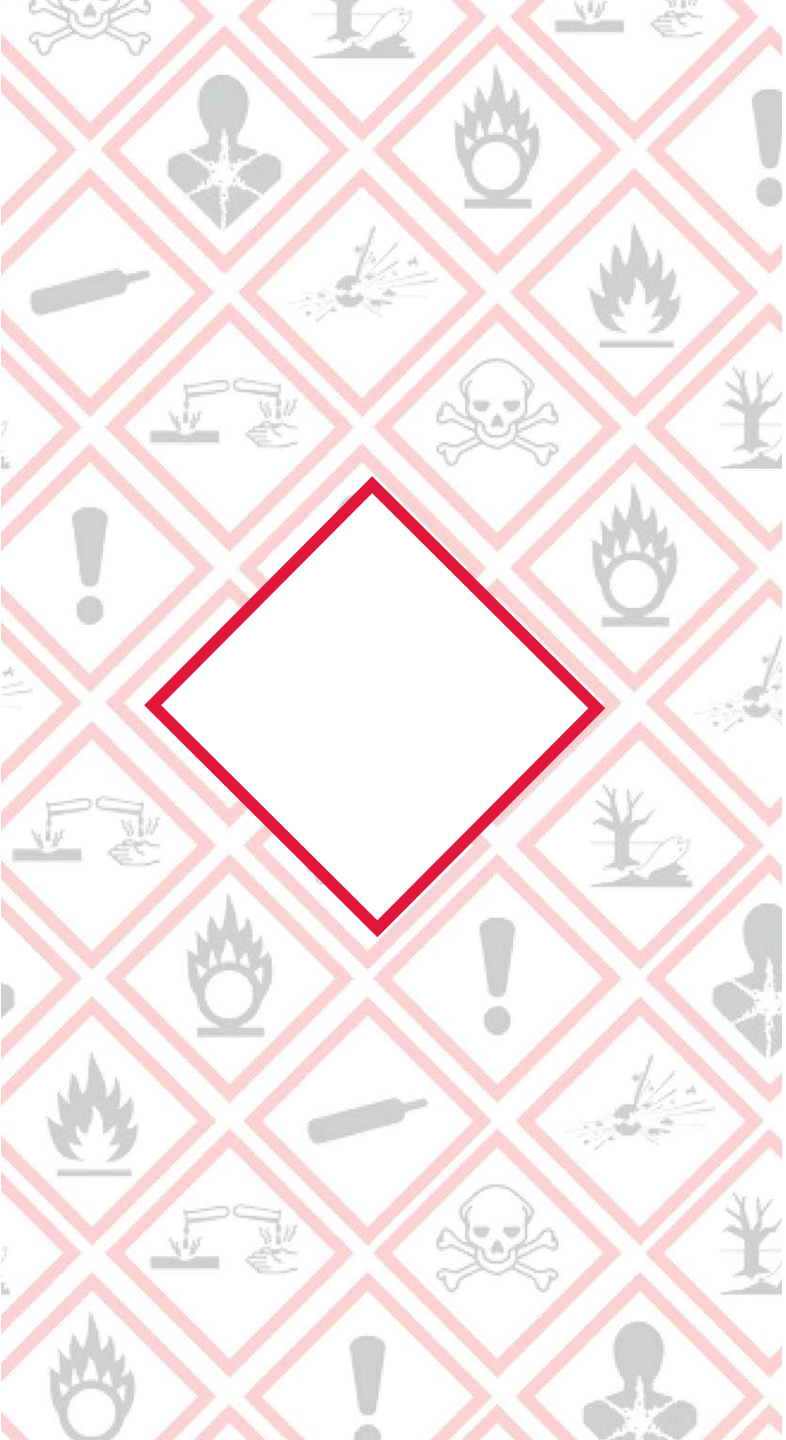

What is a safety data sheet (SDS)?

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Section 1: Identification

- Substance/mixture identification
- Recommended uses
- Name and contact detail of supplier
- Emergency contact

Example:

SECTION 1: Identification of the substance/mixture and of the company/ undertaking

1.1 Product identifier

Identification of the substance	**Acetone** ≥99,5 %, for synthesis
Article number	5025
Registration number (REACH)	01-2119471330-49-xxxx
Index number in CLP Annex VI	606-001-00-8
EC number	200-662-2
CAS number	67-64-1
Alternative name(s)	2-Propanone

1.2 Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses:	Laboratory chemical Laboratory and analytical use
Uses advised against:	Do not use for products which come into contact with foodstuffs. Do not use for private purposes (household).

1.3 Details of the supplier of the safety data sheet

Company name
Address
Contact details (phone, fax, e-mail, web-site)

Contact details to competent person responsible for the safety data sheet

1.4 Emergency telephone number

Name	Street	Postal code/city	Telephone	Website
e.g. National Poison Information Centre				

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Section 2: Hazard identification

2.1 Classification of the substance or mixture

- Type and severity of hazard

2.2 Label elements

- Pictogram
- Signal word
- Hazard statement(s)
- Precautionary statement(s)

2.3 Other hazards that do not result in classification

- *The section should include a brief and easily understood summary/conclusion of the data behind the classification*

Example:

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 (CLP)

Section	Hazard class	Cat-egory	Hazard class and category	Hazard statement
2.6	Flammable liquid	2	Flam. Liq. 2	H225
3.3	Serious eye damage/eye irritation	2	Eye Irrit. 2	H319
3.8D	Specific target organ toxicity - single exposure (narcotic effects, drowsiness)	3	STOT SE 3	H336

Supplemental hazard information

Code	Supplemental hazard information
EUH066	repeated exposure may cause skin dryness or cracking

For full text of abbreviations: see SECTION 16

The most important adverse physicochemical, human health and environmental effects

The product is combustible and can be ignited by potential ignition sources.

2.2 Label elements

Labelling according to Regulation (EC) No 1272/2008 (CLP)

Signal word **Danger**

Pictograms

GHS02, GHS07

Hazard statements

H225 Highly flammable liquid and vapour
H319 Causes serious eye irritation
H336 May cause drowsiness or dizziness

Precautionary statements

Precautionary statements - prevention

P210 Keep away from heat, sparks, open flames, hot surfaces. No smoking

Precautionary statements - response

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

Precautionary statements - storage

P403+P233 Store in a well-ventilated place. Keep container tightly closed

Supplemental hazard information

EUH066 Repeated exposure may cause skin dryness or cracking.

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Section 3: Composition/information on ingredients

Substance name

CAS number, IUPAC name

Mixtures:
Concentration or concentration interval of ingredient substances

Example:

SECTION 3: Composition/information on ingredients

3.1 Substances

Formula	:	C_3H_6O
Molecular weight	:	58,08 g/mol
CAS-No.	:	67-64-1
EC-No.	:	200-662-2
Index-No.	:	606-001-00-8

Component		Classification	Concentration
acetone			
CAS-No. EC-No. Index-No.	67-64-1 200-662-2 606-001-00-8	Flam. Liq. 2; Eye Irrit. 2; STOT SE 3; H225, H319, H336 Concentration limits: >= 20 %: STOT SE 3, H336;	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

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Mixture

Example:

2.2 Label elements

Hazard pictograms :

Signal word : Danger.

Hazard statements :
H226 - Flammable liquid and vapour.
H318 - Causes serious eye damage.
H315 - Causes skin irritation.
H317 - May cause an allergic skin reaction.
H335 - May cause respiratory irritation.
H336 - May cause drowsiness or dizziness.
H412 - Harmful to aquatic life with long lasting effects.

3.2 Mixtures : Mixture

Product/ingredient name	Identifiers	Weight %	Regulation (EC) No. 1272/2008 [CLP]
epoxy resin (MW 700-1200)	CAS: 25036-25-3	≥25 - ≤50	Skin Irrit. 2, H315 Eye Irrit. 2, H319 Skin Sens. 1, H317
xylene	REACH #: 01-2119488216-32 EC: 215-535-7 CAS: 1330-20-7 Index: 601-022-00-9	≥10 - ≤25	Flam. Liq. 3, H226 Acute Tox. 4, H312 Acute Tox. 4, H332 Skin Irrit. 2, H315 Eye Irrit. 2, H319 STOT SE 3, H335 Asp. Tox. 1, H304
butan-1-ol	REACH #: 01-2119484630-38 EC: 200-751-6 CAS: 71-36-3 Index: 603-004-00-6	≤10	Flam. Liq. 3, H226 Acute Tox. 4, H302 Skin Irrit. 2, H315 Eye Dam. 1, H318 STOT SE 3, H335 STOT SE 3, H336
hydrocarbons, C9, aromatic	REACH #: 01-2119455851-35 EC: 918-668-5 CAS: 64742-95-6	≤10	Flam. Liq. 3, H226 STOT SE 3, H335 STOT SE 3, H336 Asp. Tox. 1, H304 Aquatic Chronic 2, H411
1-methoxy-2-propanol	REACH #: 01-2119457435-35 EC: 203-539-1 CAS: 107-98-2 Index: 603-064-00-3	≤5	Flam. Liq. 3, H226 STOT SE 3, H336
ethylbenzene	REACH #: 01-2119489370-35 EC: 202-849-4 CAS: 100-41-4 Index: 601-023-00-4	≤5	Flam. Liq. 2, H225 Acute Tox. 4, H332 STOT RE 2, H373 (hearing organs) Asp. Tox. 1, H304
epoxy resin (MW ≤ 700)	REACH #: 01-2119456619-26 EC: 216-823-5 CAS: 1675-54-3 Index: 603-073-00-2	≤5	Skin Irrit. 2, H315 Eye Irrit. 2, H319 Skin Sens. 1B, H317 Aquatic Chronic 2, H411
fatty acids, C14-18 and C16-18-unsatd., maleated	REACH #: 01-2119976378-19	≤0.3	Skin Irrit. 2, H315 Skin Sens. 1, H317 **See Section 16 for the full text of the H statements declared above.**

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Section 4: First aid measures

Example:

SECTION 4: First aid measures

4.1 Description of first-aid measures

General advice
Show this material safety data sheet to the doctor in attendance.

If inhaled
After inhalation: fresh air. Call in physician.

In case of skin contact
In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower.

In case of eye contact
After eye contact: rinse out with plenty of water. Call in ophthalmologist. Remove contact lenses.

If swallowed
After swallowing: immediately make victim drink water (two glasses at most). Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

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Section 5: Fire-fighting measures

Example:

5.1 Extinguishing media

Suitable extinguishing media

co-ordinate firefighting measures to the fire surroundings
water spray, alcohol resistant foam, dry extinguishing powder, BC-powder, carbon dioxide (CO_2)

Unsuitable extinguishing media

water jet

5.2 Special hazards arising from the substance or mixture

Combustible. In case of insufficient ventilation and/or in use, may form flammable/explosive vapour-air mixture. Solvent vapours are heavier than air and may spread along floors. Places which are not ventilated, e.g. unventilated below ground level areas such as trenches, conduits and shafts, are particularly prone to the presence of flammable substances or mixtures. Vapours are heavier than air, spread along floors and form explosive mixtures with air. Vapours may form explosive mixtures with air.

Hazardous combustion products

In case of fire may be liberated: Carbon monoxide (CO), Carbon dioxide (CO_2)

5.3 Advice for firefighters

In case of fire and/or explosion do not breathe fumes. Fight fire with normal precautions from a reasonable distance. Wear self-contained breathing apparatus.

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Section 6: Accidental release measures

Example:

Personal precautions, protective equipment and emergency procedures

- *For non-emergency personnel*
- *For emergency responders*

Environmental precautions

Methods and materials for containment and cleaning up

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Advice for non-emergency personnel: Do not breathe vapors, aerosols. Avoid substance contact. Ensure adequate ventilation. Keep away from heat and sources of ignition. Evacuate the danger area, observe emergency procedures, consult an expert.
For personal protection see section 8.

6.2 Environmental precautions
Do not let product enter drains. Risk of explosion.

6.3 Methods and materials for containment and cleaning up
Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

6.4 Reference to other sections
For disposal see section 13.

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Section 7: Handling and storage

Example:

7.1 Precautions for safe handling

Advice on safe handling
Avoid generation of vapours/aerosols.

Advice on protection against fire and explosion
Keep away from open flames, hot surfaces and sources of ignition.Take precautionary measures against static discharge.

Hygiene measures
Change contaminated clothing. Preventive skin protection recommended. Wash hands after working with substance.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions
Keep container tightly closed in a dry and well-ventilated place. Keep away from heat and sources of ignition.

