below

Ingredient Classified as	Category 1 carcinogen	Category 2 carcinogen
Category 1 carcinogen	≥0.1%	
Category 2 carcinogen		≥0.1%

Written Hazard Communication Programs (e)

- No changes to the requirements
- Employers need to assure that the program is current and reflects the revised requirements
  - Will workplace labeling change?
  - Does your program include reference to hazard definitions that may need to be updated?
  - Change MSDS references to SDS
  - Update the list of hazardous chemicals as needed based on revised SDS received

Labeling (f)

- The requirement for labeling unchanged
- Label content changed – based on
  - Hazard classification
  - Refer to Appendix C for the specific requirements

Label Content Shipped Containers

- Product Identifier
  - Ingredients not required but are part of GHS label
- Signal word (danger or warning)
- Hazard statements
- Pictograms
- Precautionary statements
- Name, address and telephone number of the chemical manufacturer, importer or other responsible party
- Unknown acute toxicity statement if applicable
- HNOC information is not required on the label

Product Identifier

- The name or number used for a hazardous chemical on a label or in the SDS – provides a unique means by which user can identify the chemical – permits cross-referencing between the list of hazardous chemicals, label and SDS.

Signal Word

- A word used to indicate the relative level of severity of hazard and alert the reader to a potential hazard on the label
  - The signal words used in this section are
    - "Danger" and "Warning"

"Danger" – used for the more severe hazards

"Warning" – used for the less severe

Pictogram

- A composition that may include a symbol plus other graphic elements such as a border, background pattern, or color, that is intended to convey specific information about the hazards of a chemical
- Nine pictograms are designated under the GHS
- Eight pictograms are adopted in Hazcom 2012
  - Red border, black symbol, white background
  - Blank red diamonds are not permitted on shipped container labels

Exploding Bomb Pictogram

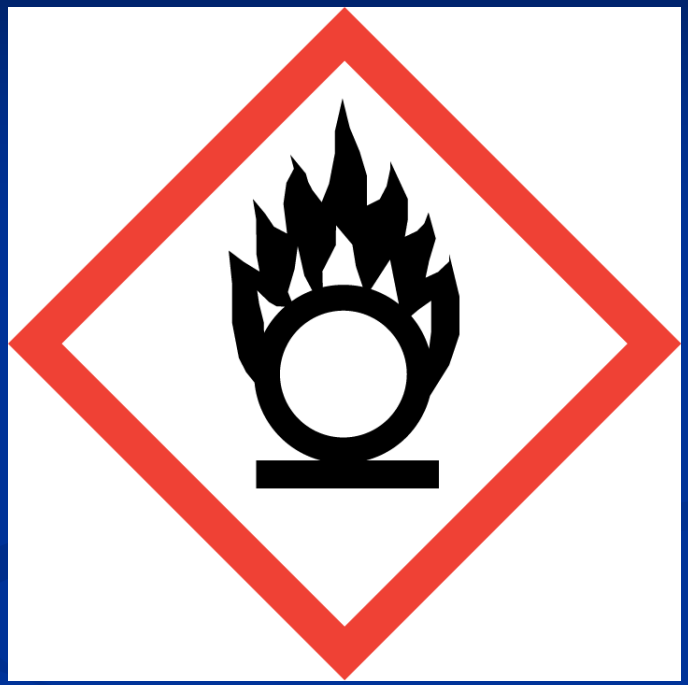
- Unstable explosives
- Explosives (Divisions 1.1-1.4)
- Self-reactives (Type A and Type B with flame)
- Organic peroxides (Type A and Type B with flame)

Flame Pictogram

- Flammable gases
- Flammable aerosols
- Flammable liquids (Categories 1-3)
- Flammable solids
- Self-reactives (Type B with bomb, Types C-F)
- Pyrophoric liquids and solids (gases Hazcom 2102)
- Self-heating substances
- Substances which in contact with water emit flammable gases
- Organic peroxides (Type B with bomb, Types C-F)

