GHS Implementation – New Opportunities!

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GHS Implementation – New Opportunities!

UN Global Harmonization system
  • Life before GHS
  • Purpose & Development of GHS

Review of National Implementations of GHS and Opportunities!
  • Review of differences in national implementation of GHS
Prior to GHS

Various national requirements developing related to classification of inherent properties of chemicals and hazard communication

• Increasing concerns related to technical barriers to global trade

• Evolution of chemical controls based in part on hazard determination

• Challenging to manage widely different national requirements
  • Expertise/knowledge of different criteria required to determine the classification of a product supplied in Canada, EU, USA, etc.
Life Before GHS

• No consistent nomenclature or definitions to describe hazard properties
  ➢ Definitions dependent on country/regulatory agency

<table>
<thead>
<tr>
<th>EU DSD criteria</th>
<th>Very toxic</th>
<th>Toxic</th>
<th>Harmful</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt; 25</td>
<td>&gt; 25 - 200</td>
<td>&gt; 200 - 2000</td>
</tr>
</tbody>
</table>

Acute Toxicity Classification Criteria (LD50)

<table>
<thead>
<tr>
<th>UN GHS criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category 1</td>
</tr>
<tr>
<td>&lt; 5</td>
</tr>
</tbody>
</table>

• Labels conforming to different standards & various hazard communication phrases
Life before GHS

Material Safety Data Sheets/Safety Data Sheets

• No consistency
  ➢ Canada WHIMS 1988
    MSDS - 9 Sections
    SDS – 16 sections
  ➢ USA OSHA
    MSDS – no format defined (content only prescribed in 1910.100(g)

• Multiple names for hazard communication document
GHS – Purpose

GHS should be judged based on the original UN agreed purpose

<table>
<thead>
<tr>
<th>Purpose of GHS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>To enhance the protection</strong> of human health &amp; the environment by providing an internationally comprehensible system for hazard communication**</td>
</tr>
<tr>
<td><strong>To provide a recognized framework for countries without an existing system</strong></td>
</tr>
<tr>
<td><strong>To facilitate international trade in chemicals whose hazards have been properly assessed and identified on an international basis</strong></td>
</tr>
<tr>
<td><strong>Harmonization: common and coherent basis for chemical classification and communication</strong></td>
</tr>
<tr>
<td><strong>Level of protection should not be reduced as a result of harmonizing classification and labelling systems</strong></td>
</tr>
</tbody>
</table>

- Implementing GHS can present a number of change management challenges!
GHS Development

Conception
• 1992 UN Conference on Environment Development

Gestation
• Harmonization Teams conducted detailed review of existing classification and labelling schemes around the world
• Established harmonized criteria in a voluntary framework

Birth
  ➢ Intended to serve as the initial basis for the global implementation of the system

Development
• Continued growth (changes every 2 years)
• More countries adopting system
GHS Implementation – New Opportunities!

• UN Global Harmonized System – a System not a Standard
  ➢ Defines criteria
  ➢ Flexibility encourages adoption
  ➢ Living system (revised regularly)

• National implementation of GHS - one Size does not fit All
  ✓ Consistent nomenclature (e.g. substances/mixtures)
  ✓ Consistent criteria for defining properties (e.g. Flammable Cat 1)
  ✓ Consistent structure for hazard communication (16 section SDS)
  ✓ Consistent labelling requirements (hazard symbol & label statements)
  ✓ Differences in classification & labelling are inherent in the design of GHS

• Opportunities
  ❑ GHS may not be perfect but has potential
  ❑ Understanding the “System” can aid implementation & living with GHS changes
GHS “Ingredients”

• UN Harmonized Voluntary System

“GHS” provides a Harmonized framework and set of rules for Classification & Labelling of Products

Harmonized “Menu” of Ingredients

<table>
<thead>
<tr>
<th>Hazard Groups</th>
<th>Hazard Classes</th>
<th>Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Hazards</td>
<td>e.g. Flammable liq.</td>
<td>Category 1</td>
</tr>
<tr>
<td>Health Hazards</td>
<td>e.g. acute toxicity</td>
<td>Category 2</td>
</tr>
<tr>
<td>Environmental Hazards</td>
<td>e.g. Hazardous to the ozone layer.</td>
<td>Category 3</td>
</tr>
</tbody>
</table>

GHS Rules for Mixtures

• Test data (for mixture)
• Bridging principles
• Calculation method (e.g. apply M-Factors or SCL)
• Use Low or High threshold for certain health hazards

GHS “Formulation” depends on the “ingredients” adopted by national governments

Use with Care
UN GHS is a System not a Static Standard

UN GHS revisions every two 2 years

• Series of changes to different areas of UN GHS
  • Differences in classification and labelling can result from revisions to GHS

• Countries usually implement the most current version of GHS at the time of adoption.
Countries Adopting Different Editions of GHS

