Introduction to the Globally Harmonized System of Classification and Labelling of Chemicals (GHS)

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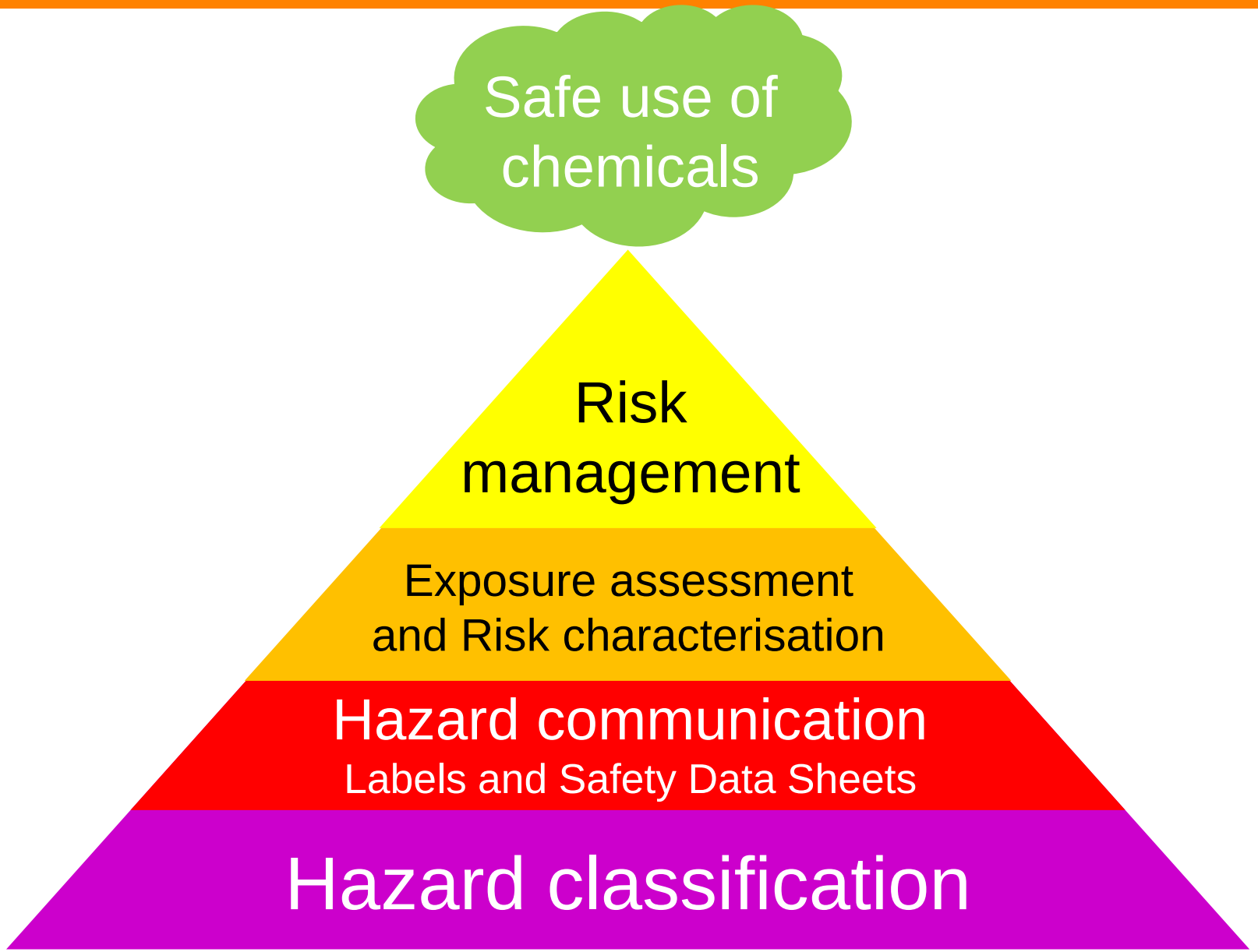
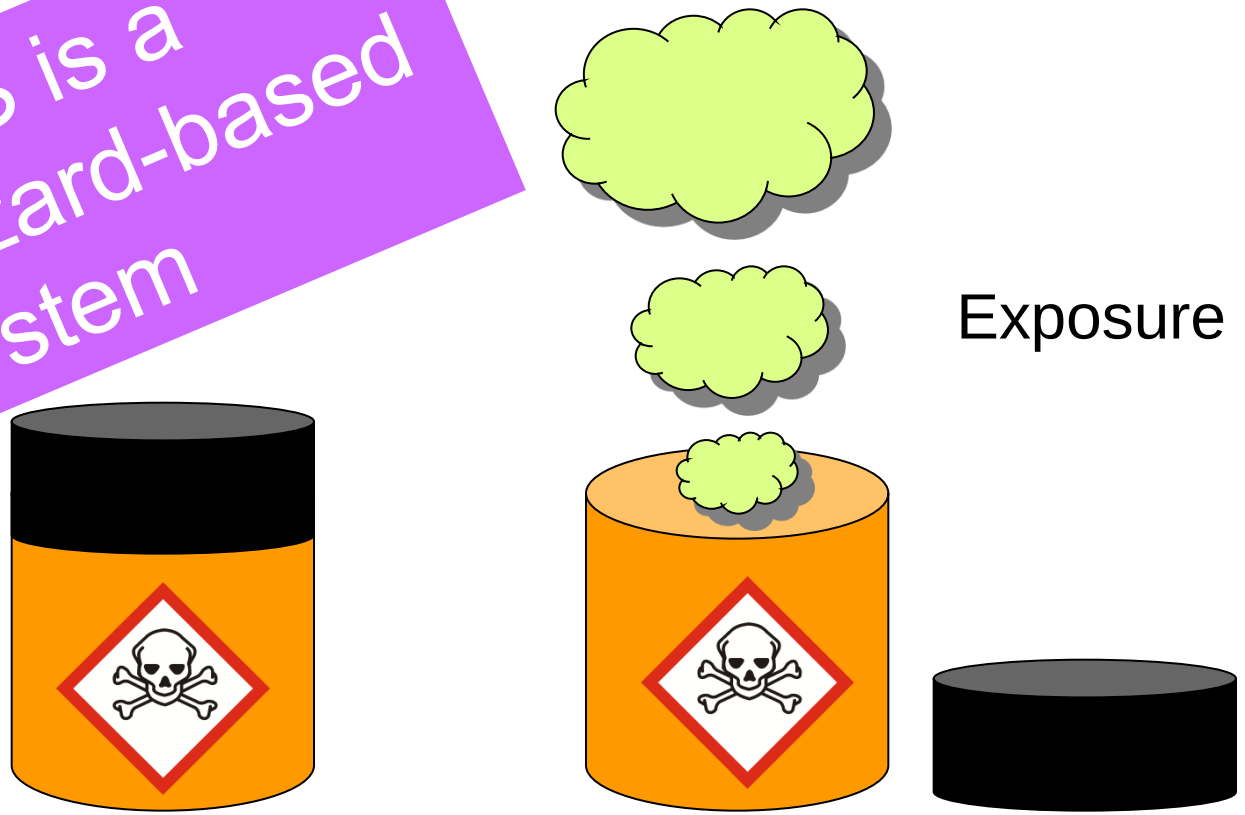