Storage class
Storage class (TRGS 510): 3: Flammable liquids

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

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Section 8: Exposure controls/personal protection

Control parameters

- *e.g. occupational exposure limits*

Appropriate engineering controls

Individual protection measures, such as personal protective equipment (PPE)

- Eye/face
- Skin
- Respiratory

Example:

Skin protection
This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).
Full contact
Material: butyl-rubber
Minimum layer thickness: 0,7 mm
Break through time: 480 min
Material tested:Butoject® (KCL 898)

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).
Splash contact
Material: Latex gloves
Minimum layer thickness: 0,6 mm
Break through time: 10 min
Material tested:Lapren® (KCL 706 / Aldrich Z677558, Size M)

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Section 9: Physical and chemical properties and safety characteristics

- Physical state
- Colour
- Odour
- Melting point/freezing point
- Boiling point or initial boiling point and boiling range
- Flammability
- Lower and upper explosion limit/flammability limit
- Flash point
- Auto-ignition temperature
- Decomposition temperature
- pH
- Kinematic viscosity
- Solubility
- Partition coefficient: n-octanol/water (log value)
- Vapour pressure
- Density and/or relative density
- Relative vapour density
- Particle characteristics

Section 9 was extensively revised in GHS Rev.6, Annex 4

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Section 10: Stability and reactivity

- Reactivity
- Chemical stability
- Possibility of hazardous reactions
- Conditions to avoid (e.g. static discharge, shock or vibration)
- Incompatible materials
- Hazardous decomposition products

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Section 11: Toxicological information

- Delayed and immediate health effects
- Chronic health effects from short and long-term exposure
- Likely routes of exposure
- Symptoms
- Numerical measures of toxicity (e.g. acute toxicity estimates, ATE)
- Sources of information

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Section 12: Ecological information

- Toxicity
- Persistence and degradability
- Bioaccumulative potential
- Mobility in soil
- Other adverse effects

Section 13: Disposal considerations

Example:

13.1 Waste treatment methods

This material and its container must be disposed of as hazardous waste. Dispose of contents/container in accordance with local/regional/national/international regulations.

Sewage disposal-relevant information

Do not empty into drains.

Waste treatment of containers/packagings

It is a dangerous waste; only packagings which are approved (e.g. acc. to ADR) may be used.

13.2 Relevant provisions relating to waste

The allocation of waste identity numbers/waste descriptions must be carried out according to the EEC, specific to the industry and process. Waste catalogue ordinance (Germany).

13.3 Remarks

Waste shall be separated into the categories that can be handled separately by the local or national waste management facilities. Please consider the relevant national or regional provisions.

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Section 14: Transport information

- UN number
- UN proper shipping name
- Transport hazard class(es)
- Packing group, if applicable
- Environmental hazards (e.g.: Marine pollutant (Yes/No))
- Transport in bulk according to International Maritime Organisation (IMO) instruments
- Special precautions which a user needs to be aware of, or needs to comply with, in connection with transport or conveyance either within or outside their premises

Example:

14.1 UN number
ADR/RID: 1090 IMDG: 1090 IATA: 1090

14.2 UN proper shipping name
ADR/RID: ACETONE
IMDG: ACETONE
IATA: Acetone

14.3 Transport hazard class(es)
ADR/RID: 3 IMDG: 3 IATA: 3

14.4 Packaging group
ADR/RID: II IMDG: II IATA: II

14.5 Environmental hazards
ADR/RID: no IMDG Marine pollutant: no IATA: no

14.6 Special precautions for user
No data available

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Section 15: Regulatory information

Example:

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

This material safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006.

National legislation

Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances. : FLAMMABLE LIQUIDS

Other regulations

Take note of Dir 94/33/EC on the protection of young people at work.

15.2 Chemical Safety Assessment

A Chemical Safety Assessment has been carried out for this substance.

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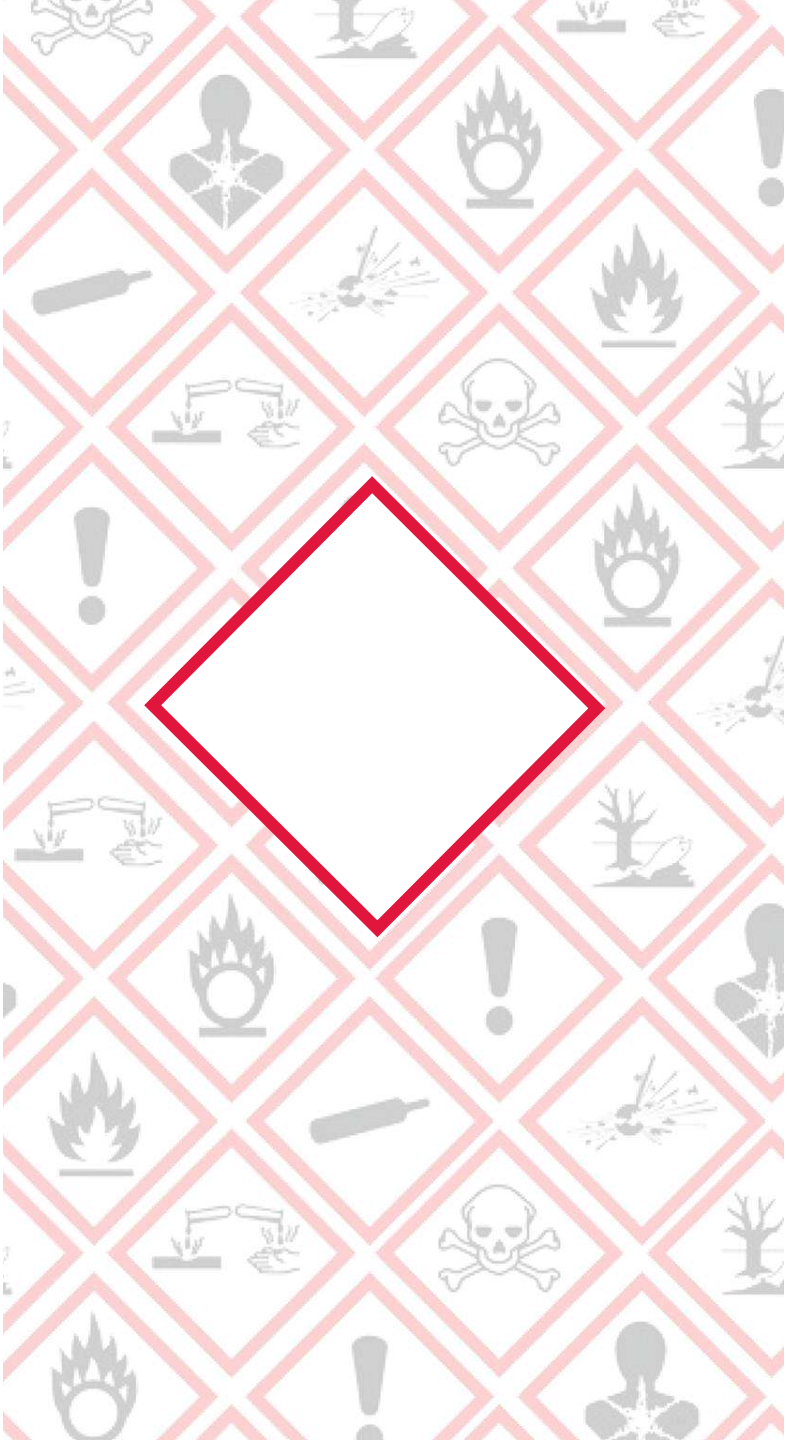
Section 16: Other information

For example:

- Date of preparation of the latest revision of the SDS, with an explanation of the changes made
- Key/legend to abbreviations and acronyms used in the SDS
- Key literature references and sources for data used to compile the SDS



Available data on substance classification

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Information on substance classification

- To create your own list is a huge and resource demanding endevour
- There is already a lot of data available

- **Note:** Substance classifications in different lists may differ slightly due to:
  - *Availability of data*
  - *Assessment of data – expert opinion*
  - *Hazard classes and categories considered*

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Survey of existing classification lists

A survey of international classification lists that follow the GHS has been done by a GHS sub-committee working group (informal correspondence group) by use of a questionnaire.

Responses:

- National/regional competent authorities *(10)*
- UN bodies and UN specialized agencies *(3)*
- Non-governmental organizations *(3)*

https://unece.org/info/Transport/Dangerous-Goods/events/368936

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Classification lists by national/regional competent authorities

Country	Name of List	Survey respondent	Number of chemicals	Legally binding or non-binding
Australia	Hazardous Chemical Information System (HCIS)	Safe Work Australia	6,375	Non-binding
Canada	Hazardous Products Regulations Classifications	Health Canada	1,375	Legally binding
China	Catalogue of Hazardous Chemicals (2015)	NRCC, MEM	2,828	Legally binding
European Union	C&L Inventory*	European Chemicals Agency	More than 4,700 harmonized (legally binding) entries In total more than 340,000 entries	Legally binding
Japan	GHS Classification Results by the Japanese Government	National Institute of Occupational Safety and Health Japan	approximately 3,300 substances	Non-binding
Malaysia	Industry Code of Practice (ICOP) Part I List of Classified Chemicals	DOSH Malaysia	662	Legally binding
New Zealand	Hazardous Substances and New Organisms (HSNO) Chemical Classification Information Database (CCID)	Environmental Protection Authority	Around 4,800	Legally binding
Republic of Korea	National Chemicals Information System (NCIS)	NIER	1,500	Legally binding
United Kingdom of Great Britain and Northern Ireland	Mandatory classification and labelling list (GB MCL List)	Health and Safety Executive (HSE)	4,317 entries covering an estimated 9,000 substances.	Legally binding
Vietnam	National Chemical Inventory	VNNIOSH	unclear	Non-binding

*updated 20 March 2025

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Classification lists by UN bodies/organizations and Non-Governmental Organizations

Body/Organization	Name of List	Survey respondent	Number of chemicals	Legally binding or non-binding
Secretariat of the ECOSOC Sub-Committee of Experts on the Transport of Dangerous Goods (TDG SubCommittee)	Dangerous goods list	UNECE	About 2,373 entries (actual number of chemicals higher)	Legally binding
World Health Organization - International Chemical Safety Cards	International Chemical Safety Cards	World Health Organization	674 (1,700 chemicals classified, but only 674 according to GHS)	Non-binding
World Health Organization - Pesticides	The WHO Recommended Classification of Pesticides by Hazard and guidelines to classification, 2019 edition	World Health Organization	678	Non-binding
CESIO (Surfactants Europe, a sector group of Cefic)	CESIO recommendations for the harmonized classification and labelling of surfactants	CESIO (Surfactants Europe), a sector group of Cefic	Provided in attachment to survey response	Non-binding
Concawe	Concawe Report - Hazard Classification and Labelling of Petroleum Substances in the European Economic Area	Concawe A.I.S.B.L.	200	Non-binding
INTERNATIONAL FRAGRANCE ASSOCIATION (IFRA)	IFRA-International Organization of the Flavor Industry (IOFI) Labelling Manual	IFRA	1659	Non-binding

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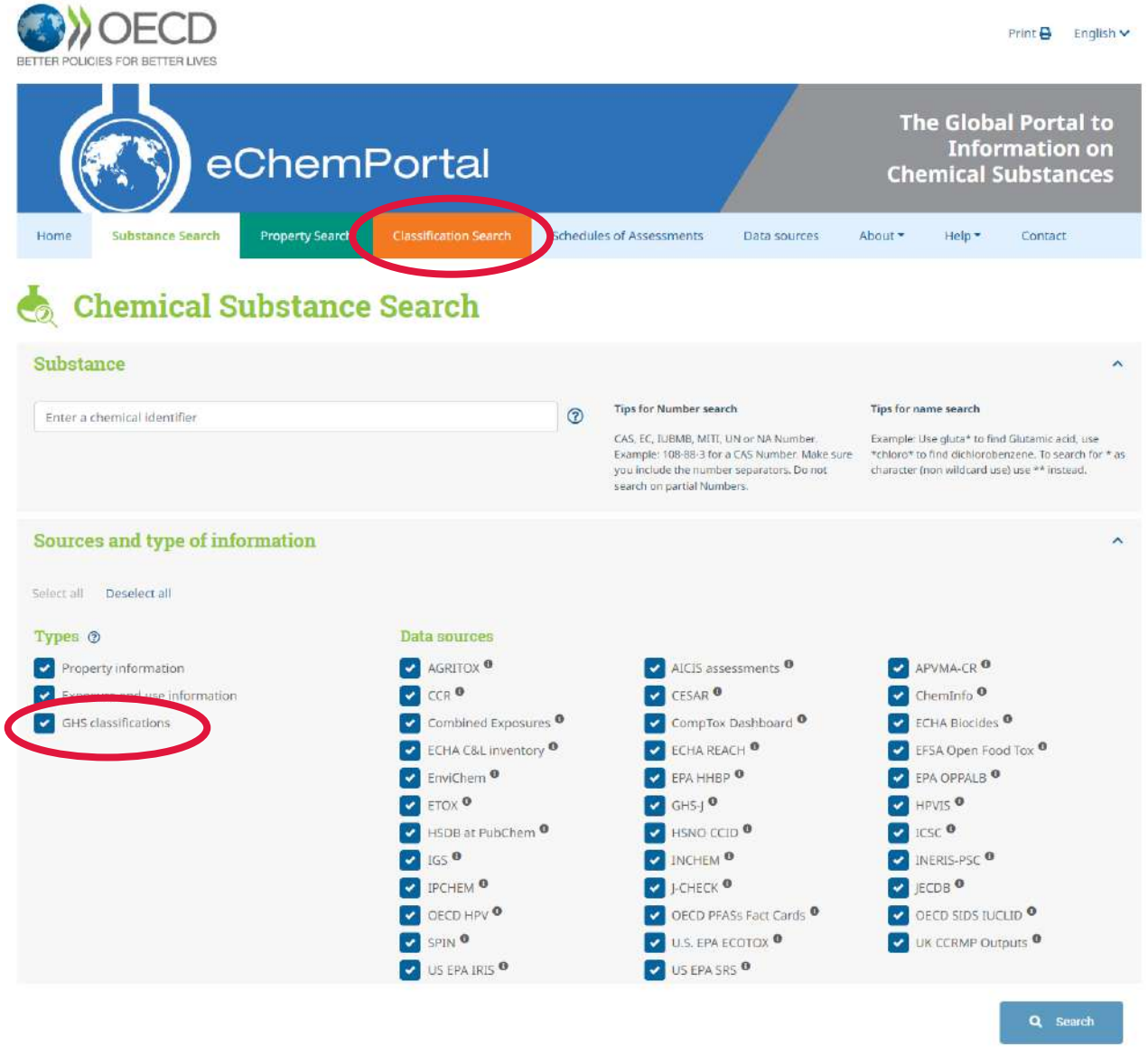
eChemPortal

eChemPortal provides free public access to information on properties of chemicals:

- Physical Chemical Properties
- Ecotoxicity
- Toxicity
- Environmental Fate and Behaviour
- Classification and labelling
- Exposure and use

eChemPortal allows searching of GHS classification results.

eChemPortal also provides links to collections of chemical hazard and risk information, and to exposure and use information on chemicals.



https://www.echemportal.org/echemportal/substance-search

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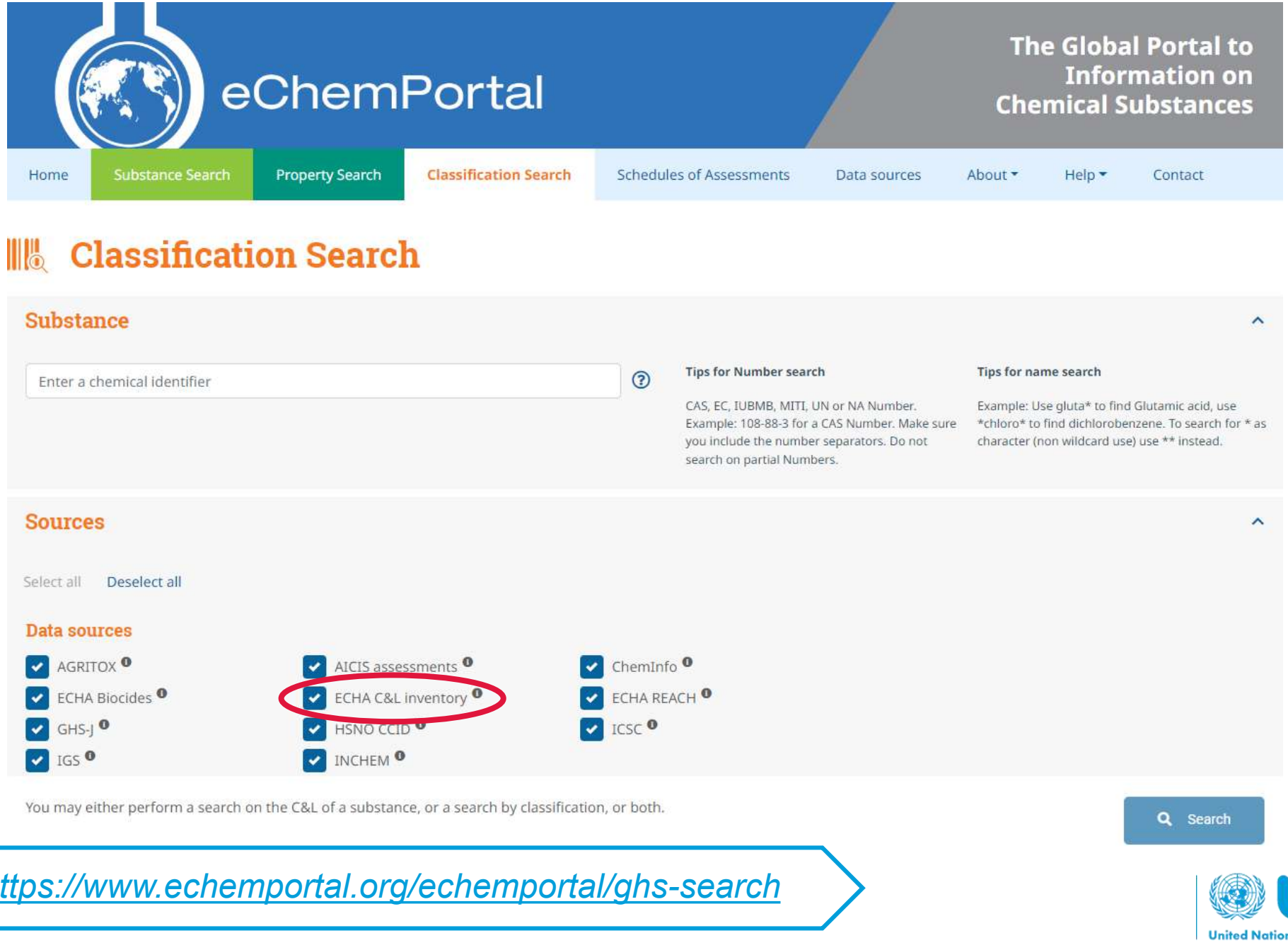

https://www.echemportal.org/echemportal/ghs-search

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Legal requirements in the European Union

Importers and Manufacturers of substances shall notify the **substance**

- if it is placed on the market, ***and***
- is classified as hazardous, irrespective of the quantity, **or**
- is subject to registration under the REACH Regulation*

Importers of mixtures shall notify a **substance in the mixture** if

- classified as hazardous and is present above the relevant concentration limit/cut-off value, which results in the classification of the mixture as hazardous according to the CLP Regulation**, **or**
- is subject to registration under the REACH Regulation

Can be joint submissions by groups of importers or manufactures

*Regulation (EC) No 1907/2006
**Regulation (EC) No 1272/2008

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Criteria for EU-harmonised (legally binding) classification and labelling

- Shall normally be done for all 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 sensitiser.*

Other hazard classes may be considered on a case-by-case basis If justification is provided demonstrating the need for such action at Community level.

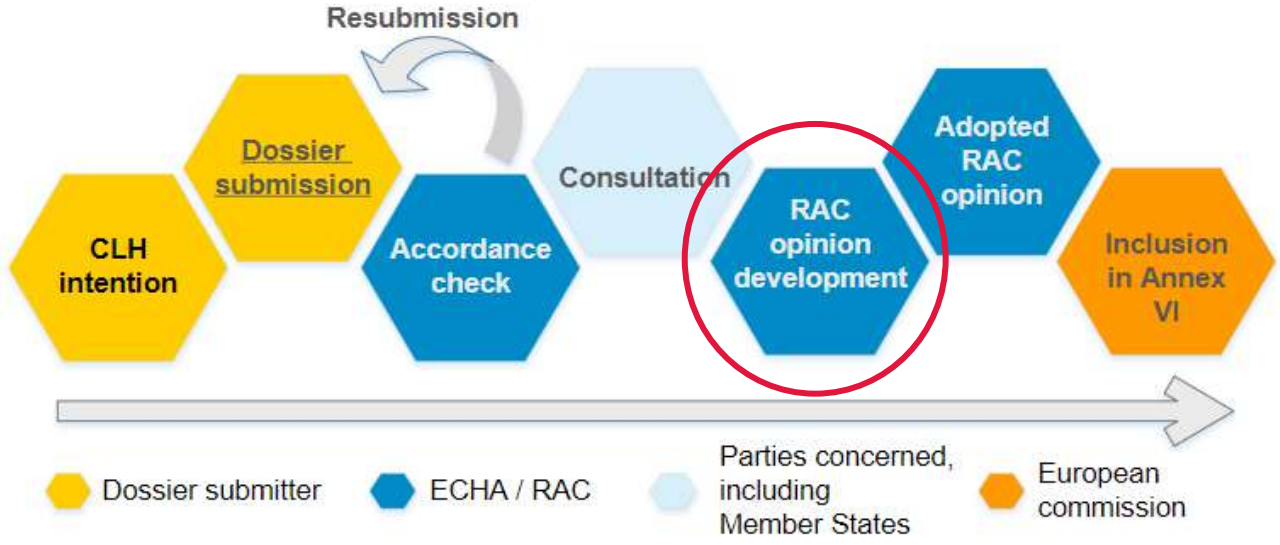
Decisions on harmonised (legally binding) classification and labelling

A **Member State competent authority (MSCA), or a manufacturer, importer and downstream user** of a substance can submit a proposal to ECHA.

- Where a substance is either a carcinogen, a mutagen, toxic to reproduction or a respiratory sensitiser
- When it is justified that a classification for a substance at EU level is needed for other hazard classes
- To add one or more new hazard classes to an existing entry (under the conditions above)

Only MSCAs may propose:

- A revision of an existing harmonised entry, for any substance that is under the scope of the CLP Regulation
- When a substance is an active substance in biocidal or plant protection product



https://echa.europa.eu/regulations/clp/harmonised-classification-and-labelling

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Navigating the database

C&L Inventory

This database contains classification and labelling information on notified and registered substances received from manufacturers and importers. It also includes the list of harmonised classifications. The database is refreshed regularly with new and updated notifications. However, updated notifications cannot be specifically flagged because the notifications that are classified in the same way are aggregated for display purposes.

Classifications derived from joint submissions to the REACH registration process are flagged accordingly. For more information on these substances, please consult the *Registered substances* database.

Please note that some of the information on C&L Inventory may belong to third parties. The use of such information may therefore require the prior permission of the third party owners. Please consult the *Legal Notice* for further information.

FURTHER INFORMATION

- More information about C&L Inventory
- Understanding the CLP Regulation
- Q&A on Public C&L Inventory
- Video tutorial
- Table of harmonised entries in Annex VI to CLP
- Registered substances
- Legal notice

See a problem or have feedback?

The database is accessible via eChemPortal

CL Inventory

Notifications submitted/updated by: 19 May 2023

› **CL Inventory**

https://echa.europa.eu/information-on-chemicals/cl-inventory-database

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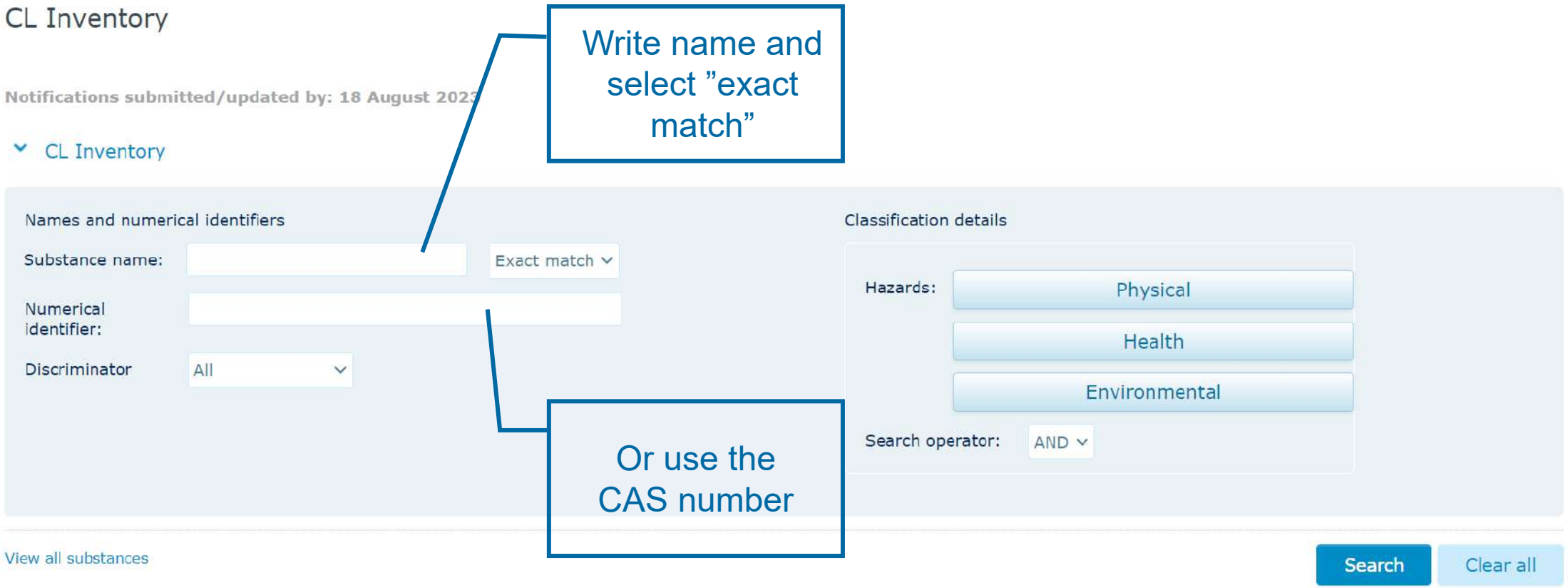
Search options



