New England Roundtable
Hazard Communication and Global Harmonization System (GHS)

Marianne Bonito
Compliance Assistance Specialist
bonito.marianne@dol.gov
(203) 579-5645
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OSHA® Occupational Safety and Health Administration

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Hazard Communication

- Top 10 Most frequently cited standards overall FY2023 (preliminary data)
- Basic components of HCS
- Proposed changes to align HCS with GHS Revision 7

OSHA® Occupational Safety and Health Administration

OSHA's Top 10

MOST CITED STANDARDS

OSHA's Top 10: FY 2023

1. Fall Protection – General Requirements
2. Hazard Communication
3. Ladders
4. Scaffolding
5. Powered Industrial Trucks
6. Lockout/Tagout
7. Respiratory Protection
8. Fall Protection – Training Requirements
9. Personal Protective and Lifesaving Equipment – Eye and Face Protection
10. Machine Guarding

OSHA's Top 10

MOST CITED STANDARDS

Hazard Communication

2

1910.1200

3,213 violations

What is GHS

- The Globally Harmonized System (GHS) is an international approach to hazard communication.
- Many countries and organizations helped develop the system.
- United Nations' document on Globally Harmonized System of Classification and Labeling of Chemicals.

Benefits of Adopting the GHS

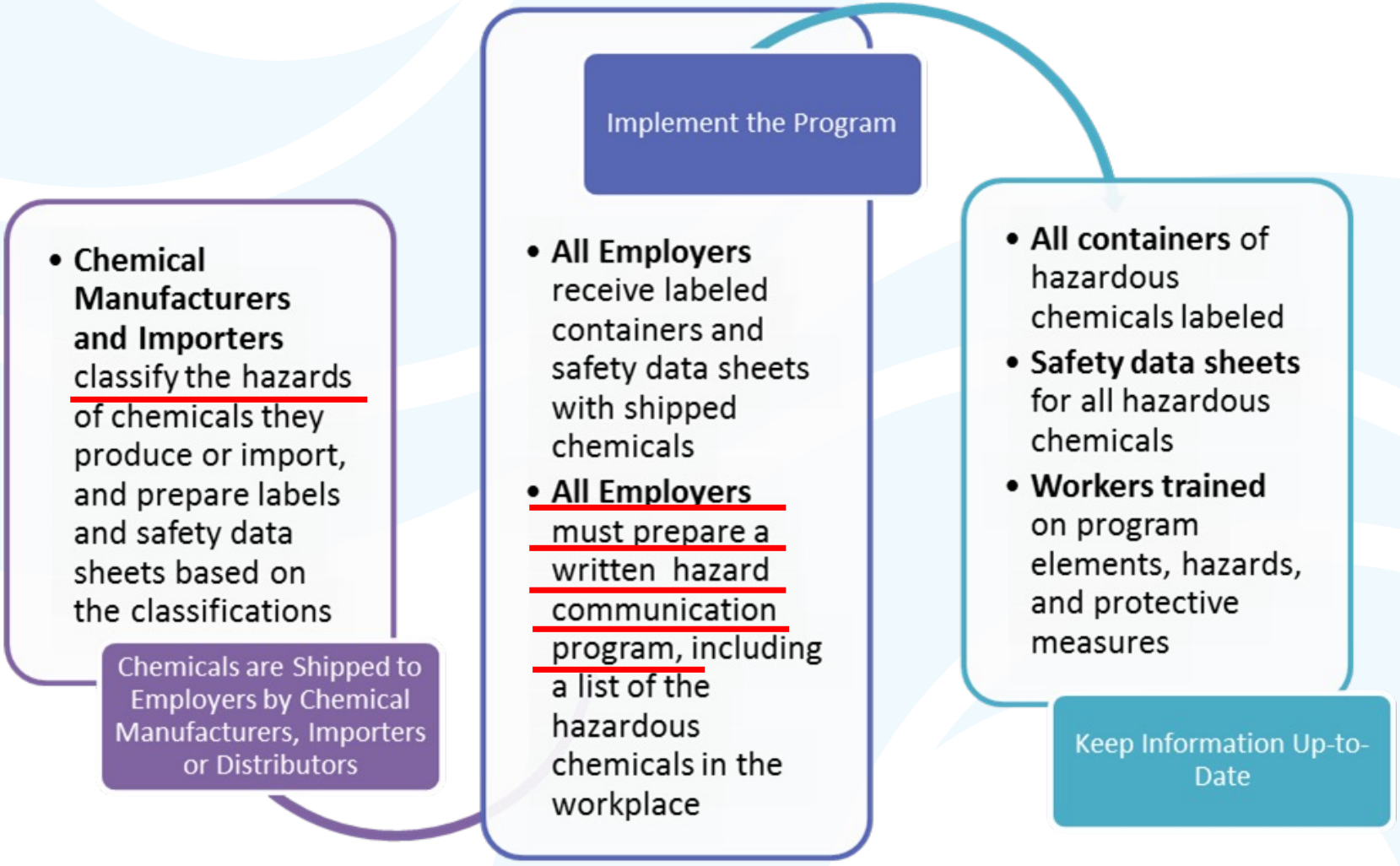
- **The primary benefit is to increase the quality and consistency of information provided to the workers, employers and chemical users.**

