

The Globally Harmonized System of Classification and Labeling of Chemicals (GHS): From HAZCOM 1994 to HAZCOM 2012 and Beyond

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HazCom 2012

- OSHA is modifying its HCS to conform to the United Nations' GHS - “
- OSHA has determined that the modifications will significantly reduce costs and burdens
- Improves quality and consistency of hazard and protection information provided to employers and employees

The Good News

- Incorporation of GHS concepts is not likely to turn your current HAZCOM program upside down!
- There are changes in hazard classification, labeling, safety data sheet content.
 - 'End' users minimally affected
- Users need to update employee training to new labeling scheme, label reading, and safety data sheet content
- Implementation period
 - 'Deadlines' in December 2013, June 1015, December 2015

Presentation objectives

- What is GHS?
- From HAZCOM 1994 $\xrightarrow{\text{GHS}}$ HAZCOM 2012
 - What Changed?
 - What Didn't?
 - What's Next?

GHS Links

- Final HCS Standard (Hazcom 2012)
 - <http://www.osha.gov/dsg/hazcom/ghs-final-rule.html>
- Side by Side Comparison: Current Standard – New Standard (as proposed)
 - <http://www.osha.gov/dsg/hazcom/side-by-side.html>
- OSHA GHS Information
 - <http://www.osha.gov/dsg/hazcom/global.html>
- U.N. Economic Commission for Europe (GHS Resources)
 - http://www.unece.org/trans/danger/publi/ghs/ghs_welcome_e.html
- Link to the 'Purple Book', 4th edition
 - http://www.unece.org/trans/danger/publi/ghs/ghs_rev04/04files_e.html

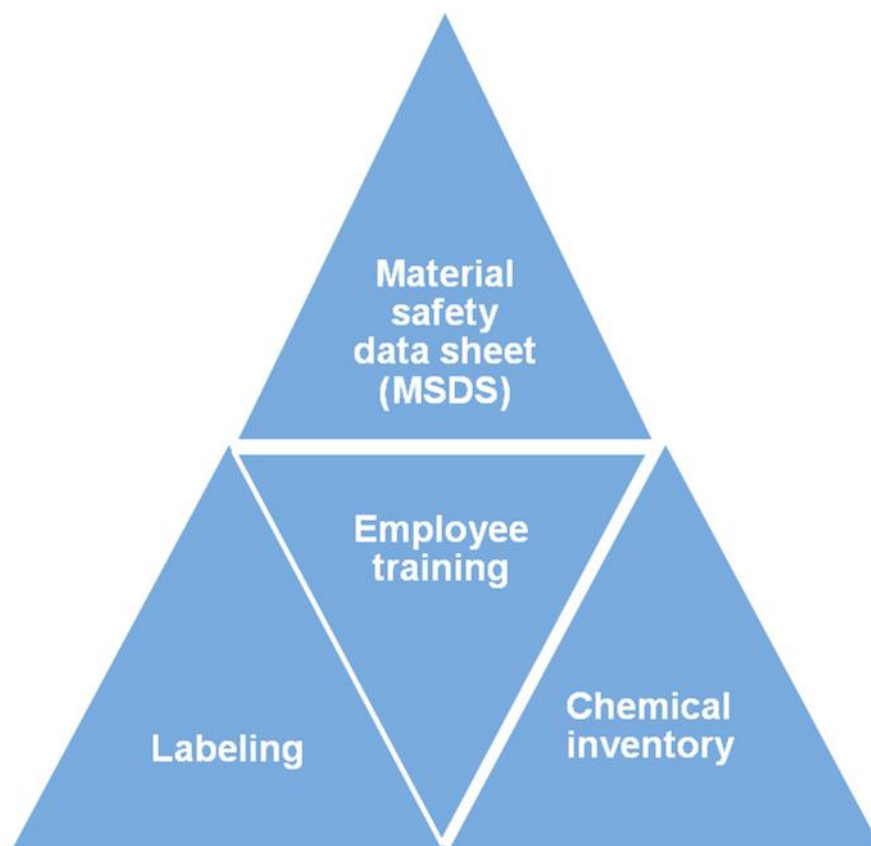
What is GHS?

- A common [INTERNATIONAL] approach to:
 - defining and classifying hazards of chemical substances and mixtures
 - communicating the information about those hazards on labels and safety data sheets (SDSs)
- One system for workers, consumers, transport workers and emergency responders
- Provides the underlying infrastructure for establishment of international, comprehensive chemical safety programs

Why GHS?

