### C\_005 - Introduction to the Globally Harmonized System of Hazard Communication



#### Kenneth L. Marshall LLE Chemical Hygiene Officer

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#### Summary

## OSHA has adopted the GHS to make US hazard communication standards consistent with international standards

- Pictograms, signal words, hazard statements and precautionary statements convey chemical safety hazards
- Multiple categories define the level of hazard within a given hazard class
- New labeling standards will supersede NFPA (HCS 1994) to insure consistent and clear hazard communication
- Safety data sheet (SDS) information must conform to a standardized format
- Full implementation of the GHS will be a longterm, on-going process

The GHS is implemented in the USA through OSHA's revised Hazard Communication Standard (HCS 2012; 29 CFR 1910.1200)



### **About this training**



- The growth of international trade in chemicals prompted the United Nations to develop a Globally Harmonized System (GHS) of Hazard Communication. The GHS was designed to replace the diverse classification systems now used with one universal standard.
- This LLE training course (C\_005) is an introduction to the changes in chemical labeling and (materials) safety data sheets resulting from OSHA's adoption of the GHS. OSHA mandates that employees complete this introductory training by <u>1 December 2013</u>. \*
- C\_005 is a one-time training course to satisfy the initial OSHA training requirement. The information in this training course, will be included in the standard LLE Chemical Safety Training (C\_001) in 2014.

\* Revised OSHA Hazard Communication Standard (HCS 2012, 29 CFR 1910.1200)

Goal: to improve knowledge of chronic health hazards and encourage the elimination of hazardous chemicals (carcinogens, mutagens, reproductive toxins) or their replacement with less hazardous materials

### **Outline**



- The GHS: background and rationale
- GHS communication elements
  - pictograms
  - signal words
  - hazard and precautionary statements
- GHS labeling requirements
- Safety data sheets
- NFPA (HCS 1994) and GHS (HCS 2012): impact of coexisting standards
- GHS implementation timeline
- Summary

## The GHS provides an international standard for hazard classification and chemical labeling



- Protect human health and the environment by implementing a global system for hazard communication
- Classify and communicate hazard and precautionary information using safety data sheets (SDS) and labels
- Provide a recognized framework to facilitate international trade
- Enable consistency in hazard communication to:
  - ease regulatory compliance
  - encourage the safe transport, handling and use of chemicals
  - promote better emergency response to chemical incidents
- Reduce the need for chemical testing on animals

### The GHS is intended to be a world-wide, universal language for chemical hazard communication

# Four key elements convey information on materials from 16 physical, 10 health, and 3 environmental hazard classes



#### **Pictograms communicate chemical hazards**



### Signal words discriminate between hazard levels



## *Hazard statements* provide succinct, critical information on the nature of the hazard and/or its severity .....



### ... while *precautionary statements* give guidance on safe work procedures and handling protocols



### The GHS mandates standardized labels on all hazardous materials containers



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## **Categories** define the level of hazard within a given hazard class. Example 1: Acute Oral Toxicity

Hazard Class: ACUTE ORAL TOXICITY								
	Category 1: Severe hazard	Category 2: Serious hazard	Category 3: <i>Moderate</i> hazard	Category 4: <i>Slight</i> hazard	Category 5: <i>Minimal</i> hazard			
LD <sub>50</sub> (mg/kg)*† Larger LD <sub>50</sub> = lower toxicity	< 5	> 5 < 50	>50 < 300	>300 < 2000	>2000 < 5000			
Pictogram	C)			•••	No symbol			
Signal word	Danger	Danger	Danger	Warning	Warning			
Hazard statement	Fatal if swallowed	Fatal if swallowed	Toxic if swallowed	Harmful if swallowed	May be harmful if swallowed			

\*LD<sub>50</sub> = Median lethal dose: the amount of a toxin, radiation, or pathogen (expressed in mg/kg of body weight) required to kill 50% of the members of a test population after a specified test duration.<sup>†</sup>

†Created by J.W. Trevan in 1927, the  $LD_{50}$  test has been phased out. The U.S. Food and Drug Administration has begun to approve non-animal alternatives to  $LD_{50}$  in response to research cruelty concerns and the lack of validity/sensitivity of animal tests as they relate to humans[1].

