

# GHS Overview – UN GHS and Country Implementation Overviews

Jytte Syska, 3E Company



# What is the GHS?



- Globally Harmonized System of Classification and Labelling of Chemicals
- A common and coherent United Nations approach to defining and classifying intrinsic hazards of chemical substances and mixtures, and conveying information about those hazards on labels and Safety Data Sheets (SDS)
- Criteria for hazard classification and hazard communication (Labels and SDSs) are harmonized and standardized.
- One system for workers, consumers, transport workers, and emergency responders.
- Provides the underlying infrastructure for establishment of national, comprehensive chemical safety programs.

# What is the GHS?



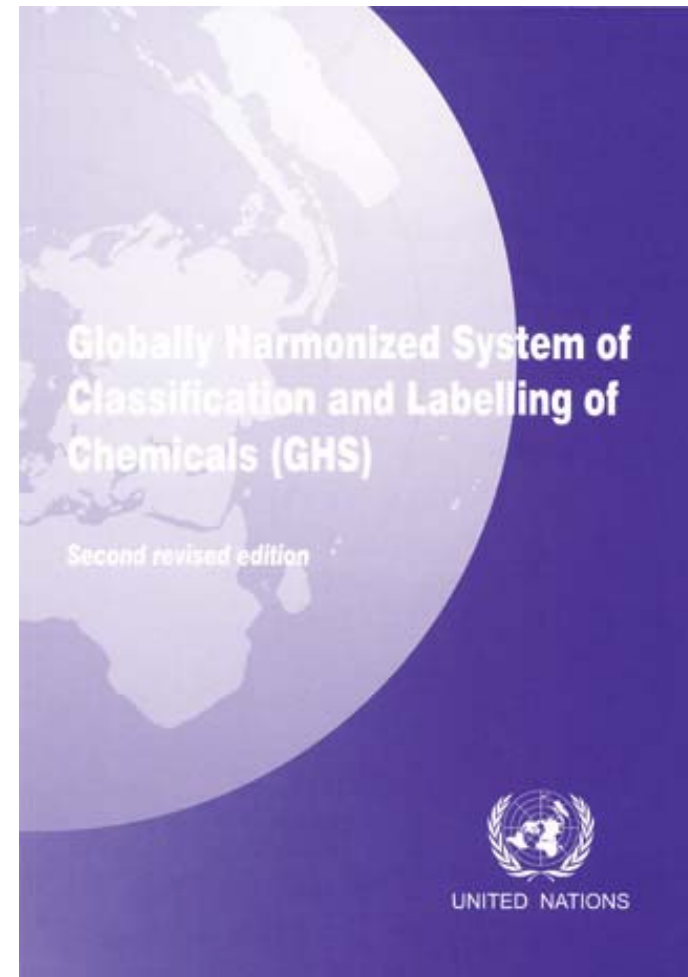
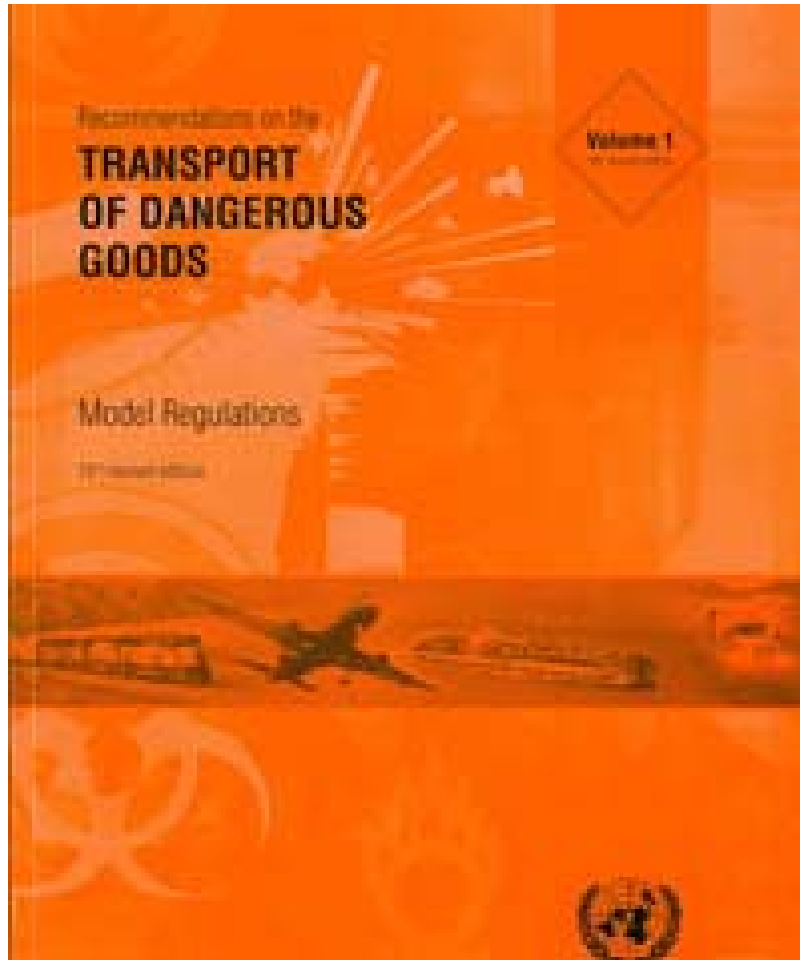
- UN GHS is not legally binding but is to be implemented by countries/regions
- Building block approach: countries and systems take what is required, choosing how to match their current level of protection
  - Different target audiences may have different blocks
- GHS will increase harmonisation but we will not see complete harmonisation