- The primary benefit: increase the quality and consistency of information provided to workers, employers and chemical users by adopting a standardized approach to hazard classification, labels and safety data.

HazCom – Pre-GHS



HazCom – Pre-GHS



- A comprehensive list of hazardous chemicals present in the workplace that a worker could be exposed to under routine or reasonably foreseeable emergency circumstances
- The table of contents for your MSDS book

HazCom – Pre-GHS



Technical bulletin whose purpose is to provide detailed information on each hazardous chemical in the workplace.”

- Chemical manufacturers/importers required to obtain or develop an MSDS for each hazardous chemical they produce or import.
- Distributors are responsible for ensuring that their customers get MSDS
- Employers must have an MSDS for each hazardous chemical that they use.

HazCom – Pre-GHS

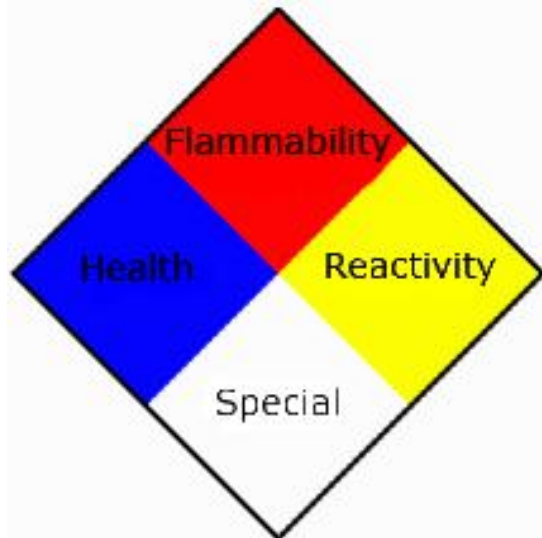
Labels

- All products shipped by manufacturers must include:
 - Identity of material;
 - Appropriate hazard warnings;
 - Name and address of the producer or other responsible party.
- All in-plant containers should include:
 - Identity of material;
 - Appropriate hazard warnings.
- Must be in English but other languages may be supplied.

HazCom – Pre-GHS

Common labeling systems

National Fire
Protection
Association



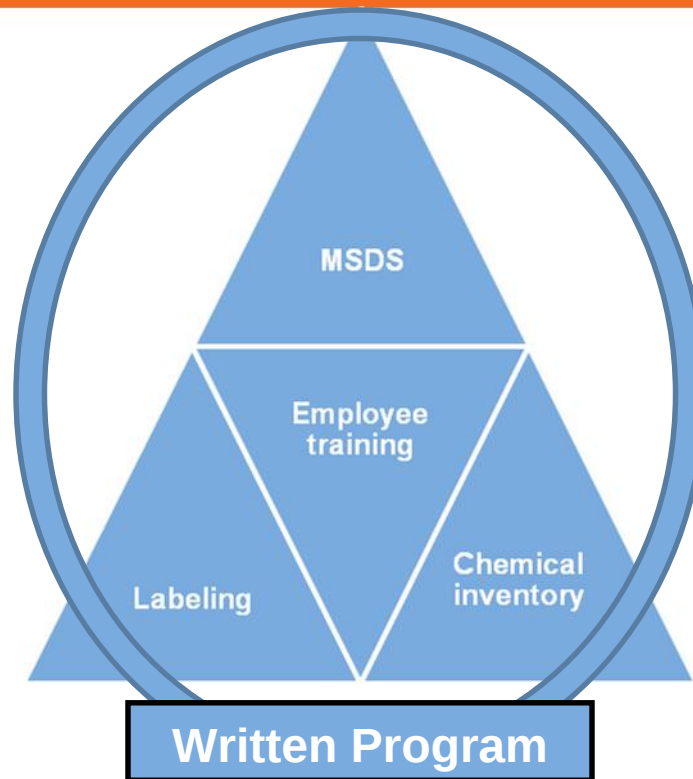
Hazardous Materials
Identification Systems
(HMIS)

Chemical Name	
CAS #	
HEALTH	☐
FLAMMABILITY	☐
INSTABILITY	☐
SPECIFIC	☐

HazCom – Pre-GHS



- All employers are required to institute an information and training program that provides workers with training on the hazardous materials that they maybe exposed to in performing their work.



Final component:

- **Written program** that ties the program elements together and details how you will implement these four elements in your facility.