Write name and select ”exact match”

Or use the CAS number

https://echa.europa.eu/information-on-chemicals/cl-inventory-database

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Search example: CAS 67-56-1

CL Inventory

Notifications submitted/updated by: 18 August 2023

› **CL Inventory**

Searched for: 'methanol' (Exact match)

Take a closer look

Name	EC / List no.	CAS no.	Classification	Source
methanol **603-001-00-X**	200-659-6	67-56-1	**Flam. Liq. 2** **Acute Tox. 3** **Acute Tox. 3** **Acute Tox. 3** **STOT SE 1**	Harmonised C&L

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Methanol (CAS 67-56-1)

Summary of Classification and Labelling

Harmonised classification - Annex VI of Regulation (EC) No 1272/2008 (CLP Regulation)

Harmonised classification

General Information

Index Number	EC / List no.	CAS Number	International Chemical Identification
603-001-00-X	200-659-6	67-56-1	methanol

ATP Inserted / Updated: CLP00

CLP Classification (Table 3)

Classification		Labelling			Specific Concentration limits, M-Factors, Acute Toxicity Estimates (ATE)	Notes
Hazard Class and Category Code(s)	Hazard Statement Code(s)	Hazard Statement Code(s)	Supplementary Hazard Statement Code(s)	Pictograms, Signal Word Code(s)		
Flam. Liq. 2	H225	H225		GHS02 GHS08 GHS06 Dgr	STOT SE 1; H370: C ≥ 10 % STOT SE 2; H371: 3 % ≤ C < 10 %	
Acute Tox. 3 *	H301	H301				
Acute Tox. 3 *	H311	H311				
Acute Tox. 3 *	H331	H331				
STOT SE 1	H370 **	H370 **				

Signal Words	Pictograms
Danger	 Flame  Health hazard  Skull and crossbones

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Methanol (CAS 67-56-1)

Notified classification and labelling

General Information

EC / List no.	Name	CAS Number
200-659-6	Methanol	67-56-1

Notified classification and labelling according to CLP criteria

Classification		Labelling			Specific Concentration limits, M-Factors	Notes	Classification affected by Impurities / Additives	Additional Notified Information	Number of Notifiers	Joint Entries	
Hazard Class and Category Code(s)	Hazard Statement Code(s)	Hazard Statement Code(s)	Supplementary Hazard Statement Code(s)	Pictograms, Signal Word Code(s)							
Flam. Liq. 2	H225	H225		GHS02 GHS08 GHS06 Dgr				State/Form	2374	✔	View details
Acute Tox. 3	H301	H301									
Acute Tox. 3	H311	H311									
Acute Tox. 3	H331	H331									
STOT SE 1	H370 (Optic nerve (ne...)	H370 (target organs: ...)									
Flam. Liq. 2	H225	H225		GHS02 GHS08 GHS06 Dgr				State/Form	2328		View details
Acute Tox. 3	H301	H301									
Acute Tox. 3	H311	H311									
Acute Tox. 3	H331	H331									
STOT SE 1	H370	H370									
Flam. Liq. 2	H225	H225		GHS02 GHS08 GHS06 Dgr				State/Form	1314		View details
Acute Tox. 3	H301	H301									
Acute Tox. 3	H311	H311									
Acute Tox. 3	H331	H331									
STOT SE 1	H370 (not specified)										
Flam. Liq. 2	H225			GHS02 GHS08 GHS06 Dgr					176		View details
Acute Tox. 3	H301	H301									
Acute Tox. 3	H311	H311									
Acute Tox. 3	H331	H331									
STOT SE 1	H370	H370									

Notified classification ("self-classification")

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Introduction to GHS

Technical elements, classifi[illegible]d labelling

Scaling-up Commitmen[illegible] GHS in Pakistan

[illegible]p

[illegible]ad, Pakistan

[illegible] December 2025

Extra slides

Lennart Dock
lennart.dock@gmail.com

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Origins of the Globally Harmonized System of Classification and Labelling of Chemicals (GHS) 1992

Rio 1992...

B. Harmonization of classification and labelling of chemicals

Basis for action

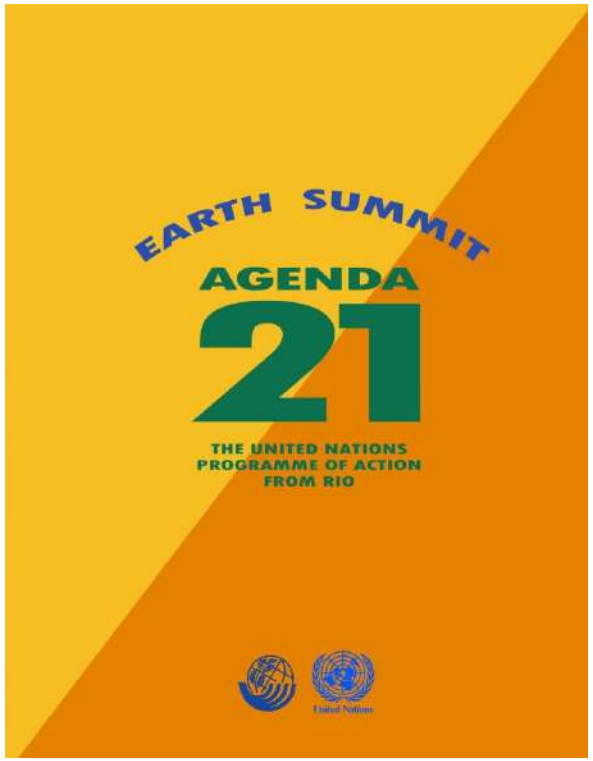
19.24. Adequate labelling of chemicals and the dissemination of safety data sheets such as ICSCs (International Chemical Safety Cards) and similarly written materials, based on assessed hazards to health and environment, are the simplest and most efficient way of indicating how to handle and use chemicals safely.

19.25. For the safe transport of dangerous goods, including chemicals, a comprehensive scheme elaborated within the United Nations system is in current use. This scheme mainly takes into account the acute hazards of chemicals.

19.26. Globally harmonized hazard classification and labelling systems are not yet available to promote the safe use of chemicals, inter alia, at the workplace or in the home. Classification of chemicals can be made for different purposes and is a particularly important tool in establishing labelling systems. There is a need to develop harmonized hazard classification and labelling systems, building on ongoing work.

Objectives

19.27. A globally harmonized hazard classification and compatible labelling system, including material safety data sheets and easily understandable symbols, should be available, if feasible, by the year 2000.



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Purpose and benefits 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

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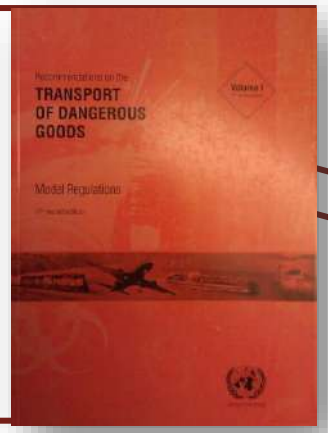
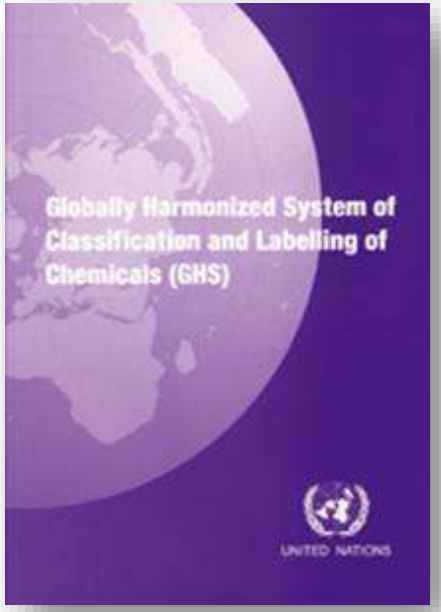
Main basis in the development of the GHS

UN Recommendations on Transport of Dangerous Goods (TDG)

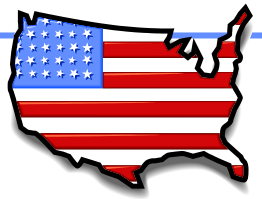


European Union directives for dangerous substances and preparations



First edition published 2003

Canadian requirements for workplace, consumers and pesticides



US requirements for workplace, consumers and pesticides

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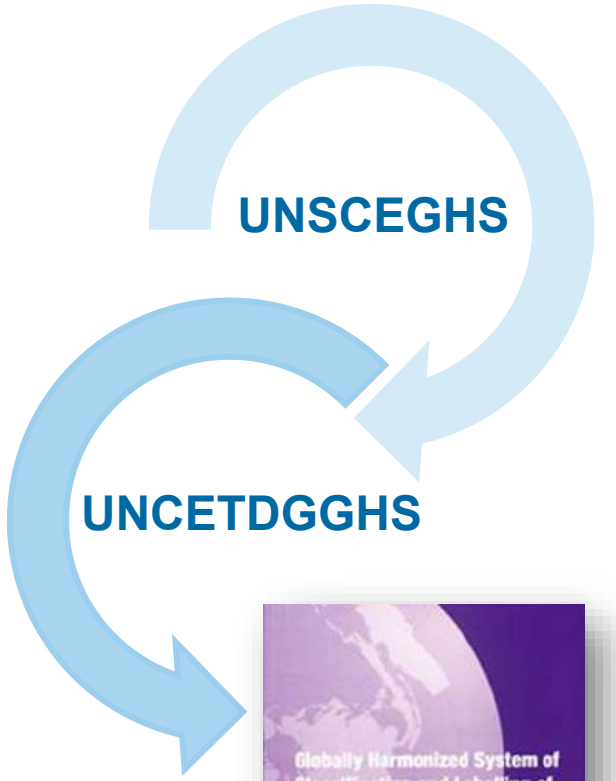
Updating the GHS

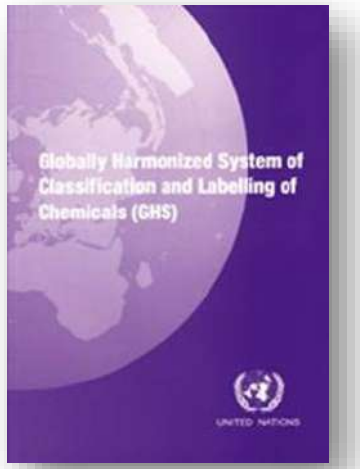
UN Sub-Committee of Experts on the GHS meets twice a year

The UN Committee of Experts on TDG and GHS meets every other year in order to adopt amendments

