Chemical Control Banding and the OSHA Hazard Communication Program?

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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- MSDS’s non-standard and out of date...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.
<table>
<thead>
<tr>
<th>MSDS Sect</th>
<th>JT Baker</th>
<th>EMS (Electron Microscopy Sciences)</th>
<th>Startex Chemical</th>
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<tbody>
<tr>
<td>1 Product ID</td>
<td>Product ID</td>
<td>Product ID</td>
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<tr>
<td>2 Composition/Ingredients</td>
<td>Composition/Ingredients</td>
<td>Composition/Ingredients</td>
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<tr>
<td>3 Hazard ID – Emergency Overview</td>
<td>Physical Data</td>
<td>Hazard ID</td>
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<tr>
<td>4 First Aid Measures</td>
<td>Fire &amp; Explosion</td>
<td>First Aid Info</td>
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<td>5 Firefighting Measures</td>
<td>Health Hazard &amp; First Aid</td>
<td>Firefighting</td>
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<td>6 Accidental Release</td>
<td>Reactivity</td>
<td>Accidental Release</td>
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<tr>
<td>7 Handling &amp; Storage</td>
<td>Spill &amp; Leak Procedures</td>
<td>Handling &amp; Storage</td>
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<tr>
<td>8 Exposure Controls, PPE</td>
<td>PPE</td>
<td>Exposure Controls, PPE</td>
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<tr>
<td>9 Physical/Chemical Properties</td>
<td>Special Precautions</td>
<td>Physical Properties</td>
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<tr>
<td>10 Stability &amp; Reactivity</td>
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<tr>
<td>11 Toxicological Info</td>
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<td>Disposal Info</td>
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<td>12 Ecological Info</td>
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<td>Regulatory</td>
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<td>13 Disposal Considerations</td>
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<td>14 Transport Info</td>
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<td>15 Regulatory Info</td>
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<tr>
<td>16 Other Info (NFPA/Label)</td>
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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
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)
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 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.

<table>
<thead>
<tr>
<th>Hazard Group (w/ examples)</th>
<th>Target airborne concentration range</th>
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<tbody>
<tr>
<td></td>
<td>Particulate</td>
<td>Vapors</td>
</tr>
<tr>
<td>A - Skin and eye irritants</td>
<td>&gt;1-10 mg/m³</td>
<td>&gt;50-500 ppm</td>
</tr>
<tr>
<td>B - Harmful on single exposure</td>
<td>&gt;0.1-1 mg/m³</td>
<td>&gt;5-50 ppm</td>
</tr>
<tr>
<td>C - Severely irritating &amp; corrosive; skin sensitizers</td>
<td>&gt;0.01-0.1 mg/m³</td>
<td>&gt;0.5-5 ppm</td>
</tr>
<tr>
<td>D - Very toxic on single exposure; reproductive hazard</td>
<td>&lt;0.01 mg/m³</td>
<td>&lt;0.5 ppm</td>
</tr>
<tr>
<td>E - Carcinogens, asthmagens</td>
<td>Seek specialist advice</td>
<td></td>
</tr>
<tr>
<td>S: skin and eye contact</td>
<td>Prevent or reduce skin and/or eye exposure</td>
<td></td>
</tr>
<tr>
<td>Hazard</td>
<td>Danger (High)</td>
<td>Warning (Moderate)</td>
</tr>
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<td>-----------------</td>
<td>-------------------------------------------------------------------------------</td>
<td>-------------------------------------------------</td>
</tr>
<tr>
<td>Flammability</td>
<td>Flashpoint &lt; 20°F Extremelly flammable liquid and vapor</td>
<td>20°F ≤ F.P. &lt; 100°F Flammable liquid and vapor.</td>
</tr>
<tr>
<td>Reactivity</td>
<td>Ready detonation or explosive decomposition at normal temperature and pressure</td>
<td>Normally unstable. Detonation possible with strong irritation. Violent reaction with water.</td>
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<tr>
<td>Skin Absorption</td>
<td>LD&lt;sub&gt;50&lt;/sub&gt; ≤ 200mg/kg May be fatal if absorbed through skin.</td>
<td>200 &lt; LD&lt;sub&gt;50&lt;/sub&gt; ≤ 1000 mg/kg A single prolonged exposure may cause absorption in harmful amounts; repeated exposure could cause death.</td>
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<tr>
<td>Inhalation</td>
<td>LC&lt;sub&gt;50&lt;/sub&gt; ≤ 200 ppm or ≤ 2mg/liter for 1 hr. Excessive concentrations readily attainable and may cause death; single brief exposure may cause death</td>
<td>200 &lt; LC&lt;sub&gt;50&lt;/sub&gt; ≤ 2000 ppm, or 2 &lt; LC&lt;sub&gt;50&lt;/sub&gt; ≤ 20 mg/liter for 1 hr. Excessive concentrations readily attainable and may cause death; single brief exposure may cause death</td>
</tr>
<tr>
<td>Ingestion</td>
<td>LC&lt;sub&gt;50&lt;/sub&gt; ≤ 50 mg/kg Single dose oral toxicity high or very high; severe burns of mouth.</td>
<td>50 &lt; LD&lt;sub&gt;50&lt;/sub&gt; ≤ 500 mg/kg Single dose oral toxicity moderate or moderate to high.</td>
</tr>
<tr>
<td>Eye/Skin Contact</td>
<td>Eye Impairment of vision; blindness; corrosive.</td>
<td>Moderate or severe irritation, injury.</td>
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<td></td>
<td>Ski Short, single exposure may cause severe burns; prolonged, repeated exposure may cause severe burns</td>
<td>Severe Irritation; prolonged or repeated exposure may cause skin burns; allergic skin reaction in humans.</td>
</tr>
</tbody>
</table>
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.