What's changed: Three major changes

- **Hazard classification:**
 - Chemical manufacturers/importers required to determine hazards they produce or import
 - Hazard classification to provide specific criteria for classification of health and physical hazards, as well as classification of mixtures.
- **Labels**
 - Chemical manufacturers/importers required to provide a label that includes a harmonized signal word, pictogram, and hazard statement for each hazard class and category. Precautionary statements must also be provided.
- **Safety Data Sheets:**
 - Will now have a specified 16-section format.

What's changed: Hazard classification

- Establishes newly defined terms:
 - Hazard class – The nature of the health or physical hazard;
 - Hazard category – Categories compare hazard severity *within* the class.
- Classification of chemical or substance using available data : no additional testing required to classify a chemical

What's changed: Hazard classification

- Haz Com 2012 contains two mandatory appendices to be used by chemical manufacturers/importers
 - Provide prescriptive guidance for *health* (App. A) and *physical* (App. B) hazard determination.
- Has specific criteria for determining health and physical hazards as well as determination criteria for mixtures.
- Definitions section changed to reflect new hazard definitions.

Hazard category numerical ratings

HAZARD	
<u>Category Hazard</u>	
1	highest
2	high
3	medium
4	low

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

What's Changed: New hazard classification

Hazard Not Otherwise Classified (HNOC)

- 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 or health hazard classes addressed in this section
- Not required on the label

Appendix A : Health/Environmental Hazards

- Acute toxicity
- Skin corrosion/irritation
- Serious eye damage/eye irritation
- Respiratory or skin sensitization
- Germ cell mutagenicity
- Carcinogenicity
- Reproductive toxicity
- Specific target organ toxicity – Single and repeated exposure
- Aspiration hazard
- *Aquatic toxicity – acute and chronic**
- *Hazardous to the ozone layer**

* GHS definition not included in HCS 2012

Appendix B – Physical Hazards

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

What's Changed? – Labels

The requirement for labeling is unchanged. However, label content changed based on hazard classification.

Appendix C has specific requirements

Label content on shipped containers:

- Product identifier
- Supplier identifier
- Chemical identity
- *Hazard pictograms**
- *Signal words**
- *Hazard statements**
- *Precautionary information*

*Standardized

What's Changed? - Labels

○ Product identifier

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

○ Supplier identifier

What's Changed? - Labels

Signal word

- A single word used to indicate a potential hazard and the relative level of severity of hazard
 - “Danger” = more severe hazards
 - “Warning” = less severe

❖ *Note – “Caution” is not a GHS signal word.*

What's Changed? - Labels

Pictogram

- A composition that may include a symbol plus other graphic elements such as a border, background pattern or color
- Intended to convey specific information about the hazards of a chemical
- Eight of the nine GHS pictograms adopted by OSHA



Health Hazard

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



Flame

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



Exclamation Mark

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



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



Environment (Non Mandatory)

- Aquatic Toxicity



Skull and Crossbones

- Acute Toxicity (fatal or toxic)

What's Changed? - Labels

Hazard and precautionary statements

- a phrase that describes recommended measures to be taken to minimize or prevent adverse effects
- Example: Flammable liquids
 - Category 1: *Extremely flammable liquid and vapor*
 - Category 2: *Highly flammable liquid and vapor*
 - Category 3: *Flammable liquid and vapor*
 - Category 4: *Combustible liquid*
- Precautionary statements are selected from tables in Appendix C based on hazard class.

What's Changed? - Labels

Hazard and precautionary statements

Label Elements Flammable Liquids

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

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)

What's Changed? - Labels

Hazard and precautionary statements

Label Elements Carcinogenicity

Hazard Category
1A and 1B
2

Signal Word
Danger
Warning

Hazard Statement
May cause cancer
Suspected of causing cancer

Pictogram



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... <i>... in accordance with local/ regional/ national/ international regulations (to be specified)</i>

Chemical Hazard Labeling:

- There are many different types of labels used in the chemical industry
- NFPA 704- (Bulk Tank storage)
- DOT- Hazardous Materials, in commerce transportation
- HMIS- Hazard Material ID System
- RCRA Hazardous Waste-Generator Requirements