Flame over Circle Pictogram

- Oxidizing gases
- Oxidizing liquids
- Oxidizing solids



Gas Cylinder Pictogram

- Compressed gas
- Liquefied gas
- Refrigerated liquefied gas
- Dissolved gas

Corrosion Pictogram

- Corrosive to metals (steel or aluminum >6.25 mm/year at 55C)
- Skin corrosion/irritation – Category 1 (A, B and C)
- Serious eye damage/irritation – Category 1

Skull and Crossbones Pictogram

- Acute toxicity – Categories 1-3 (oral, inhalation or dermal routes)

Exclamation Mark Pictogram

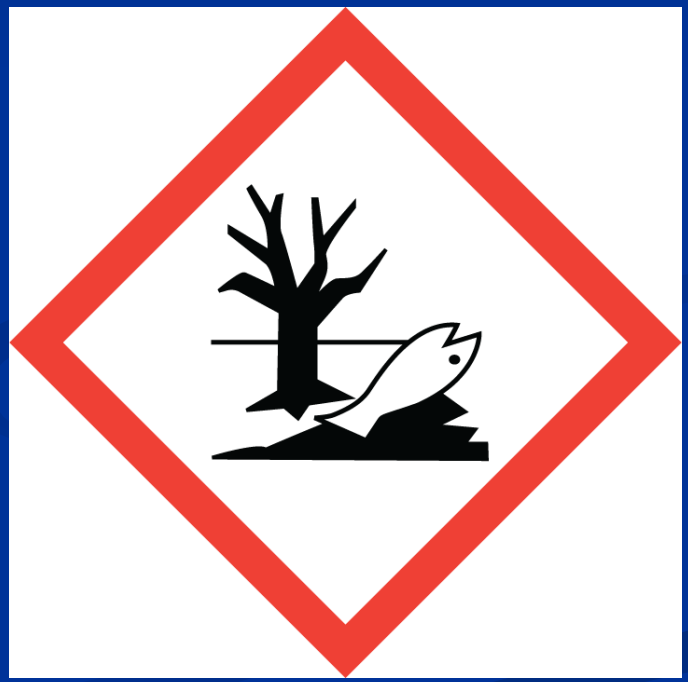
- Acute toxicity – Category 4 (oral, inhalation or dermal routes)
- Skin irritation/corrosion – Category 2
- Serious eye damage/ irritation – Category 2A
- Skin sensitizer
- STOST (single exposure) – Category 3 (respiratory tract irritation, narcotic effects)
- Ozone Depleting (not Hazcom 2012)

Health Hazard Pictogram

- Respiratory sensitizer
- Germ cell mutagenicity
- Carcinogenicity
- Toxic to reproduction
- STOT (single exposure) – Categories 1-2
- STOT (repeated exposure) – Categories 1-2
- Aspiration hazard

Environment Pictogram (NOT Hazcom 2012)

- Acute hazards to the aquatic environment – Category 1 (Categories 2 and 3 no pictogram or signal word)
- Chronic hazards to the aquatic environment – Categories 1 and 2 (Categories 3 and 4 no pictogram or signal word)



Hazard and Precautionary Statements

- Hazard statement for each level of hazard (category) within each hazard class (See Appendix C)
  - Example: Flammable liquids
    - Category 1: Extremely flammable liquid and vapour
    - Category 2: Highly flammable liquid and vapour
    - Category 3: Flammable liquid and vapour
    - Category 4: Combustible liquid
- Precautionary statements are selected from tables in Appendix C, based on the classification

Example 1

- Gas LEL 0.9% UEL 6%

- Classification Flammable Gas Category 1
  - Consider also classification as compressed gas

Example 1

C.4.15 FLAMMABLE GASES
(Classified in Accordance with Appendix B.2)

Pictogram
Flame

Hazard category	Signal word	Hazard statement
1	Danger	Extremely flammable gas

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Keep away from heat/sparks/open flames/hot surfaces. -No smoking. Chemical manufacturer, importer, or distributor to specify applicable ignition source(s).	**Leaking gas fire: Do not extinguish, unless leak can be stopped safely.** **Eliminate all ignition sources if safe to do so.**	**Store in well-ventilated place.**	

Example 1 Label

FLAMMABLE GAS PRODUCT

DANGER

Extremely flammable gas

Prevention

Keep away from heat, sparks, open flames and hot surfaces. No smoking.