  - » **Reduce confusion / Increase comprehension of hazards.**
  - » **Improve downstream risk management.**
  - » **Facilitate training.**
  - » **Help address literacy problems.**

Directorate of Enforcement Programs

- **Letters of Interpretation**
  - » Provide guidance on specific sections of the standard.
  - » Where appropriate are incorporated into the directive.
- **Hazard Communication Directive**
  - » CPL 02-02-079, Effective date July 9, 2015
  - » Provides guidance on how OSHA enforces the Hazard Communication Standard.

How Hazard Communication Works



16-Section Safety Data Sheet

1. Identification of the substance or mixture and of the supplier
2. Hazards identification
3. Composition/information on ingredients Substance/Mixture
4. First aid measures
5. Firefighting measures
6. Accidental release measures
7. Handling and storage
8. Exposure controls/personal protection
9. Physical and chemical properties
10. Stability and reactivity
11. Toxicological
12. *Ecological information (non mandatory)*
13. *Disposal considerations (non mandatory)*
14. *Transport information (non mandatory)*
15. *Regulatory information (non mandatory)*
16. Other information including information on preparation and revision of the SDS

SDS: GHS version

kester

SAFETY DATA SHEET (SDS)
According to 1907/2006/EC, Article 31

Printing Date 11/06/2012 | Version number 2 | Reviewed on 11

1 PRODUCT AND COMPANY IDENTIFICATION

***Trade name:* 245 Flux Cored Solder Sn63Pb37; Sn60Pb40**
Relevant identified uses of the substance or mixture and uses advised against Professional use of lead sold

Application of the substance / the preparation: Flux cored solder

Details of the supplier of the safety data sheet
This Safety Data Sheet has been updated in accordance with the Globally Harmonized System (GHS).
Manufacturer/Supplier:
Kester
800 West Throndale Ave.
Itasca, IL 60143
Tel (630) 616-4000
Fax (630) 616-4044

Kester Components Pte Ltd
500 Chai Chee Lane
Singapore 469024
Tel: 65-64491133

Information department: *SDS Coordinator (630) 616-6844*
Emergency telephone number:
CHEMTREC 24-Hour Emergency Response Telephone Number : (800) 424-9300
CHEMTREC 24-Hour Emergency Response (Outside US & Canada) Telephone Number : (703) 527-3887

2 HAZARDS IDENTIFICATION

Classification of the substance or mixture
Classification according to Regulation (EC) No 1272/2008

GHS08 Health hazard

Resp. Sens. 1B	*H334*	*May cause allergy or asthma symptoms or breathing difficulties if inhaled.*
Repr. 1A	*H360*	*May damage fertility or the unborn child.*
STOT RE 2	*H373*	*May cause damage to organs through prolonged or repeated exposure.*

GHS09 Environment

Aquatic Chronic 2 H411 Toxic to aquatic life with long lasting effects.

