

OSHA and the United Nations Globally Harmonized System of Classification and Labeling of Chemicals (GHS)

Automotive Specialty Products Alliance
December 2009

OSHA HCS & GHS

Hazard Communication Standard (HCS)

1983

29CFR 1910.1200: 1915.1200; 1917.28; 1918.90 and
1926.59

Covered Manufacturing Sector of Industry

1987

Expanded to all industries (fully enforced since 1989)

Requires chemical manufacturers and importers to
evaluate chemicals

OSHA HCS & GHS

Hazard Communication Standard (HCS)

- Requires chemical manufacturers and importers to evaluate chemicals to determine if they are hazardous
- Definitions of health and physical hazards
- Communication of information downstream
- All employers with hazardous chemicals required to have hazardous communication program: container labels, safety data sheets and employee training

OSHA HCS & GHS

June 1992

United Nations Conference on Environment and Development
mandate:

Development of a Globally Harmonized Chemical Classification
and Labeling System

*A globally harmonized hazard classification and compatible
labeling system, including material safety data sheets and easily
understandable symbols should be available, if feasible, by the
year 2000*

Formally adopted 2002

Goal for implementation: 2008

OSHA HCS & GHS

Globally Harmonized System of Classification and Labeling of Chemicals (GHS)

- Increase the quality and consistency of information provided to workers, employers and users
- Adopts a standardized approach to hazard classification, labels and safety data
- Provides a single set of harmonized criteria for classifying chemicals according to the health and physical hazards
- Included signal words, pictograms, hazard statements, precautionary statements and safety data sheets with standardized format

OSHA HCS & GHS

September 30, 2009

Notice of Proposed Rulemaking

Modifies the current Hazard Communication Standard to align with the provisions of the GHS

- Hazard Classification: *specific criteria for health and physical hazards. Levels of severity. Classification for mixtures*
- Labels: *include harmonized signal word, pictogram, hazard statement, precautionary statements*
- Safety Data Sheets: *specific 16 section*
- Information and training: *required within two years of final rule*
- Modifies safety standards that reference HCS (i.e. PSM / Hazwoper)

OSHA HCS & GHS

Comparison of Existing HCS to Proposed

Purpose: *Same*

Scope and Application: *No Substantive Changes*

OSHA HCS & GHS

Definitions

Added: *Classification, Hazard category, Hazard class, Hazard statement, Label elements, Pictogram, Precautionary statement, Product identifier, Safety data sheet, Signal word, Substance and Unclassified hazard*

Deleted: *Combustible liquid, Compressed gas, Explosive, Flammable, Flashpoint, Hazard warning, Identity, Material Safety Data Sheet, Organic peroxide, Pyrophoric, Unstable (reactive), and Water-reactive*

Revised: *Chemical, Chemical name, Hazardous Chemical, Health hazard, Label, Mixture and Physical hazard*

OSHA HCS & GHS

Hazard Classifications

Major difference from the performance oriented approach in HCS

Specific criteria for each health and physical hazard

...determine the hazard classes and category of each class that best apply to the chemical...

...classifying chemicals shall identify the full range of available scientific literature and other evidence concerning potential hazards. There is no requirement to test the chemical...

Test Method Neutral

OSHA HCS & GHS

Hazard Classifications

- Detailed instructions for hazard evaluation and determinations as to whether mixtures of the substance are covered.
- Mandatory use of Appendixes A (health) and B (physical)
- OSHA has decided to delete references to any lists in the classification provisions being proposed
- Removal of the “Floor” Chemicals and ability for classification based on one positive study

Changes to the present classification of common chemicals?

OSHA HCS & GHS

Health Hazard Classification

Hazard Class	Categories
Acute toxicity: oral, dermal, inhalation	1-4 <i>Category 5 not adopted</i>
Skin Corrosion / Irritation	Corrosion category 1A, 1B, 1C; irritation category 2 <i>Irritation Category 3 not adopted</i>
Serious Eye Damage / Irritation	Irreversible category 1; Reversible category 2
Respiratory or skin sensitization	Respiratory subcategories 1A and 1B; Skin subcategories 1A and 1B
Germ Cell Mutagenicity	1 A/B, 2

OSHA HCS & GHS

Health Hazard Classification

Hazard Class	Categories
Carcinogenicity	1 A/B, 2
Reproductive Toxicity	Categories 1 A/ B, 2, effects of or via lactation
Target Organ Systemic Toxicity Single Exposure	1,2,3
Target Organ Systemic Toxicity Repeated or Prolonged Exposure	1, 2
Aspiration	category 1 <i>Category 2 not adopted</i>

OSHA HCS & GHS

Physical Hazard Classification

Hazard Class	Categories
Flammable Gases	1 and 2
Flammable Aerosols	1 and 2
Oxidizing Gases	1
Gases Under Pressure	compressed gas, liquefied gas, refrigerated liquefied gas, dissolved gas
Flammable Liquids	1,2,3,4
Flammable Solids	1 and 2
Self Reactive Chemicals	category type A-G
Pyrophoric Liquids	1