# What is the GHS?



- Note: The GHS is NOT the same as the Harmonised Tariff Schedule
- Harmonised Tariff schedule:
  - 2901 Acyclic hydrocarbons:
    - 2901.1 Saturated:
      - 2901.10 10 00 Ethane and butane
- GHS classification:
  - Flammable Gas 1;
  - Pressurised Gas;
  - Carcinogen 1A;
  - Mutagen 1B;

# The UN Purple Book:



# The UN Purple Book:



- The UN Committee of Experts for the Transport of Dangerous Goods and the Globally Harmonised System of Classification and Labeling of Chemicals formally adopted the GHS in December 2002.
- The GHS/UN document is a living document and is updated every 2 years
  - First edition was published in 2003
  - First revision published in 2005
  - Second revision in July 2007
  - Third revision will be published in 2009

National implementations to stay aligned with revisions

# UN GHS structure



## Classification:

- Hazard classes & Hazard categories

# UN GHS structure



UN Class	UN Categories
EXPLOSIVES	Unstable explosive and Division 1.1 - 1.6
FLAMMABLE GASES	Category 1 - 2
FLAMMABLE AEROSOLS	Category 1 - 2
OXIDIZING GASES	Category 1
GASES UNDER PRESSURE	Compressed gas; Liquefied gas; Refrigerated liquefied gas; Dissolved gas
FLAMMABLE LIQUIDS	Category 1 - 4
FLAMMABLE SOLIDS	Category 1 - 2
SELF-REACTIVE SUBSTANCES	Type A - G
PYROPHORIC LIQUIDS	Category 1
PYROPHORIC SOLIDS	Category 1
SELF-HEATING SUBSTANCES	Category 1 - 2
SUBSTANCES, WHICH IN CONTACT WITH WATER, EMIT FLAMMABLE GASES	Category 1 - 3
OXIDIZING LIQUIDS	Category 1 - 3
OXIDIZING SOLIDS	Category 1 - 3
ORGANIC PEROXIDES	Type A - G
CORROSIVE TO METALS	Category 1
ACUTE TOXICITY	Category 1 - 5
SKIN CORROSION / IRRITATION	Category 1 (incl. A, B and C) - 3
SERIOUS EYE DAMAGE / EYE IRRITATION	Category 1, 2A, 2B
RESPIRATORY SENSITIZATION	Category 1
SKIN SENSITIZATION	Category 1
GENOTOXICITY	Category 1A, 1B, 2
CARCINOGENICITY	Category 1A, 1B, 2
TOXIC TO REPRODUCTION	Category 1A, 1B, 2, EFFECTS ON OR VIA LACTATION
SPECIFIC TARGET ORGAN SYSTEMIC TOXICITY (SINGLE EXPOSURE)	Category 1 - 3
SPECIFIC TARGET ORGAN SYSTEMIC TOXICITY (REPEATED EXPOSURE)	Category 1 - 2
ASPIRATION HAZARD	Category 1 - 2
AQUATIC TOXICITY (ACUTE)	Category 1 - 3
AQUATIC TOXICITY (CHRONIC)	Category 1 - 4
HAZARDOUS TO THE OZONE LAYER	Category 1

