Stand-by our Webinar will Begin Soon

Globally Harmonized System (GHS) of Classification & Labeling of Chemicals & OSHA HazCom 2012

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Today's Presenter

Michele Sullivan, Ph.D.

- Recognized expert in domestic and international hazard communication and author of numerous MSDS and GHS Guidance Manuals.
- She testified as an expert witness at the Senate Subcommittee hearing on "Hazard Communication in the Workplace".
- She participated in the ANSI Z400.1 MSDS and Z129.1 Labeling Standards development and training.
- She participated on the NACOSH Hazard Communication Work Group that advised OSHA about 29 CFR 1910.1200, the Hazard Communication Standard.
- Society for Chemical Hazard Communication (SCHC) Board Member and former Chairwoman & President of SCHC.

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Housekeeping

Michele Sullivan, Ph.D.

- Detailed Presentation on OSHA GHS/HazCom 2012
- One-way presentation with Q&A session at end
- Please email questions to brad.montgomery@accuform.com
- Any unanswered questions will be addressed within 24-hours
- Slides are property of Michele Sullivan, Ph.D.
- Online resources available at www.accuform.com/GHS or www.GHSSource.com

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Select Agenda Items

GHS/HCS 2012

- What is GHS
- GHS Elements
- OSHA GHS Final Rule (HCS 2012)
- Implementation Timelines
- HCS 2012 Hazards
- HCS 2012 Label Overview
- Pictograms & Symbols
- Procedure for multiple hazards
- HMIS and NFPA
- SDSs

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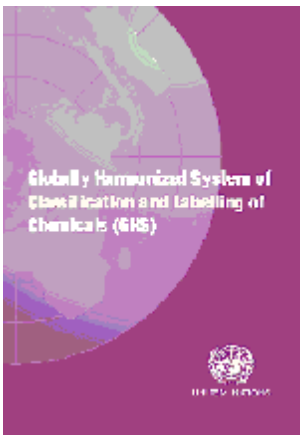
The Globally Harmonized System (GHS) of Classification & Labeling of Chemicals

OSHA GHS/HazCom 2012



GHS Purple Book

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GHS

- The GHS is **not** a model regulation or legislation
- It is an approach or framework
- Provides the informational framework upon which countries can base programs for the sound management of chemicals
- It consists of harmonized and standardized elements
  - ***Hazard statements***, ***symbols*** and ***signal words*** have been ***standardized*** and ***harmonized*** and form an integrated hazard communication system
  - Criteria for hazard classification are harmonized
- It permits self-classification
- Competent Authorities will decide how to apply the various elements of the GHS based on the needs of the CA and target audiences (workplace, consumer, transport, etc.)

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The GHS Harmonized Elements (Building Blocks)

- **Classification Criteria**
  - A Physical Hazards
  - B Health Hazards
  - C Environmental Hazards
  - D Mixtures
- **Hazard Communication**
  - E Labels
    - Symbols/pictograms
    - Signal Words
    - Hazard Statements (e.g., H200)
    - [Precautionary information (e.g., P201)]
    - Product identifier/ingredient disclosure
  - F MSDS / Safety Data Sheets
  - G Risk-based labeling for chronics in consumer uses

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OSHA GHS HCS 2012 – 3/26/12 Fed Reg

- The major change is the switch from performance-oriented requirements to specified requirements.
- OSHA sought to maintain/enhance the protection provided by the current rule
  - Scope and application are mostly unchanged, maintaining practical accommodations made by OSHA
  - Written hazard communication program requirements, worker training, and trade secret provisions are largely unchanged from existing rule
  - Includes changes to the substance specific standards
  - Includes changes to safety standards, e.g., PSM, 1910.106 Flammable & Combustible Liquid Standard
- The HCS 2012 mostly maintains consistency with the GHS as negotiated/adopted – mostly GHS Rev3
- Maintains the framework of the current HCS 1994
  - Only changed provisions that need to be changed to align with GHS
  - Only paragraphs that changed are published in FR regulatory text
  - A FR notice will be published to correct errors, e.g., Table A.1.1/dermal

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GHS HCS 2012 (j) Effective Dates

Effective Completion Date	Requirement(s)	Who
December 1, 2013	Train employees on the new label elements and safety data sheet (SDS) format.	Employers
June 1, 2015* December 1, 2015	Compliance with all modified provisions of this final rule, except: The Distributor shall not ship containers labeled by the chemical manufacturer or importer unless it is a GHS label	Chemical manufacturers, importers, distributors and employers
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. Includes the substance specific standard changes	Employers
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

*This date coincides with the EU CLP implementation date for mixtures.

Organization of OSHA HCS 2012

- HCS 2012 Regulatory Text
  - (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) (New)
  - GHS Rev 3 Part 3
- Appendix B, Physical Hazard Criteria (Mandatory)(New)
  - GHS Rev 3 Part 2
- Appendix C, Allocation of Label Elements (Mandatory) (New)
  - GHS Rev3: Chapter 1, Annex 3
    - **Pyrophoric Gas, Simple Asphyxiant, Combustible Dust**
- Appendix D, Safety Data Sheets (Mandatory) (New)
  - GHS Rev 3 Table 1.5.2
- Appendix E, Definition of "Trade Secret" (Mandatory)
- Appendix F, Guidance for Hazard Classifications re: Carcinogenicity (Non-Mandatory) (New)
  - GHS Rev 3 Part 3 Chapter 3.6
    - **IARC, NTP, OSHA additions**

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(b) Scope & Application: basically unchanged

- (b)(2) This section applies to any chemical which is **known to be present** in the workplace in such a manner that employees may be **exposed under normal conditions of use** or **in a foreseeable emergency**.

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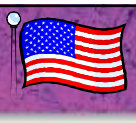
OSHA HCS 2012 Definitions



- Remove from the current HCS definitions:
  - Combustible liquid; explosive; flammable; organic peroxide; oxidizer; pyrophoric; unstable (reactive); and water-reactive
  - Flashpoint; hazard warning; and MSDS
- Revisions to be consistent with the GHS
  - Chemical; chemical name; hazardous chemical; health hazard; label; mixture; physical hazard; and trade secret
    - **Chemical: any substance, or mixture of substances**
- Additions to the definitions
  - Classification; hazard category; hazard class; hazard statement; label element; pictogram; precautionary statement; product identifier; Safety Data Sheet (SDS); signal word; substance; and **pyrophoric gas**, **simple asphyxiant, HNOC**
    - **Product identifier: the name or number used for a hazardous chemical on a label or in the SDS.**

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Hazard Determination → Hazard Classification

- "**Classification**" means 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. In addition, 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.
- This is "classification" rather than just determining that there is a hazardous effect (carcinogenicity), there is also a finding of how severe that effect might be (Category 1 or 2)
- "Hazardous chemical" means any chemical which is classified as a physical hazard or a health hazard, a **simple asphyxiant**, **combustible dust**, **pyrophoric gas**, or **Hazard Not Otherwise Classified.**

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HCS 2012 HNOC

- *Hazard not otherwise classified* (HNOC) means 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 or is under a GHS hazard category that has not been adopted by OSHA (e.g., acute toxicity Category 5).
- *Hazards not otherwise classified* do not have to be addressed on containers but must be addressed in SDS section 2