Response

Leaking gas fire: Do not extinguish, unless leak can be stopped safely.

Eliminate all ignition sources if safe to do so.

Storage

Store in well-ventilated place.

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Example 2

- Liquid
  - LD50 oral rat 200 mg/kg
  - LD50 dermal rabbit 50 mg/kg
  - LC50 (vapor) rat 3 mg/L

Classification

Acute Toxicity Oral Category 3

Acute Toxicity Dermal Category 1

Acute Toxicity Inhalation Category 3

C.4.1 ACUTE TOXICITY – ORAL (CONTINUED)
(Classified in Accordance with Appendix A.1)

Pictogram
Skull and crossbones

Hazard category	Signal word	Hazard statement
3	Danger	Toxic if swallowed

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Wash … thoroughly after handling. … Chemical manufacturer, importer, or distributor to specify parts of the body to be washed after handling. **Do not eat, drink or smoke when using this product.**	**If swallowed: Immediately call a poison center/doctor/...** … Chemical manufacturer, importer, or distributor to specify the appropriate source of emergency medical advice. **Specific treatment (see ... on this label)** ... Reference to supplemental first aid instruction. - *if immediate administration of antidote is required.* **Rinse mouth.**	**Store locked up.**	**Dispose of contents/container to...** ... in accordance with local/regional/national/international regulations (to be specified).

C.4.2 ACUTE TOXICITY - DERMAL
(Classified in Accordance with Appendix A.1)

Pictogram
Skull and crossbones

Hazard category	Signal word	Hazard statement
1	Danger	Fatal in contact with skin
2	Danger	Fatal in contact with skin

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Do not get in eyes, on skin, or on clothing. **Wash … thoroughly after handling.** … Chemical manufacturer, importer, or distributor to specify parts of the body to be washed after handling. **Do not eat, drink or smoke when using this product.** **Wear protective gloves/protective clothing.** Chemical manufacturer, importer, or distributor to specify type of equipment.	**If on skin: Wash with plenty of water/...** … Chemical manufacturer, importer, or distributor may specify a cleansing agent if appropriate, or may recommend an alternative agent in exceptional cases if water is clearly inappropriate. **Immediately call a poison center/doctor/…** … Chemical manufacturer, importer, or distributor to specify the appropriate source of emergency medical advice. **Specific treatment (see ... on this label)** ... Reference to supplemental first aid instruction. - *if immediate measures such as specific cleansing agent is advised.* **Take off immediately all contaminated clothing and wash it before reuse.**	**Store locked up.**	**Dispose of contents/container to...** ... in accordance with local/regional/national/international regulations (to be specified).

C.4.3 ACUTE TOXICITY – INHALATION (CONTINUED)
(Classified in Accordance with Appendix A.1)

Hazard category	Signal word	Hazard statement	Pictogram
3	Danger	Toxic if inhaled	Skull and crossbones

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
Avoid breathing dust/fume/gas/mist/ vapors/spray. Chemical manufacturer, importer, or distributor to specify applicable conditions. **Use only outdoors or in a well-ventilated area.**	**If inhaled: Remove person to fresh air and keep comfortable for breathing.** **Call a poison center/doctor/...** ... Chemical manufacturer, importer, or distributor to specify the appropriate source of emergency medical advice. **Specific treatment (see ... on this label)** ... Reference to supplemental first aid instruction. - *if immediate specific measures are required.*	**Store in a well-ventilated place. Keep container tightly closed.** - *if product is volatile so as to generate hazardous atmosphere.* **Store locked up.**	**Dispose of content/container to...** ... in accordance with local/regional/national/international regulations (to be specified).