Safe use of chemicals
Risk management
Exposure assessment and Risk characterisation
Hazard communication
Labels and Safety Data Sheets
Hazard classification

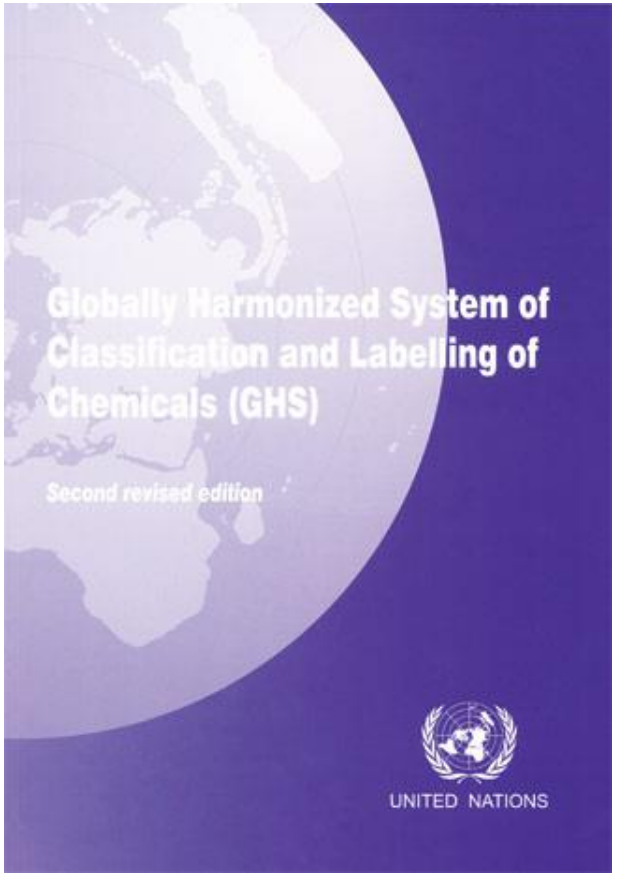
Hazard and Risk

GHS is a hazard-based system



Exposure

”Purple Book”



The Globally Harmonized Systems of Classification and Labelling of Chemicals (GHS)

5th revised edition adopted December 2012

➔6th revised edition to be adopted December 2014

Available in English, French, Spanish, Russian, Chinese, Arabic

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

”Chemicals”

- **Substance:** Chemical elements and their compounds in the natural state or obtained by any production process, including any additive necessary to preserve the stability of the product and any impurities deriving from the process used, but excluding any solvent which may be separated without affecting the stability of the substance or changing its composition.

- **Mixture:** Mixtures or solutions composed of two or more substances in which they do not react.

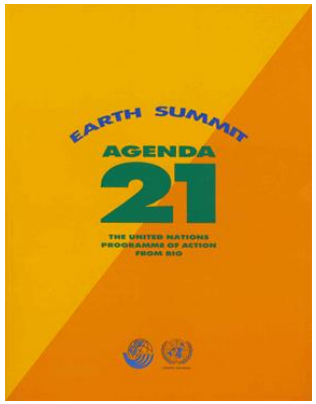
- **Alloy:** An alloy is a metallic material, homogenous on a macroscopic scale, consisting of two or more elements so combined that they cannot be readily separated by mechanical means. Alloys are considered to be mixtures for the purpose of classification under the GHS.