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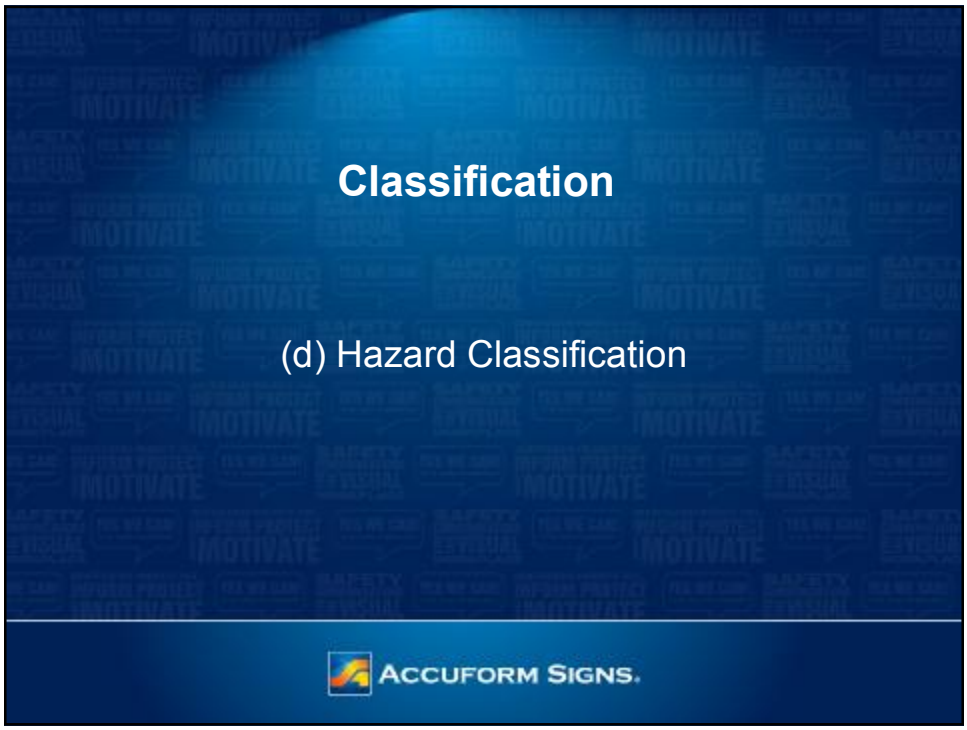
HCS 2012 OSHA Defined Hazards

Hazard	Pyrophoric Gas	Simple Asphyxiant	Combustible Dust*
Definition	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.	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.	None
Pictogram		No pictogram	No pictogram
Signal word	Danger	Warning	Warning
Hazard statement	Catches fire spontaneously if exposed to air	May displace oxygen and cause rapid suffocation	May form combustible dust concentrations in air
*The chemical manufacturer or importer shall label chemicals that are shipped in dust form, and present a combustible dust hazard in that form when used downstream, under paragraph (f)(1); 2) the chemical manufacturer or importer shipping chemicals that are in a form that is not yet a dust must provide a label to customers under paragraph (f)(4) if, under normal conditions of use, the chemicals are processed in a downstream workplace in such a way that they present a combustible dust hazard; and 3) the employer shall follow the workplace labeling requirements under paragraph (f)(6) where combustible dust hazards are present.			



Health hazards covered by HCS 2012

1. **Acute toxicity** (HCS 2012 A1.1)
2. **Skin corrosion/irritation** (HCS 2012 A1.2)
3. **Serious eye damage/eye irritation** (HCS 2012 A1.3)
4. **Respiratory or skin sensitization** (HCS 2012 A1.4)
5. **Germ cell mutagenicity** (HCS 2012 A1.5)
6. **Carcinogenicity** (HCS 2012 A1.6)
7. **Reproductive toxicity** (HCS 2012 A1.7)
8. **Specific target organ toxicity- single exposure** (HCS 2012 A1.8)
9. **Specific target organ toxicity- repeated exposure** (HCS 2012 A1.9)
10. **Aspiration hazard** (HCS 2012 A1.10)

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OSHA GHS HCS 2012 – Health Hazards (Building Blocks)

Hazard Class GHS REV 4	Hazard Category GHS REV 4				
Acute Toxicity, Oral	1	2	3	4	5
Acute Toxicity, Dermal	1	2	3	4	5
Acute Toxicity, Inhalation	1	2	3	4	5
Aspiration hazard	1	2			
Skin Corrosion/Irritation	1(Corrosion)			Irritation	
	1A	1B	1C	2	3
Eye Corrosion /Irritation	1	2(A)	2(B)		
Respiratory Sensitisation	1	(1A)	(1B)		
Skin Sensitisation	1	(1A)	(1B)		
Germ Cell Mutagenicity	1A	1B	2		
Carcinogenicity	1A	1B	2		
Reproductive Toxicity - Fertility	1A	1B	2	Lactation	
Reproductive Toxicity - Development	1A	1B	2		
SpecTargetOrganTox – Single Dose	1	2	3		
SpecTargetOrganTox – Repeat Dose	1	2			

High Hazard → Low Hazard

OSHA Mixture Summary

	HCS	OSHA HCS 2012
Acute toxicity	≥ 1%	ATE; ≥ 1 % Or < 1 % where relevant
Skin corrosion/ irritation	≥ 1%	Calculation, cutoffs; ≥ 1 % Or < 1 % where relevant
Eye Damage/Irritation	≥ 1%	Calculation, cutoffs; ≥ 1 % Or < 1 % where relevant
Skin sensitization Cat 1	≥ 1%	≥ 0.1%
Cat 1A		≥ 0.1%
Cat 1B		≥ 1.0%
Respiratory sensitization Cat 1	≥ 1%	≥ 0.1%
Cat 1A		≥ 0.1%
Cat 1B		≥ 1.0 % [≥ 0.2% for gases]
Mutagenicity: Cat 1	≥ 1%	≥ 0.1% Cat 1 = SDS/label
Category 2		≥ 1% Cat 2 = SDS/label
Carcinogenicity: Category 1	≥ 0.1%	≥ 0.1% Cat 1 = SDS/label
Category 2		≥ 0.1% < 1% Cat 2 = SDS (optional label) ≥ 1% Cat 2 = SDS/label
Reproductive toxicity: Cat. 1 / Lactation	≥ 1%	≥ 0.1% Cat 1 = SDS/label
Category 2		≥ 0.1% Cat 2 = SDS/label
STOT: Category 1	≥ 1%	≥ 1% Cat 1 = Cat 1 SDS/label
Category 2		≥ 1% Cat 2 = Cat 2 SDS/label
Category 3		≥ 20% additive
Aspiration: Category 1	≥ 1%	≥ 10% of Cat 1's and kinematic viscosity ≤ 20.5 mm^2/s @ 40°C

Physical hazards covered by HCS 2012

1. **Explosives** (HCS B2.1)
2. **Flammable/unstable gases** (HCS B2.2)
3. **Aerosols** (HCS B2.3)
4. **Oxidizing gases** (HCS B2.4)
5. **Gases under pressure** (HCS B2.5)
6. **Flammable liquids** (HCS B2.6)
7. **Flammable solids** (HCS B2.7)
8. **Self-reactive substances and mixtures** (HCS B2.8)
9. **Pyrophoric liquids** (HCS B2.9)
10. **Pyrophoric solids** (HCS B2.10)
11. **Self-heating substances and mixtures** (HCS B2.11)
12. **Substances and mixtures which, in contact with water, emit flammable gases** (HCS B2.12)
13. **Oxidizing liquids** (HCS B2.13)
14. **Oxidizing solids** (HCS B2.14)
15. **Organic peroxides** (HCS B2.15)
16. **Corrosive to metals** (HCS B2.16)

OSHA HCS 2012 – Physical Hazards (Building Blocks)

Hazard Class GHS REV 4	Hazard Category GHS REV 4						
Explosives	Unstable Explosives	Div1.1	Div 1.2	Div 1.3	Div 1.4	Div 1.5	Div 1.6
Flammable/Unstable Gases	1	2	A	B			
Aerosols	1	2	3				
Oxidising Gases	1						
Pressurised Gases							
Compressed Gases	1						
Liquefied Gases	1						
Refrigerated Liquefied Gases	1						
Dissolved Gases	1						
Flammable Liquids	1	2	3	4			
Flammable Solids	1	2					
Self-reactive Substances	Type A	Type B	Type C	Type D	Type E	Type F	Type G
Pyrophoric Liquids	1						
Pyrophoric Solids	1						
Self-heating Substances	1	2					
Water Reactive➔Flammable Gases	1	2	3				
Oxidising Liquids	1	2	3				
Oxidising Solids	1	2	3				
Organic Peroxides	Type A	Type B	Type C	Type D	Type E	Type F	Type G
Corrosive to Metals	1						

High Hazard → Low Hazard

Label

Label Definition

– "Label" means an appropriate group of written, printed or graphic information elements concerning a hazardous chemical that is affixed to, printed on, or attached to the immediate container of a hazardous chemical, or to the outside packaging.