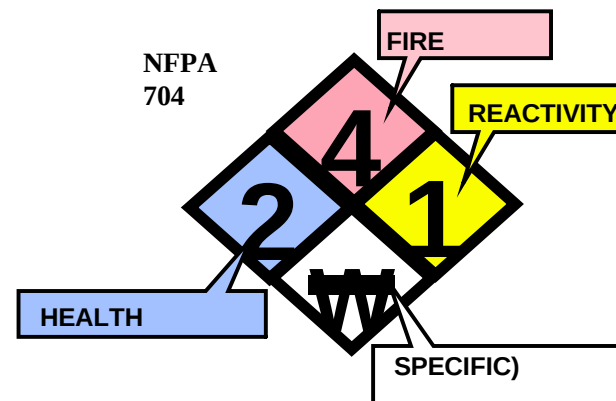
DOT
Labeling



HMIS

Chemical Name	
HEALTH	☐
FLAMMABILITY	☐
REACTIVITY	☐
PERSONAL PROTECTION ☐	

NFPA
704



SAMPLE LABEL

CODE _____

Product Name _____

Product
Identifier

Company Name _____

Street Address _____

City _____ State _____

Postal Code _____ Country _____

Emergency Phone Number _____

Supplier
Identification

Keep container tightly closed. Store in a cool, well-ventilated place that is locked.
Keep away from heat/sparks/open flame. No smoking.
Only use non-sparking tools.
Use explosion-proof electrical equipment.
Take precautionary measures against static discharge.
Ground and bond container and receiving equipment.
Do not breathe vapors.
Wear protective gloves.
Do not eat, drink or smoke when using this product.
Wash hands thoroughly after handling.
Dispose of in accordance with local, regional, national, international regulations as specified.

In Case of Fire: use dry chemical (BC) or Carbon Dioxide (CO₂) fire extinguisher to extinguish.

First Aid

If exposed call Poison Center.

If on skin (or hair): Take off immediately any contaminated clothing. Rinse skin with water.

Precautionary
Statements

Hazard Pictograms

Signal Word
Danger

Highly flammable liquid and vapor.
May cause liver and kidney damage.

Hazard
Statements

Supplemental Information

Directions for Use

Fill weight: _____ Lot Number: _____
Gross weight: _____ Fill Date: _____
Expiration Date: _____

What's Changed? - Labels

- Solid metal, wood and plastic items not exempted as articles
- Labels may be transmitted to customer at initial shipment:
 - With shipment;
 - With SDS.
- Labels not required with subsequent shipments unless label changes.
- Labels required for materials that form combustible dusts when processed.

What's Changed? - SDSs

- Incorporates a standardized 16 section format
- Same as ANSI Z400.1 - *“Hazardous Workplace Chemicals - Hazard Evaluation and Safety Data Sheet and Precautionary Labeling Preparation”*
- Classification detailed in Section 2.
- Labelling appears in Section 2.

Standardized Format SDS

- o Section 1. Identification
- o Section 2. Hazard(s) identification
- 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
- Section 9. Physical and chemical properties
- Section 10. Stability and reactivity
- Section 11. Toxicological information
- Section 12. Ecological information
- Section 13. Disposal considerations
- Section 14. Transport information
- Section 15. Regulatory information
- Section 16. Other information, including date of preparation or last revision

What's Changed? - SDSs

1. Identification

- Unique identifier
- Supplier's information (name, address, contact information)
- Recommended use
- Emergency contact

What's Changed? - SDSs

2. Hazard identification

- Classification (hazard class/category)
- Labeling
 - Signal word, symbol (pictogram), hazard statement(s), precautionary statement(s)
 - Symbol name can be used instead of pictogram
 - Hazards not otherwise classified (HNOC) information
 - Unknown acute toxicity statement

What's Changed? - SDSs

3. Composition/information on ingredients
 - Substances (chemical identity / synonyms, CAS#, impurities or stabilizing agents)
 - Mixtures – name and exact percent or concentration range of all ingredients classified as health hazards
 - Trade secrets must be specified (but not percent)
4. First aid measures – immediate/special treatment requirements
5. Firefighting measures – suitable extinguishing media, special hazards

What's Changed? - SDSs

6. Accidental release measures
 - Personal precautions and methods for containment/clean-up
7. Handling and storage including incompatibility
8. Exposure controls/PPE
 - Including PELs, TLVs, and all other OELs recommended by manufacturer/importer

What's Changed? - SDSs

9. Physical and chemical properties

- Specific data elements specified

10. Stability and reactivity

11. Toxicological information

- Description of health effects by likely route of exposure
- Symptoms (immediate or delayed)
- Numerical measures of toxicity (LD₅₀, LC₅₀)
- Carcinogen designation by NTP, IARC or OSHA

What's Changed? - SDSs

12. Ecological information*

13. Disposal considerations*

14. Transportation information*

15. Regulatory information*

16. Other information

- Date of SDS preparation or last revision

* not be enforced by OSHA

What's Changed: Other Standards Affected

- Changing the HCS to conform to the GHS requires modification of other OSHA standards.
- Modifications have been made to the standards for Flammable and Combustible Liquids in general industry (29 CFR 1910.106) and construction (29 CFR 1926.152) to align the requirements of the standards with the GHS hazard categories for flammable liquids.

