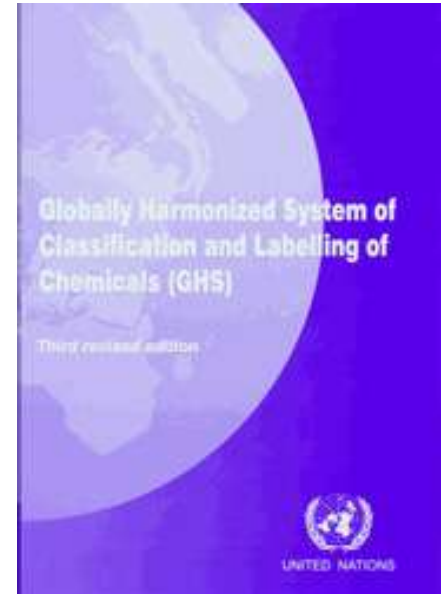




HAZARD COMMUNICATION IN THE 21ST CENTURY: ADOPTING THE GHS

How Will The Changes Affect Your Workplace?

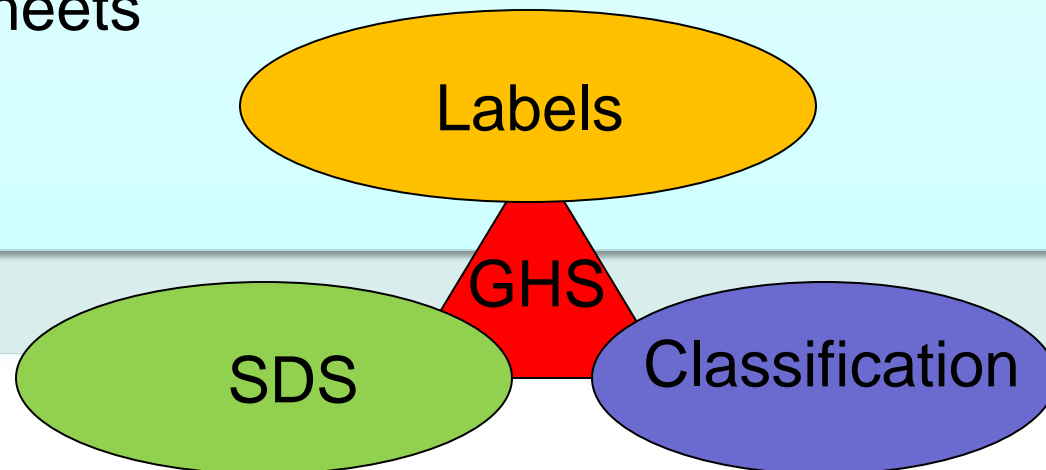


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WHAT IS GHS?

- Globally Harmonized System of Classification and Labeling of Chemicals
- International systematic approach to:
 - Defining and classifying hazards
 - Communicating health and safety information on labels and Safety Data Sheets





HISTORY OF GHS



- International mandate to harmonize was adopted at the UN Conference on Environment and Development in 1992
- *“A globally-harmonized hazard classification and compatible labeling system, including safety data sheets and easily understandable symbols, should be available, if feasible, by the year 2000”*
- GHS formally adopted by the UN Economic and Social Council July 2003 with a goal of 2008 implementation



WHY IS THE GHS A GOOD IDEA?



- Different systems for classifying and labeling hazardous materials between countries
- Different systems exist within a given country between regulatory agencies
- Current system is:
 - expensive for regulation and enforcement
 - costly and confusing for manufacturers to comply
 - confusing to workers and employers to understand the differences between the systems



WHY DOES THE U.S. NEED IT?



- In the USA there are an estimated 945,000 hazardous chemicals used in over 5 million workplaces by over 40 million workers
- Domestic producers have to classify and label multiple times for the same product
- Increased worker comprehension of consistent labeling, resulting in safer use of chemicals



BENEFITS OF HARMONIZATION

- GHS promises to be beneficial to governments, chemical producers, and end users of chemicals:
 - Promote regulatory efficiency
 - Ease compliance for manufacturers and suppliers
 - Improve the protection of humans and environment through the sound management of chemicals
 - Reduce costs
 - **Facilitate trade by reducing barriers**



BENEFITS OF HARMONIZATION

- OSHA estimates that 43 fatalities and 585 I&I will be prevented annually at a monetized benefit of \$266M per year
- Additional cost reductions and productivity improvements are estimated at over \$500M per year
- Annualized compliance cost of the proposed standard is just under \$100M per year