- Global companies need to manage multiple editions of GHS and anticipate countries adopting future editions.
GHS Revisions – rev 5 Changes

Summary of changes in revision 5 (published in 2013)

• Addition of new test method for oxidizing solids

• Clarification of hazard classification criteria
  • skin corrosion/irritation
  • severe eye damage/irritation

• Revised/simplified classification & labelling summary tables

• New codification system for pictograms

• Revised/rationalized Precautionary statements
GHS Revision 6

Summary of changes in revision 6

- **New hazard** class for desensitized explosives
- **New hazard category** for pyrophoric gases
- Miscellaneous provisions intended to **clarify the criteria** for some hazard classes (explosives, specific target organ toxicity following single exposure, aspiration hazard and hazardous to the aquatic environment);
- Additional information to be included in the Safety Data Sheets (section 9);
- Revised and further **rationalized precautionary statements**
- New example in Annex 7 addressing labelling of small packages
GHS Revisions – Potential Opportunities

GHS Change Management

• Encourage national regulatory agencies to accept use of the latest revision of GHS (including new/revised/deleted precautionary statements) taking into account the GHS building blocks and categories implemented into national legislation

• Consider UN Model regulations for GHS
  • Precedent set with model regulations for Transportation
  • “UN Recommendations on the Transport of Dangerous Good – Model Regulations
    (source:http://www.unece.org/trans/danger/publi/unrec/guidingprinciples/guidingprinciplesrev15_e.html)
GHS Revisions – Opportunity

Minimize changes to existing Precautionary statements in revision 5
• Examples (rev 4 versus rev 5)

<table>
<thead>
<tr>
<th>P Statement Code</th>
<th>Revisions 4 Statement</th>
<th>New/Improved Revision 5 Statements</th>
</tr>
</thead>
<tbody>
<tr>
<td>P210</td>
<td>Keep away from heat/sparks/open flames/hot surfaces. No smoking.</td>
<td>Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking</td>
</tr>
<tr>
<td>P420</td>
<td>Store away from other materials</td>
<td>Store separately</td>
</tr>
<tr>
<td>P381</td>
<td>Eliminate all ignition sources if safe to do so.</td>
<td>In case of leakage, remove all ignition sources</td>
</tr>
</tbody>
</table>

• Impacts on Industry of changes to existing P Statements
  ➢ Translation into all relevant languages
  ➢ Impact assessment to identify product SDSs and Label to be revised
  ➢ Management of old and new statements depending on timing for national implementation of revision 5

• Limit changes to P Statements only if modification enhances protection of human health and the environment
GHS National Implementations - Opportunity

• Wording of GHS P statements can change in national regulations

<table>
<thead>
<tr>
<th>GHS P Statement Code</th>
<th>Revisions 5 Statement</th>
<th>USA OSHA P Statements</th>
</tr>
</thead>
<tbody>
<tr>
<td>P272</td>
<td>Contaminated work clothing <em>should</em> not be allowed out of the workplace.</td>
<td>Contaminated work clothing <em>must</em> not be allowed out of the workplace.</td>
</tr>
</tbody>
</table>

**Opportunity**

• Build consensus on new statements to reduce risk of national deviations

• If national reasons to deviate from UN GHS P statements, consider country specific statement

  Example of country specific label statements
  
  ➢ European Union has EU specific label phrases (e.g. EUH66)
GHS SDS Authoring - Opportunity

Training of SDS Authors – opportunity

- Authors trained in UN GHS system
  - Easier transition to authoring national compliant SDS

- Ability to author for GHS countries (especially with smart authoring system) as consistent criteria and common system

- Easier to utilize/interpret classification data from suppliers in other (GHS) countries – no need to translate “EU DSD Toxic” definition for USA substance classification

- Increasing availability of substance data to aid in appropriate GHS classification

http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en
GHS SDS Authoring - Opportunity

Addressing hazard communication in countries w/out national regulations – opportunity

- Alignment of Classification/labelling and SDSs with GHS
  - Decision on building blocks & GHS version often driven by supply chain consideration
  - Positioned to transition to potential future national adoption of GHS

- Voluntary (industry) adoption of GHS
  - Supports UN GHS purpose and encourages adoption of single system for hazard classification and communication
National Harmonized GHS Classification Lists

Inconsistent substance classifications on national harmonized lists

Example - Differences between National Lists for Stoddard solvent

EU CLP Regulation (Annex VI) – GHS classification

<table>
<thead>
<tr>
<th>Index No</th>
<th>International Chemical Identification</th>
<th>EC No</th>
<th>CAS No</th>
</tr>
</thead>
<tbody>
<tr>
<td>649-245-00-4</td>
<td>Stoddard solvent; Low boiling point naphtha — unspecified; [A colourless, refined petroleum distillate that is free from rancid or objectionable odors and that boils in a range of approximately 148.8 °C to 204.4 °C (300 °F to 400 °F)]</td>
<td>232-480-3</td>
<td>8052-41-3</td>
</tr>
</tbody>
</table>