GHS07

Acute Tox. 4	*H302*	*Harmful if swallowed.*
Acute Tox. 4	*H332*	*Harmful if inhaled.*

Label elements
Labelling according to Regulation (EC) No 1272/2008
The product is classified and labelled according to the CLP regulation.
Hazard pictograms

GHS07 GHS08 GHS09

Hazard Classification

- Each physical or health hazard is a “hazard class” (e.g., Carcinogenicity is a hazard class).
- A “hazard class” may be sub-divided in the criteria into several “hazard categories” based on the degree of severity of the hazard.
- Placing a chemical into a “hazard class” , and where necessary, a “hazard category”, is the concept of classification—determining not only the hazard, but also the severity of the effect.

Hazard Classification, cont.

- Manufacturers are still responsible for determining the hazards of the chemicals they produce or import.

- Classification (similar to hazard determination) is based on the full range of available information. The procedures for determining if the manufacturer has properly performed the hazard classification are provided in Appendix A (health) and Appendix B (physical).

Health Hazards

Hazard Class	Hazard Category			
Acute Toxicity	1	2	3	4
Skin Corrosion/ Irritation	1A	1B	1C	2
Serious Eye Damage/ Eye Irritation	1	2A	2B	
Respiratory or Skin Sensitization	1			
Germ Cell Mutagenicity	1A	1B	2	
Carcinogenicity	1A	1B	2	
Reproductive Toxicity	1A	1B	2	Lactation
STOT – Single Exposure	1	2	3	
STOT – Repeated Exposure	1	2		
Aspiration	1			
Simple Asphyxiants	Single Category			

Physical Hazards

Hazard Class	Hazard Category						
Explosives	**Unstable Explosives**	**Div 1.1**	**Div 1.2**	**Div 1.3**	**Div 1.4**	**Div 1.5**	**Div 1.6**
Flammable Gases	**1**	**2**					
Flammable Aerosols	**1**	**2**					
Oxidizing Gases	**1**						
Gases under Pressure Compressed Gases Liquefied Gases Refrigerated Liquefied Gases Dissolved Gases	**1**						
Flammable Liquids	**1**	**2**	**3**	**4**			
Flammable Solids	**1**	**2**					
Self-Reactive Chemicals	**Type A**	**Type B**	**Type C**	**Type D**	**Type E**	**Type F**	**Type G**
Pyrophoric Liquids	**1**						
Pyrophoric Solid	**1**						
Pyrophoric Gases	**Single category**						
Self-heating Chemicals	**1**	**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	**Type A**	**Type B**	**Type C**	**Type D**	**Type E**	**Type F**	**Type G**
Corrosive to Metals	**1**						
Combustible Dusts	**Single category**						

Hazards not Otherwise Classified (HNOC)

- This definition was added to ensure that hazards covered by the former HCS continue to be covered.
- Information will be required on the safety data sheets in Section 2.
- Hazard information on the label, is not mandatory, but can be provided under supplementary information.
- Such hazards must also be addressed in worker training.

Combustible Dust

- **Combustible dust is covered separately from HNOC, but is not specifically defined.**
- **Guidance for defining combustible dust is to be taken from existing documents, including the directive for the National Emphasis Program; the NFPA standards also provide useful information.**
- **Combustible dust must be addressed on labels where appropriate:**
  - » ***Warning. May form combustible dust concentrations in air.***
  - » **Paragraph (f)(4) may apply to materials shipped in solid form, that create combustible dust when processed.**

How do these fit in?