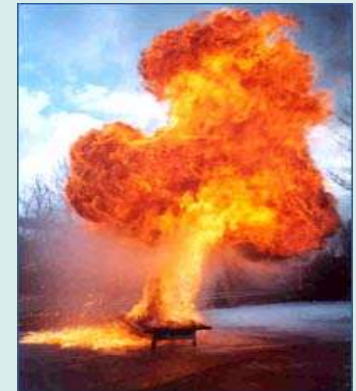
PRINCIPLES OF HARMONIZATION

- Comprehensibility
- Include all types of chemicals
- Intrinsic hazard-based system
- All systems will have to be changed
- Protection will not be reduced
- Can be phased-in



SCOPE OF GHS

- Applies to all hazardous chemical substances and mixtures including:
 - Pesticides
 - Pharmaceuticals
 - Explosives
 - Food additives
 - Cleaners
 - Many other chemicals





SCOPE OF GHS

- Exemptions:
 - RCRA & CERCLA hazardous wastes
 - Tobacco products
 - Wood products
 - Food or alcoholic beverages
 - Drugs
 - Cosmetics
 - CPSA & FHSA consumer products
 - Articles





US AGENCIES IMPACTED

- OSHA
- DOT
- EPA
- CPSC





HOW WILL HAZCOM CHANGE?

- Basic framework will remain the same
- Criteria for classification of chemical hazards
- Labeling provisions to include
 - Standardized signal words
 - Pictograms
 - Standardized hazard statements and
 - Precautionary statements
- Format for safety data sheets (SDS)
- Definitions of new terms, revisions of others, and some are removed
- New Appendices A, B, C and D (mandatory)
- Pre-empts state laws



Hazard Classification

- Health Hazards
- Physical Hazards
- Environmental Hazards
- No more “floor” of chemicals
- Appendix A – Health Hazard Criteria
- Appendix B – Physical Hazard Criteria
- Unclassified Hazard
- Mixtures
- No testing requirement



Hazard Classification

- Only intrinsic hazardous properties of chemicals are considered
- For some hazard classes, classification results directly when the data satisfy the criteria
- For others, classification of a chemical shall be determined on the basis of the total **weight of evidence** using expert judgment
- Refer to Appendices A and B



HEALTH HAZARDS CLASSES

Defined in
proposed HCS
Appendix A

1. Acute Toxicity
2. Skin Corrosion/Irritation
3. Serious Eye Damage/Eye Irritation
4. Respiratory or Skin Sensitization
5. Germ Cell Mutagenicity
6. Carcinogenicity
7. Reproductive Toxicity
8. Specific Target Organ Toxicity
9. Aspiration hazard



PHYSICAL HAZARD CLASSES

Defined in
proposed HCS
Appendix B

1. Explosives
2. Flammability – gases, aerosols, liquids, solids
3. Water - activated flammable gases
4. Oxidizers – liquid, solid, gases
5. Self-reactive chemicals
6. Pyrophoric – liquids, solids
7. Self-Heating chemicals
8. Organic Peroxides
9. Corrosive to Metals
10. Gases under pressure



Mixtures

- GHS has tiered approach:
 - Review available test data on mixture as a whole
 - Use bridging principles to extrapolate data
 - Refer to cut-offs based on known hazards of ingredients (some are as low as 0.1%)
- **Manufacturers or importers are ultimately responsible for the accuracy of the information even when relying on SDS information from suppliers**
- Refer to Appendices A and B



ELEMENTS OF GHS

Unclassified Hazard

- OSHA wanted to allow flexibility for newly identified substances and hazards
 - Combustible dust
 - Simple asphyxiants
- Need to be added to labels and SDSs





ENVIRONMENTAL HAZARD CLASSES

1. Hazardous to Aquatic Environment
2. Hazardous to the Terrestrial Environment
3. Section 12 on SDS
4. Not mandatory





HARMONIZATION OF COMMUNICATION

- Update Written Hazard Communication Program (HCP)
 - Labels and other forms of warnings
 - Safety Data Sheets (SDS)
 - Chemical Inventory
 - Employee training and information



KEY LABEL ELEMENTS

Defined in
proposed HCS
Appendix C

- Product identifier
- Contact information
- Chemical identity
- **Standardized** hazard pictograms / symbols
- **Standardized** signal words
 - “Danger” or “Warning”
- **Standardized** hazard statements
- Precautionary statements (codified)
 - Prevention, response, storage, disposal
- Supplemental information (optional)