New edition every other year



Suggestions for amendments



GHS Rev.10 was adopted in 2022, and released in 2023

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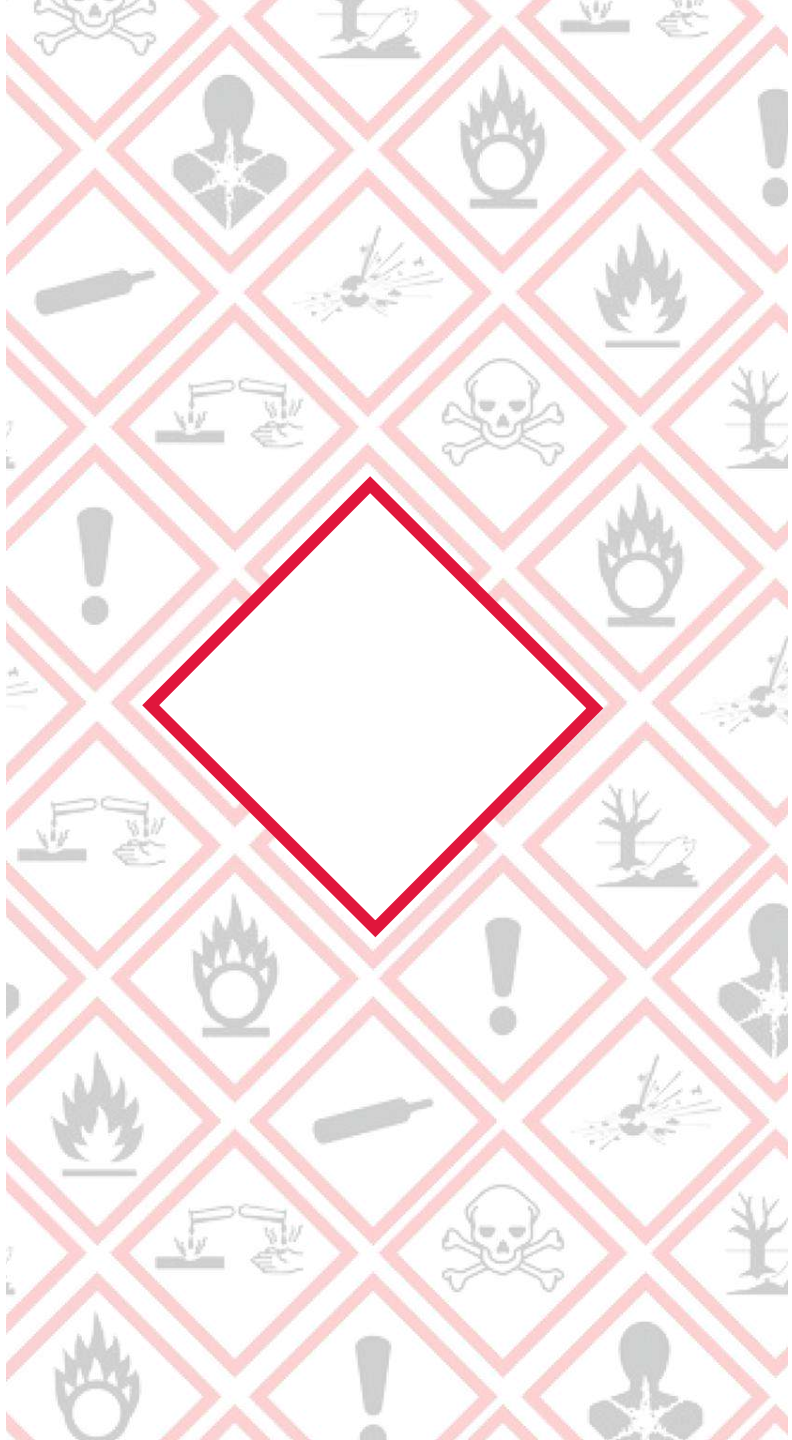

The role of GHS in chemicals management

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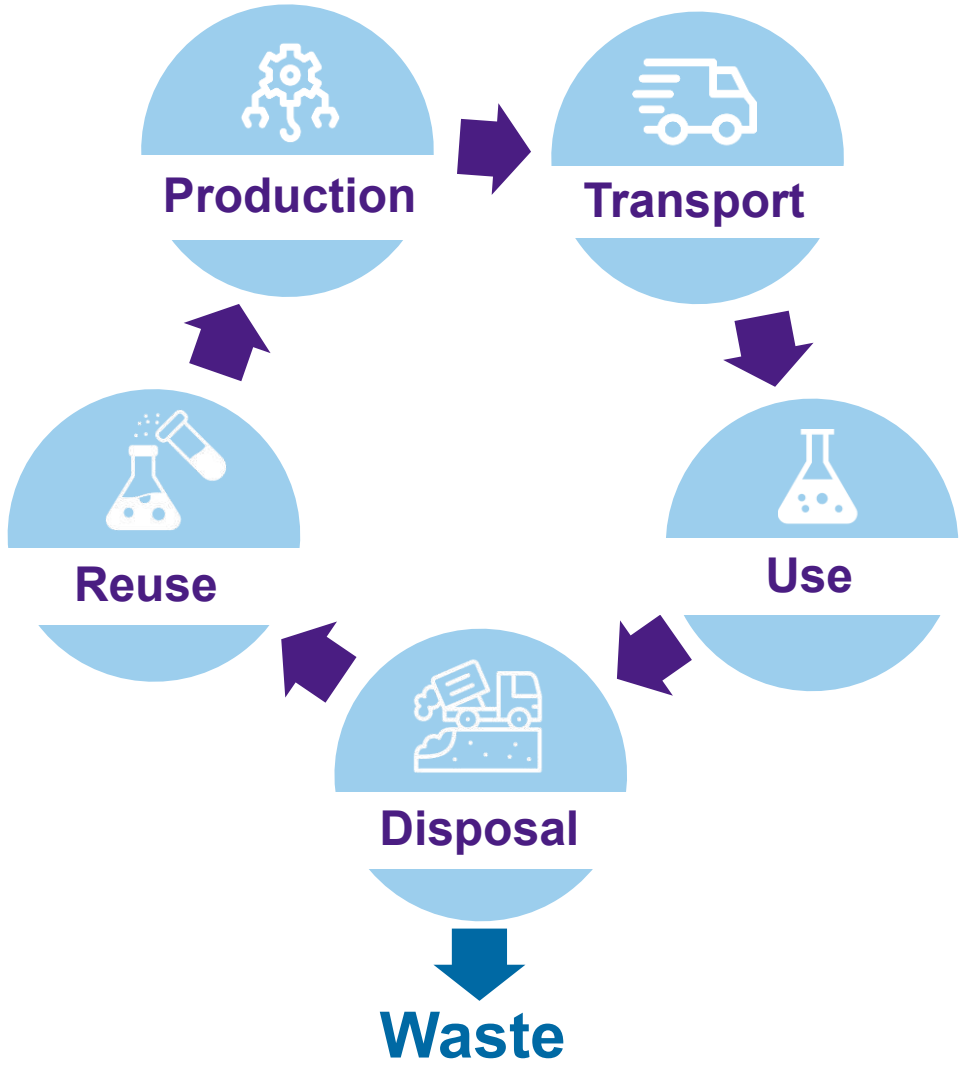
Chemicals in everyday life



Chemicals are part of modern, everyday life.

Chemicals are used as single substances, combined in mixtures or integral parts of various products, such as electronics, food packaging materials, toys and textiles.

While largely beneficial, chemicals may also pose a threat to human health and the environment, based on intrinsic hazardous properties as well as production, use and disposal patterns.

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Hazard and Risk

Hazard x Exposure = Risk

Intrinsic Properties constant

Use-dependent *variable*

The degree of capacity of a chemical to cause harm depends on its **intrinsic hazardous properties**, i.e. its capacity to interfere with normal biological processes, and its capacity to burn, explode, corrode, etc.

The concept of **risk** (the likelihood of harm to occur) is introduced when **exposure** is considered in conjunction with data on hazard.

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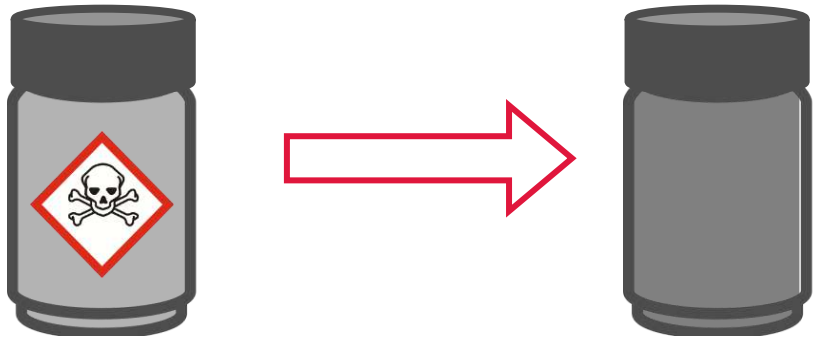
”No harm from chemicals”

Safe chemicals
e.g. substitution



Safe use of chemicals
reducing exposure

If you can minimize either hazard or exposure, you minimize the risk or likelihood of harm.

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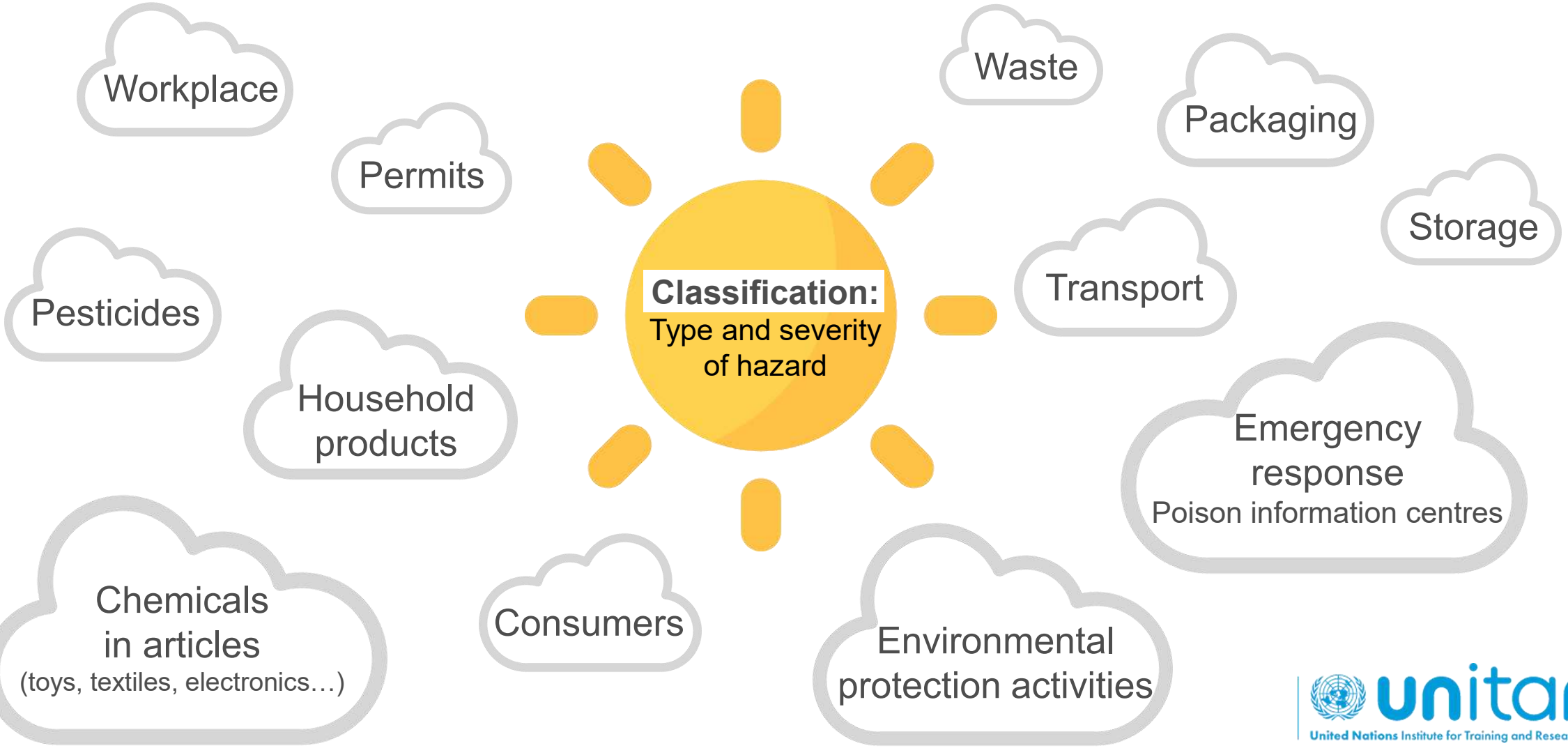
Hazard classification is fundamental for risk assessment and risk reduction



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Implementing GHS and available data on substance classification

