

ACHMM Conference

OSHA's Chemical Hazard
Communication Standard and the
Globally Harmonized System

History of the MSDS

- Originated from maritime standards, which preceded OSHA (under the Bureau of Labor Standards)
- Evolved as an accepted industry practice in response to requests for more information about chemical products
- No established format existed, but there was a suggested OSHA form 20

History of the HCS

- Promulgated by OSHA in 1983
- Preamble committed to “harmonization”
- Written program, labels, training; required chemical manufacturers and importers to develop and distribute MSDSs
- Performance-oriented requirements that specified MSDS content, but not its format
- Optional OSHA form 174 is now obsolete

The MSDS Under HCS

- A detailed document that provides information about a product including:
 - Physical and chemical properties
 - Physical hazards and health hazards
 - Precautions for safe handling, storage, usage
 - Routes of exposure
 - Control measures
 - Emergency and first aid procedures

OSHA's MSDS

- Used as a reference for managing hazardous chemicals in the workplace
- Product-related, not usage-related
- When properly detailed, should address foreseeable misuse
- Aids in the selection of safe products

ANSI Consensus Standard MSDS

- Voluntary, but prescribes a certain format so information can be easily located
- 16 sections with standardized headings
- Meets or exceeds all requirements of HCS
- Endorsed by ICCA, ILO, ISO and EU

Enter The GHS

- International mandate adopted in 1992
- Adopted by the United Nations in 2003
- Now available for worldwide implementation
- Goal to be fully operational by 2008

Why is GHS Needed?

- Global economy
- Differing label requirements
- Differing hazard definitions/terms used
- Differing amount/type/organization of information
- Burden of compliance

Benefits of the GHS

- Labels which use:
 - Pictograms to address literacy problems
 - Certain signal words
 - Hazard statements that contain identical information and language for the same hazard
- SDSs (Safety Data Sheets)
 - Harmonized format
 - Sequence of information specified; found in prescribed and consistent locations

Benefits of GHS

- For training purposes
 - Prescribed label elements and information on SDSs facilitate comprehensibility
- Reduces barriers to global trade

The SDS

- Comprehensive information
 - Includes safety, health and environmental hazards, safety precautions, training assist
- Product-related
- Wide application
 - Transportation, emergency response, consumer use

When is an SDS Necessary?

- Substances and mixtures that meet the harmonized criteria for physical, health or environmental hazards under GHS
- Substances that meet carcinogenic properties, reproductive toxin criteria or target organ systemic toxicity, exceeding cutoff limits ($\geq 0.1\%$ or $\geq 1\%$)

SDS Content

- Clear description of the data used
- Indication where no information is available or applicable
- Additional information can be added, sub-headings can be used

What Does This Mean for HCS?

- Framework of the standard will not change
- Training requirements will stay the same
- Label and SDS format will change
- Hazard definitions will change

Effect on HCS

- Labels

- Biggest change, labels will need to be modified to comply
- GHS uses harmonized pictograms, hazard statements and signal words for specific hazards

OSHA Regulatory Agenda

- In May 2006, OSHA indicated it was planning to modify the HCS to adopt GHS
- ANPR published on September 12, 2006
- ANPR
 - Describes HCS and GHS and the GHS provisions OSHA expects to adopt
 - Lists resources and asks for comments

Other Issues

- Likely to change hazard communication provisions in substance-specific standards
- May need to change definitions in other standards such as criteria for a flammable liquids

Why is Guidance Needed?

- Preparation and distribution of MSDSs is a standard industry practice worldwide
- Some issues remain:
 - Manner in which MSDSs are completed
 - Accuracy of the information
 - How easily the information can be understood
 - Completeness of the data
- There is wide consensus on the 16-section format

Impact of the GHS

- By using the 16-section format, consistency is ensured with both international approaches and the HCS
- One document will comply with US and international requirements
- All sections must be completed correctly
- Need to present information in a comprehensible and understandable format

Comparison of Requirements

- Listed by MSDS section
- OSHA HCS (form 174), ANSI and GHS comparison

Product and Company ID

- **HCS**

- Product identity (same as on label), name, address and phone number of manufacturer, distributor or responsible party
- 174 adds regular and emergency phone number, signature and date of preparation

- **ANSI**

- Product identity (same as on label) or other means of identification, name, address and phone number of supplier, emergency phone number

Product and Company ID

- GHS
 - Product identifier or other means of identification, recommended use and restrictions on use, supplier details, emergency phone number

Hazards Identification

- HCS

- Health hazards including acute and chronic effects, target organs/ systems, signs and symptoms of exposure, conditions aggravated by exposure, primary routes of entry, OSHA IARC or NTP carcinogen
- Physical hazards, listed in other sections
- 174 adds route(s) of entry

Hazards Identification

- ANSI
 - Emergency overview (which includes product description, health and environmental concerns), OSHA HCS regulatory status, potential health effects (acute, chronic and target organ), signs and symptoms of exposure, medical conditions aggravated by exposure, relevant routes of exposure, OSHA IARC or NTP carcinogen, potential environmental effects

Hazard Identification

- GHS
 - GHS classification of substance/mixture, GHS label elements and precautionary statements including symbols used, other hazards that do not result in classification or are not covered by GHS

Composition

- HCS

- Chemical and common name of ingredients contributing to known hazards, for mixtures ingredients $\geq 1\%$ that present a hazard, ingredients $\geq 0.1\%$ that are carcinogens
- 174 adds PEL, TLV, other limits and %