Example 2 Label

TOXIC LIQUID

DANGER

Fatal in contact with skin. Toxic if swallowed or inhaled.

Prevention

Do not get in eyes, on skin, or on clothing. Avoid breathing vapors. Wash hands thoroughly after handling. Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area.

Response

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

IF ON SKIN: Wash with plenty of soap and water. Immediately call a POISON CENTER or doctor. Take off immediately all contaminated clothing and wash it before reuse.

IF INHALED: Remove person to fresh air and keep comfortable for breathing.

Call a POISON CENTER or doctor.

Storage

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

Disposal

Dispose of contents in accordance with local and federal regulations.

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Label Elements Flammable Liquids

Hazard Category	Signal Word	Hazard Statement
1	Danger	Extremely flammable liquid and vapor
2	Danger	Highly flammable liquid and vapor
3	Warning	Flammable liquid and vapor

Pictogram

Prevention	Response	Storage	Disposal
Keep away from heat/ sparks/open flames/ hot surfaces. – No smoking Keep containers tightly closed. Ground/Bond container and receiving equipment. Use explosion-proof electrical/ ventilating / lighting/…./equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Wear protective gloves/ eye protection/ face protection	If on skin (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/shower. In case of fire: Use … for extinction.	Store in a well-ventilated place. Keep cool	Dispose of contents/container to… *… in accordance with local/ regional/ national/ international regulations (to be specified)*

Label Elements Carcinogenicity

Hazard Category	Signal Word	Hazard Statement	Pictogram
1A and 1B	Danger	May cause cancer	
2	Warning	Suspected of causing cancer	

Prevention	Response	Storage	Disposal
Obtain special instructions before use Do not handle until all safety precautions have been read and understood Use personal protective equipment as required.	If exposed or concerned: Get medical advice/attention	Store locked up	Dispose of contents/container to… … *in accordance with local/ regional/ national/ international regulations (to be specified)*

Hazcom 2012 Label Example

2-Methyl Flammaline

Danger
Highly Flammable Liquid and Vapor
May cause cancer

Keep away from heat/, sparks, open flames and hot surfaces. – No smoking
Keep containers tightly closed.
Ground container and receiving equipment.
Use explosion-proof electrical equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Wear protective gloves and eye protection.
Use other personal protective equipment as required.
If on skin (or hair): Remove immediately all contaminated clothing. Rinse skin with water/shower.
If exposed or concerned: Get medical advice.
In case of fire: Use water fog, foam or dry chemical for extinction.
Store in a well-ventilated place. Keep cool
Dispose of contents to hazardous waste in accordance with all local, state and national regulations

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Solid Materials

- Solid metal, wood, plastic items not exempted as articles
- Label may be transmitted to the customer at initial shipment
  - With shipment
  - With SDS
- Not required with subsequent shipments unless label changes
- Materials that form combustible dusts when processed

Label Content in the Workplace

- Product identifier
- Signal word (danger or warning)
- Hazard statements
- Pictograms
- Precautionary statements

or

- 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

Workplace Labeling

- Will you continue to use HMIS or NFPA?
- While the hazard category number does not appear on the label, consider:

HAZARD	
Category	Hazard
1	highest
2	high
3	medium
4	low

HMIS/NFPA	
Index	Hazard
1	slight
2	moderate
3	serious
4	severe

GHS/Hazcom 2012 Safety Data Sheet (g)

- Incorporates a standard 16 section SDS
- Same as ANSI Z400.1
- Classification detailed in Section 2
- Labeling appears in Section 2 of the SDS

16 Sections of SDS

1. Identification
2. Hazards identification
   - Classification (Hazard Class/Category)
   - Labeling
     - Signal Word, Symbol. Hazard Statements, Precautionary Statements
     - Symbol name can used instead of graphic
     - Hazards not Otherwise Classified information
     - Unknown acute toxicity statement