Purpose of the GHS

- Enhance the protection of human health and the environment by providing an internationally comprehensible system for hazard communication;
- Provide a legal framework for countries without an existing system;
- Reduce the need for testing and evaluation of chemicals;
- Facilitate international trade in chemicals whose hazard have been properly assessed and identified on an international basis

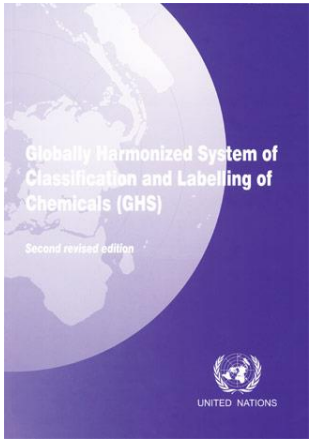
The origin of GHS - milestones

- **June 1992**
  The mandate to create a globally harmonized hazard classification and labelling system was adopted at the *UN Conference on Environment and Development.*



- **October 1999**
  The *UN Sub-Committee of Experts on the Globally Harmonized System* (GHS) was formed.

- **September 2002**
  The *World Summit on Sustainable Development* in Johannesburg encouraged countries to implement the GHS by 2008.



- **December 2002**
  The first edition of the ”Purple Book” was adopted.

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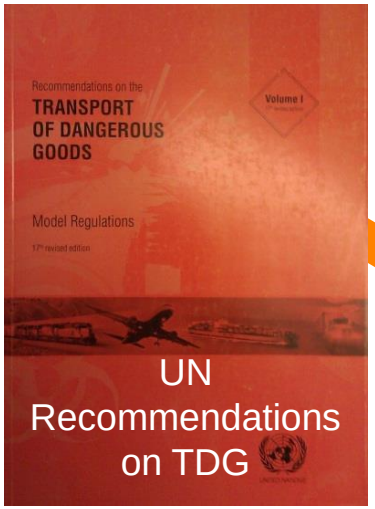
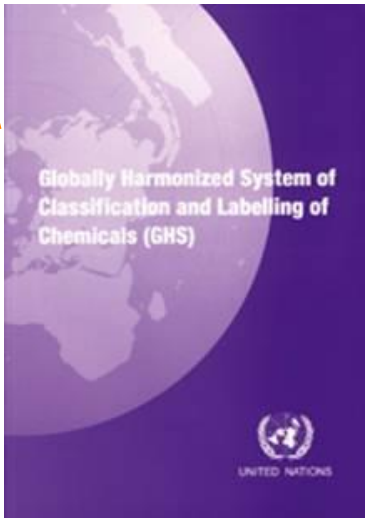
Key inputs for the development of the GHS

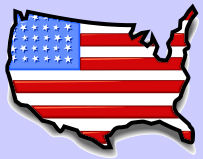


UN Recommendations on TDG



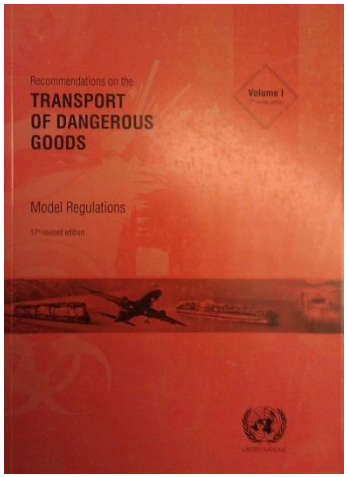
Canadian requirements for workplace, consumers and pesticides

EU directives for dangerous substances and preparations



US requirements for workplace, consumers and pesticides

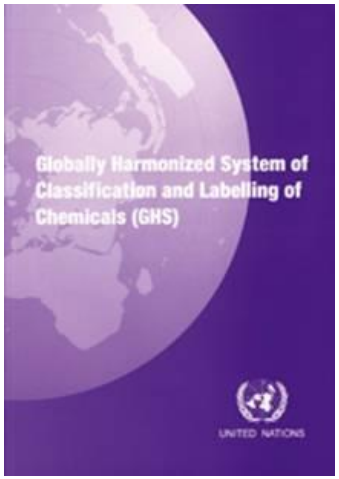
The UN biannual cycle



New edition every other year.

The Committee of Experts meets every other year

UNCETDGGHS



New edition every other year.

Suggestions for amendments.

UNSCETDG

UNSCEGHS

The Sub-Committees of Experts meet back-to-back twice a year.