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Key GHS Label Elements

- Harmonized label elements have been assigned to each hazard class and hazard category
  - Hazard symbol(s)/pictogram(s)
  - Signal word
  - Hazard statement(s)
- Other label information to be provided
  - Precautionary statement(s)
  - Product identifier/ingredient disclosure
  - Supplier identification

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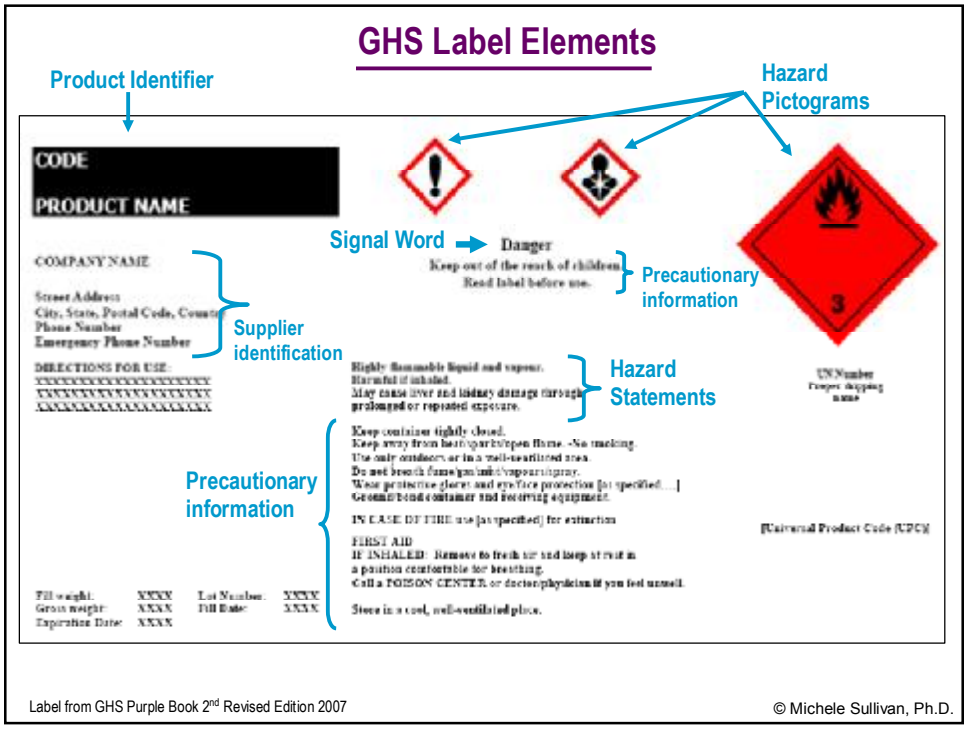
GHS Label Elements
Product Identifier
Hazard Pictograms
CODE
PRODUCT NAME
Signal Word
Danger
Keep out of the reach of children
Read label before use.
Precautionary information
COMPANY NAME
Street Address
City, State, Postal Code, Country
Phone Number
Emergency Phone Number
Supplier identification
DIRECTIONS FOR USE:
Hazard Statements
Precautionary information
UN Number
Proper shipping name
[Universal Product Code (UPC)]
Fill weight: XXXX
Gross weight: XXXX
Expiration Date: XXXX
Lot Number: XXXX
Fill Date: XXXX
Label from GHS Purple Book 2nd Revised Edition 2007
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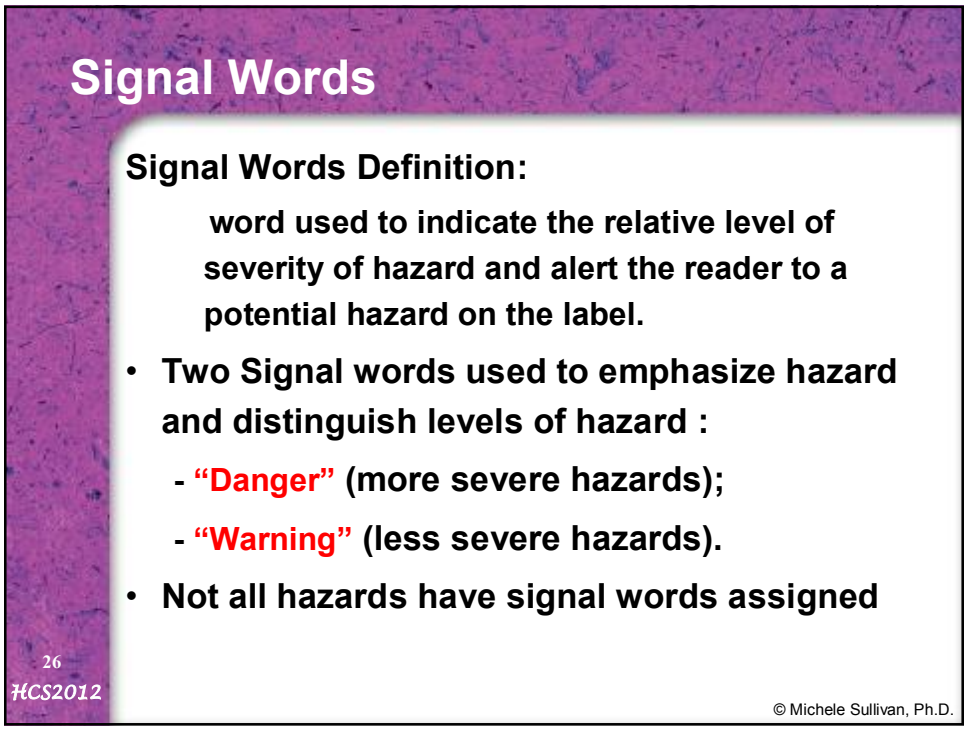
Signal Words
Signal Words Definition:
word used to indicate the relative level of severity of hazard and alert the reader to a potential hazard on the label.
• Two Signal words used to emphasize hazard and distinguish levels of hazard :
- "Danger" (more severe hazards);
- "Warning" (less severe hazards).
• Not all hazards have signal words assigned
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Pictograms/Symbols


Pictogram Definition:

Graphical composition that includes a symbol and other graphic elements, such as a border, background pattern or color that is intended to convey specific information about the hazards of a chemical. Eight pictograms are designated in HCS 2012 for application to a hazard category

Symbol Definition:

a graphical element intended to succinctly convey information

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TRANSPORT *"PICTOGRAMS"*

•Flammable Liquid
•Flammable Gas
•Flammable Aerosol

•Flammable solid
•Self-Reactive Substances

•Pyrophorics (Spontaneously Combustible)
•Self-Heating Substances

•Substances, which in contact with water, Emit flammable gases (Dangerous When Wet)