Not required

If you use in-house, train

Watch for conflict with GHS

(e.g., flammability)

Potential confusion:

1=bad (GHS); not bad (these)

Chemical Labels - Format

- Labels cover physical, health and environmental hazards.
- Signal Words
- Hazards Statements
- Precautionary Statements
- Pictograms

Label Requirements – Shipped Containers

- Product identifier
- Signal word
- Hazard statement(s)
- Pictogram(s)
- Precautionary statement(s)
- Name, address, and phone number of the responsible party

Signal Word

- **Signal word used to indicate the relative level of hazard severity.**
- **Danger - More Severe Hazard**
- **Warning – Less Severe Hazard**

Simple Asphyxiant and Pyrophoric Gas

- **"Simple asphyxiant" means 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.**
  - » **Label: *Warning. May displace oxygen and cause rapid suffocation.***

- **"Pyrophoric gas" means 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.**
  - » **Label: *Danger. Catches fire spontaneously if exposed to air.***

Label Example

Pictograms

Hazard Statement

- **Statement associated with the hazard class or degree of hazard.**

- **Hazard class and category that describes the nature of the hazard(s) of a chemical, including, where appropriate, the degree of hazard.**

Highly flammable vapor

Precautionary Statement

- **A phrase that describes recommended measures to be taken to minimize or prevent adverse effects resulting from exposure to a hazardous chemical, or improper storage or handling of a hazardous chemical.**

Do not breathe vapors

Wear protective gloves

HCS Pictograms and Hazards

Health Hazard  • Carcinogen • Mutagenicity • Reproductive Toxicity • Respiratory Sensitizer • Target Organ Toxicity • Aspiration Toxicity	**Flame**  • Flammables • Pyrophorics • Self-Heating • Emits Flammable Gas • Self-Reactives • Organic Peroxides	**Exclamation Mark**  • Irritant (skin and eye) • Skin Sensitizer • Acute Toxicity (harmful) • Narcotic Effects • Respiratory Tract Irritant • Hazardous to Ozone Layer (Non-Mandatory)
Gas Cylinder  • Gases Under Pressure	**Corrosion**  • Skin Corrosion/ Burns • Eye Damage • Corrosive to Metals	**Exploding Bomb**  • Explosives • Self-Reactives • Organic Peroxides
Flame Over Circle  • Oxidizers	**Environment** (Non-Mandatory)  • Aquatic Toxicity	**Skull and Crossbones**  • Acute Toxicity (fatal or toxic)

There are nine pictograms used in the new GH System.
(8 are mandatory)

Hazard Communication Training

- **Label elements**
  - » Train employees on the type of information that the employee would expect to see on the new labels.
  - » How they might use that information.

- **Safety Data Sheet Format**
  - » Train the employees on the standardized 16 section format and the type of information they would find in the various sections.

Proposed Changes to align HCS with GHS Revision 7

- **Maintain alignment with the GHS**
  - » **Appendix A (health hazards)**
  - » **Appendix B (physical hazards)**
  - » **Appendix C (label elements)**
  - » **Appendix D (SDS)**
- **Address Issues that have come to light since implementation of the 2012 HCS**
  - » **Release for shipment**
  - » **Small packages labeling**
  - » **Safety Data sheets**

Appendix A – Health Hazards

- **Revised health hazard definition**
  - e.g. update definition for germ cell mutagenicity
- **Update to Skin corrosion/irritation, Serious eye damage/eye irritation**
  - Clarification on classification scheme
- **General updates to hazard classes**
  - e.g., acute toxicity – clarification on use of data from human experience

Appendix B – Physical Hazards

- Pyrophoric gases and unstable gases
- Flammable gases
- Desensitized explosives
- Aerosols

Pyrophoric Gases and Unstable Gases

- **Under this proposal these gas categories have been placed under flammable gases**

  - Pyrophoric – under Category 1A

  - Unstable gases – under Category 1A

Flammable Gases

- **It was noted that the flammable gases category 1 was extremely broad and captured essentially all flammable gases**
  - In some circumstances this leads to over warning
  - Or worse – leads employers to choose a chemical with a higher risk