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Topics

1. Benefits and costs of implementing GHS
2. GHS implementation strategy
3. Available data on substance classification

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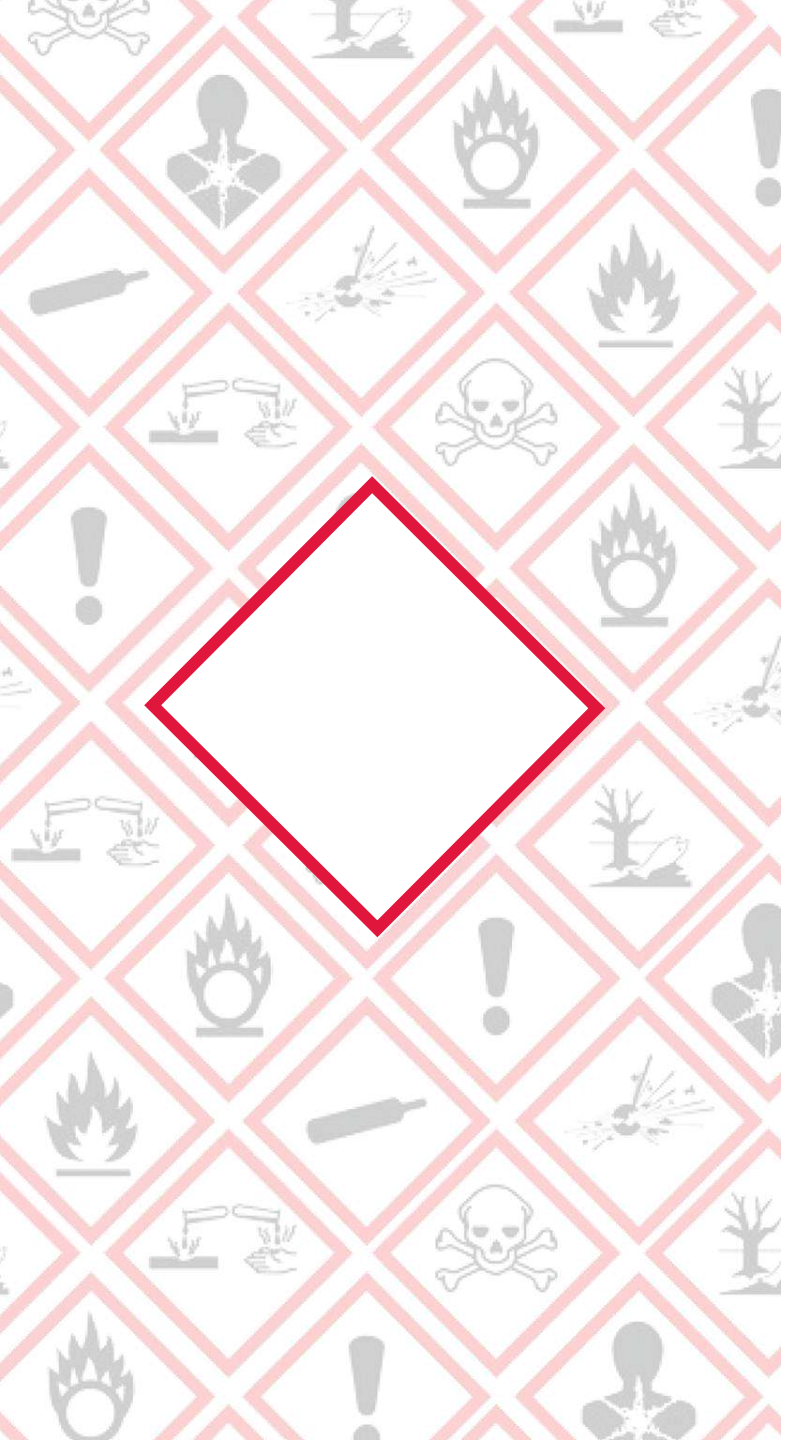

Benefits and costs of implementing

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2002 World Summit of Sustainable Development - Plan of Implementation

23. Renew the commitment, as advanced in Agenda 21, to sound management of chemicals throughout their life cycle and of hazardous wastes for sustainable development as well as for the protection of human health and the environment, inter alia, aiming to achieve, by 2020, that chemicals are used and produced in ways that lead to the minimization of significant adverse effects on human health and the environment, using transparent science-based risk assessment procedures and science-based risk management procedures, taking into account the precautionary approach, as set out in principle 15 of the Rio Declaration on Environment and Development, and support developing countries in strengthening their capacity for the sound management of chemicals and hazardous wastes by providing technical and financial assistance. This would include actions at all levels to:

(c) Encourage countries to implement the new globally harmonized system for the classification and labelling of chemicals as soon as possible with a view to having the system fully operational by 2008;

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Benefits of implementing GHS

*"**GHS** is the true backbone of chemicals management, and its importance cannot be underlined enough! As a system that ensures chemical hazards are identified and classified consistently, it sets universal standards for protective measures that prevent exposure. Through product labels and safety data sheets, the communication of hazards helps to ensure chemicals can be used safely, and safeguards people's health and the environment. As a recognised, globally-agreed framework, GHS is also integral for reducing international trade barriers and the administrative burden on companies."*

Björn Hansen, [former] Executive Director, European Chemicals Agency (ECHA), January 2022

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Benefits of implementing GHS

The basic goal of hazard communication is to ensure that employers, employees and the public are provided with adequate, practical, reliable and comprehensible information on the hazards of chemicals, so that they can take effective preventive and protective measure for their health and safety. Thus, implementation of effective hazard communication provides benefits for governments, companies, workers, and members of the public.

The US Occupational Health and Safety Administration (OSHA)

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Benefits to governments

- **Improved protection** of workers and the public from chemical hazards;
- **Fewer chemical accidents** and incidents ;
- Lower **health care costs**;
- **Avoiding duplication** of efforts in creating national systems;
- Reduction in the costs of **enforcement**;
- **Improved reputation** on chemical issues both domestically and internationally.

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Benefits to industry

- **Safer** work environments - fewer accidents and illnesses and reduced associated costs;
- **Improved relations** with employees;
- **Increased efficiency** and **reduced costs** in compliance with hazard communication regulations;
- Facilitate future **growth** by expanding into international markets and facilitate **trading**;
- Maximization of **expert resources** with minimum labour and costs;
- Improved corporate **image and credibility**.

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Benefits to workers and civil society

- **Improved safety** for workers and others through consistent and simplified communications on chemical hazards and practices to follow for safe handling and use;

- **Greater awareness** of hazards, resulting in safer use of chemicals in the workplace and in the home.

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Costs and benefits

A synthesis of studies addressing costs and benefits of implementing GHS concluded:

- The **costs** associated with exposure to harmful chemicals are estimated to be in the range of several percentage points of global GDP;
- The economic **benefits of action** from preventing chemical exposure are significant;
- Although uncertainties in the cost and benefit analysis certainly exist, the study presents significant evidence that the **benefits of GHS** implementation far outweigh the costs, likely by a factor of 3 or more;
- For many countries that have yet to implement GHS the **costs** of implementation will be **even lower** and the **benefits even more substantial** than the estimates summarized in the study.

G.F. Bond, Synthesis of GHS Cost Benefit Papers (2019), published by the International Council of Chemical Associations (ICCA)

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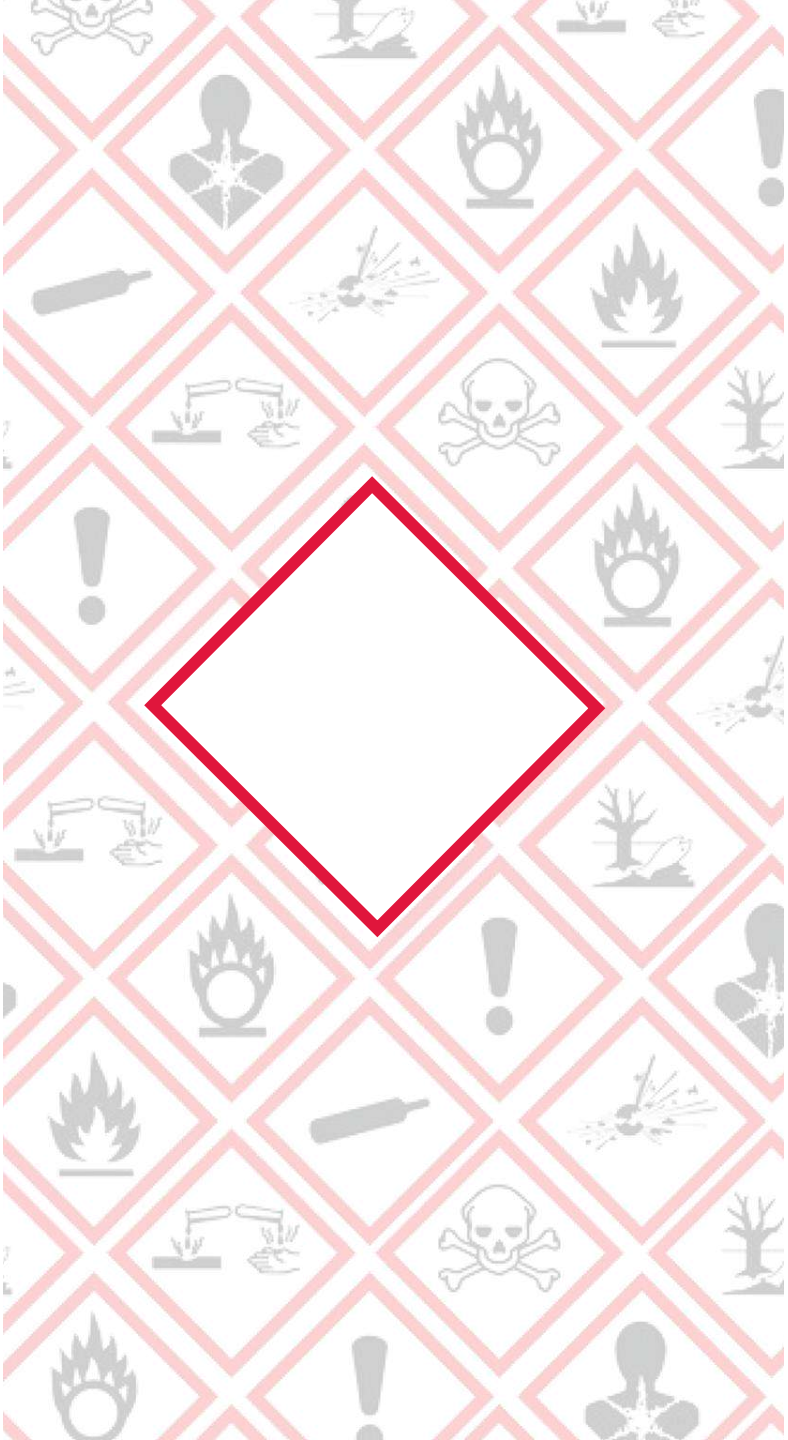

GHS implementation strategy

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Considerations when adopting and transposing GHS into national legislation

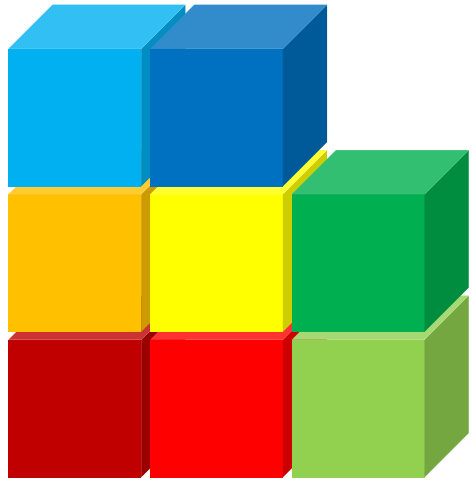
- Existing *(national)* legislation on classification and labelling
- Horizontal or sector-specific legislation
- Application of the *"building block approach"*
- Additional elements *(hazards, labelling provisions)*
- What revision of GHS to adopt
- Mechanism for updating legislation when GHS is revised
- If a list of classified substances *(legally binding or guiding)* should be included

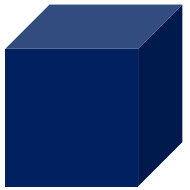
Adopting GHS: the Building Block Approach

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





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UNITAR Guidance on GHS implementation

The UNITAR guidance was created to provide a detailed description of possible steps for developing a national GHS implementation strategy.

https://cwm.unitar.org/publications/publications/ghs.aspx

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Considerations

- **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
  - Workers and workers associations
  - Civil society

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IOMC Toolbox

The toolbox developed by the Inter-Organization Programme for the Sound Management of Chemicals (IOMC) can assist in directing interested parties to specific elements of GHS implementation.

https://iomctoolbox.org/node/50038/steps

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Main stakeholders

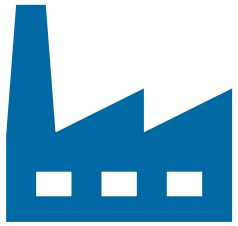
Authorities

Global

Regional

National

Local



Business and industry

Manufacturers

Importers

Supplier

Distributor

Users

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Tasks of authorities

Legislation

- General
- Targeted
  - *Specific products*
  - *Use setting*
- Obligations of stakeholders specified

Guidance

- Awareness raising
- Training

Inspection

- Desktop
- On site - Access rights

Enforcement

- Penalties and sanctions

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Task of business and industry