Classification

<table>
<thead>
<tr>
<th>Hazard Class and Category Code(s)</th>
<th>Pictogram</th>
<th>Signal Word</th>
<th>Hazard statement Code(s)</th>
<th>Suppl. Hazard statement Code(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1 B</td>
<td>H350</td>
<td>Dgy</td>
<td>H350</td>
<td></td>
</tr>
<tr>
<td>Muta. 1B</td>
<td>H340</td>
<td></td>
<td>H340</td>
<td></td>
</tr>
<tr>
<td>STOT RE 1</td>
<td></td>
<td></td>
<td>H372</td>
<td></td>
</tr>
<tr>
<td>Asp. Tox. 1</td>
<td>H304</td>
<td></td>
<td>H304</td>
<td></td>
</tr>
</tbody>
</table>

Notes

Note P:

The classification as a carcinogen or mutagen need not apply if it can be shown that the substance contains less than 0.1 % w/w benzene (EINECS No 200-753-7).

ExxonMobil

- Substance listed as carcinogenic
- No note to explain substance is NOT non-carcinogenic if Benzene less than 0.1%
- Different classification compared to EU (MY does not include STOT RE 1) hazard statement

* STOT RE 1 = Specific Target Organ Toxicity Repeat Exposure Cat 1
Guidance on GHS Classification

Opportunity
• Encourage greater leverage of sector specific guidance rather than
development of more national substance classification lists

Key Requirements for Harmonized Lists
• Transparency (data considered, study quality, etc.)
• Science based classification
• Consensus (reflect input from stakeholders)
• Evergreen (regularly updated based on new
information and/or changes to UN GHS)

National Lists of Classified Substances

<table>
<thead>
<tr>
<th>Country/Region</th>
<th>Reference</th>
<th># Substances</th>
</tr>
</thead>
<tbody>
<tr>
<td>European Union</td>
<td>EU CLP Annex VI</td>
<td>Approximately 5,900</td>
</tr>
<tr>
<td>Serbia (Candidat EU country)</td>
<td>Decree No. 10/2011 (May 5, 2011)</td>
<td>Approximately 5,900</td>
</tr>
<tr>
<td>Australia</td>
<td>Hazardous Substances Information System (HSIS), as amended through September 2014</td>
<td></td>
</tr>
<tr>
<td>Korea</td>
<td>Occupational Safety &amp; Health Agency, December 2011</td>
<td>6,316</td>
</tr>
<tr>
<td>China</td>
<td>AQSIQ No. 2015 00, August 19, 2015</td>
<td>Approximately 3,000</td>
</tr>
<tr>
<td>Japan</td>
<td>JISII GHS (Classification list updated through March 27, 2008)</td>
<td>370</td>
</tr>
<tr>
<td>Malaysia</td>
<td>Industry Code of Practice on Chemical Classification and Hazard Communication 2014, Part 1, 2014</td>
<td>233</td>
</tr>
<tr>
<td>Taiwan</td>
<td>Council of Labor Affairs, CHEH Documents, June 2014</td>
<td>Approximately 3,200</td>
</tr>
<tr>
<td>Quebec (Canada)</td>
<td>Guidelines WHMIS 2015 Classifications (GSTR/KM) (April 27, 2015)</td>
<td>Approximately 2,100</td>
</tr>
</tbody>
</table>

http://www.unece.org/trans/danger/publi/ghs/guidance.html

UN evaluating practicability of a UN harmonized classification list
Harmonized System ≠ Harmonized Label

• National implementation of GHS system gives rise to different labels depending on the country

• Classification/Labelling dependent on:
  ✓ Hazard Group(s) & Classes
  ✓ Categories adopted
  ✓ Version (edition) of GHS
  ✓ National (mandatory) Substance Classification List
  ✓ Country specific requirements e.g. European Union “EUH” statements
  ✓ National Language
GHS is a Journey

Summary
• GHS is a global system that by design allows national flexibility and can result in differences in how products are classified/labelled
• Understanding of the variables associated with national adoption of GHS brings opportunities
• Harmonized substance classification lists should be transparent, based on consensus & kept evergreen

Product Name: **Opportunities via understanding**

**Hazard Statements:**
H901: *Not all countries adopt the same edition of GHS.*
H902: *Classification depends on Hazard Classes & Categories adopted.*
H903: *Classification of mixtures also depends on whether high or low thresholds adopted*

**Precautionary Statements:**
P801: *Substances having the same CAS# can have different classifications due to different properties, impurities, constituents, etc.*
P802: *National GHS Classification lists should be based on sound science.*

**Supplier:** UNECE Inc.