

Globally Harmonized System (GHS) For Classification & Labeling Of Chemicals

An International Mandate Of The United Nations



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What Is The GHS?

- A World-Wide Initiative to:
 - Harmonize existing HazCom systems for all chemicals in commerce
 - Develop a single world-wide system
 - Classify chemicals based on their hazards
- Uses unified Labels and Safety Data Sheets to communicate hazards



What Does The GHS Do?

- Uses standardized **pictograms**, **hazard statements**, and **signal words**:
 - “Danger” and “Warning”
- Uniformly **classifies** chemical hazards
- Communicates hazard information on product **Labels** and **Safety Data Sheets** logically and comprehensively







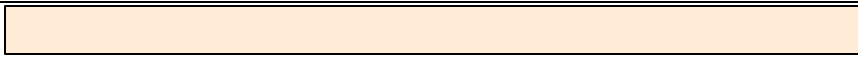





Reasons For A GHS

- Growing international trade
- Different requirements for labeling of chemicals
- **Different classifications of identical products in different countries**
- Need for an international safety standard



Worldwide Classification Frequently Different

Example: Chemical w/ LD₅₀ = 260 mg/kg

REGULATION	CLASSIFICATION
US (OSHA)	Toxic
Canada (WHIMIS)	Toxic (D2B)
EU	
Australia	
New Zealand	
Japan	Toxic
China	
Malaysia	
India	
Thailand	
Korea	Toxic
Under GHS	



Worldwide Classification Frequently Different

Example: Chemical w/ LD₅₀ = 260 mg/kg

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India	
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Thailand	Harmful
Korea	Toxic
Under GHS	Danger (Skull & Cross Bones)



GHS Objectives

- Promote common, consistent, **Hazard-Based criteria** for classifying chemicals according to their:
 - Health hazards
 - Physical hazards and
 - Environmental hazards
- This is unlike most present Risk-based systems



GHS History



- The United Nations Conference on Environment and Development (UNCED) first proposed GHS in 1992
- This goal later endorsed by several international organizations
- More than a decade of work had gone into the new global system



GHS History – The UN Mandate

"A globally-harmonised hazard classification and compatible labelling system, including material safety data sheets and easily understandable symbols, should be available, if feasible, by the year 2000."



GHS History

- UN Recommendations on Transport of Dangerous Goods established GHS-like classification and labeling criteria for HazMats
- PHMSA adopted several GHS elements in 49CFR100-180
- Environmental, worker and consumer safety regs still need to be harmonized



GHS History

- 2002: UN Committee of Experts on Transport of Dangerous Goods and GHS
 - Formally adopted the GHS
 - Recommended that GHS be used worldwide
- GHS was to be considered a living document and updated as necessary



GHS History

- First version of **GHS Guidance Document** became available in 2003
- Contained harmonized classification criteria and hazard communication elements
- Aim of GHS is worldwide implementation
- Countries already having classification and labeling systems will align them with GHS



Benefits Of The GHS



- Enhances human health, safety and environmental protection
- Promotes sound management of chemicals worldwide
- Reduces Barriers and Facilitates Trade
- Reduces costs involved in developing, manufacturing, distributing, and transporting hazardous chemicals



Governments Benefit

- Fewer chemical accidents and incidents
- Lower health care costs
- Improved protection of workers and public from chemical hazards
- Reduce costs and ease coordination for legislation, implementation and monitoring,
- Supports improved inter-agency coordination and cooperation



Companies & Workers Benefit

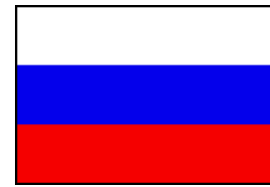
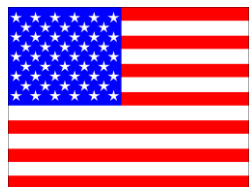
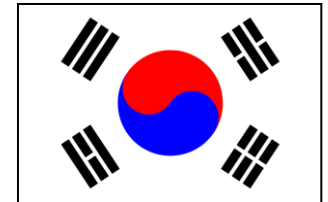
- Safer work environment and transport of chemicals
- Improved employee relations
- Increased compliance with HazCom regs
- Minimizing labor and costs
- Fewer accidents and illnesses
- Improved corporate image and credibility