•Oxidizing Gases
•Oxidizing Liquids
•Oxidizing Solids

•Explosive Divisions 1.1, 1.2, 1.3
•Self-Reactives
•Organic Peroxides

•Explosive Division 1.4

•Explosive Division 1.5

•Explosive Division 1.6

•Compressed Gases

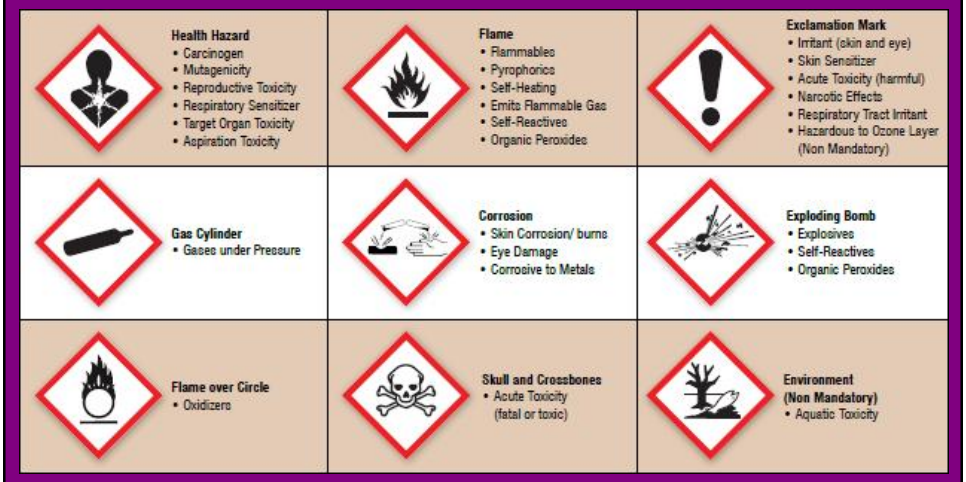
•Organic Peroxides

•Acute Toxicity (Poison): Oral, Dermal, Inhalation

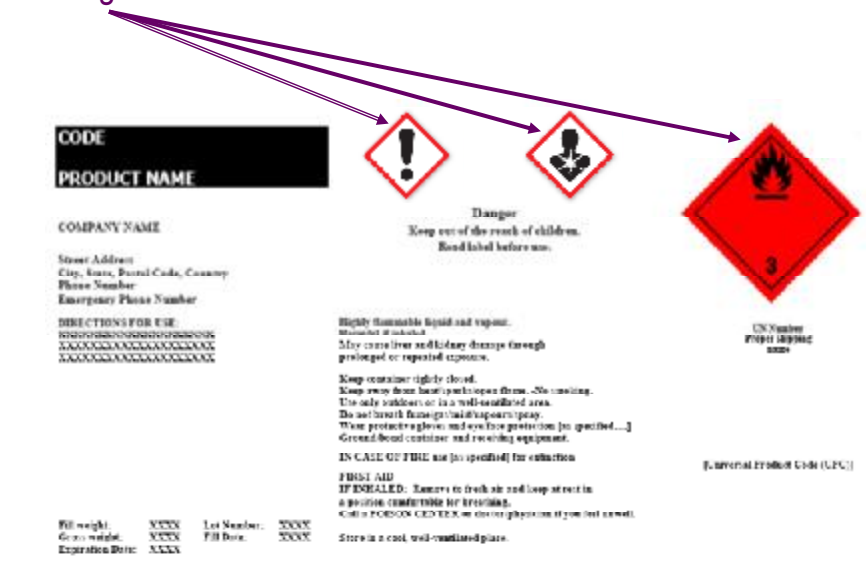
•Corrosive

•New (GHS) Marine Pollutant

OSHA HCS 2012 Pictograms & Hazard Classes



Pictograms are one of the label elements shown on GHS labels



Label from GHS Purple Book 2nd Revised Edition 2007

GHS Pictograms - Transport Pictograms

- HCS 2012
- Where a pictogram required by the DOT under 49 CFR appears on a shipped container, the GHS pictogram specified for the same hazard shall not appear.
- Transport sector
  - pictograms have the background and symbol colors currently used.
- In sectors other than transport users will need to be able to recognize the pictograms from both transport and GHS—where there is a single packaging (e.g., a drum of chemicals), GHS pictograms will not be provided where there is already a transport pictogram addressing the hazard.

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OSHA HCS 2012 Pictograms

- The final rule remains as proposed, and requires pictograms to have a **red frame**, with a black symbol on a white background, for all shipped chemicals regardless of destination.
- Final rule prohibits blank frames on the label
  - C.2.3.1 Pictograms shall be in the shape of a square set at a point and shall include a black hazard symbol on a white background with a red frame sufficiently wide to be clearly visible. **A square red frame set at a point without a hazard symbol is not a pictogram and is not permitted on the label.**

NOT permitted

???

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Q. Will OSHA allow blank red borders?

- A. The revised Hazard Communication Standard (HCS) requires that **all red borders printed on the label have a symbol printed inside it.** If OSHA were to allow blank red borders, workers may be confused about what they mean and concerned that some information is missing. **OSHA has determined that prohibiting the use of blank red borders on labels is necessary to provide the maximum recognition and impact of warning labels and to ensure that users do not get desensitized to the warnings placed on labels.**

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HCS2012 OSHA HCS 2012 Questions & Answers
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GHS Inner Container Label: Flami Stuff

FLAMMI STUFF
(disodiumflammy)
Danger
May cause fire or explosion; strong oxidizer
Causes severe skin burns and eye damage

Keep away from heat. Keep away from clothing and other combustible materials. Take any precaution to avoid mixing with combustibles. Wear protective gloves, eye protection and face protection. Wear fire and flame resistant clothing. Do not breathe dusts. Wash thoroughly after handling. Store locked up. Dispose of contents and container in accordance with local, state and federal regulations

First aid:
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with plenty of water. Wash contaminated clothing before reuse.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
Immediately call a doctor.
IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

Fire:
In case of fire: flood with water to extinguish.
In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.

Great Chemical Company, Newark, NJ Telephone (888) 123-4567

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Example GHS Outer Container Label

FLAMMI STUFF

Danger

May cause fire or explosion; strong oxidizer
Causes severe skin burns and eye damage

Keep away from heat. Keep away from clothing and other combustible materials. Take any precaution to avoid mixing with combustibles. Wear protective gloves, eye protection and face protection. Wear fire and flame resistant clothing. Do not breathe dusts. Wash thoroughly after handling. Store locked up. Dispose of contents and container in accordance with local, state and federal regulations

First aid:

IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with plenty of water. Wash contaminated clothing before reuse.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
Immediately call a doctor.
IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

Fire:

In case of fire: flood with water to extinguish.
In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.

Oxidizing solid, corrosive, n.o.s (disodiumflammy)
UN3085

Great Chemical Company, Newark, NJ Telephone (888) 123-4567

HCS 2012 Hazard Statements

Definition:

> Phrase assigned to a hazard class and category that describes the nature of the hazards of a chemical, including, where appropriate, the degree of hazard.

- A single harmonized hazard statement for each level of hazard within each hazard class
  - 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
- The text of all applicable hazard statements shall appear on the label, except as otherwise specified.
- The information in italics shall be included as part of the hazard statement as provided.
  - "causes damage to organs (*state all organs affected*) through prolonged or repeated exposure (*state route of exposure if no other routes of exposure cause the hazard*)".

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Precautionary Statements

- HCS 2012 Precautionary statement definition:
  - Phrases (and/or pictograms) that describe recommended measures that should be taken to minimize or prevent adverse effects resulting from exposure to a hazardous chemical, or improper storage.
- HCS 2012 has 4 types of precautionary statements:
  - Prevention: *Wear face protection*
  - Response (spillage/exposure, first aid, emergency response)
  - Storage: *Keep container tightly closed*
  - Disposal: *Dispose of contents/container to... ... in accordance with local/regional/national/international regulations*
- Precautionary statements
  - are linked to the hazard classification
  - cover general emergency response and first-aid
  - may require supplementary first aid, treatment measures or specific antidotes or cleansing materials

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HCS 2012 APPENDIX C – ALLOCATION OF LABEL ELEMENTS (MANDATORY)

C.4.4 SKIN CORROSION/IRRITATION
(CLASSIFIED IN ACCORDANCE with appendix A.2)

Pictogram
Corrosion

Hazard category	Signal word	Hazard statement
1A to 1C	Danger	Causes severe skin burns and eye damage

Precautionary statements

Prevention	Response	Storage	Disposal
Do not breathe dusts or mists. *- if inhalable particles of dusts or mists may occur during use.* **Wash ...thoroughly after handling.** ...Manufacturer, importer, or distributor to specify parts of the body to be washed after handling. **Wear protective gloves/protective clothing/eye protection/face protection.** Manufacturer, importer, or distributor to specify type of equipment.	**If swallowed: Rinse mouth. Do NOT induce vomiting.** **If on skin (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.** **Wash contaminated clothing before reuse.** **If inhaled: Remove victim to fresh air and keep at rest in a position comfortable for breathing.** **Immediately call a poison center or doctor/physician.** **Specific treatment (see ... on this label)** .. Reference to supplemental first aid instruction. *- Manufacturer, importer, or distributor may specify a cleansing agent if appropriate.* **If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.**	**Store locked up.**	**Dispose of contents/container to...** .. in accordance with local/regional/national/internatio nal regulations (to be specified).