16 Sections of SDS

3. Composition/information on ingredients
   - Substances – name, CAS/Other identifier, impurities, etc that contribute to hazards
   - Mixtures – name and exact percentage or concentration range of all ingredients classified as health hazards and
     - Present at their cut-off/concentration limit or
     - Present below their cut-off/concentration limit but present a health hazard
   - Trade Secrets must be specified
4. First aid measures
   - Includes main symptoms of exposure and necessity for immediate/special treatment
5. Firefighting measures

16 Sections of SDS

6. Accidental release measures

   Personal precautions and methods for containment/cleanup

7. Handling and storage including incompatibility

8. Exposure controls/personal protection

   - Including PELS, TLVs and all other occupational exposure limits (OELs) recommended by manufacturer/importer

16 Sections of SDS

9. Physical and chemical properties
   - Data elements specified
10. Stability and reactivity
11. Toxicological information
   - Description of health effects by likely route of exposure
   - Symptoms
   - Numerical measures of toxicity
   - Whether chemical listed as a carcinogen by NTP, IARC or OSHA

16 Sections of Safety Data Sheet (SDS)

- Section 12 - Ecological information
- Section 13 - Disposal considerations
- Section 14 - Transportation information
- Section 15 - Regulatory information
- Information in these Sections will not be enforced
- Section 16 - Other information
  - The date of MSDS preparation or last revision

SUBSTANCE: LITHIUM

TRADE NAMES/SYNONYMS: Lithium Metal
CHEMICAL FAMILY: Element
FORMULAS: Li

SECTION 2 HAZARDS IDENTIFICATION

GHS Classification:

Health	Environmental	Physical
Eye Corrosion/Irritation- Category 1 Skin Corrosion/Irritation – Category 1	None	Substances and Mixtures Which, in Contact with Water, Emit Flammable Gases – Category 1

GHS Label

Lithium

DANGER!

H260 In contact with water releases flammable gases, which may ignite spontaneously

H314 Causes severe skin burns and eye damage.

Prevention

P223 Do not allow contact with water

P231+ P232 Handle under inert gas. Protect from Moisture

P260 Do not breathe dusts.

P264 Wash thoroughly after handling

P280 Wear protective gloves/protective clothing/ eye protection/ face protection.

Response

P301+P330+P331 IF SWALLOWED Rinse Mouth Do NOT Induce Vomiting

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Response

P302 IF ON SKIN:

P335+P334 Brush off loose articles from skin. Immerse in cool water/wrap in wet bandage

P302 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P310 Immediately call a POISON CENTER or doctor/physician

P370+P378 In case of fire, use extinguishing media on basis of NaCl, pulverized limestone, Class D graphite powder. Never use water.

Storage

P402+P404 Store in a dry place. Store in closed container.

P405 Store locked up

Disposal

P501 Dispose of contents/containers in accordance with local/ regional/ national/ international regulation.

Supplemental Hazard Information: Lithium may explode when in contact with water. Exposure to moist air may result in fire. Lithium can react with water to produce flammable hydrogen gas, which may create a fire and explosion hazard. Spontaneous ignition can occur if Lithium is heated to its melting point. Lithium dusts may ignite spontaneously in moist air. Lithium can react with moisture to produce corrosive compounds. NEVER purge open

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OSHA HCS 2012 Effective Dates

- The final rule is effective 60 days following publication in the Federal Register (May 25, 2012)
- Employers must train employees of the new labels and SDS format by December 1, 2013
- Manufacturers/Importers/Distributor and Employers must comply by June 1, 2015
- Distributors cannot ship containers without compliant labels after December 1, 2015
- Employers must update hazcom program and provide additional training for new hazards by June 1, 2016

Effects on Other Standards

- Substance Specific Standards
  - Change workplace signs to make statements consistent with HCS
  - Revised standards to reference HCS for labels, SDS and training, identified hazards to address

Effects on Other Standards

1910.1450 Laboratory Standard

A. Remove the definitions of

Combustible liquid, Compressed gas, Explosive, Flammable, Flashpoint, Organic peroxide, Oxidizer, Unstable (reactive), and *Water-reactive* from paragraph (b);

B. Revise the definitions of *Hazardous*

chemical, Physical hazard, and Reproductive *toxins* in paragraph (b);

C. Add definitions of *Health hazard* and *Mutagen*

Lab Standard Definitions

Ha*zardous chemical* means any chemical which is classified as health hazard or simple asphyxiant in accordance with the Hazard Communication Standard (§ 1910.1200).