Stakeholders



- A multitude of countries
- International organizations
- Stakeholder organizations
- Domestic Manufacturers & Importers



Stakeholders & Other interested Parties

- Chemical Manufacturers
- Users/Consumers
- Trade Associations
- Federal, State and Local Government
- **Emergency Responders**
- Transporters
- Unions
- Consultants
- Individuals
- and Others



Changes To OSHA's Hazard Communication Standard



Now:

29 CFR 1910.1200; 1915.1200;
1917.28; 1918.90 and 1926.59
(Final Rule Amended Under GHS
March 26th, 2012)



OSHA's HazCom Standard

- 1983 - HazCom Standard adopted for manufacturing sector of industry
- 1985 - OSHA established an 8 Section “voluntary” MSDS format, Form 174
- 1987 - Expanded to all industries where employees are potentially exposed to hazardous chemicals



Aligning The HazCom Standard (HCS) To The GHS

- Enables workers to access information more efficiently
- **Safety Data Sheets** to finally have a standardized format
- GHS minimizes compliance burden of having multiple labels and SDSs for same product shipped to different countries
- Will decrease cost of providing hazard info



Major Changes To The HCS



- **Hazard classification:** Specific criteria for classification of health and physical hazards for single compounds & mixtures
- **Labels:** Chemical manufacturers and importers will be required to include:
 - a harmonized **signal word**
 - a **pictogram**
 - a **hazard statement** for each hazard class and category
 - **Precautionary statements**



Major Changes To The HCS

- **Safety Data Sheets:** Will now have a specified 16-section format (similar to ANSI Z400.1-2004)
- **Information and training:**
 - GHS does not address training
 - Amended **HCS changes requires worker training**
 - **To include recognition and understanding of new Labels and SDSs**



Safety Data Sheets Under GHS

Section 1. Identification

Section 2. Hazard(s) classification & labeling statements

Section 3. Composition/information on ingredients

Section 4. First-aid measures

Section 5. Fire-fighting measures

Section 6. Accidental release measures

Section 7. Handling and storage

Section 8. Exposure controls/personal protection



Safety Data Sheets Under GHS

Section 9. Phys and Chem Properties/Measurements

Section 10. Stability & reactivity (Heat, water, incompatibles)

Section 11. Toxicological information (Health info)

Section 12. Ecological information (Environ effects)

Section 13. Disposal considerations

Section 14. Transport info (49CFR, Can DGR...)

Section 15. Regulatory info (CA Prop 65, NJRTK...)

Section 16. Other info (Preparer, Contact #, Date...)



Impact Of The Amended HCS

- **Number of workers affected by the revised HCS:** Over 43 million
- **Affected Industries:** Over 5 million workplaces
- **Compliance costs** for revisions would be incurred during transition over a 3 year phase-in period



OSHA Estimated Annualized Compliance Costs

- **Classifying chemical hazards** based on GHS criteria & revising SDSs and labels:
 - \$11 million a year for about 90,000 establishments
- **Training workers** to become familiar with new warning symbols and revised **SDS** format:
 - \$44 million/year for all affected workplaces

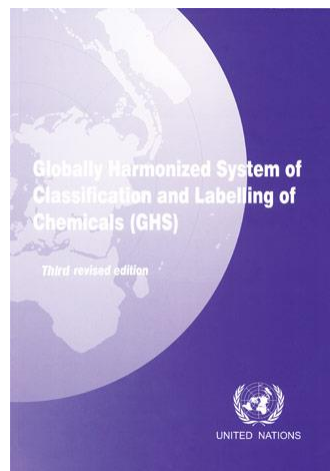


OSHA Estimated Annual Benefits Of The Amended Standard

- Will prevent 43 fatalities and 585 injuries & illnesses
- Financial benefits of these reductions in safety and health risks: \$266 million
- \$585 million/yr cost reductions and productivity improvements
- In total, proposed revisions expected to save \$754 million/yr