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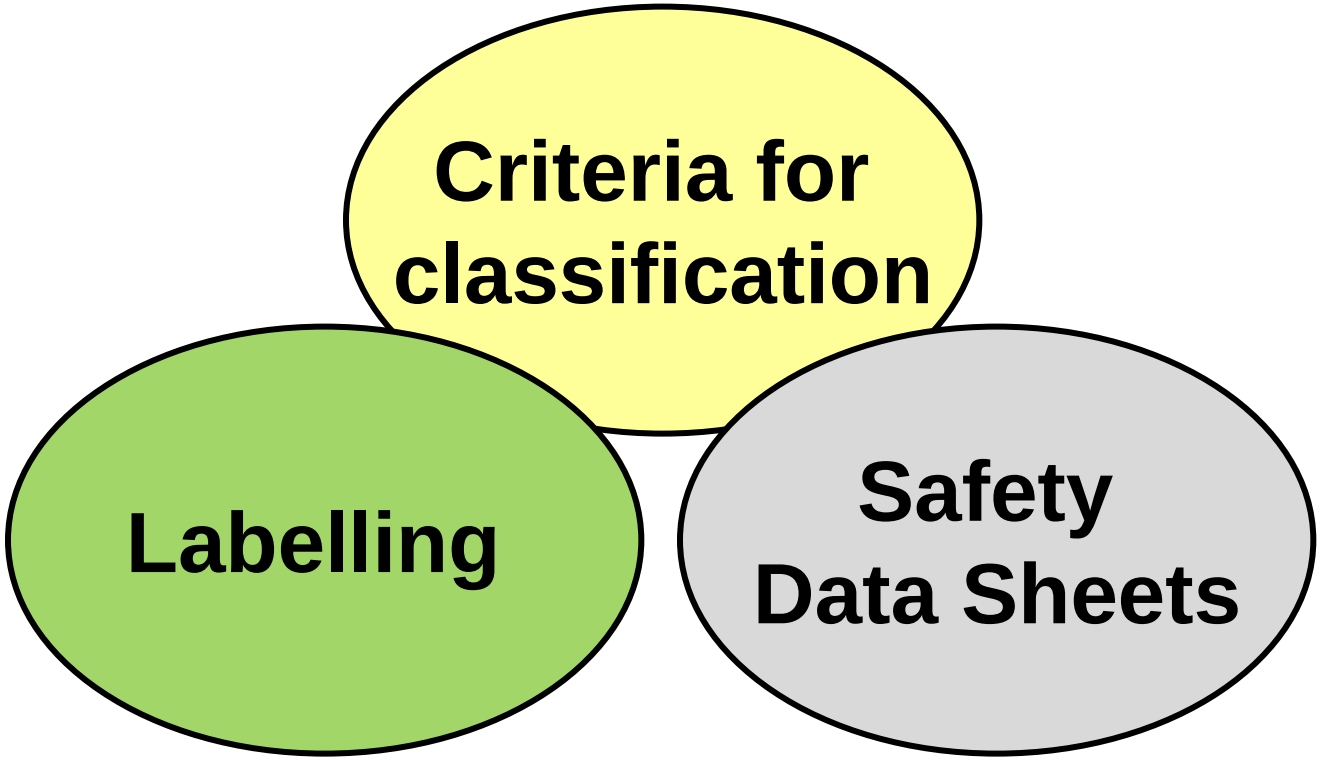
Elements of the GHS

Hazard assessment



Hazard communication

Hazard assessment and communication

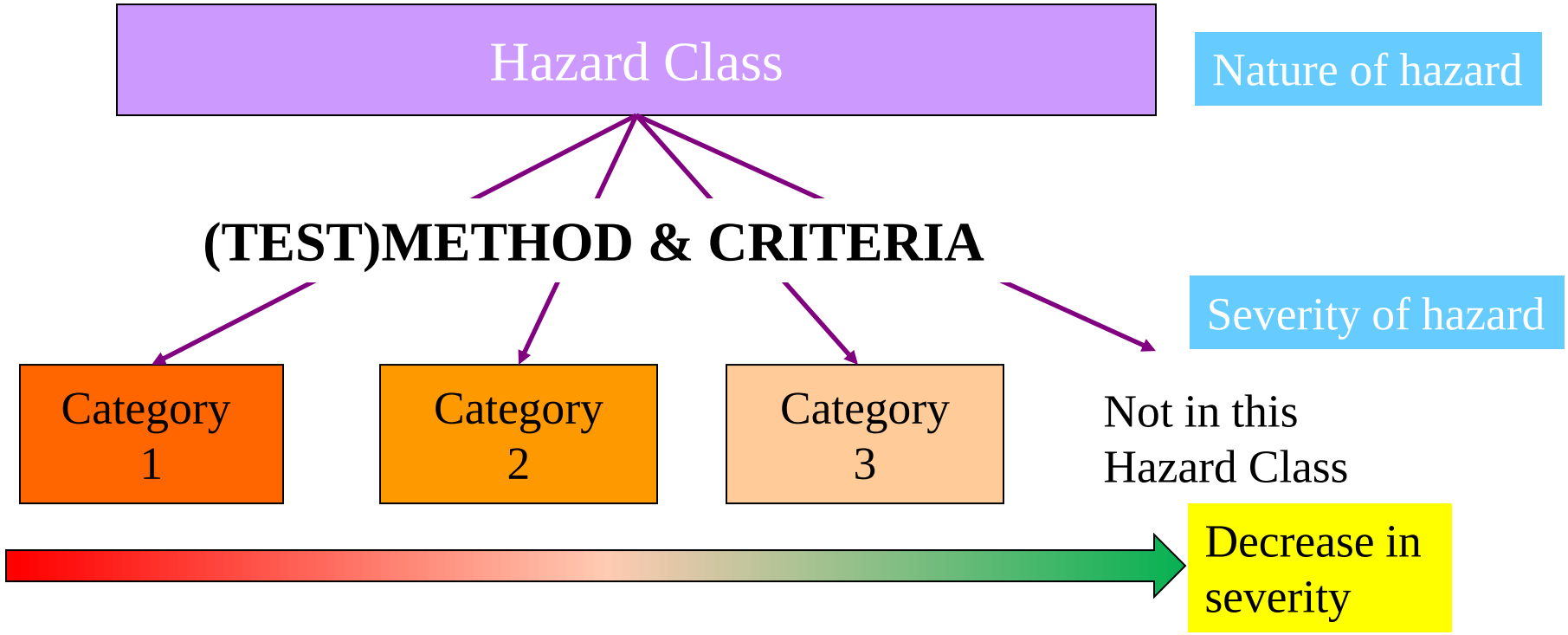
Need to know:

- ✓ The nature of the hazard (toxic, flammable etc)
- ✓ The severity of the hazard (e.g. irritant ➔ corrosive)

Need to communicate the hazard:

- ✓ Clear
- ✓ Comprehensive
- ✓ Easily understood

Hazard classification



Physical hazards

Hazard Class	Hazard Category						
Explosives	Unstable	Div1.1	Div 1.2	Div 1.3	Div 1.4	Div 1.5	Div 1.6
Flammable Gases	1	2	A	B			
Aerosols	1	2	3				
Oxidising Gases	1						
Gases under pressure	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 Solids	1						
Self Heating Chemicals	1	2					
Water Reactive - emits Flammable Gases	1	2	3				
Oxidising Liquids	1	2	3				
Oxidising Solids	1	2	3				
Organic Peroxides	Type A	Type B	Type C	Type D	Type E	Type F	Type G
Corrosive to Metals	1						

Health hazards

Hazard Class	Hazard Category					
Acute Toxicity						
Oral	1	2	3	4	5	
Dermal	1	2	3	4	5	
Inhalation	1	2	3	4	5	
Skin Corrosion/Irritation	Corrosive			Irritant		
	1A	1B	1C	2	3	
Serious Eye Damage/Irritation	1			2A	2B	
Sensitization						
Respiratory	1A	1B				
Skin	1A	1B				
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 hazard	1	2				

Environmental hazards

Hazard Class	Hazard Category
	Not normally used when considering packaged goods, (but for transport of bulk quantities).
Hazardous to the aquatic environment	
Short-term (Acute) hazard	**Acute 1** | **Acute 2** | **Acute3**
Long-term (Chronic) hazard	**Chronic 1** | **Chronic 2** | **Chronic 3** + **Chronic 4**
Hazardous to the ozone layer	**1**

Three steps in classification

1. **Identify** relevant data regarding the hazards of a chemical (substance or mixture);
2. **Review** the data to ascertain the hazards associated with the chemical; and
3. **Decide** if the chemical should be classified as hazardous and, where appropriate, the degree of hazard by comparison of the data with the hazard classification criteria.

Classification of substances

- **Data** generated in accordance with **test methods** (e.g. OECD TG, UN Manual for TDG);
  - *Test data is required to assess physical hazard*
- **Epidemiological data and experience** on the effects on humans, such as occupational data and data from accident databases;
- **Other information** (to fill data gaps) including Read across, Grouping of chemicals and **SAR/QSAR** ((Quantitative) Structure Activity Relationship)

Classification of mixtures

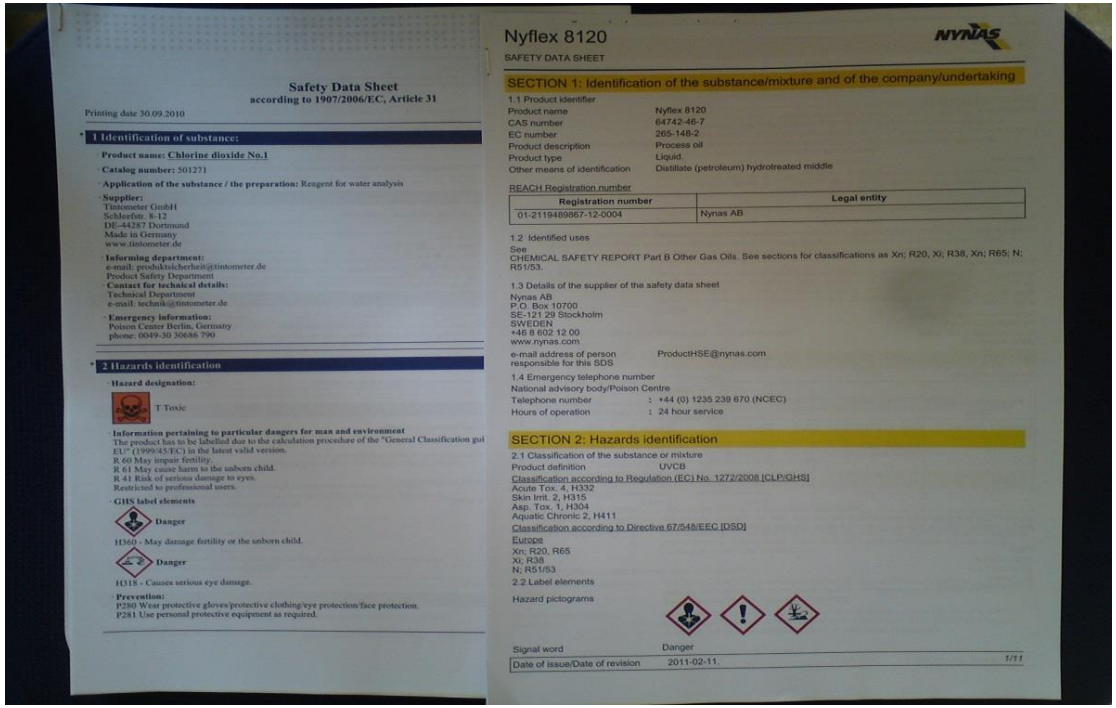
Tiered approach:

- Classification derived using data on the mixture and applying the classification criteria;
  - ➢ *Mandatory for physical hazards*
- Classification based on the application of bridging principles*;
- Classification based on the classification of the ingredient substances* through
  - calculation
  - concentration thresholds.

*not applicable for physical hazards

Hazard communication

Package labelling



Safety Data Sheets

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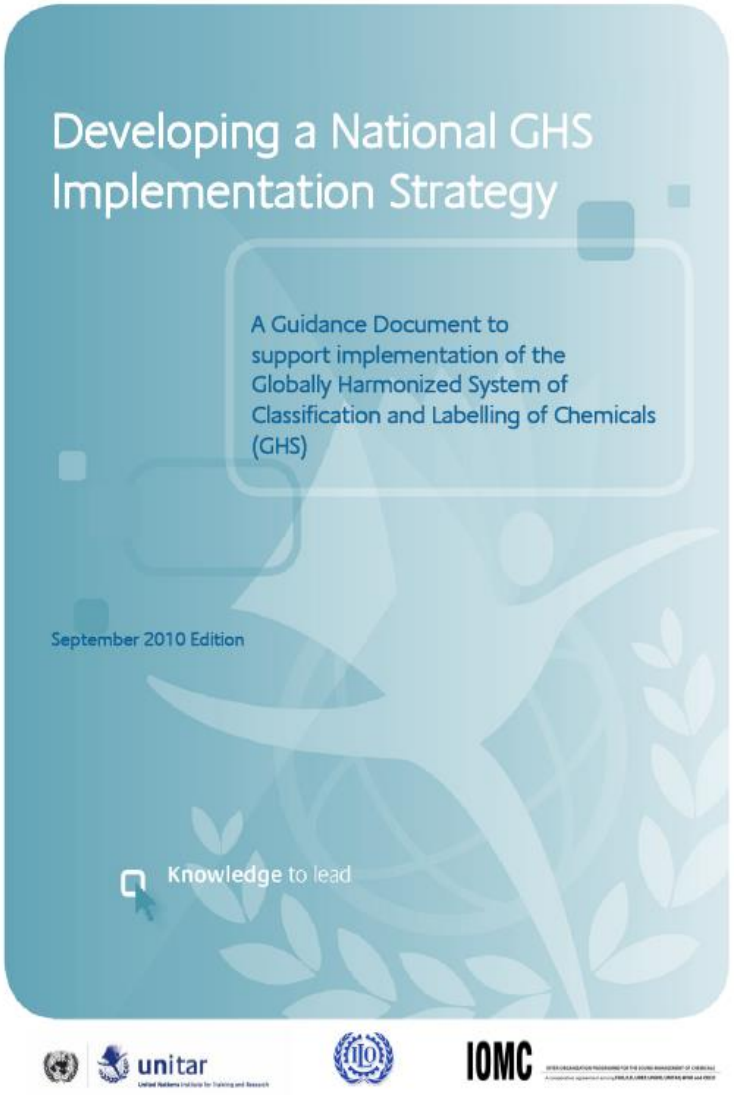
Labelling elements

Pictogram	
Signal word	Danger Warning
Hazard statement	H###
Precautionary statement	P###

Considerations when implementing the GHS



- Industrial development
  - Non-chemical producing country
  - Major chemical production country
- Basic infrastructure
  - Legislation
  - Enforcement
  - Institutional capacity
- Sectorial capacity
  - Industrial workplace
  - Agriculture
  - Transport sector
  - Consumer sector
- Actor-specific considerations
  - Government
  - Business and industry
  - Civil society

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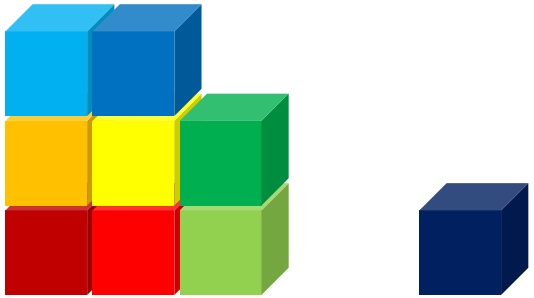
The Building Block Approach