HCS 2012 Product Identifier

- **Product identifier definition**:
  - **name or number used for a hazardous chemical on a label or in the SDS.**
  - **It provides a unique means by which the user can identify the chemical.**
  - **The product identifier used shall permit cross-references to be made among the list of hazardous chemicals required in the written hazard communication program, the label and the SDS.**

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DECLARATION OF INGREDIENTS

- **For substances/mixtures supplied exclusively for workplace use:**
  - **Competent authority may authorize chemical identities to be included only in SDS (OSHA HCS 2012)**

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Supplemental hazard information

- Provides further detail and does not contradict the standardized hazard information; or
- Provides information about hazards not yet in the GHS.
- Option to providing supplementary information related to the hazard, such as physical state or route of exposure, with the hazard statement
- Examples:
  - Poison
  - % ingredients
  - Name of sensitizing ingredients
  - EU CLP obligatory: EUH001/Explosive when dry
  - **x % of the mixture consists of ingredients of unknown acute (oral/dermal/inhalation) toxicity**

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HCS 2012 Supplier identification

- Name, address, and telephone number of the chemical manufacturer, importer, or other responsible party should be provided on the label.

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HCS2012

HCS 2012 Label format

- Signal word, Hazard statement(s), Pictogram(s) are located together on the tag, label or mark [1910.1200 f(3)]
- The label for each hazardous chemical that is classified shall include the signal word, hazard statement(s), pictogram(s), and precautionary statement(s) specified in Appendix C.4 for each hazard class and associated hazard category, except as provided
- Where a label required by the Department of Transportation under Title 49 of the Code of Federal Regulations appears on a container, the pictogram specified in C.4 for the same hazard **shall not appear**.

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HCS2012

GHS Labeling Guidance - Annex 7

- Where transport and other GHS information appear on a single packaging (e.g. a 55 gallon drum), consideration must be given to ensuring label elements address the needs of the different sectors.
- Transport pictograms
  - convey information immediately in an emergency situation.
  - must be seen from a distance and in conditions that are smoky or otherwise partially obscure the package.
- Transport-related pictograms are distinct in appearance from for non-transport pictograms intended which helps to distinguish them.
- Transport pictograms may be placed
  - on a separate panel of a GHS label to distinguish them from other information or
  - adjacent to other GHS information on the packaging.
- Pictograms may be distinguished by adjusting their size.
  - Generally, the size of non-transport pictograms should be proportional to the size of the text of the other label elements.
  - This is generally smaller than transport-related pictograms, but size adjustments should not affect clarity or comprehensibility of non-transport pictograms.

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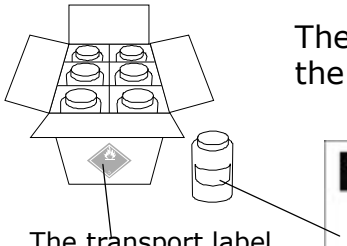
HCS2012

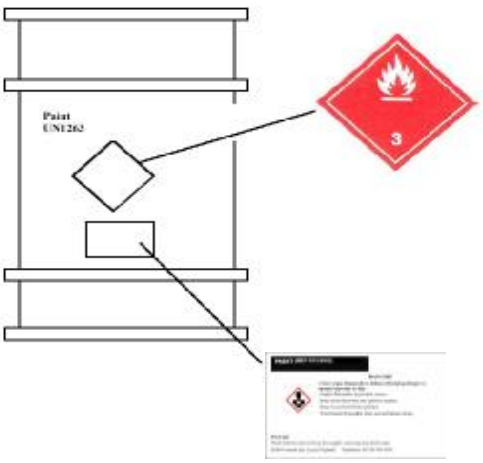
Label Configuration For a Combination Package



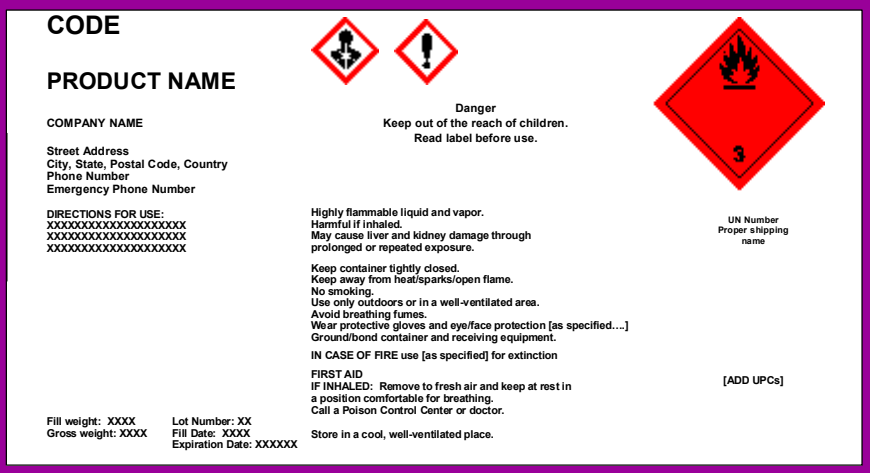
The GHS label would be on the inner package

The transport label would be shown on the outer packaging

Label Configuration For a Single Package



Example of a GHS label with the transport label included. This could be used for an outer packaging or single packaging.



Product classified as: (a) Flammable liquid, Category 2; (b) Acute inhalation, Category 4; and (c) STOT repeated exposure, Category 2.

OSHA Labels on Shipped Containers

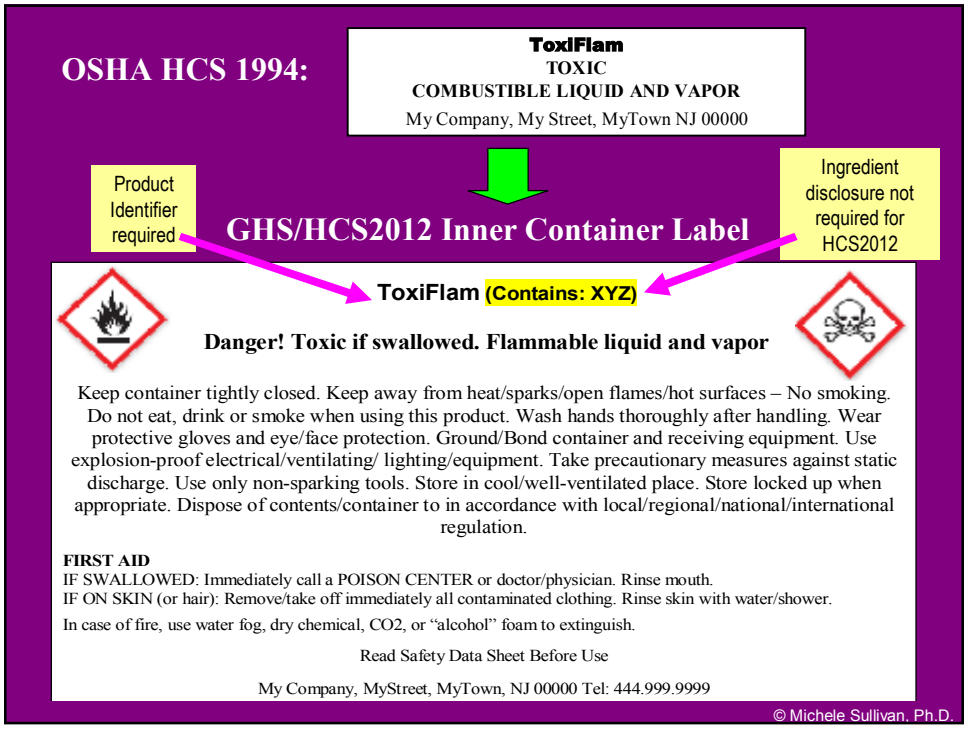
HCS 1994 (performance)

- containers of hazardous chemicals
  - Identity of hazardous chemical(s)
  - Appropriate hazard warnings
  - Name/address of chemical manufacturer, importer, or other responsible party.
  - (3 month updating - stayed)

HCS 2012 (specified)

- containers of hazardous chemicals
  - Product identifier
  - Signal word
  - Hazard statement(s)
  - Pictogram(s)
  - Precautionary statement(s)

  Specified
  - Name, address, telephone number of responsible party
  - In some cases,
    - OSHA Defined Hazards
    - × percent of the mixture consists of ingredient(s) of unknown acute toxicity
    - Supplemental information
- **6 month** updating of significant information regarding hazards
- HNOC do not have to be addressed on containers
- No H/P statement numbers/codification