Classification:

• Hazard classes & Hazard categories

Label

MSDS: 16 sections

# Tiered Approach - to Mixture Classification



Use test data for the mixture, when available



Use “bridging” principles, if applicable

- Dilution
- Batching
- Concentration of Highly Toxic Mixtures
- Interpolation within One Toxic Category
- Substantially Similar Mixtures



Estimate (calculate) hazard(s) based on the known ingredient information

# GHS Calculation Types



## Health and Environment

End Point	Calculation Type		
	Simple Threshold	Proportional Equation	Summation Methods
Acute Toxicity		√	
Skin Corrosion/Irritation	√ <sup>1</sup>		√
Serious Eye Damage/Irritation	√ <sup>1</sup>		√
Sensitization	√		
Mutagenicity	√		
Carcinogenicity	√		
Reproductive Toxicity	√		
Target Organ Toxicity			√
Aspiration			√ <sup>2</sup>
Environmental <ul style="list-style-type: none"> <li>• Acute Additivity Method</li> <li>• Acute Summation Method</li> <li>• Chronic Summation Method</li> </ul>		√	√ √

1. Only if Additivity does not apply
2. In conjunction with the viscosity of the mixture

# Hazard communication - labels












Label includes:

1. Supplier identification
2. Product identifiers
3. Substance names of substances contributing to the classification of the mixture as regards
  - i. Acute toxicity,
  - ii. Skin corrosion or serious eye damage
  - iii. CMR
  - iv. Respiratory or skin sensitisation
  - v. Specific target organ toxicity
  - vi. (Aspiration hazard)

# Label includes (cont'd)

4. Hazard pictograms
5. Signal word
  - i. Danger
  - ii. Warning
6. Hazard (H) statements
7. Precautionary (P) statements

								
Expl. bomb	Flame	Flame over circle	Gas cylinder	Corrosion	Skull & crossbone	Exclamation mark	Health hazard	Environment

# Safety Data Sheet



- 16 section SDS
- Section 2 includes the GHS classification as well as the GHS label elements
- [GHS SDS sample](#)
- [GHS SDS label](#)

HS Welcome -

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

Edit View Favorites Tools Help

ECHA Website - Events GHS Welcome http://www.hmac.org/... Googles billedresultat f...

**UNECE** United Nations Economic Commission for Europe

Search [Site map](#)

Home About UNECE **Programmes** Information Meetings Contact Us

**Transport Division**

**Dangerous Goods**

**GHS**

**Historical background**

**GHS presentations**

**GHS pictograms**

**GHS activities**

**GHS implementation**

**GHS Sub-Committee:**

**Mandate**

**Agendas, reports, documents**

**GHS official text and corrigenda:**

**GHS (Rev.2) (2007)**

**Amend. to Rev.1**

**GHS (Rev.1) (2005)**

**Amend. to the 1st edition**

**GHS 1st edition (2003)**

**Related publications**

**Globally Harmonized System of Classification and Labelling of Chemicals (GHS)**

[French](#)

Chemicals, through the different steps from their production to their handling, transport and use, are a real danger for human health and the environment. People of any ages, from children to elderly, using many different languages and alphabets, belonging to various social conditions, including illiterates, are daily confronted to dangerous products (chemicals, pesticides, etc.)