Health hazard means a chemical that is classified as posing one of the following hazardous effects: Acute toxicity (any route of exposure); skin corrosion or irritation; serious eye damage or eye irritation; respiratory or skin sensitization; germ cell mutagenicity; carcinogenity; reproductive toxicity; specific target organ toxicity (single or repeated exposure); aspiration hazard. The criteria for determining whether a chemical is classified as a health hazard are detailed in Appendix A of the Hazard Communication Standard (§ 1910.1200) and § 1910.1200(c) (definition of "simple asphyxiant").

Lab Standard Definitions

Mutagen means chemicals that causepermanent changes in the amount or structure of the genetic material in a cell. Chemicals classified as mutagens in accordance with the Hazard Communication Standard (§ 1910.1200) shall be considered mutagens for purposes of this section.

Physical hazard means a chemical that is classified as posing one of the following hazardous effects: Explosive; flammable (gases, aerosols, liquids, or solids); oxidizer (liquid, solid, or gas); self reactive; pyrophoric (gas, liquid or solid); self-heating; organic peroxide; corrosive to metal; gas under pressure; in contact with water emits flammable gas; or combustible dust. The criteria for determining whether a chemical is classified as a physical hazard are in Appendix B of the Hazard Communication Standard (§ 1910.1200) and § 1910.1200(c) (definitions of "combustible dust" and "pyrophoric gas").

Lab Standard Definitions

Reproductive toxins mean chemicals that affect the reproductive capabilities including adverse effects on sexual function and fertility in adult males and females, as well as adverse effects on the development of the offspring. Chemicals classified as reproductive toxins in accordance with the Hazard Communication Standard (§ 1910.1200) shall be considered reproductive toxins for purposes of this section.

Safety Standards

- PSM 1910.119
  - Added HCS reference for flammable gas and specific flashpoint criteria for flammable liquids
- 1910.106 Flammable Liquids
  - Removed reference to combustible liquids, refer to HCS for hazard criteria for aerosols, change flammable liquid definition to conform to HCS, change in text to refer to FL category 1-4, adding flashpoint criteria where needed

Flammable Liquids

GHS FL Category	Flashpoint °F	Boiling Point °F	OSHA Class	Flashpoint °F	Boiling Point °F
1	<73.4	≤ 95	1A	<73	<100
2	<73.4	>95	1B	<73	≥100
3	≥73.4 and ≤140		1C II	≥73 and <100 ≥100 and <140	
4	>140 and ≤199.4		IIIA	≥140 and <200	
None			IIIB	>200	

Other Safety Standards

- 1910.107 Spray Finishing (added definition)
- 1910.120 Hazwoper (definition of health hazard)
- 1910.123, 124, 125 Dipping and Coating (removed definition of combustible liquid, revised flashpoint and flammable liquid definitions, changed references)
- 1910.252 Welding and Brazing (added Hazard Communication requirements)

What Should I Do Now

- Review new SDS as they arrive for new hazards
  - Is sampling needed?
  - Is a less hazardous chemical available?
  - Are new engineering controls needed?
- Review Written Hazcom Program
  - Keep list of hazardous chemicals up to date
  - In-Plant labeling?
- Prepare for employee training

Label Resources

Stay in Compliance with the 2012 Hazcom Standard and the Globally Harmonized System (GHS)

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New GHS Products from Labelmaster

GHS Training Program & Manuals

GHS Training Kits

GHS & SDS Training Cards & Posters

Globally Harmonized System – "Purple Book"