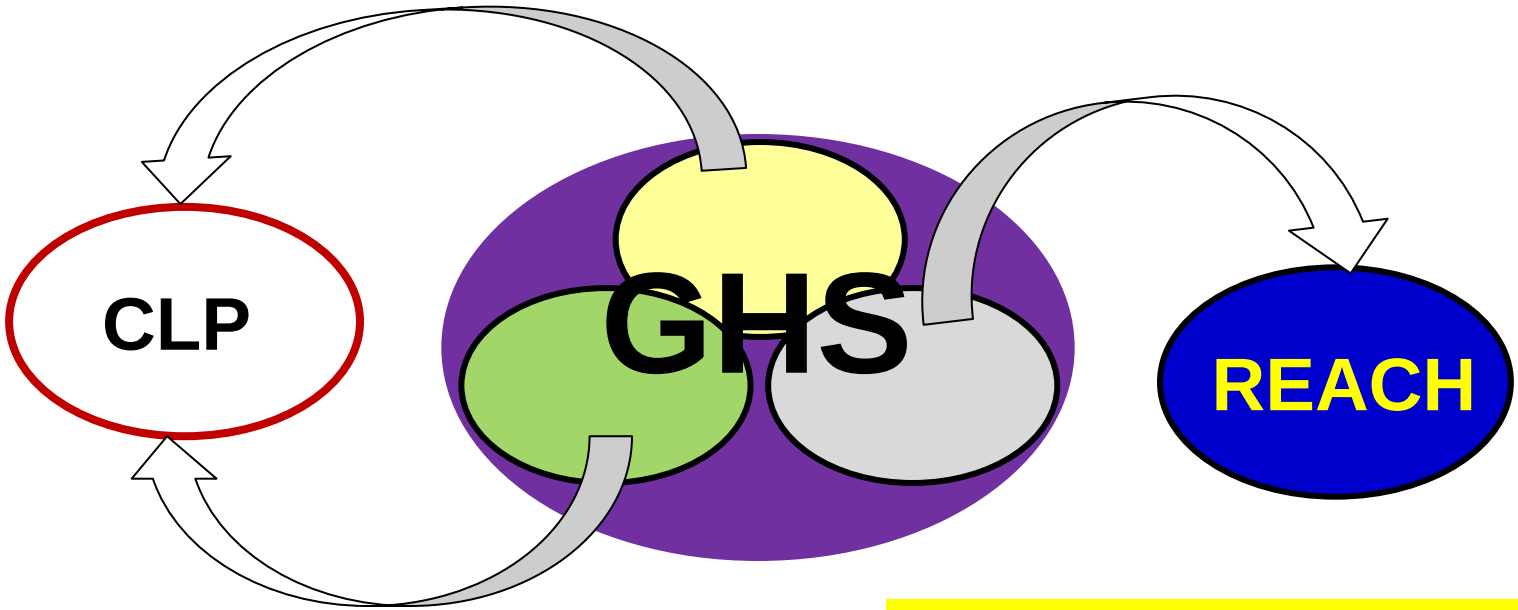


Adoption:

- *In full* with additions as appropriate *not to reduce* protection of human health and the environment compared with existing systems currently in place

- *In parts* in order to minimize changes to existing systems

GHS in EU



CLP: Regulation 1272/2008 on the Classification, Labelling and Packaging of Substances and Mixtures

REACH: Regulation 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals

Physical hazards: CLP

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Corrosive to Metals	1						

Health hazards: CLP

Hazard Class	Hazard Category
Acute Toxicity	
Oral	1 2 3 4 5
Dermal	1 2 3 4 5
Inhalation	1 2 3 4 5
Skin Corrosion/Irritation	Corrosive: 1A 1B 1C; Irritant: 2 3
Serious Eye Damage/Irritation	1 2
Sensitization	
Respiratory	1A 1B
Skin	1A 1B
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 hazard	1 2