What Hasn't Changed?

- Full exemptions
 - Hazardous waste
 - Hazardous substances at CERCLA sites
 - Tobacco
 - Wood/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

What Hasn't Changed?

- Full exemptions
 - Drugs
 - Cosmetics packaged for sale or for personal consumption
 - Consumer products if used only in a consumer manner
 - Nuisance particles (non-combustible)
 - Radiation (ionizing and non-ionizing)
 - Biological hazards

What's Changed?

Federal Agency Activities Changes

- GHS Environmental Protection Agency (EPA)
- GHS U.S. Department of Transportation (DOT)
- Policy of the U.S. Consumer Product Safety Commission on the GHS Consumer Product Safety Commission (CPSC)

What's Changed?

Other Standards Affected

- Changing the HCS to conform to the GHS requires modification of other OSHA standards.
- Modifications have been made to the standards for Flammable and Combustible Liquids in *general industry* (29 CFR 1910.106) and *construction* (29 CFR 1926.152) to align the requirements of the standards with the GHS hazard categories for flammable liquids.

What's Changed?

Other Standards Affected (continued)

- Modifications to the Process Safety Management of Highly Hazardous Chemicals standard (29 CFR 1910.119) will ensure that the scope of the standard is not changed by the revisions to the HCS.
- In addition, modifications have been made to most of OSHA's substance-specific health standards, ensuring that requirements for signs and labels and SDSs are consistent with the modified HCS.

What's Next?

Effective completion date	Requirement(s)	Who
Dec. 1, 2013	Train employees on the new label elements and (SDS) format.	Employers

What's Next?

Effective completion date	Requirement(s)	Who
June 1, 2015*	Compliance with all modified provisions of this final rule, <i>except that:</i>	Chemical manufacturers, importers, distributors and employers
Dec. 1, 2015	The distributor shall not ship containers labeled by the chemical manufacturer or importer unless it is a GHS label .	

*This date coincides with the EU implementation date for classification of mixtures.

What's Next?

Effective completion date	Requirement(s)	Who
June 1, 2016	Update alternative workplace labeling and hazard communication program as necessary, and provide additional employee training for newly identified physical or health hazards.	Employers

What's Next?

Effective completion date	Requirement(s)	Who
Transition period to the effective completion dates noted above	May comply with either 29 CFR 1910.1200 (the final standard), or the current standard, or both	Chemical manufacturers, importers, distributors, and employers

Next Steps: General

Review/understand the new hazard classifications/categories.

- Review updated SDS for changes in hazards.
- Assess workplace controls in light of new classifications.
- Review and update your written program.
- Keep your list of hazardous chemicals up-to-date.

Next steps (specific): Obtain NEW

SDS

Labels

Next Steps: Employee training

- Gather chemical manufacturer data such as telephone and contact information
- SDS will be sent to employers from the manufacturer data base
- If you don't receive them you can use the data collected to contact the manufacturer
- June 1, 2016 employer program requirements

Next Steps: Employee training

- Label elements
 - Signal words
 - Pictograms [9 of them]
 - Hazard statement
 - Precautionary statement
 - Hazard category ratings
- SDS format
 - Specified 16 section format
- FAQ relevant to your facility

Next Steps: Labeling

- o Decide how you are going to label your secondary chemical containers
- o HMIS
- o NFPA
- o Other
- o Label implementation date is June 2015

PRODUCT IDENTIFIER		REFERENCE
HEALTH	☐ ☐	PRODUCT USE:
FLAMMABILITY	☐	MANUFACTURER:
REACTIVITY	☐	PERSONAL PROTECTION:
PERSONAL PROTECTION	☐	REFER TO SAFETY DATA SHEET

ICC-HM02P

What's Next?

Secondary labeling strategy?

- o Consider using pictograms/signal words for secondary labeling instead of NFPA/HMIS to avoid confusion during the transition period.

What's Next?

Employee information and training

- Consider establishing a HCS 2012 training guide that includes a list of the new health and physical hazard phrases.
- Poster of pictograms with their meaning near SDS location.
- FAQ relevant to your facility.

Questions ?

