

# Chemical Control Banding and the OSHA Hazard Communication Program?

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# GHS/HazCom/Control Banding

- This presentation will:
  - Look at what lies ahead in the GHS process for chemicals and why the HazCom Standard must change
  - Understand why we need a Globally Harmonized MSDS
  - What we should do as employers, especially with multi-national operations or products/materials...

# GHS/HazCom/Control Banding

- Continuing...
  - Introduce Control Banding
  - Look at possible ways to improve or go beyond the HazCom standard with Control Banding

# HazCom Standard

- **Written in 1983.**
- **Effective June 1988**
- **Requires Hazard Assessment**
- **All employers to provide information to their employees about the hazardous chemicals to which they are exposed**

# What's Wrong With HazCom?

Focuses on paper (MSDS,  
Labels, Written Program)

and

not the needed controls of  
working with chemicals

# OSHA's Action with HazCom?

- Employers are not fully implementing the Standard
- MSDS's non-standard and out of date..
- Not being used correctly–
  - HazCom is OSHA's # 2 Violation
  - #1 in NYS Public & Private Sectors

# Current State – MSDS's

- OSHA does not specify the format, only the minimum content.
- Warnings for the same material are different (from Danger-Poison to *Severe Irritant*)
- Exposure data for the same material is different
- Quick reference to emergency data not same..

MSDS Sect	JT Baker	EMS (Electron Microscopy Sciences)	Startex Chemical
1	Product ID	Product ID	Product ID
2	Composition/Ingredients	Composition/Ingredients	Composition/Ingredients
3	Hazard ID – Emergency Overview	Physical Data	Hazard ID
4	First Aid Measures	Fire & Explosion	First Aid Info
5	Firefighting Measures	Health Hazard & First Aid	Firefighting
6	Accidental Release	Reactivity	Accidental Release
7	Handling & Storage	Spill & Leak Procedures	Handling & Storage
8	Exposure Controls, PPE	PPE	Exposure Controls, PPE
9	Physical/Chemical Properties	Special Precautions	Physical Properties
10	Stability & Reactivity		Stability & Reactivity
11	Toxicological Info		Disposal Info
12	Ecological Info		Regulatory
13	Disposal Considerations		
14	Transport Info		
15	Regulatory Info		
16	Other Info (NFPA/Label)		

# What Do We Change?

- GHS format MSDS..
- Common Terminology on MSDS, labels, shipping papers, etc.
- Use of Standard Risk (Hazard) Phrases, Safety Phrases, and Signal words...

# OSHA and GHS/HazCom

GHS -- Global Harmonization System, "A common and coherent approach to defining and classifying hazards, and communicating information on labels and safety data sheets."

- NOTE - Soon to be published ANPRM for Revisions to HazCom incorporating many GHS principles.

# GHS Principles

## ➤ Classification Criteria

Health and Environmental Hazards

Physical Hazards

Mixtures

## ➤ Hazard Communication








Labels

Safety Data Sheets

# Labels and Marking

- Use of common R-Phrases (Hazard) and Signal words on labels and MSDS's.. allows standardization
- Common Picto-grams from container label warnings to DOT shipping labels and Placards...
- Classification by Danger or Hazard:
  - Harmful
  - Toxic
  - Very toxic

# Pictograms

SKIN CORROSION/IRRITATION				
Category 1A	Category 1B	Category 1C	Category 2	Category 3
 <p><b>Danger</b> Causes severe skin burns and eye damage</p>	 <p><b>Danger</b> Causes severe skin burns and eye damage</p>	 <p><b>Danger</b> Causes severe skin burns and eye damage</p>	 <p><b>Warning</b> Causes skin irritation</p>	<p>No symbol</p> <p><b>Warning</b> Causes mild skin irritation</p>
			<p>Not required under the <i>UN Recommendations on the Transport of Dangerous Goods, Model Regulations</i>.</p> <p>Note: UN Model Regulations pictogram colours: Symbol: black background: upper half: white; lower half: black with white border; Figure 8: white.</p>	

Should be same Pictogram Used on Labels, Placards, Shipping papers, and in MSDS (SDS)

# GHS/HazCom

## ➤ Issues Include:

- R-Phrases (Risk Phrases)/(Hazard Phrases)
- S- Phrases (Safety Phrases)
- Standardized Signal Words (Warnings)
- Standardized Picto-grams
- GHS proposed 16 Section MSDS (an agreed method of hazard determination and control, and standardized warning and risk phrases).
- ANSI Z400.1- 2004 format now is in agreement with the UN/ILO format.

# Sample R- Phrases

- R14:
  - Reacts violently with water.
- R17:
  - Spontaneously flammable in air
- R20:
  - Harmful by inhalation.
- R21:
  - Harmful in contact with skin.
- R22:
  - Harmful if swallowed.
- R23:
  - Toxic by inhalation.
- R20/21/22:
  - Harmful by inhalation, in contact with skin and if swallowed.