GHS PICTOGRAMS

GHS Pictograms and Hazard Classes

 <ul style="list-style-type: none">• Oxidizers	 <ul style="list-style-type: none">• Flammables• Self reactives• Pyrophorics• Self-Heating• Emits flammable gas• Organic peroxides	 <ul style="list-style-type: none">• Explosives (Divisions 1.1 to 1.4 only)• Self reactives• Organic peroxides
 <ul style="list-style-type: none">• Acute toxicity (severe)	 <ul style="list-style-type: none">• Corrosive to metals• Skin corrosion• Serious eye damage/eye irritation	 <ul style="list-style-type: none">• Gases under pressure
 <ul style="list-style-type: none">• Carcinogen• Respiratory sensitizer• Reproductive toxicity• Target Organ toxicity• Mutagenicity• Aspiration toxicity	 <ul style="list-style-type: none">• Aquatic Toxicity (acute)• Aquatic Toxicity (chronic)	 <ul style="list-style-type: none">• Irritant• Dermal sensitizer• Acute toxicity (harmful)



SAMPLE GHS LABEL

Resin solution X 50

Company name

Street

City, State, ZIP Code

Tel.: / Fax: / e-mail:



UN1263



Danger

If medical advice is needed, have product container or label at hand. Keep out of reach of children. Read label before use.

Hazard statements:

May be fatal if swallowed and enters airways. Suspected of damaging fertility or the unborn child. May cause damage to organs through prolonged or repeated exposure. Flammable liquid and vapour. Causes skin irritation. Causes serious eye irritation. May cause an allergic skin reaction. May cause drowsiness or dizziness. Toxic to aquatic life with long lasting effects.

Precautionary statements:

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Keep container tightly closed. IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. IF ON SKIN: Wash with plenty of soap and water. IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing. Store in a well-ventilated place. Keep container tightly closed. Store in a well-ventilated place. Keep cool. Store locked up. Dispose of contents/container in accordance with local/regional/national/international regulations.

Product contains: reaction product: bisphenol-A-(epichlorohydrin) epoxy resin (number average molecular weight ≤ 700), toluene

Gefahr

Ist ärztlicher Rat erforderlich, Verpackung oder Etikett bereithalten. Darf nicht in die Hände von Kindern gelangen. Vor Gebrauch Etikett lesen.

Gefahrenhinweise:

Kann bei Verschlucken und Eindringen in die Atemwege tödlich sein. Kann vermutlich die Fruchtbarkeit beeinträchtigen oder das Kind im Mutterleib schädigen. Kann die Organe schädigen bei längerer oder wiederholter Exposition. Flüssigkeit und Dampf entzündbar. Verursacht Hautreizungen. Verursacht schwere Augenreizung. Kann allergische Hautreaktionen verursachen. Kann Schläfrigkeit und Benommenheit verursachen. Giftig für Wasserorganismen, Langzeitwirkung.

Sicherheitshinweise:

Vor Gebrauch besondere Anweisungen einholen. Vor Handhabung sämtliche Sicherheitsratschläge lesen und verstehen. Von Hitze/ Funken/offener Flamme/heißen Oberflächen fernhalten. Nicht rauchen. Behälter dicht verschlossen halten. BEI VERSCHLUCKEN: Sofort GIFTINFORMATIONSZENTRUM oder Arzt anrufen. BEI BERÜHRUNG MIT DER HAUT: Mit reichlich Wasser und Seife waschen. BEI BERÜHRUNG MIT DER HAUT (oder dem Haar): Alle kontaminierten Kleidungsstücke sofort ausziehen. Haut mit Wasser abwaschen/büchsen. BEI EINATMEN: An die frische Luft bringen und in einer Position ruhigstellen, die das Atmen erleichtert. An einem gut belüfteten Ort lagern. Behälter dicht verschlossen halten. An einem gut belüfteten Ort lagern. Kühl halten. Unter Verschluss lagern. Entsorgung des Inhalts / des Behälters gemäß den örtlichen / regionalen / nationalen / internationalen Vorschriften.

Enthalt: Reaktionsprodukt: Bisphenol-A-Epichlorhydrinharz mit durchschnittlichem Molekulargewicht ≤ 700 , Toluol



LABELS & OTHER WARNINGS

- Labels must be included with initial shipment or with SDS prior to 1st shipment
- Can't conflict with DOT or HMTA
- Workplace labeling
 - Each container of hazardous chemicals
 - Can use other forms of labeling
 - Note: HMIS/NFPA have significant differences
 - Not required for “transfer containers” for immediate use
 - Can't remove/deface label unless immediately replaced
- Must revise within 3 months of new hazard information



SAFETY DATA SHEETS

Defined in
proposed HCS
Appendix D

- Used primarily in workplace but also for community right-to-know
- GHS provisions are based on the 16-section format (ANSI and ISO standards)
 - Designed for multiple audiences
 - Promote consistency, quality and comprehensibility
 - Defined in Appendix D