- ANSI

- Chemical, common name and CAS number of hazardous ingredients, ingredients $\geq 1\%$ that present a hazard, ingredients $\geq 0.1\%$ that are carcinogens

Composition

- GHS

- Substance

- Chemical identity, common name, CAS number or other identifying number, impurities/additives which are classified or contribute to the classification

- Mixture

- Chemical identity and concentration or range of concentrations of all hazardous ingredients within the meaning of the GHS present above cut-off levels

First Aid Measures

- HCS
 - Emergency and first aid procedures
- ANSI
 - First aid by route of exposure, note to physician, antidotes

First Aid Measures

- GHS
 - Description, subdivided into routes of exposure, most important symptom, acute and delayed symptoms, need for immediate medical attention or special treatment

Fire Fighting

- HCS
 - Physical hazards (fire, explosion), emergency procedures
 - 174 adds flammable limits, extinguishing media, special firefighting procedures, unusual hazards
- ANSI
 - Qualitative flammable properties and reactivity hazards, suitable extinguishing media, specific physical and chemical hazards, hazardous combustion byproducts, PPE and precautions for firefighting

Fire Fighting

- GHS
 - Suitable and unsuitable extinguishing media, specific hazards arising from the chemical including hazardous combustion products, special protective equipment and precautions for fire fighters

Accidental Release Measures

- HCS
 - Procedures for clean up of spills and leaks
- ANSI
 - Methods of clean up and containment, precautions for personnel and the environment
- GHS
 - PPE and personnel precautions, emergency procedures, environmental precautions, methods for clean up and containment

Handling and Storage

- HCS
 - Precautions for handling, use, hygiene
 - 174 adds storage precautions
- ANSI
 - Precautions for storage, handling, use
- GHS
 - Precautions for safe handling, storage, incompatibilities

Exposure Controls / PPE

- HCS
 - Engineering and work practice controls, protective measures during maintenance, PPE, exposure limits
 - 174 adds type of respirator, gloves, eye protection, hygienic practices

Exposure Controls / PPE

- ANSI

- PEL, TLV, BEI, WEEL, full range of PPE, hygiene

- GHS

- Occupational exposure and biological limit values, engineering controls, PPE

Physical and Chemical Properties

- HCS

- Properties such as vapor pressure, flash point
- 174 adds boiling point, specific gravity, melting point, vapor density, evaporation rate, solubility in water, appearance, odor

Physical and Chemical Properties

- ANSI and GHS

- Appearance, color, odor, physical state, pH, flammability (LEL/UEL, flash point, auto ignition temperature), melting/freezing/boiling point, decomposition temperature, vapor pressure and vapor density, relative density, evaporation rate, solubility, partition coefficient

Physical and Chemical Properties

- ANSI
 - Specific gravity, coefficient of water/oil distribution, evaporation rate, viscosity, particle size, molecular weight/formula
- GHS
 - Odor threshold, boiling range

Stability and Reactivity

- HCS

- Physical hazards (potential for fire, explosion, reactivity), organic peroxides, pyrophoric, unstable, water reactive
- 174 includes conditions to avoid, hazardous polymerization, incompatibility, decomposition byproducts

Stability and Reactivity

- ANSI and GHS
 - Physical hazards, chemical stability, conditions to avoid, incompatibility with materials, hazardous decomposition products, hazardous reactions

Toxicological Information

- HCS

- Health hazards including acute and chronic effects, target organs or systems

- ANSI

- Complete toxicology, immediate and delayed effects, LD50 and LC50, corrosivity, irritation, sensitization, carcinogenicity, neurological, developmental, mutagenic and reproductive effects, target organ effects

Toxicological Information

- GHS
 - Concise, complete and comprehensible toxicological effects and source of data, routes of exposure, symptoms related to physical, chemical and toxicological characteristics, immediate, delayed and chronic effects from short and long-term exposure, numerical data

Ecological Information

- ANSI

- Effects and ecological fate, most important characteristics such as mobility, persistence, accumulation and degradation, other effects

- GHS

- Aquatic and terrestrial ecotoxicity, persistence and degradation, bioaccumulation, mobility in soil, other effects

Disposal

- ANSI
 - Proper disposal, recycling and reclamation, packaging disposal
- GHS
 - Waste residue handling and disposal including disposal of contaminated packaging

Transport

- ANSI
 - Basic shipping information, hazardous substances, marine pollutants, special precautions, additional information
- GHS
 - UN number, UN shipping name, transport hazard, packaging group, marine pollutant, special precautions

Regulatory Information

- ANSI
 - Federal, state and international information
- GHS
 - Safety, health and environmental regulations

Other Information

- HCS
 - Date of preparation or change
- ANSI
 - Other safety and health related information, label text, hazard rating, preparation and revision, legend or key used, related literature
- GHS
 - Preparation and revision of SDS

Disclaimer

- This information has been developed by an OSHA Compliance Assistance Specialist and is intended to assist employers, workers, and others as they strive to improve workplace health and safety. While we attempt to thoroughly address specific topics, it is not possible to include discussion of everything necessary to ensure a healthy and safe working environment in a presentation of this nature. Thus, this information must be understood as a tool for addressing workplace hazards, rather than an exhaustive statement of an employer's legal obligations, which are defined by statute, regulations, and standards. Likewise, to the extent that this information references practices or procedures that may enhance health or safety, but which are not required by a statute, regulation, or standard, it cannot, and does not, create additional legal obligations. Finally, over time, OSHA may modify rules and interpretations in light of new technology, information, or circumstances; to keep apprised of such developments, or to review information on a wide range of occupational safety and health topics, you can visit OSHA's website at www.osha.gov.