Environmental hazards: CLP

Hazard Class	Hazard Category
	Not normally used when considering packaged goods, (but for transport of bulk quantities).
Hazardous to the aquatic environment	
Short-term (Acute) hazard	**Acute 1** / **Acute 2** / **Acute3**
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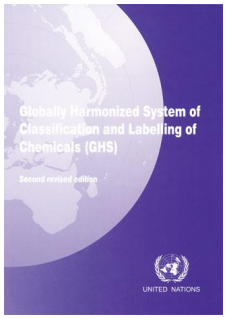
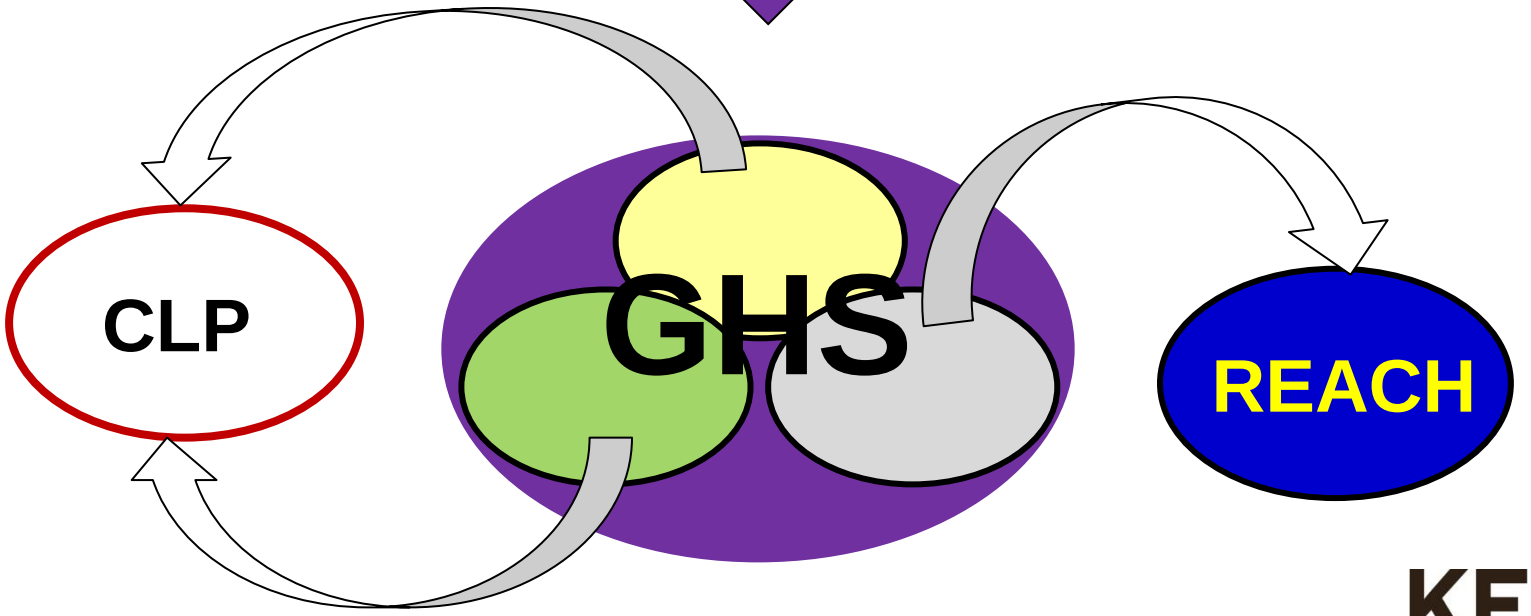
Hazardous to the ozone layer	**1**

Updating CLP

Biannual revision





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EU-harmonised and legally binding classification and labelling

- Shall normally be done for all effects/hazard classes of active substances in:
  - plant protection products
  - biocidal products.
- Shall for other substances normally be done for substances that may be
  - Carcinogenic, Mutagenic or Toxic for Reproduction (CMR);
  - Respiratory sensitisers

  ➢ Other effects may be considered on a case-by-case basis

CLP annex VI

Table 3.1 (GHS-format)

Index No	Intern. Chemical Identific.	EG No	Cas No	Classification Hazard Class and Category code(s)	Haz. Statem. Code(s)	Labelling Hazard pictogram, Signal word code(s)	Hazard Statement code(s)
603-004-00-6	n-butanol	200-751-6	71-36-3	Flam. Liq. 3 Acute Tox. 4 (*) STOT SE 3 Skin Irrit. 2 Eye Dam. 1 STOT SE 3	H226 H302 H335 H315 H318 H336	GHS02 GHS05 GHS07 Dgr	H226 H302 H335 H315 H318 H336

Danger

Causes serious eye damage

Classification and labelling inventory

- A data base of all C&L information submitted to ECHA (notifications, registrations) + CLP Annex VI
  - 5.7 Million notifications for over 120,000 substances
  - About 25% of which have diverging classifications

- Available at www.echa.eu

Resources on the web: GHS

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

UN SCEGHS webpage (GHS text (in EN, FR, ES, RU, ARA, CHI), meeting agendas, documents, reports, guidance etc)

http://www2.unitar.org/cwm/ghs_partnership/index.htm

UNITAR: WSSD Global Partnership for Capacity Building to Implement the GHS

http://www2.unitar.org/cwm/publications/cw/ghs/GHS_Companion_Guide_final_June2010.pdf

UNITAR: Understanding the GHS: A Companion Guide to the Purple Book

http://www2.unitar.org/cwm/publications/cw/ghs/GHS_GD_September2010.pdf

UNITAR: Developing a national GHS strategy

http://www2.unitar.org/cwm/publications/cw/ghs/IOMC_GHS_Guide_Nov_08_Final.pdf

IOMC: Assisting Countries with the Transition Phase for GHS Implementation

Resources on the web: CLP

http://echa.europa.eu/legislation/classification_legislation_en.asp
Classification Legislation (CLP, DSD, DPD, Test Methods)

http://echa.europa.eu/documents/10162/13562/clp_introductory_en.pdf
ECHA: Introductory guidance on the CLP

http://echa.europa.eu/documents/10162/13562/clp_en.pdf
ECHA: Guidance on the application of the CLP criteria

http://echa.europa.eu/information-on-chemicals/cl-inventory
ECHA: The Classification and Labelling Inventory

Thank you for your attention

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