To face this danger, and given the reality of the extensive global trade in chemicals and the need to develop national programs to ensure their safe use, transport and disposal, it was recognized that an internationally-harmonized approach to classification and labelling would provide the foundation for such programs. Once countries have consistent and appropriate information on the chemicals they import or produce in their own countries, the infrastructure to control chemical exposures and protect people and the environment can be established in a comprehensive manner.

The new system, which was called "Globally Harmonized System of Classification and Labelling of Chemicals (GHS)", addresses classification of chemicals by types of hazard and proposes harmonized hazard communication elements, including labels and safety data sheets. It aims at ensuring that information on physical hazards and toxicity from chemicals be available in order to enhance the protection of human health and the environment during the handling, transport and use of these chemicals. The GHS also provides a basis for harmonization of rules and regulations on chemicals at national, regional and worldwide level, an important factor also for trade facilitation.

The first edition of the GHS, which was intended to serve as the initial basis for the global implementation of the system, was approved by the Committee of Experts at its first session (11-13 December 2002) and published in 2003. The first revised edition of the GHS ([GHS Rev.1](#)) was published in 2005 and included the [amendments to the first edition](#) adopted by the Committee of Experts at its second session (10 December 2004). At its third session (14 December 2006), the Committee of Experts adopted a set of [amendments to the first revised edition of the GHS](#), which are included in the [second revised edition of the GHS](#) (published in July 2007).

While governments, regional institutions and international organizations are the primary audiences for the GHS, it also contains sufficient context and guidance for those in industry who will ultimately be implementing the requirements which have been adopted.

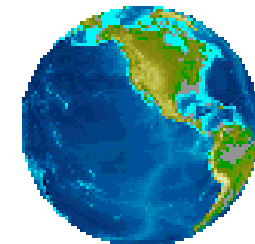
The Plan of Implementation of the World Summit on Sustainable Development (WSSD), adopted in Johannesburg in 2002, encourages countries to implement the GHS as soon as possible with a view to having the system fully operational by 2008.

Information about the **status of implementation of the GHS** by country is available (in English only) in the page following the link

Internet 100%

# Global Implementation of the GHS - Status Update

Jytte Syska, 3E Company



# Countries with implementation



New Zealand



Japan



Taiwan



China



Russia



EU



South Korea



Singapore



Vietnam

# New Zealand



- GHS classification criteria implemented by the Hazardous Substances & New Organisms Act in July 2001
- HSNO Approved Code of Practice for Preparation of Safety Data Sheets (HSNO CoP 8-1 09-06)
- HSNO Approved Code of Practice for Labeling of Hazardous Substances (HSNO CoP 10-1 08-07)
- NZ classifications have some additions to and deviations from UN GHS
- Correlation table between UN GHS to New Zealand GHS
- GHS labels
  - From July 2008 for chemicals that fall under a Group Standard
  - But labels in accordance with overseas jurisdictions (Europe, Australia, USA or Canada) are accepted until end of 2010

# Japan



- GHS label (article 57-1) and GHS MSDS (article 57-2) required by the Industrial Safety and Health law as of December 1, 2006
- Japan Industrial Standard (JIS) Z 7251:2006 - Labeling of Chemicals based on GHS
- Japan Industrial Standard (JIS) Z 7250:2005 – Material Safety Data Sheets for Chemical Products
  - All UN hazard categories are applied in Japan under ISHL
  - Under revision
- Applies to listed substances
  - 640 listed for MSDS (specific cut off values)
  - 99 listed for labels (specific cut off values)
- Advisory list with GHS classifications published by NITE (National Institute of Technology and Evaluation)
- GHS requirements not yet implemented by Regulations other than ISHL but GHS classification is recommended in general

# Taiwan



- Two regulations:
  - Regulation of Labeling and Hazard Communication of Dangerous and Harmful Substances (effective on December 31, 2008) (“CLA Regulation”)
    - CLA Regulation does not have Environmental Hazard Categories
  - Management Measures on Toxic Substances Labeling and Material Safety Data Sheet (EPA No. 0960095329) (Effective Date: December 31, 2008) (“EPA Regulation”)
    - EPA Regulation has Environmental Hazard Categories
- Taiwan National Standard, CNS 15030: Classification and Labeling of Chemicals (based on GHS (Rev.1)(2005)).
- MSDSs and labels are required for (1<sup>st</sup> implementation phase)
  - the 1,062 substances specified by the CLA (Council of Labour Affairs) and for products containing these
  - the 258 toxic chemicals listed by EPA
  - Voluntary compliance is welcomed

# China



MSDSs and Precautionary Labels are required by Decree No 423 of Ministry of Labor of Dec 20, 1996, and effective 1997, Jan.1.