OSHA HCS 1994:
ToxiFlam
TOXIC
COMBUSTIBLE LIQUID AND VAPOR
My Company, My Street, MyTown NJ 00000
Product Identifier required
GHS/HCS2012 Inner Container Label
Ingredient disclosure not required for HCS2012
ToxiFlam (Contains: XYZ)
Danger! Toxic if swallowed. Flammable liquid and vapor
Keep container tightly closed. Keep away from heat/sparks/open flames/hot surfaces – No smoking. Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling. Wear protective gloves and eye/face protection. Ground/Bond container and receiving equipment. Use explosion-proof electrical/ventilating/ lighting/equipment. Take precautionary measures against static discharge. Use only non-sparking tools. Store in cool/well-ventilated place. Store locked up when appropriate. Dispose of contents/container to in accordance with local/regional/national/international regulation.
FIRST AID
IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. Rinse mouth.
IF ON SKIN (or hair): Remove/take off immediately all contaminated clothing. Rinse skin with water/shower.
In case of fire, use water fog, dry chemical, CO2, or "alcohol" foam to extinguish.
Read Safety Data Sheet Before Use
My Company, MyStreet, MyTown, NJ 00000 Tel: 444.999.9999
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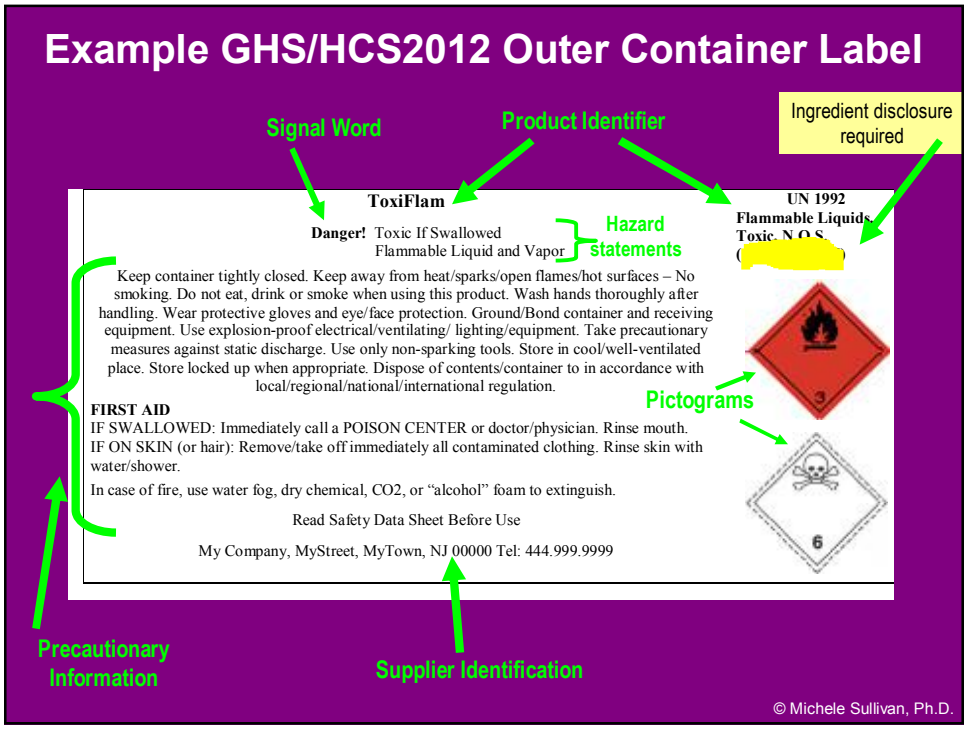
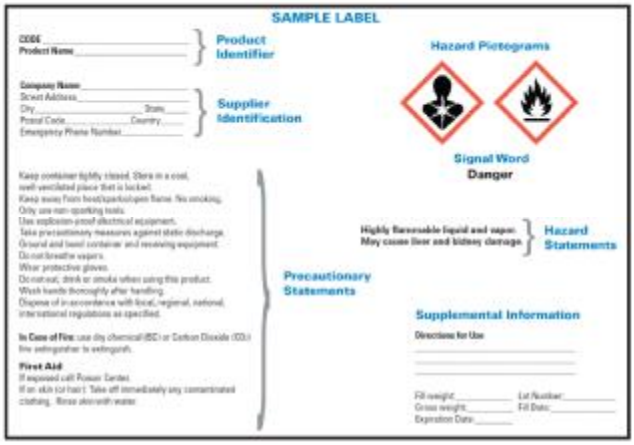

Example GHS/HCS2012 Outer Container Label
Signal Word
Product Identifier
Ingredient disclosure required
ToxiFlam
Danger! Toxic If Swallowed
Flammable Liquid and Vapor
Hazard statements
UN 1992
Flammable Liquids
Toxic, N.O.S.
Keep container tightly closed. Keep away from heat/sparks/open flames/hot surfaces – No smoking. Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling. Wear protective gloves and eye/face protection. Ground/Bond container and receiving equipment. Use explosion-proof electrical/ventilating/ lighting/equipment. Take precautionary measures against static discharge. Use only non-sparking tools. Store in cool/well-ventilated place. Store locked up when appropriate. Dispose of contents/container to in accordance with local/regional/national/international regulation.
Pictograms
FIRST AID
IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. Rinse mouth.
IF ON SKIN (or hair): Remove/take off immediately all contaminated clothing. Rinse skin with water/shower.
In case of fire, use water fog, dry chemical, CO2, or "alcohol" foam to extinguish.
Read Safety Data Sheet Before Use
My Company, MyStreet, MyTown, NJ 00000 Tel: 444.999.9999
Precautionary Information
Supplier Identification
© Michele Sullivan, Ph.D.

OSHA HCS 2012: Labels on shipped containers

(f)(1) **Labels on shipped containers.** ... Where the chemica manufacturer or importer is required to label, tag or mark the following shall be provided: (i) Product identifier; (ii) Signal word; (iii) Hazard statement(s); (iv) Pictogram(s); (v) Precautionary statement(s); and, (vi) **Name, address, and telephone number of the chemical manufacturer, importer, or other responsible party.**



OSHA 3492-02 2012

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HCS2012

OSHA HCS 2012: label pictogram precedence

The following rules of precedence apply to reduce the number of hazard pictograms :

- If  applies, then  shall not appear **where it is used for acute toxicity;**
- If  applies, then  shall not appear for skin or eye irritation;
- If  applies for respiratory sensitization, then  shall not appear skin sensitization or for skin and eye irritation

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HCS2012

Purple text deviates from GHS – eye/skin/respiratory irritants, skin sensitizer, narcotic effects, ozone

HCS 2012 Precedence for multiple hazards

- **Signal words**
  - Only one appears per label

    DANGER > **WARNING**
- **Hazard statements**
  - The text of all applicable hazard statements shall appear on the label, except as otherwise specified.
    - Hazard statements may be combined where appropriate to reduce the information on the label and improve readability, as long as all of the hazards are conveyed as required.
- **Precautionary statements**
  - Precautionary statements may be combined or consolidated to save label space and improve readability
  - For multiple hazards with similar PS, include the most stringent PS (usually preventive measures).