GHS Pictogram Software

GHS Pictogram Labels

GHS Drum Labels

GHS Custom Labels

HCS/GHS SDS Compliance Centers

GHS Printer & Accessories

Home > Safety & Security > Flammable Storage & Chemical Safety > GHS

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GHS

Comply with laws, regulations or directives for the classification and labeling of hazardous materials known as Globally Harmonized System of Classification and Labeling of Chemicals (GHS)

A single unified approach to classifying chemical hazards, designing warning labels, and organizing information on safety data sheets. According to OSHA, this system includes:

- Identifying health, physical and environmental hazards
- Creating a classification process that uses information on chemicals for comparison with the identified hazard measures
- Communication hazard information as well as a way to protect oneself from the hazard on labels and Safety Data Sheets (SDS)

The purpose of this system is to make it easy to identify chemicals and potential hazards when chemicals are shipped all over the world, regardless of spoken language. Hazard communication now lies in standard symbols that eliminate confusion.

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GHS Labels (Paper) - Flame

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GHS Labels

In May 2012, OSHA passed new safety label regulations based on UN-championed international standards. All hazardous substances must comply with the new **Globally Harmonized System (GHS)** for domestic and international commerce.

We make it easy to comply with these new guidelines by offering GHS labels in two regulation-compliant materials and in two standardized sizes:

- GHS labels are made from paper or polyolefin film, with adhesives that adhere to international regulations.
- Labels are available in 1"x1" or 2"x2" dimensions.
- Compare our prices to other GHS label retailers - **we offer the best value on the web!**

GHS Labels

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Global Harmonized System Bomb Exploding Pictogram

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Global Harmonized System Corrosion Pictogram

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For More Information

The GHS

http://www.unece.org/trans/danger/publi/ghs/ghs_rev04/04files_e.html

Final HCS Standard (Hazcom 2012)

http://www.osha.gov/dsg/hazcom/ghs-final-rule.html

Side by Side Comparison – Current Standard – New Standard

http://www.osha.gov/dsg/hazcom/side-by-side.html

OSHA GHS Information

http://www.osha.gov/dsg/hazcom/global.html

SCHC Resources

- Pictogram summary sheet
- GHS information sheets
  - Pictograms
  - Flammable and Combustible Liquids
  - Labeling
  - Eye Damage/Irritation
  - What is the GHS
  - More

SCHC OSHA Alliance Webpage

www.schc.org

Information Sheets and Webinar

Current GHS Infomation Sheet Library:
The following sheets were produced by the SCHC-OSHA Alliance GHS Information Sheet Workgroup:

English	Español
Info Sheet #1: Pictograms	Hoja de Información N° 1: Pictogramas
Info Sheet #2: Flammable and Combustible Liquids	Hoja de Información N° 2: Líquidos Inflamables (y Combustibles)
Info Sheet #3: What is the GHS?	Hoja de Información N° 3: ¿Qué es el GHS?
Info Sheet #4: Labeling - OSHA vs. GH	Hoja de Información N° 4: Etiquetado - OSHA versus GHS
Info Sheet #5: Eye Damage / Eye Irritation	Hoja de Información N° 5: Daño ocular/irritación ocular
Info Sheet #6: Germ Cell Mutagenicity	Hoja de Información N° 6: Mutagenicidad en células germinales
Info Sheet #7: Carcinogenicity	

OSHA/SCHC Alliance Webinar Archive Available

Through OSHA's Alliance with the Society for Chemical Hazard Communication (SCHC), an informational presentation on "Hazard Communication – The Revised Standard and What Changes You Can Expect in the Workplace" has been made available to aid companies in understanding the requirements of the new Hazard Communication Standard (HCS 2012). The webinar describes changes to the Hazard Communication Standard to align with the Globally Harmonized System (GHS). Topics included changes expected in training, labeling, and safety data sheets and compliance aides available through SCHC.
The following materials are now available:

Thank You

Questions?