GHS Details



The Purple Book

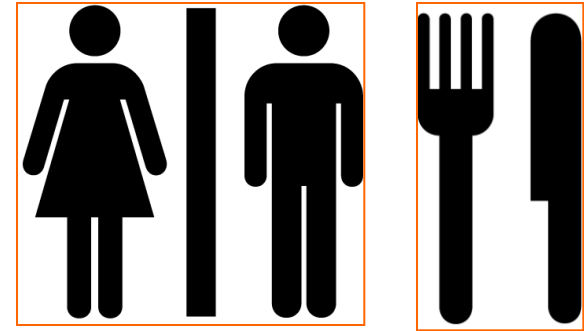
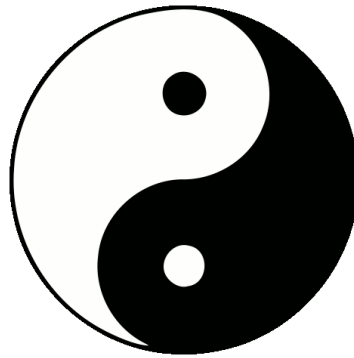


The GHS Purple Book Consists Of Four Parts & 10 Annexes

- Part 1 – Introduction (scope, definitions, Labels & SDSs)
- Part 2 – Physical Hazards (16)
- Part 3 – Health Hazards (10)
- Part 4 – Environmental Hazards (Aquatic)
- Annexes (10) Classification & Guidance



Commonly Recognized Pictograms



Transportation Pictograms



The GHS Pictograms



Explosives
Self-reactive subst.
Organic peroxide



Flammable substance
Self-reactive substance
Pyrophoric and self-heating substance



Oxidizing substance
Organic peroxides



Compressed gas



Skin corr./irrit.
Eye corr./irrit.
Corrosive to metal



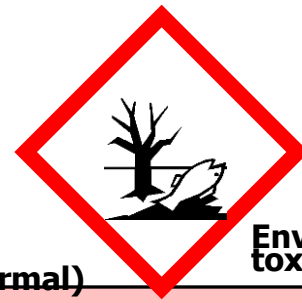
Sensitization (Respiratory)
Mutagenicity
Carcinogenicity
Reproductive toxicity
Target organ toxicity



Acute toxicity



Acute toxicity
Skin corr./irrit.
Eye corr./irrit.
Sensitization (Dermal)



Environmental toxicity



Current North American Labels

- US Workforce labels follow:

- OSHA
- ANSI
- NJ Right to Know Law
- CA Proposition 65

- Canada Workforce labels follow WHMIS

- Lots of differences among these



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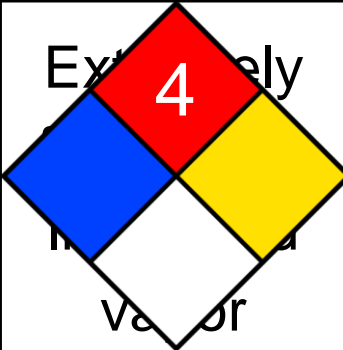
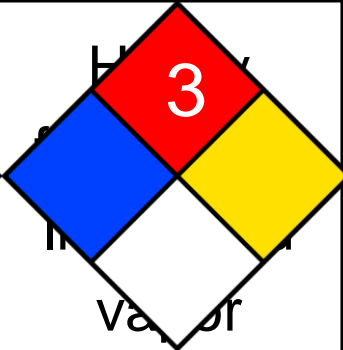
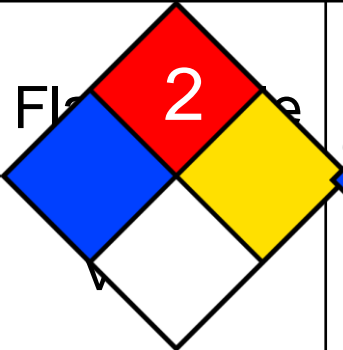
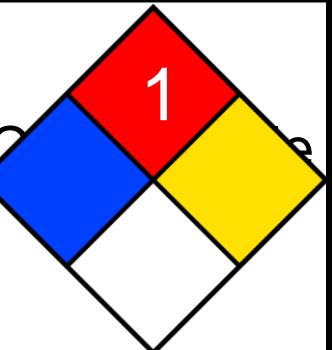