Material Safety Data Sheet

Section 1 - Product Identification

Section 2 - Hazardous Ingredients

Section 3 - Physical Data

Section 4 - Fire and Explosion Data

Section 5 - Reactivity Data

Section 6 - Toxicological Properties

Section 7 - Preventive Measures

Section 8 - First Aid Measures

Section 9 - Preparation Date of MSDS



SDS FORMAT: 16 SECTIONS

1. Identification
2. Hazard(s) identification
3. Composition - ingredient info
4. First-aid measures
5. Fire-fighting measures
6. Accidental release measures
7. Handling and storage
8. Exposure control, PPE, exposure limits
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



SAFETY DATA SHEET IMPLEMENTATION

- **Manufacturer, Importer must develop**
- Employers must have them in the workplace and make them accessible
- Can develop SDS for similar mixtures
- Must be updated within 3 months of new hazard information
- Must be provided with initial shipment or sent to distributor/employer prior to 1st shipment



TRADE SECRETS

- Chemical identification and % composition details can be kept confidential, but:
 - Must be a “bona fide” trade secret
 - Must still provide protection and health effect data
 - Must provide details under certain circumstances, including:
 - Medical emergencies;
 - Exposure assessments;
 - Medical surveillance;
 - Medical treatment;
 - PPE; and
 - Engineering controls
- Appendix E



EMPLOYEE TRAINING & INFORMATION

- Must be done at initial assignment or when new hazard is introduced
- Information
 - HCS/GHS requirements
 - Operations with hazardous chemicals
 - Location and availability of HCP
- Training
 - Methods used to detect presence or release of hazardous chemical
 - Physical and health hazards
 - Protection measures
 - Hazard Communication Program (**Labels & SDS!**)



STATUS OF OSHA RULE REVISIONS

- Advance Notice of Proposed Rulemaking (ANPR) issued September 2006.
- Proposed Rule published September 30, 2009 (REV. 3)
- Notice of informal public hearings issued December 30, 2009:
 - March 2, 2010 in Washington, DC at DOL
 - March 31, 2010 in Philadelphia
 - April 13, 2010 in Los Angeles
- **Final rule expected by end of 2011**



EFFECTIVE DATES - IMPLEMENTATION

- **Employees must be trained** on new labels and SDS within **2 years** of publication of final rule
- All other provisions effective in **three years** of publication of final rule
- During the **three years phase-in**, compliance with either current or new final rule will be permitted.



IMPACT ON MANUFACTURERS

- Classification of chemicals/products
 - need expertise and data
- Review and modify MSDS to fit new format and information requirements for SDS
 - Management of SDS
 - Prepare new labels
 - Update training





IMPACT ON CHEMICAL USERS

- Obtain new SDS
- Understand new labeling
- Understand new hazard classifications
- Update Written Program
- Update Training Program
- Assess workplace controls





WILL OTHER STANDARDS CHANGE?

- OSHA will update other standards to reflect new hazard classification system, such as:
 - Flammable and combustible liquids (106)
 - Now based upon BPs and FLPs
 - Spray finishing (107)
 - Dipping and coating (123-125)
 - Process safety management (119)
 - Substance-specific standards (1000s)
 - Impacts signs and label statements
 - Welding, cutting and brazing (252)
 - Others...



GLOBAL IMPLEMENTATION

- United states
- Canada
- European Union
- Australia
- New Zealand
- China
- Japan
- Korea
- Mexico



CONCLUSIONS

- GHS is here to stay and will be accepted eventually by most nations
- OSHA has issued a very detailed and comprehensive proposed rule on GHS
- Expected to result in significant benefits in terms of protecting workers and facilitating compliance and trade
- Implementation dates are still a few years away
- Changes will be gradual but extensive
- Some countries will have unique requirements regarding classifications, labels and language
- **Start preparing now so compliance will be easier once it is required!**



For Further Assistance....

Proposed Standard:

- <http://edocket.access.gpo.gov/2009/pdf/E9-22483/pdf>

Guidance Available Online:

- www.osha.gov/dsg/hazcom/global.html
- www.osha.gov/dsg/hazcom/ghs.htm

Comparison to Existing HCS:

- www.osha.gov/dsg/hazcom/ghoshacomparison.html

Fact Sheets Available Online:

- www.osha.gov/as/opa/facts-hcs-ghs.html

United Nations

- http://www.unece.org/trans/danger/publi/ghs/ghs_welcome_e.html



THANK YOU

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