# 16 Section Format – MSDS

- 1 ID of Substance
- 2 Composition
- 3 Hazards ID
- 4 First Aid Measures
- 5 Fire Fighting Measures
- 6 Accidental Release
- 7 Handling & Storage
- 8 Exposure Controls

# 16 Section Format – MSDS

- 9 Physical & Chemical Prop
- 10 Stability & Reactivity
- 11 Toxicology
- 12 Ecological Info
- 13 Disposal Consider.
- 14 Transport
- 15 Regulatory Info
- 16 Other Information

# What is Control Banding?

- A chemical is assigned to a "band" for control measures, based on:
  - its hazard classification (exposure route, toxicity characteristics, strength)
  - the amount of chemical in use
  - its volatility/dustiness (ability to become airborne)

# Control Banding – ILO Toolkit

There are five Control Banding stages presented by Pavan Baichoo of the International Labor Organization (ILO):

- Hazard Classification
- Scale Of Use
- Ability To Become Airborne.
- Finding The Control Approach
- Finding The Task Specific Control Guidance Sheets.

# Ability to get Airborne

- Physical Form of chemical affects how likely it is to get into air
- Solids - 3 levels of dustiness (Low-pellets, Medium – crystalline, High – powder)
- Liquids – 3 Levels of volatility (High – Bpt < 60° C, Medium – 60°C < Bpt < 150° C, Low-Bpt > 150°C)

# Exposure Evaluation

- Personal Monitoring
- General Area Monitoring

# After Control Banding Evaluation

- After evaluation, the outcome is one of four recommended control strategies:
  1. Employ good industrial hygiene practice
  2. Use local exhaust ventilation
  3. Enclose the process
  4. Seek the advice of a specialist

# A chemical is assigned to a "band" for control measures, based on its hazard classification

Hazard Group (w/ examples)	Target airborne concentration range	
	Particulate	Vapors
<b>A</b> - Skin and eye irritants	>1-10 mg/m <sup>3</sup>	>50-500 ppm
<b>B</b> - Harmful on single exposure	>0.1-1 mg/m <sup>3</sup>	>5-50 ppm
<b>C</b> - Severely irritating & corrosive; skin sensitizers	>0.01-0.1 mg/m <sup>3</sup>	>0.5-5 ppm
<b>D</b> - Very toxic on single exposure; reproductive hazard	<0.01 mg/m <sup>3</sup>	<0.5 ppm
<b>E</b> - Carcinogens, asthmagens	Seek specialist advice	
S: skin and eye contact	Prevent or reduce skin and/or eye exposure	

Signal Words Hazard	Danger (High)	Warning (Moderate)	Caution (Low)	Not Classified as Dangerous
Flammability	Flashpoint < 20°F Extremely flammable liquid and vapor	20°F ≤ F.P. < 100°F Flammable liquid and vapor. Flammable Solid.	100°F ≤ F.P. < 200°F Combustible liquid and vapor.	Flashpoint ≥ 200°F
Reactivity	Ready detonation or explosive decomposition at normal temperature and pressure	Normally unstable. Detonation possible with strong initiation. Violent reaction with water.	Unstable at elevated temperatures and pressures. Reacts nonviolently with water.	Essentially nonreactive
Skin Absorption	LD <sub>50</sub> ≤ 200mg/kg May be fatal if absorbed through skin.	200 < LD <sub>50</sub> ≤ 1000 mg/kg A single prolonged exposure may cause absorption in harmful amounts; repeated exposure could cause death	1000 < LD <sub>50</sub> ≤ 2000 mg/kg Repeated exposure may result in absorption of harmful amounts even though LD <sub>50</sub> may be unknown or is > 2000 mg/kg.	LD <sub>50</sub> > 2000 mg/kg
Inhalation	LC <sub>50</sub> ≤ 200 ppm or ≤ 2mg/liter for 1 hr. Excessive concentrations readily attainable and may cause death; single brief exposure may cause death	200 < LC <sub>50</sub> ≤ 2000 ppm, or 2 < LC <sub>50</sub> ≤ 20 mg/liter for 1 hr. Excessive concentrations readily attainable and may cause death; single brief exposure may cause death	LC <sub>50</sub> ≤ 2000 ppm, or > 20 mg/liter for 1 hr. Could be hazardous on single exposure; simple asphyxia; may cause irritation to upper respiratory tract/lungs/eyes; prolonged excessive exposure may cause adverse effects.	LC <sub>50</sub> > 2000 ppm, or > 20 mg/liter. No adverse effects; not likely to be hazardous; dust may cause irritation; exposure to vapors unlikely.
Ingestion	LC <sub>50</sub> ≤ 50 mg/kg Single dose oral toxicity high or very high; severe burns of mouth.	50 < LD <sub>50</sub> ≤ 500 mg/kg Single dose oral toxicity moderate or moderate to high.	500 < LD <sub>50</sub> ≤ 2000 mg/kg Single dose oral toxicity low or low to moderate.	LD <sub>50</sub> > 2000 mg/kg
Eye/Skin Contact				
Eye	Impairment of vision; blindness; corrosive.	Moderate or severe irritation, injury.	Slight irritation; slight corneal injury.	No corneal injury; slight, transient irritation.
Skin	Short, single exposure may cause severe burns; prolonged, repeated exposure may cause severe burns	Severe irritation; prolonged or repeated exposure may cause skin burns; allergic skin reaction in humans.	Slight to moderate irritation, even a burn on single, prolonged, or repeated exposure; allergic skin reaction in susceptible individuals	Essentially nonirritating

Control Bands:

D

C

B

A

# Conclusions..

- HazCom needs upgrades to be effective.
- Employers need to improve attention given to controls through process review.
- Too much left to the employee, “read the MSDS”.
- Control Banding, while a useful tool, will likely remain an internal voluntary process.
- OSHA needs to require a format (ANSI Z400.1) as a Standard MSDS, adopt standard GHS labeling criterion, wording and Picto-grams.