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HCS 2012 Small packages

- The current HCS does not have a small package exemption or limitation, but OSHA has allowed **practical accommodations in enforcement policies**
  - Ensuring that workers receive the required label information may be accomplished in ways other than simply attaching it directly to each small container.
  - OSHA will examine the situation to make sure that the information is associated with the proper containers, and that it is complete.
- OSHA is not adopting any regulatory requirements for small packages

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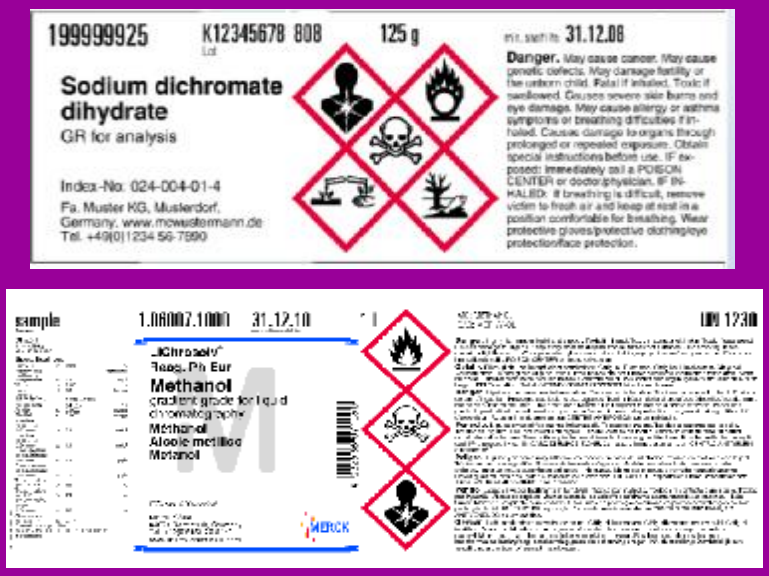
HCS2012

Example EU CLP label –pictogram on small containers



HSA Labelling Packaging SDS Webinar

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HCS 2012: § (f) workplace labeling

- Maintains the approach allowing employers to use workplace-specific labeling systems as long as they provide the required information (f)(6), (f)(7), (f)(8)
  - **Product identifier** and **words**, **pictures, symbols, or combination thereof**, which provide **general information on the hazards**
  - Signs, placards, process sheets, batch tickets, operating procedures, or other written materials
- Such workplace label systems will have to be **reviewed** to make sure the information is consistent with the new classifications
- ACA/NPCA HMIS III
  - "Don't drastically change" for now
- NFPA 704 2012 edition, next revision 2017
  - not changing

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OSHA GHS HCS 2012 workplace labeling example

ACCUFORM SIGNS.

HMIS/NFPA Numerical Ratings

Currently, the HMIS/NFPA and GHS hazard criteria are different.

HMIS/NFPA Hazard Ratings	GHS Hazard Categories
0 = Minimal Hazard	Cat. 1 ~ 'Severe Hazard'
1 = Slight Hazard	Cat. 2 ~ 'Serious Hazard'
2 = Moderate Hazard	Cat. 3 ~ 'Moderate Hazard'
3 = Serious Hazard	Cat. 4 ~ 'Slight Hazard'
4 = Severe Hazard	Cat. 5 ~ 'Minimal Hazard'

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Q. How will workplace labeling provisions be changing under the revised Hazard Communication Standard?

- A. The current standard provides employers with flexibility regarding the type of system to be used in their workplaces and OSHA has retained that flexibility in the revised Hazard Communication Standard (HCS). Employers may choose to label workplace containers either with the same label that would be on shipped containers for the chemical under the revised rule, or with label alternatives that meet the requirements for the standard. Alternative labeling systems such as the National Fire Protection Association (NFPA) 704 Hazard Rating and the Hazardous Material Information System (HMIS) are permitted for workplace containers. However, the information supplied on these labels must be consistent with the revised HCS, e.g., no conflicting hazard warnings or pictograms.

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HCS2012 OSHA HCS 2012 Questions & Answers

OSHA HCS: HMIS/NFPA 704

- HCS 2012 preamble
  - **Neither the proposal nor final rule prohibits the use of NFPA or HMIS rating systems**
- HCS NPRM preamble
  - **OSHA recognizes that the approach to numbering hazard categories in the GHS differs from that used in the HMIS and NFPA systems. However, the Agency does not believe that this will result in confusion.** GHS category numbers determine the label elements that would be required for a chemical, but the category numbers themselves would not appear on labels. Where GHS category numbers would appear on the SDS (Section 2—Hazards identification), they would be accompanied by the label elements for the chemical, which would clearly indicate the degree of hazard. **OSHA, therefore, does not anticipate that this information will cause employees to become confused.**

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HCS2012

OSHA Health Standards

- Substance-specific standards (benzene, MC, formaldehyde, etc.)
  - generally pre-date the current HCS
  - do not have a comprehensive approach to hazard communication

- HCS 2012 updates the provisions regarding what is to be communicated to workers to ensure the health effects are consistent with the GHS criteria
  - Labels/signage
    - Table XIII-4 Regulated Area Signs in Substance-Specific Health Standards

  - Hazards
    - Table XIII-5 Health Effects determined for the Substance Specific Standards

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OSHA 2012 Health Standards

- Asbestos (1910.1001; 1926.1101; 1915.1001)
- 13 Carcinogens (1910.1003)
- Vinyl Chloride (1910.1017)
- Inorganic Arsenic (1910.1018)
- Lead (1910.1025; 1926.62)
- Chromium (VI) (1910.1026; 1926.1126; 1915.1026)
- Cadmium (1910.1027; 1926.1127)
- Benzene (1910.1028)
- Coke Oven Emissions (1910.1029)
- Cotton Dust (1910.1043)
- 1,2-dibromo-3-chloropropane (1910.1044)
- Acrylonitrile (1910.1045)
- Ethylene Oxide (1910.1047)
- Formaldehyde (1910.1048)
- Methylenedianiline (1910.1050; 1926.60)
- 1,3-Butadiene (1910.1051)
- Methylene Chloride (1910.1052)
- Occupational exposure to hazardous chemicals in laboratories (1910.1450)

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Asbestos 29 CFR 1910.1001

– Labels/signage

•Table XIII-4 Regulated Area Signs in Substance-Specific Health Standards

Standard	Substance	Original signs	Final Changes
1910.1001	Asbestos Regulated areas	DANGER, ASBESTOS, CANCER AND LUNG DISEASE HAZARD, AUTHORIZED PERSONNEL ONLY  	DANGER ASBESTOS MAY CAUSE CANCER CAUSES DAMAGE TO LUNGS AUTHORIZED PERSONNEL ONLY
	Where the use of respirators and protected clothing is required	RESPIRATORS AND PROTECTIVE CLOTHING ARE REQUIRED IN THIS AREA	WEAR RESPIRATORY PROTECTION AND PROTECTIVE CLOTHING IN THIS AREA

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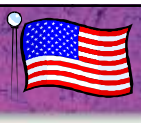
OSHA GHS HCS 2012
Hazard Communication: SDSs

ACCUFORM SIGNS.

HCS 2012 SDS Format



Use the 16 Section headings as follows:

1. Identification
2. ***Hazard(s) Identification***
3. Composition/information on ingredients
4. First-aid measures
5. Fire-fighting measures
6. Accidental release measures
7. Handling and storage
8. Exposure controls/personal protection (PEL,TLV,OEL)
9. Physical and chemical properties
10. Stability and reactivity
11. Toxicological information
12. ***Ecological information***
13. ***Disposal considerations***
14. ***Transport information***
15. ***Regulatory information***
16. Other information

A new Appendix D, Safety Data Sheets, provides the details of what is to be included in each section

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HCS2012

OSHA HCS 2012: SDS

- HCS 2012 presents all 16 SDS Sections for consistency and harmonization
  - OSHA will not enforce information requirements in sections 12 through 15, as these areas are not under its jurisdiction
- HCS 2012 Appendix D indicates that a subheading "within a section" needs to be marked when no relevant information is available
- OSHA does not consider the subheading letters to be mandatory, but the information each subheading identifies is required to be included
- In section 2, GHS symbols may be a graphic or the symbol name