Generation of data

- Identity of chemicals
- Properties of chemicals
- Use of chemicals

Dissemination of knowledge

- Hazard classification
- Labels
- Safety Data Sheets

Safe use

- Training and protection
  - *Staff*
  - *Suppliers*
  - *Downstream users*

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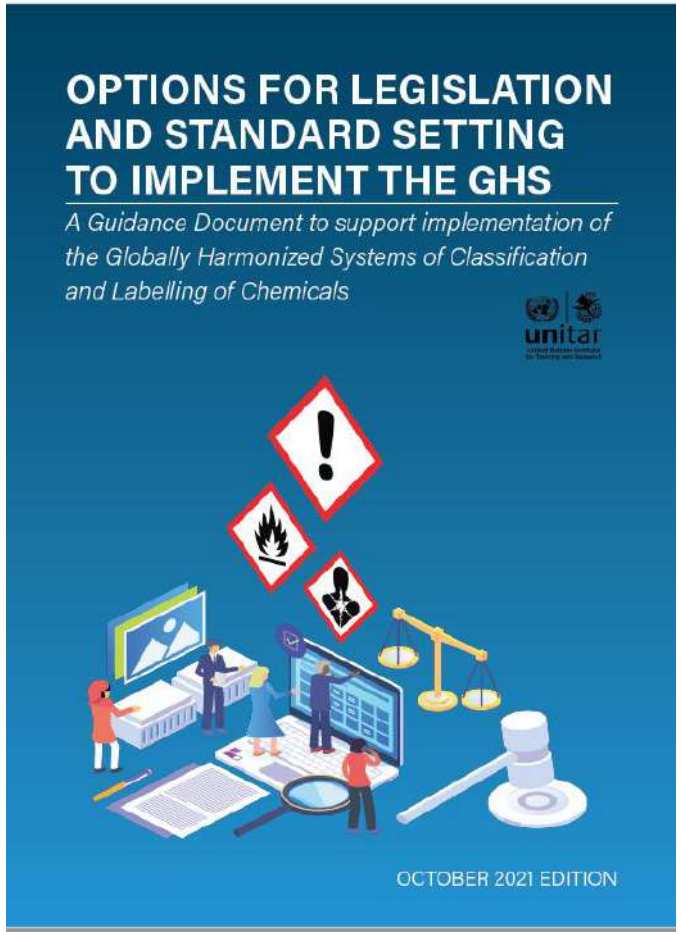
Guidance document to support implementation



Provides information and explanations on options for legal implementation of the GHS based on actions that have been taken in various countries or by relevant regional and international organizations

Contains examples of how the GHS has been legally implemented in

- ***European Union and UK***
- ***USA***
- ***Canada***
- ***Australia***
- ***New Zealand***
- ***China***
- ***Japan***
- ***South Africa***

https://unitar.org/sustainable-development-goals/planet/our-portfolio/globally-harmonized-system-classification-and-labelling-chemicals/global-partnership-implement-ghs

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GHS implementation in the European Union

Topic	GHS	EU
Physical hazards	Part 2	CLP Annex I, Part 2
Health hazards	Part 3	CLP Annex I, Part 3
Environmental hazards	Part 4	CLP Annex I, Part 4
Special rules (EU)		**CLP Annex II**
Hazard Statements	Annex 1 and 3	CLP Annex III
Precautionary Statements	Annex 1 and 3	CLP Annex IV
Hazard pictograms	Annex 1 and 3	CLP Annex V
Harmonised (legally binding) classification and labelling for certain hazardous substances (>4,000 entries)		**CLP Annex VI**
Safety data sheet	Annex 4	**REACH Annex 2**

CLP: Regulation (EC) No 1272/2008 on Classification, Labelling , and Packaging of substances and mixtures
REACH: Regulation (EC) No 1907/2006 on the Registration, Evaluation, Authorisation and Restriction of Chemicals

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CLP *generally* applies to **all substances and mixtures** placed on the market

Noted exemptions (covered by other EU legal acts)

- Radioactive substances and mixtures
- Substances and mixtures intended for scientific research and development, *which are not placed on the market*
- Waste
- Medical products
- Veterinary medicinal products
- Cosmetic products
- Medical devices
- Food or feeding stuff

} *in the finished products and intended for the final user*

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What are the differences between GHS and CLP?

- CLP is legally binding and directly applicable in the Member States of the EU, whereas GHS is not legally binding.
- In addition to GHS, CLP is also based on previous EU legislation, i.e. the Dangerous Substances Directive *67/548/EEC (DSD)* and the Dangerous Preparations Directive *1999/45/EC (DPD).*
- CLP includes all GHS hazard classes but not all hazard categories within a hazard class as corresponding hazard categories were not part of DSD. Examples include acute toxicity cat. 5, flammable liquids cat. 4 and skin irritation cat. 3.
- CLP includes special labelling and packaging rules brought over from the DSD and DPD, e.g. rules on small packaging, on supplemental information for certain mixtures and provision of child-resistant fastenings or tactile warnings.
- CLP includes rules for the situation when a substance is both covered by CLP and by transport legislation.
- CLP does not include specific rules on Safety Data Sheets as they are regulated by REACH.

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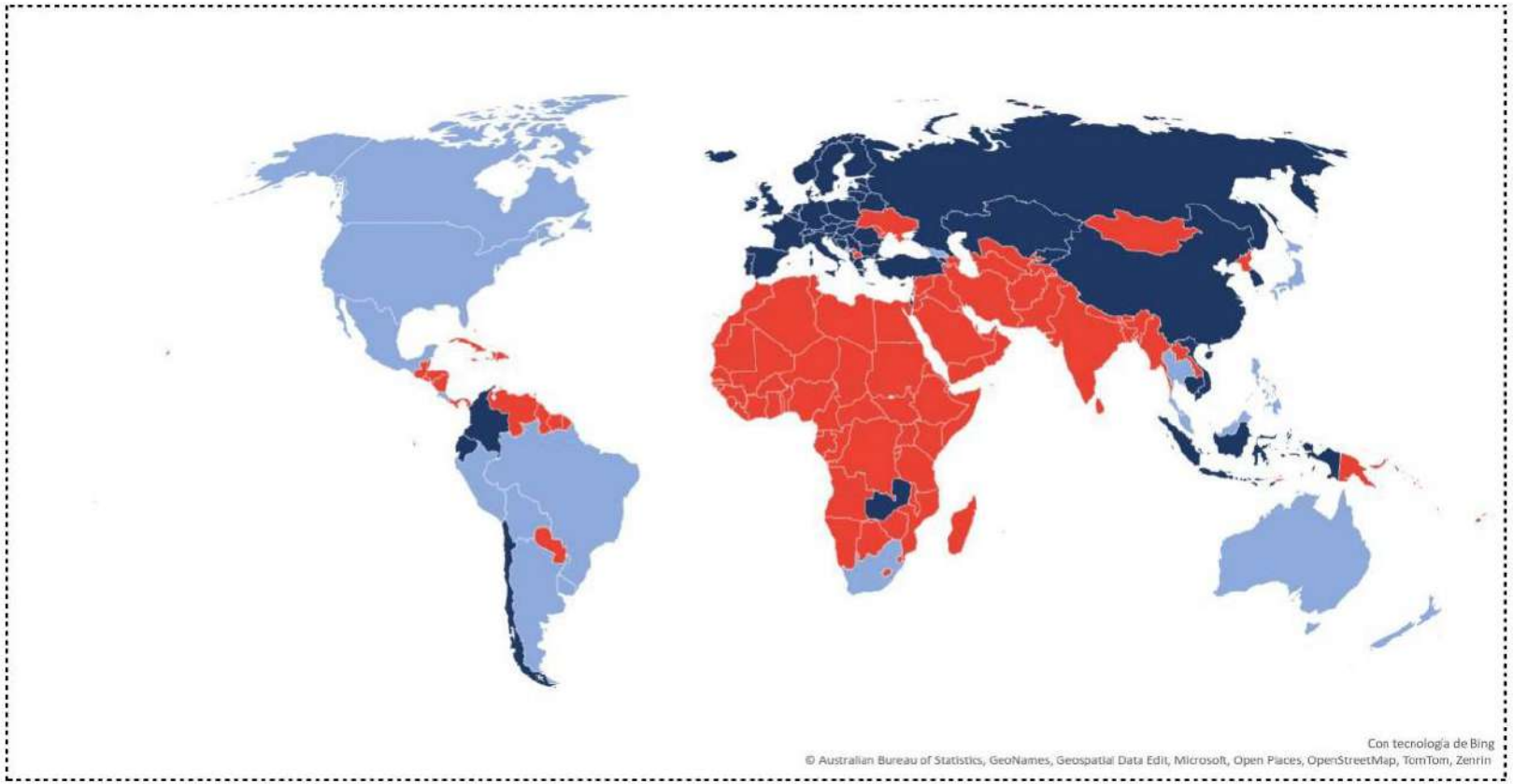
Global implementation of GHS



The boundaries shown on this map do not imply endorsement or acceptance by UNITAR

GHS IMPLEMENTATION KEY

- 0 - no legal implementation
- 1 - legal implemenation in 1 or 2 sectors
- 2 - legal implementation in all sectors

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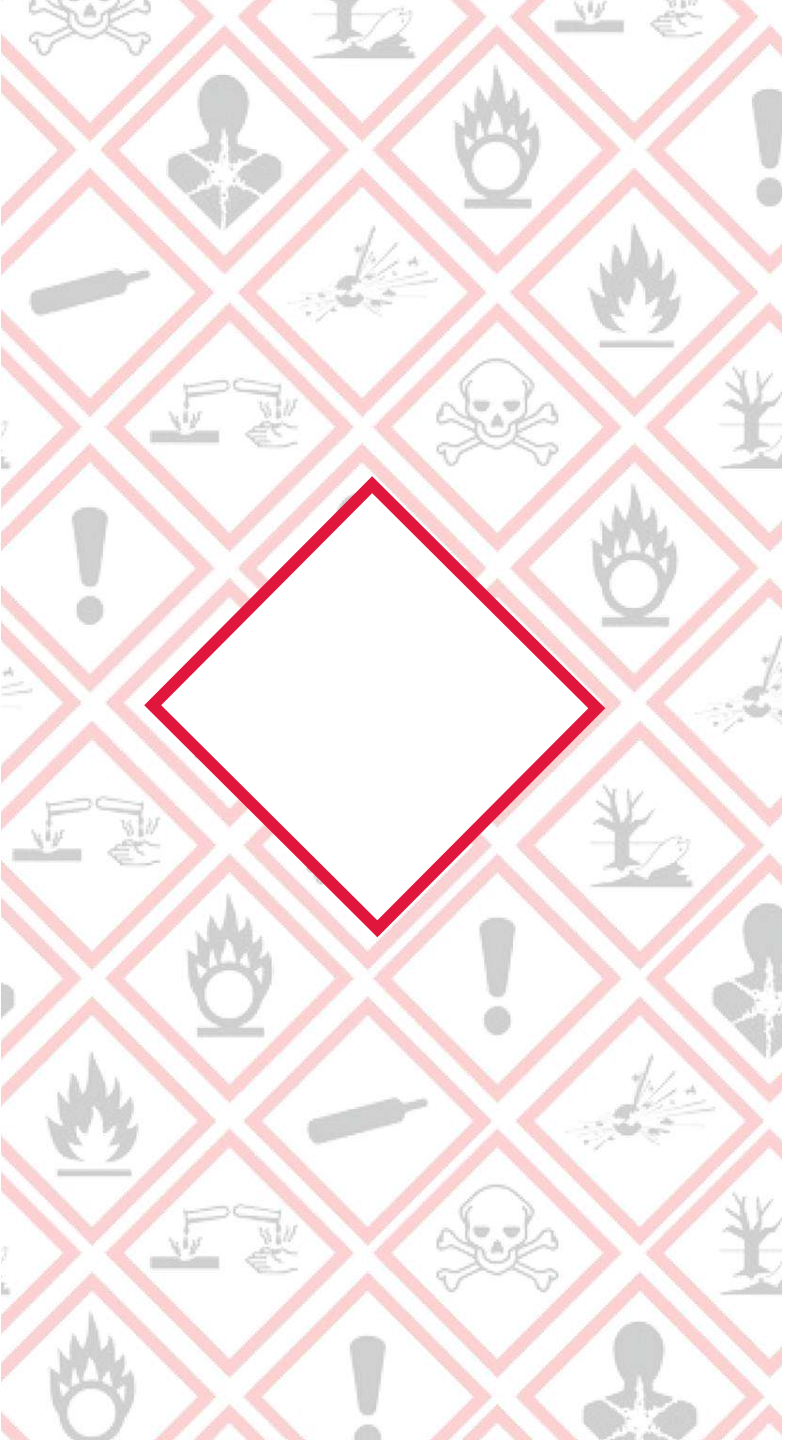

Examples of summary tables in the GHS Annex 3

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Matrix of precautionary statements by hazard class/category (one example from GHS Annex 3, section 3)

EYE DAMAGE/IRRITATION

(CHAPTER 3.3)

Hazard category	**Symbol**		**Signal word**	**Hazard statement**	
1	Corrosion		Danger	H318	Causes serious eye damage

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
P280 **Wear eye protection/face protection.** Manufacturer/supplier or the competent authority may further specify type of equipment where appropriate.	P305 + P354 + P338 **IF IN EYES: Immediately rinse with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.** P317 **Get medical help.**		

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Matrix of precautionary statements by hazard class/category (another example from GHS Annex 3, section 3)

SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (CHAPTER 3.8)					
Hazard category	**Symbol**		**Signal word**	**Hazard statement**	
1	Health hazard		Danger	H370	Causes damage to organs <...> <<...>>
				<...>	*(or state all organs affected if known)*
				<<...>>	*(state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard)*

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
P260 **Do not breathe dust/fume/gas/mist/ vapours/spray.** Manufacturer/supplier or the competent authority to specify applicable conditions. P264 **Wash …thoroughly after handling.** … Manufacturer/supplier or the competent authority to specify parts of the body to be washed after handling. P270 **Do not eat, drink or smoke when using this product.**	P308 + P316 **IF exposed or concerned: Get emergency medical help immediately.** Competent Authority or manufacturer / supplier may add, 'Call' followed by the appropriate emergency telephone number, or the appropriate emergency medical help provider, for example, a Poison Centre, Emergency Centre or Doctor. P321 **Specific treatment (see ... on this label)** – *if immediate measures are required.* ... Reference to supplemental first aid instruction.	P405 **Store locked up.**	P501 **Dispose of contents/container to...** ... in accordance with local/regional/national/international regulations (to be specified). Manufacturer/supplier or the competent authority to specify whether disposal requirements apply to contents, container or both.