- **The updated Hazard class added a new subcategory:**
  - Updated the Criteria to include a new subcategory 1b for flammable liquids which have a low burning velocity or high flammability limit
  - Update the Labeling information
  - Streamlined the classification process

New Flammable Gases Criteria

Table 2.2.1: Criteria for categorization of flammable gases

Category		Criteria	
1A	Flammable gas	Gases, which at 20 °C and a standard pressure of 101.3 kPa: (a) are ignitable when in a mixture of 13% or less by volume in air; or (b) have a flammable range with air of at least 12 percentage points regardless of the lower flammability limit. unless data shows them to meet the criteria of category 1B	
	Pyrophoric gas	Flammable gases that ignite spontaneously in air at a temperature of 54 °C or below	
	Chemically Unstable gas	A	Flammable gases which are chemically unstable at 20°C and a standard pressure of 101.3 kPa
		B	Flammable gases which are chemically unstable at a temperature greater than 20°C and/or a pressure greater than 101.3 kPa
1B	Flammable gas	Gases which meet the flammability criteria for Category 1A, but which are not pyrophoric, nor chemically unstable, and which have at least either: a) A lower flammability limit of more than 6% by volume in air; or b) A fundamental burning velocity of less than 10 cm/s;	
2	Flammable gas	Gases, other than those of Category 1A or 1B, which, at 20 °C and a standard pressure of 101.3 kPa, have a flammable range while mixed in air.	

Hazard Communication Elements for Flammable Gases

Label Element	Category 1A	Category 1B	Category 2
Hazard statement	Extremely Flammable Gas	Flammable Gas	Flammable Gas
Signal word	Danger	Danger	Warning
Pictogram			No Pictogram

Desensitized Explosives

- The revised HCS will include a new Chapter in Appendix B, Chapter B.17 will be known as Desensitized Explosives
- These are explosives that must be wetted with water or alcohols, diluted with other substances or dissolved or suspended in water or other liquid substances to suppress or reduce their explosive properties

New Desensitized Explosives Criteria

Category	Table 2.17.1: Criteria for desensitized explosives Criteria
1	Desensitized explosives with a corrected burning rate (A_C) equal to or greater than 300 kg/min but not more than 1200 kg/min
2	Desensitized explosives with a corrected burning rate (A_C) equal to or greater than 140 kg/min but less than 300 kg/min
3	Desensitized explosives with a corrected burning rate (A_C) equal to or greater than 60 kg/min but less than 140 kg/min
4	Desensitized explosives with a corrected burning rate (A_C) less than 60 kg/min

Hazard Communication for Desensitized Explosives

Label Element	Category 1	Category 2	Category 3	Category 4
Hazard Statement	Fire, blast or projection hazard; increased risk of explosion if desensitizing agent is reduced.	Fire, blast or projection hazard; increased risk of explosion if desensitizing agent is reduced.	Fire, blast or projection hazard; increased risk of explosion if desensitizing agent is reduced.	Fire hazard; increased risk of explosion if desensitizing agent is reduced.
Signal Word	Danger	Danger	Warning	Warning
Pictogram				

Aerosols

- Proposed change provides better differentiation between aerosols and gases under pressure
  - No gas cylinder pictogram
  - Updated hazard statements
- Under this proposal
  - Aerosols will be classified in three categories depending on their flammable properties and heat of combustion.
  - Aerosols with a flammable component will be classified in Categories 1 or 2
  - Aerosols with no flammable components will be Category 3

Hazard Communication for Aerosols

Label elements	Category 1	Category 2	Category 3
Hazard Statement	Extremely flammable aerosol. Pressurized container: may burst if heated.	Flammable aerosol. Pressurized container: may burst if heated.	Pressurized container: may burst if heated
Signal Word	Danger	Warning	Warning
Pictogram			No Pictogram