OSHA HCS & GHS

Flammable Liquid Definitions

GHS			Flammable and Combustible Liquids Standard (29 CFR 1910.106)		
Category	Flashpoint (° C)	Boiling Point (°C)	Class	Flashpoint (° C)	Boiling Point (°C)
Flammable 1	< 23	≤ 35	Flammable IA	< 22.8	< 37.8
Flammable 2	< 23	> 35	Flammable IB	<22.8	≥ 37.8
Flammable 3	≥ 23 and ≤ 60		Flammable IC Combustible II	≥ 22.8 and < 37.8 ≥ 37.8 and < 60	
Flammable 4	> 60 and ≤ 93		Combustible Class IIIA	≥ 60 and < 93.3	
None			Combustible Class IIIB	≥ 93.3	

OSHA HCS & GHS

Physical Hazard Classification

Hazard Class	Categories
Pyrophoric Solids	1
Self Heating Chemicals	1 and 2
Chemicals which in contact with water, emit flammable gases	1,2,3
Oxidizing Liquids	1,2,3
Oxidizing Solids	1,2,3
Organic Peroxides	1
Chemicals Corrosive to Metal	1

OSHA HCS & GHS

“Unclassified” Hazards

- Regulation cannot define every type of hazard
- Situations exist in which the classifier identifies evidence of a hazard which does not meet the currently specified criteria
- Chemicals exhibiting the “unclassified” dangers are to be treated as Hazardous.
- Beyond the International standards

Examples: combustible dust and simple asphyxiates

OSHA HCS & GHS

Hazard Classification Mixtures

- Test data is available for the complete mixture
- Bridging Principles
 - Dilution*
 - Batching*
 - Concentration of mixtures*
 - Interpolation with one toxicity category*
 - Substantially the same*
 - Aerosols*
- Criteria for each hazard (*Concentrations / cut off limits*)

OSHA HCS & GHS

Hazard Communication Program

GHS Does Not Specify a requirement
No substantive changes

OSHA HCS & GHS

Labels

Required of Manufacturers and Importers

Substantial change from current requirements

Label must include:

*Product Identifier, Signal Word, Hazard Statement(s), Pictogram(s),
Precautionary Statement(s), Supplier information*

Mandatory use of Appendix C

OSHA HCS & GHS



Explosives
Self Reactives
Organic Peroxides



Flammables
Pyrophorics
Self Heating
Emits Flammable Gas
Self Reactives
Organic Peroxides



Oxidizers



Gases under pressure



Corrosives



Acute toxicity (severe)



Irritant
Skin Sensitizer
Acute Toxicity (harmful)
Narcotic effect
Respiratory Irritation
Hazard to Ozone



Carcinogen
Mutagenicity
Reproductive Toxicity
Target Organ Toxicity
Aspiration Toxicity



Aquatic Toxicity

OSHA HCS & GHS

Safety Data Sheet

Similar to ANSI

Annex D (mandatory) describes contents

OSHA HCS & GHS

Safety Data Sheet

Section	Requirements
1. Identification	<ul style="list-style-type: none">a) Product identifier used on labelb) Other means of identificationc) Recommended use of the chemical and restrictions on used) Name, address and telephone number of the manufacturer, importer or other responsible partye) Emergency phone number
2. Hazard(s) Identification	<ul style="list-style-type: none">a) Classification of the chemicalb) Signal word, hazard statement(s), symbols(s), and precautionary statement(s) (graphical or name)c) Unclassified hazards e.g. combustible dustd) Where ingredient with an unknown acute toxicity is used in a mixture $\geq 1\%$ a statement that x % of the mixture consists of unknown toxicity

OSHA HCS & GHS

Safety Data Sheet

Section	Requirements
3. Composition / Information on Ingredients	Substances: a. chemical name, b. common name and synonym, 3. CAS and other identifiers, d. impurities and stabilizing additives which are classified and contribute to the classification
	Mixtures: Chemical name and concentration or concentration ranges of all ingredients which are classified as health hazards
	When trade secret is claimed: a statement that the chemical identity and / or percentage of composition has been withheld as a trade secret
4. First-aid measures	<ul style="list-style-type: none"> a) Description of necessary measure according to routes of exposure. b) Most important symptoms/effects, acute and delayed c) Indication of immediate medical attention and special treatment
5. Fire-fighting measures	<ul style="list-style-type: none"> a) Suitable extinguishing media b) Specific hazards arising from the chemical c) Special protective equipment and precautions for fire-fighters
6. Accidental Release Measures	<ul style="list-style-type: none"> a) Personal precautions for safe handling b) Methods and materials for containment and cleanup

OSHA HCS & GHS

Safety Data Sheet

Section	Requirements
7. Handling and Storage	<ul style="list-style-type: none">a. Precautions for safe handlingb. Conditions for safe storage including an incompatibilities
8. Exposure controls / Personal protection	<ul style="list-style-type: none">a) OSHA permissible exposure limit (PEL) and any other exposure limit used or recommended by the manufacturer, importer or employer preparing the SDSb) Appropriate engineering controlsc) Individual protection measures, such as PPE
9. Physical and chemical properties	<ul style="list-style-type: none">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 point, 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