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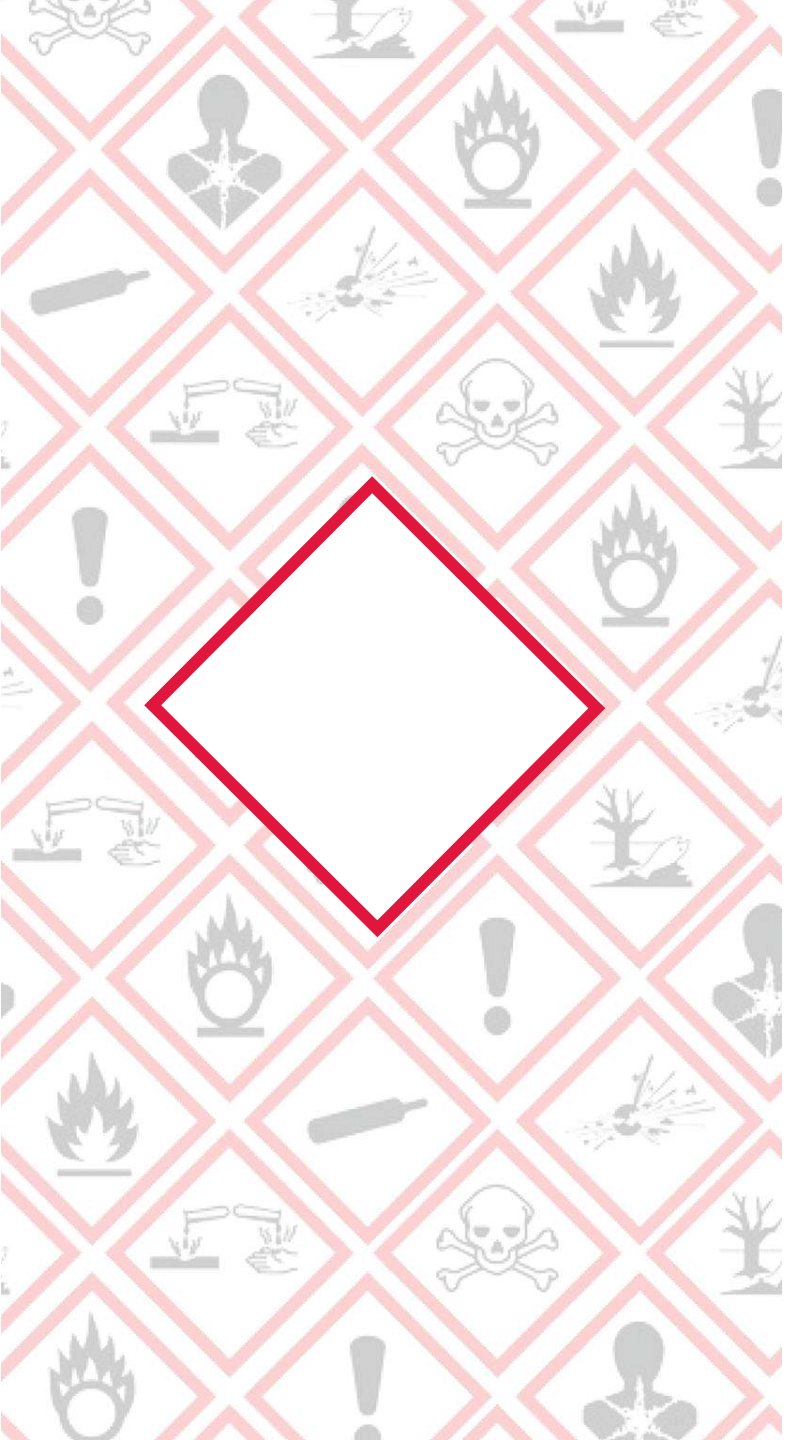

Some labelling examples presented in GHS

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Single packaging using 3 adjacent panels to convey multiple hazards.

Product classified as: (a) Category 2 Flammable liquid; (b) Category Acute 4 (by inhalation); and (c) Category 2 Specific target organ toxicant following repeated exposure.

<table>
<tr><td>CODE

PRODUCT NAME</td><td>  </td><td rowspan="2"> 
</td></tr>
<tr><td>COMPANY NAME</td><td>Danger
Keep out of the reach of children.
Read label before use.</td></tr>
<tr><td>Street Address
City, State, Postal Code, Country
Phone Number
Emergency Phone Number</td><td></td><td></td></tr>
<tr><td>DIRECTIONS FOR USE:
XXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXX</td><td>Highly flammable liquid and vapour.
Harmful if inhaled.
May cause liver and kidney damage through prolonged or repeated exposure.</td><td>UN Number
Proper shipping name</td></tr>
<tr><td></td><td>Keep container tightly closed.
Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
Use only outdoors or in a well-ventilated area.
Do not breathe dust/fume/gas/mist/vapours/spray.
Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/…
Ground and bond container and receiving equipment.

In case of fire: Use [as specified] to extinguish.

FIRST AID
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
Call a POISON CENTER/doctor if you feel unwell.</td><td>[Universal Product Code (UPC)]</td></tr>
<tr><td>Fill weight: XXXX Lot Number: XXXX
Gross weight: XXXX Fill Date: XXXX
Expiration Date: XXXX</td><td>Store in a well-ventilated place. Keep cool</td><td></td></tr>
</table>

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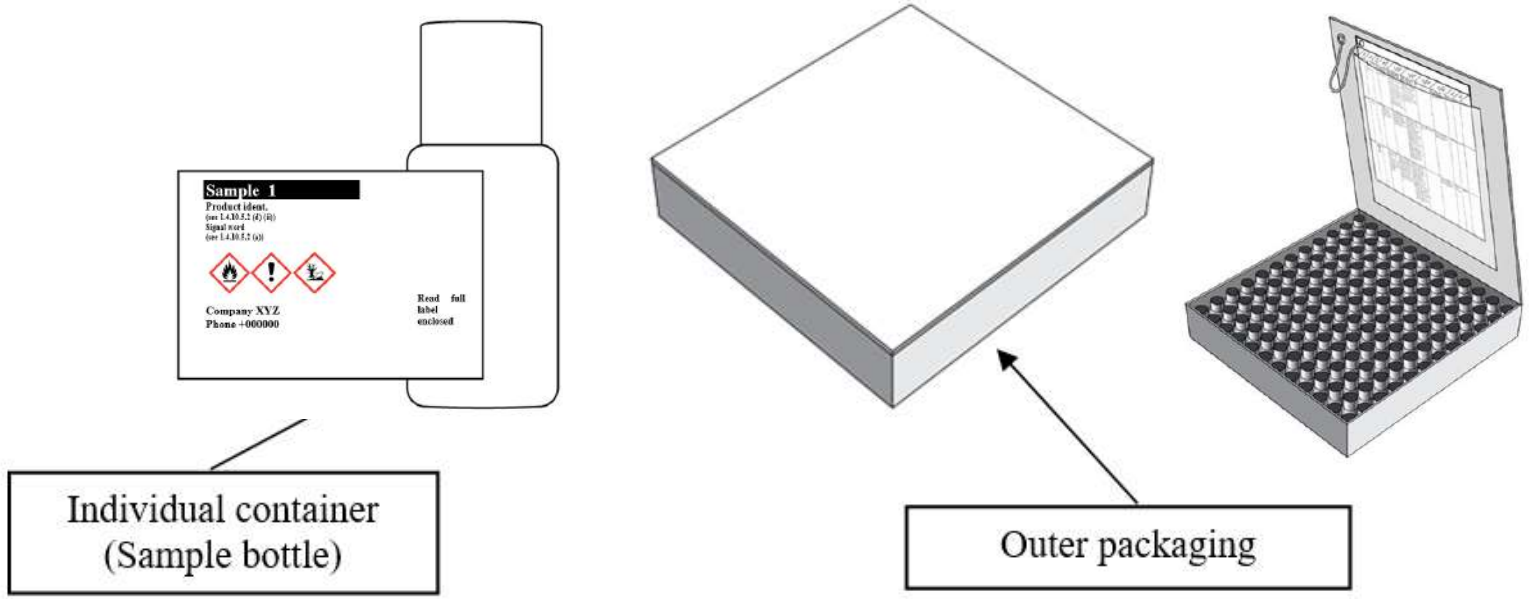
Labelling of small packaging



Individual container label

As the area available for a label on the different individual containers is not sufficient to include all required GHS label elements, the following minimum required information should be required:

- supplier identification (i.e. name and telephone number);
- product identifier[2];
- pictogram(s);
- signal word;
- the statement "Read full label enclosed".

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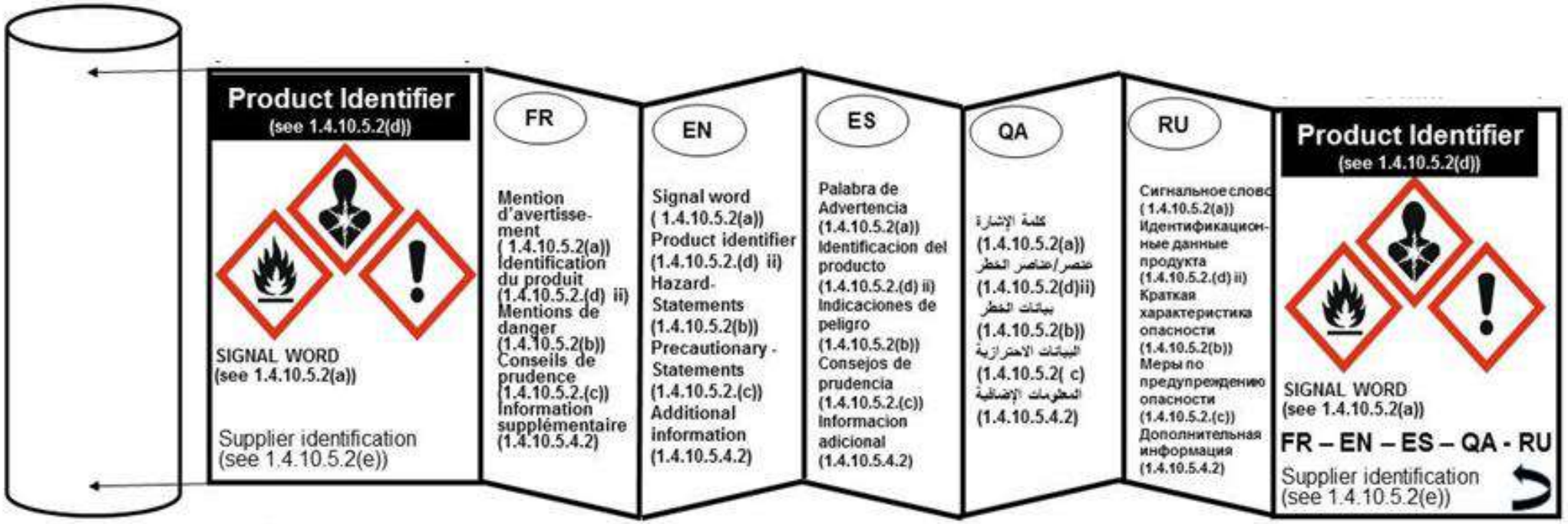
Fold-out multilingual label



back page
Completely fixed to immediate container

front page
wrapped around the can

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For more information,

please contact UNITAR

Globally Harmonized System of Classification and Labelling of Chemicals | UNITAR

or visit the GHS website

https://unece.org/about-ghs

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