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HCS2012

HCS 2012 Table D.1--Minimum Information for an SDS	
1. Identification	(a) Product identifier used on the label; (b) Other means of identification; (c) Recommended use of the chemical and restrictions on use; (d) Name, address, and telephone number of the chemical manufacturer, importer, or other responsible party; (e) Emergency phone number.
2. Hazard(s) identification	(a) Classification of the chemical in accordance with paragraph (d) of §1910.1200; (b) Signal word, hazard statement(s), symbol(s) and precautionary statement(s) in accordance with paragraph (f) of §1910.1200. (Hazard symbols may be provided as graphical reproductions in black and white or the name of the symbol, e.g., flame, skull and crossbones); **(c) Describe any hazards not otherwise classified that have been identified during the classification process;** **(d) Where an ingredient with unknown acute toxicity is used in a mixture at a concentration ≥ 1% and the mixture is not classified based on testing of the mixture as a whole, a statement that X% of the mixture consists of ingredient(s) of unknown acute toxicity is required.**
3. Composition/information on ingredients	Except as provided for in paragraph (i) of §1910.1200 on trade secrets: *For Substances* (a) Chemical name; (b) Common name and synonyms; (c) CAS number and other unique identifiers; (d) Impurities and stabilizing additives which are themselves classified and which contribute to the classification of the substance. *For Mixtures* In addition to the information required for substances: (a) The chemical name and concentration (exact percentage) or concentration ranges of all ingredients which are classified as **health hazards** in accordance with paragraph (d) of §1910.1200 and (1) Are present above their cut-off/concentration limits; or **(2) Present a health risk below the cut-off/concentration limits.** **(b) The concentration (exact percentage) shall be specified unless a trade secret claim is made in accordance with paragraph (i) of §1910.1200, when there is batch-to-batch variability in the production of a mixture, or for a group of substantially similar mixtures (See A.0.5.1.2) with similar chemical composition. In these cases, concentration ranges may be used.** *For All Chemicals Where a Trade Secret is Claimed* **Where a trade secret is claimed in accordance with paragraph (i) of §1910.1200, a statement that the specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret is required.**
4. First-aid measures	(a) Description of necessary measures, subdivided according to the different routes of exposure, i.e., inhalation, skin and eye contact, and ingestion; (b) Most important symptoms/effects, acute and delayed. (c) Indication of immediate medical attention and special treatment needed, if necessary.
5. Fire-fighting measures	(a) Suitable (and unsuitable) extinguishing media. (b) Specific hazards arising from the chemical (e.g., nature of any hazardous combustion products). (c) Special protective equipment and precautions for fire-fighters.
6. Accidental release measures	(a) Personal precautions, protective equipment, and emergency procedures. (b) Methods and materials for containment and cleaning up.
7. Handling and storage	(a) Precautions for safe handling. (b) Conditions for safe storage, including any incompatibilities.
8. Exposure controls/personal protection	**(a) OSHA permissible exposure limit (PEL), American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV), and any other exposure limit used or recommended by the chemical manufacturer, importer, or employer preparing the safety data sheet, where available.** (b) Appropriate engineering controls. (c) Individual protection measures, such as personal protective equipment.

HCS 2012 SDS Section 2: ToxiFlam

2. HAZARD(S) IDENTIFICATION

(a) Classification: Flammable liquid, Category 3
Acute Toxicity, Category 3

(b) Labeling:

Signal word: Danger

Hazard statement(s): Flammable liquid and vapor.
Toxic if swallowed

Symbol(s): Flame, Skull & crossbones

Precautionary statements:
Keep container tightly closed. Keep away from heat/sparks/open flames/hot surfaces – No smoking. Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling. Wear protective gloves and eye/face protection. Ground/Bond container and receiving equipment. Use explosion-proof electrical/ventilating/ lighting/equipment. Take precautionary measures against static discharge. Use only non-sparking tools. Store in cool/well-ventilated place. Store locked up when appropriate. Dispose of contents/container to in accordance with local/regional/national/international regulation. In case of fire, use water fog, dry chemical, CO_2, or "alcohol" foam to extinguish.
IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. Rinse mouth.
IF ON SKIN (or hair): Remove/take off immediately all contaminated clothing. Rinse skin with water/shower.

(c) Hazards Not Otherwise Classified: None

(d) Unknown Acute Toxicity: None

9. Physical and chemical properties	(a) Appearance (physical state, color, etc.); (b) Odor; (c) Odor threshold; (d) pH; (e) Melting point/freezing point; (f) Initial boiling point and boiling range; (g) Flash point; (h) Evaporation rate; (i) Flammability (solid, gas); (j) Upper/lower flammability or explosive limits; (k) Vapor pressure; (l) Vapor density; (m) Relative density; (n) Solubility(ies); (o) Partition coefficient: n-octanol/water; (p) Auto-ignition temperature; (q) Decomposition temperature; (r) Viscosity.
10. Stability and reactivity	(a) Reactivity; (b) Chemical stability; (c) Possibility of hazardous reactions; (d) Conditions to avoid (e.g., static discharge, shock, or vibration); (e) Incompatible materials; (f) Hazardous decomposition products.
11. Toxicological information	Description of the various toxicological (health) effects and the available data used to identify those effects, including: (a) Information on the likely routes of exposure (inhalation, ingestion, skin and eye contact); (b) Symptoms related to the physical, chemical and toxicological characteristics; (c) Delayed and immediate effects and also chronic effects from short- and long-term exposure; (d) Numerical measures of toxicity (such as acute toxicity estimates). **(e) Whether the hazardous chemical is listed in the National Toxicology Program (NTP) Report on Carcinogens (latest edition) or has been found to be a potential carcinogen in the International Agency for Research on Cancer (IARC) Monographs (latest edition), or by OSHA.**
12. Ecological information (Non-mandatory).	(a) Ecotoxicity (aquatic and terrestrial, where available); (b) Persistence and degradability; (c) Bioaccumulative potential; (d) Mobility in soil; (e) Other adverse effects (such as hazardous to the ozone layer).
13. Disposal considerations (Non-mandatory).	Description of waste residues and information on their safe handling and methods of disposal, including the disposal of any contaminated packaging.
14. Transport information (Non-mandatory).	(a) UN number; (b) UN proper shipping name; (c) Transport hazard class(es); (d) Packing group, if applicable; (e) Environmental hazards (e.g., Marine pollutant (Yes/No)); (f) Transport in bulk (according to Annex II of MARPOL 73/78 and the IBC Code); (g) Special precautions which a user needs to be aware of, or needs to comply with, in connection with transport or conveyance either within or outside their premises.
15. Regulatory information (Non-mandatory)	Safety, health and environmental regulations specific for the product in question.
16. Other information including date of last change to it.	The date of preparation of the SDS or the last change to it.

HCS 2012: Employee Information and Training

- Revision to employee training to clarify what must be included in the training:
  - Details of the hazard communication program
    - Explanation of the labels on shipped containers and the workplace labeling system used by the employer
    - SDS
      - the order of information and
      - how employees can obtain & use the appropriate hazard information.
- Employers have to train employees on the new label system/SDS format to ensure the information is comprehensible
- Resources
  - NIOSH is developing on-line GHS pictogram training
  - The United Nations Institute on Training and Research (UNITAR) is developing GHS training materials
    - Basic e-learning course
    - Advanced course in development

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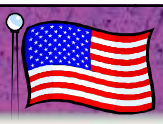
OSHA GHS HCS 2012



- OSHA will have several distribution waves of guidance materials
  - Already available
    - OSHA's Quick Cards (labels, pictograms, and SDS), FAQs, Redlined old HCS, and Side-by-Side comparison of old and new HCS
      http://www.osha.gov/dsg/hazcom/index.html
      http://www.osha.gov/dsg/hazcom/ghs-final-rule.html
  - 2 fact sheets/"OSHA Briefs": labels/pictograms and SDS
  - 2 SME brochures: chemical producers and chemical users
  - hazard communication model training program, SDS brochure
  - guidance on hazard classification

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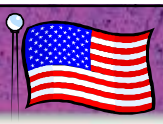
OSHA GHS HCS 2012 References



OSHA GHS HCS Federal Register Notice 77:17574-17896 (2012, March 26).
http://www.gpo.gov/fdsys/pkg/FR-2012-03-26/pdf/2012-4826.pdf

Side-by-side comparison of the current HCS to the Final Rule
http://www.osha.gov/dsg/hazcom/side-by-side.html

Appendix A: Health Hazard Criteria (Mandatory)
http://www.osha.gov/dsg/hazcom/appendix_a.pdf

Appendix B: Physical Hazard Criteria (Mandatory)
http://www.osha.gov/dsg/hazcom/hazcom-appendix-b.html

Appendix C: Allocation of Label Elements (Mandatory)
http://www.osha.gov/dsg/hazcom/hazcom-appendix-c.html
Appendix D: Safety Data Sheets (Mandatory)
http://www.osha.gov/dsg/hazcom/hazcom-appendix-d.html

Appendix F: Guidance for Hazard Classifications Regarding Carcinogenicity
http://www.osha.gov/dsg/hazcom/hazcom-appendix-f.html

29 CFR 1910.1200 HCS GHS Final Regulatory Text:
http://www.osha.gov/dsg/hazcom/HCSFinalRegTxt.html

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