Six Elements Of The GHS Label

- Product Identifier
- Supplier Identification
- Chemical Identification
- Hazard Pictograms
- Signal Words
- Hazard Statements describing nature of hazards



Example: GHS Flammable Liquids Labeling Elements

	Category 1	Category 2	Category 3	Category 4
Symbol				No symbol To be used
Signal Word	Danger	Danger	Warning	Warning
Hazard Statement	Extremely flammable liquid or vapor 	Highly flammable liquid or vapor 	Flammable liquid or vapor 	Flammable liquid or vapor 



GHS Label For Acetone

Acetone



DANGER

Highly flammable liquid and vapor.

Causes severe eye irritation.

Keep away from heat, sparks and flame – No smoking.

Take precautionary measures against static discharge.

Keep from direct sunlight.

Keep container closed when not in use.

Store in a cool/low temperature, well-ventilated place away from heat and ignition sources.



Use only in a well-ventilated area.

Avoid contact with eyes, skin and clothing.

Wear appropriate personal protective equipment, avoid direct contact.

Flush eyes with water for at least 15 minutes while holding eyelids open.

Company Name

Street Address, City, State/Province, Country

Telephone: (Country Code)-###-####



Acetone SDS (Part of Section 2)



Signal word: Danger

Hazard statement(s):

H225 Highly flammable liquid and vapor.

H316 Causes mild skin irritation.

H319 Causes serious eye irritation.

H336 May cause drowsiness or dizziness.

Precautionary statement(s):

P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

P261 Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray.

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



GHS Label For Epichlorohydrin

Top Half Of Label

Epichlorohydrin
1-Chloro-2,3-epoxypropane
CAS No. 106-89-8
UN No. 2023



D A N G E R

Hazard statements:

- Toxic if swallowed
- Toxic in contact with skin
- Fatal if inhaled
- May cause an allergic skin reaction.
- May cause genetic defects.
- May cause cancer
- Cause severe skin burns and eye damage
- Cause serious eye irritation
- Toxic to aquatic life



GHS Label For Epichlorohydrin

Bottom
Half Of
Label

Precautionary statements:

- Keep out of reach of children.
- Keep container tightly closed.
- Do not handle until all safety precautions have been read and understood.
- Wear eye/face protection.
- Wear protective gloves/clothing.
- Wear respiratory protection, as specified by the manufacturer.
- Do not breathe dust/fume/gas/mist/vapours/spray.
- Use appropriate ventilation.
- Wash thoroughly after handling.

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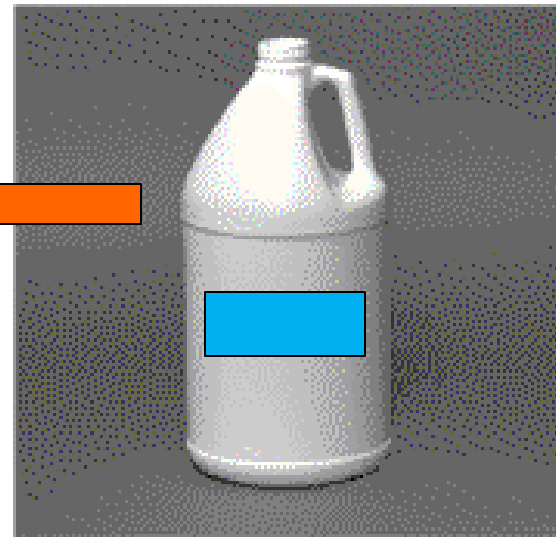
Fax. 41 22 917 00 00



GHS Label Placement For Combination Packages



Put 6
Units
in box



GHS Single
Package Label

No GHS Label on Outer
Package if Danger is
noted by diamond label(s)



GHS Adoption Timeline

- **December 1, 2013:** 43 million employees in 5 million US businesses must train on new label elements and SDS format
- **June 1, 2015:** Manufacturers must reclassify chemicals and send SDSs & Labels in GHS format



GHS Adoption Timeline

- **December 1, 2015:** Distributors must send only updated SDSs and Labels
- **June 1, 2016:** Employers must be in full compliance



Questions? Comments?



Any Concerns