Appendix C – label elements

- New or updated hazards
  - Updated from changes to Appendix A and B
- Updated guidance
  - Clarification to desensitized explosives, aerosols, flammable gases
- Precautionary statements
  - Clarification to desensitized explosives, aerosols, flammable gases
  - Combined statements (e.g. fire response and first aid measures)

Appendix D - SDS

- **Key Updates to SDS**
  - Section 9 – physical and chemical properties
    - e.g. inclusion of particle size
  - Section 11
    - e.g. inclusion of interactive effects and use of SAR/QSAR/read across

Implementation Issues

- Release for Shipment
- Small Packages Labelling
- Safety Data Sheet

Release for Shipment

- Update chemicals released for shipment – based on Letters of Interpretation (LOIs) issued since 2012
  - Purpose is to account for products with long distribution cycles
  - Timing is changed for updating the label when new information becomes available
  - Intended to reduce employee exposure by limiting handling of materials that have already been packaged

Small packages

- Abbreviated labelling requirements on immediate container when full label is infeasible for containers
  - Based on LOIs
- Full label would still be required on outer package

Improve SDS preparation

- Based on Letters of Interpretation (LOIs)
  - Section 2 – clarification of how chemical hazard information is presented
    - e.g. hazard associated with change in chemical's physical form under normal conditions of use
  - Section 3- trade secrets information
  - Section 8 – clarification on inclusion of PEL, TLV, or other exposure limits for individual ingredients or constituents in mixtures

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Proposed Changes to align HCS with GHS Revision 7

- **Alignment with Canada**
  - » Concentration ranges for CBI (Confidential Business Information)
    - Potential to align with WHMIS
    - OSHA currently does not allow for CBI claims on concentration ranges
      - Would allow for claiming prescriptive concentration ranges for materials claimed as trade secret
      - Proposing prescriptive concentration ranges as mandatory if claiming CBI for range
  - » Small packages
  - » HNOC and PNOC

Proposed Changes to align HCS with GHS Revision 7

- **Improve alignment with other U.S. agencies**
  - » Department of Transportation
    - - Bulk packaging
    - - GHS pictogram
  - » Environmental Protection Agency
    - - Release for shipment

Preliminary Economic Analysis

- The proposed rule would result in an estimated net cost savings of $26.8 million per year at a seven percent discount rate or $27.5 million per year at a three percent discount rate:
  - Net cost savings of $26.8 million (at a seven percent discount rate) consist of $31.1 million cost savings and $4.3 million costs:
    - $29.8 million savings: released for shipment
      - Six industries affected (four manufacturing and two wholesale) –
    - $1.3 million savings: very small labels
      - Affected manufacturers fall in only a few NAICS industries: Other Basic Chemical Manufacturing, Inorganic and Organic (NAICS 325180 and 325199, respectively) and Pharmaceutical and Medical Manufacturing (NAICS 3254—encompassing 6-digit NAICS 325411, 325412, 325413, and 325414).
    - $3.5 million costs: revising SDS/labels

Preliminary Economic Analysis

- The proposal would affect 115,758 firms, 152,427 establishments, and 1,510,780 employees.
- The proposed updates to the standard would result in modest, non-quantifiable improvements in worker health and safety above those already achieved under the current HCS.
- The agency has preliminarily determined that this rulemaking is not "economically significant" within the meaning of section 3(f)(1) of Executive Order 12866 because it is not likely to have an effect on the economy of $100 million or more in any one year.
- OSHA has also made a preliminary determination that this proposed action is deregulatory.

Preliminary Economic Analysis

- The rule would not have significant impact on a substantial number of small entities
- For every affected industry, the proposed rule would provide either cost savings or the costs would be less than one percent of revenues or ten percent of profits;
- The proposed rule would not impose costs in excess of one percent of annual revenues or five percent of annual profits for small entities or very small entities in any industry.

Questions?

Resources

www.OSHA.gov

www.osha.gov/hazcom

1-800-321-6742 (OSHA)