- The requirements applies to mixtures or substances listed in GB 13690-1992.
- Manufactures, users, transporters etc. must provide SDS and Label.
- GB 13690 is under revision with expected entry into force July 1, 2009

Classification:

- GB20576-2006 to GB20602-2006 - translation of UN Purple book
- Published October 2006, in force Jan 1, 2008.
- Currently under revision to include the 2007 changes to the UN Purple Book

# China (cont'd)



## SDSs:

- GB /T 16483-2008
- Issued: June 6, 2008
- Implementation: Feb. 1, 2009

## Labels:

- 1) GB/T 22234-2008
  - Effective from Feb. 1, 2009.
  - Equivalent to the Japanese JIS Z 7251:2006
- 2) Draft GB 15258-xxxx
  - Will replace: GB 15258-1999 (General Rules for Preparation of Precautionary Label for Chemicals)
  - Proposed date of entry into force: July 1, 2009
  - Transition period will be 1 year from the effective date

# Korea



## Ministry of Labor:

- Industrial Safety and Health Law
- Pure substances: July 1, 2010; Mixtures: July 1, 2013
- KOSHA has published advisory list with GHS classifications

## Ministry of Environment:

- Ministerial Decree of Toxic Chemical Control Law
- The revision of the toxic chemicals classification list has not yet been published.
- Effective July 2008 with transitional period: Single toxic chemical (June 30, 2011); Mixtures of toxic chemicals (June 30, 2013)

The two ministries are working to better coordinate their implementations

- Different hazard categories adopted by each Ministry
- Different timelines for implementation

# Singapore



MSDSs and labels are required by the Workplace Safety and Health Regulation (2006) section 42 and 43.

Singapore Standard SS 586:2008:

- Revision of SS 286:1984 (Caution Labeling for Hazardous Substances) and CP 98:2003 (Preparation of Material Safety Data Sheets (MSDS))
- Not all hazards categories are not adopted:
- Transitional period:
  - Manufacturers and suppliers
  - Single substances: by the end of 2010
  - Mixtures: by the end of 2012

# Vietnam



GHS is implemented in the Vietnam Chemical Law by Decree No. 108/2008/ND-CP of October 7, 2008

Follows and refers to the UN GHS classifications

Implements all UN hazard categories

# Russia



Russian GOST standard 30333-2007 is based on GHS:

- Classification
- Labels
- SDSs

Adopted by

- Russia,
- Kazakhstan,
- Azerbaijan,
- Byelorussia,
- Kirghizia,
- Moldova,
- Tadjikistan,
- Uzbekistan

In force January 2009

# Other countries to watch



- Switzerland
- Australia
- Malaysia
- South Africa
- Thailand
- Philippines

# GHS around the globe



- Companies with global supply and trade of their chemicals will benefit from the national implementations of the GHS system because the basic principles for classification of the chemicals will be harmonised.
  - Some of the countries make a [partial implementation of GHS](#)
  - Some have national lists of GHS classifications, some are mandatory to follow
  - Some have kept part of their previous classification and labeling requirements
  - Countries do not implement revisions to the UN Purple book at the same time
- Companies have to decide how to meet these different requirements where the GHS classification and the labeling of a chemical substance or mixture may vary from country to country

Thank you for your attention!

Jytte Syska

3E Company Europe

Email: [jsyska@3ecompany.com](mailto:jsyska@3ecompany.com)

Phone: +45 70 22 81 70

Cell: +45 21 64 25 26