OSHA HCS & GHS

Safety Data Sheet

Section	Requirements
10. Stability and Reactivity	<ul style="list-style-type: none">a. Reactivityb. Chemical Stabilityc. Possibility of hazardous reactionsd. Conditions to avoid (e.g. static discharge, shock, or vibration)e. Incompatible materialsf. Hazardous decomposition products
11. Toxicological information	Description of toxicological (health) effects and available data including: <ul style="list-style-type: none">a. Information on the likely routes of exposureb. Symptoms related to the physical, chemical and toxicological characteristicsc. Delayed and immediate effects; chronic effects from short / long term exposured. Numerical measures of toxicity
12. Ecological information (non-mandatory)	<ul style="list-style-type: none">a) Ecotoxicityb) Persistence and degradabilityc) Bioaccumulative potentiald) Mobility in soile) Other adverse effects (such as hazardous to the ozone layer)

OSHA HCS & GHS

Safety Data Sheet

Section	Requirements
13. Disposal considerations (non-mandatory)	Description of waste residues and information on their safe handling and methods of disposal; including disposal of any contaminated packaging
14. Transport information (non-mandatory)	<ul style="list-style-type: none">a. UN numberb. UN proper shipping namec. Transport hazard class (es)d. Packing group, if applicablee. Environmental hazards (e.g. marine pollutants (yes/no))f. Transport in bulk (according to MARPOL and the IBC Code)g. Special precaution which a user needs to be aware of, or needs to comply with, in connection with transport or conveyance
15. Regulatory information (not-mandatory)	Safety, health and environmental regulations specific for the product in question
16. Other information	The date of preparation of the SDS or the last change to it

OSHA HCS & GHS

Trade Secrets

Similar to existing

Disclosure of the percentage composition of mixtures
on the SDS may be protected

OSHA HCS & GHS

Effective Dates

Training within 2 years of final rule

Labels & SDS must be covered; otherwise same as current

Manufacturers, Importers, Distributor and Employer
Compliance within 3 years of final rule

No difference for chemicals v mixtures

OSHA HCS & GHS

Further Input

- Comments due December 29, 2009
- Possible Tools?
- Development of database of chemical classification?
- Alternative Approaches:
 - Voluntary implementation*
 - Exemptions based on business size*
 - Partial adaptation*

OSHA HCS & GHS

Other Jurisdictions

Location	GHS Status
Argentina, Chile, Columbia, Peru, Venezuela	Scheduled for implementation in 2009/2010 with an 18-month transition period.
Australia	Scheduled to be implemented on December 1, 2010, for substances and December 1, 2015, for preparations with no transition period
Brazil	Scheduled for implementation in 2009/2010 with an 18-month transition period.
Canada	To adopt GHS, Workplace Hazardous Materials Information System (WHMIS) and Hazardous Product Act (HPA) regulations must be amended. Progress amending these regulations has been slow
China	Expected to be implemented within a short timeframe. Implementation will include a requirement for SDSs to meet The Safety Data Sheets for Chemical Products - Contents and Order of Sections regulation (GB/T 16483-2008) effective February 1, 2009. A transition period may be allowed but has not been confirmed. If a transition period is to occur, it is expected to be for a period of one to 16 months

OSHA HCS & GHS

Other Jurisdictions

Location	GHS Status
European Union (EU)	The Classification, Labelling and Packaging (CLP) regulation 1272/2008 adopted GHS criteria into the REACH regulation. REACH Annex I follows the GHS format, and Annex II SDS requirements overlap with CLP regulations. Implementation dates are December 1, 2010, for substances and 2015 for mixtures.
India	No information is currently available regarding the progress of GHS in India.
Indonesia	Implementation 2010: Substances; mixtures voluntary
Japan	Implemented for 640 listed chemicals ; 99 are required to be labelled in accordance with GHS. Non-mandatory classification adopted for 1,500 substances. GHS compliant SDSs scheduled for June 30, 2010.
Korea	Implementation on June 30, 2010, for substances and June 30, 2013, for mixtures (preparations). GHS environmental classifications are scheduled to be implemented on June 30, 2014, for substances and mixtures (preparations)
Malaysia	2010: Substances; 2013; Mixtures
New Zealand	New Zealand was one of the first countries to adopt GHS on July 1, 2008. Currently, exemptions for GHS compliant labels and SDSs are in place for exports to the U.S., EU, and Australia until 2010.

OSHA HCS & GHS

Other Jurisdictions

Location	GHS Status
Philippines	Scheduled to be implemented in 2010 with a three-year transition period.
Singapore	2010: Substances; 2012: Mixtures
Switzerland	Implementation is scheduled for 2010
Taiwan	The requirement for GHS compliant SDSs for toxic substances was adopted on January 1, 2009.
Thailand	Implementation July 2008: Substances; December 2009: Mixtures
Vietnam	Implementation November 2009

OSHA HCS & GHS

Thank You

Mark Vagasky, The Redstone Group,
mvagasky@redstonegrp.com

(614) 923-9077