[1]http://simple.wikipedia.org/wiki/LD50

## **Categories** define the level of hazard within a given hazard class. Example 2: *Flammable liquids*

Hazard Class: FLAMMABLE LIQUID								
	Category 1: Severe hazard	Category 2: Serious hazard	Category 3: <i>Moderate</i> hazard	Category 4: Slight hazard				
Flash point (°C)*	< 23	< 23	<u>&gt;</u> 23	> 60				
Boiling point (°C)	<u>&lt;</u> 35	> 35	<u>&lt;</u> 60	<u>&lt;</u> 93				
Pictogram				No symbol				
Signal word	Danger	Danger	Danger	Warning				
Hazard statement	<i>Extremely</i> flammable liquid and vapor	<i>Highly</i> flammable liquid and vapor	Flammable liquid and vapor	Combustible liquid				

\*Flash point = lowest temperature at which the material is ignitable in the vapor state

Sub-categories also exist for certain specific chemical classes (e.g., explosives, self-reacting materials, peroxides)

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## GHS labeling is intended to supersede the NFPA labeling system used in the USA since 1994....



- Material identity
- Hazard warnings
- Hazard rating index numbers
- Supplier information

### GHS (OSHA HCS 2012) Label



- 1. Product identifier
- 2. Signal word
- 3. Pictograms
- 4. Hazard statements
- 5. Precautionary statements
- 6. Supplier information
- 7. Supplemental information

## .... however, the numerical hazard classification rating scales for GHS and NFPA are exactly opposite!



Both the NFPA and GHS systems will be in simultaneous use over an indefinite transition period.

Use <u>extreme caution</u> when interpreting label or SDS information!

## OSHA has provided guidance on the co-existence of the HCS 1994 and GHS (HCS 2012) labeling standards

- OSHA HCS 2012 final rule (29 CFR 1910.1200), published in the Federal Register on 26 March, 2012 (page 17758):
  - *". . .neither the proposal nor final rule prohibits the use of NFPA or HMIS rating systems."*
- OSHA Hazard Communication website FAQ's (https://www.osha.gov/dsg/hazcom/index.htm)
  - ".... 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 2012 (GHS) standard, e.g., no conflicting hazard warnings or pictograms.
- OSHA brief on labels (February 2013):
  - "Employers may continue to use rating systems such as National Fire Protection Association (NFPA) diamonds or HMIS requirements for workplace labels as long as they are consistent with the requirements of the HCS 2012 standard and the employees have immediate access to the specific hazard information .... An employer using NFPA or HMIS labeling must, through training, ensure that its employees are fully aware of the hazards of the chemicals used."

#### The GHS will supersede (but not entirely replace) the NFPA system as employers transition to the new standard

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### Beginning 1 December 2013, manufacturers must provide Safety Data Sheets in a standardized format

#### **OSHA HCS 1994**

Document format flexible (within guidelines)



Transition begins: 12/1/2013

#### GHS (OSHA HCS 2012)

#### Document format is mandated



#### Safety Data Sheets (SDS) must contain:

- Product identification /name
- Hazard identification
- Composition/Information on ingredients
- First aid measures
- Fire fighting measures
- Accidental release measures
- Handling and storage
- Exposure controls / personal protection

- Physical /chemical properties
- Stability and reactivity
- Toxicological information
- Ecological information
- Disposal considerations
- Transportation information
- Regulatory information
- Other information

#### Full GHS implementation must be completed by 1 June 2016



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### For more information on the GHS.....





#### https://www.osha.gov/dsg/hazcom/ghs.html

http://www.unece.org/trans/danger/publi/ghs/ghs\_ welcome\_e.html

#### http://www.ghs.legislation.com

http://en.wikipedia.org/wiki/Globally\_Harmonized\_ System\_of\_Classification\_and\_Labelling\_of\_ Chemicals

## You have completed the first step in the C\_005 training-but there is still *one more thing*.....





Go to the LLE Safety Zone (below) and take the C\_005 quiz to complete this training

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#### http://safety.lle.rochester.edu/520\_training/presentations.php

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