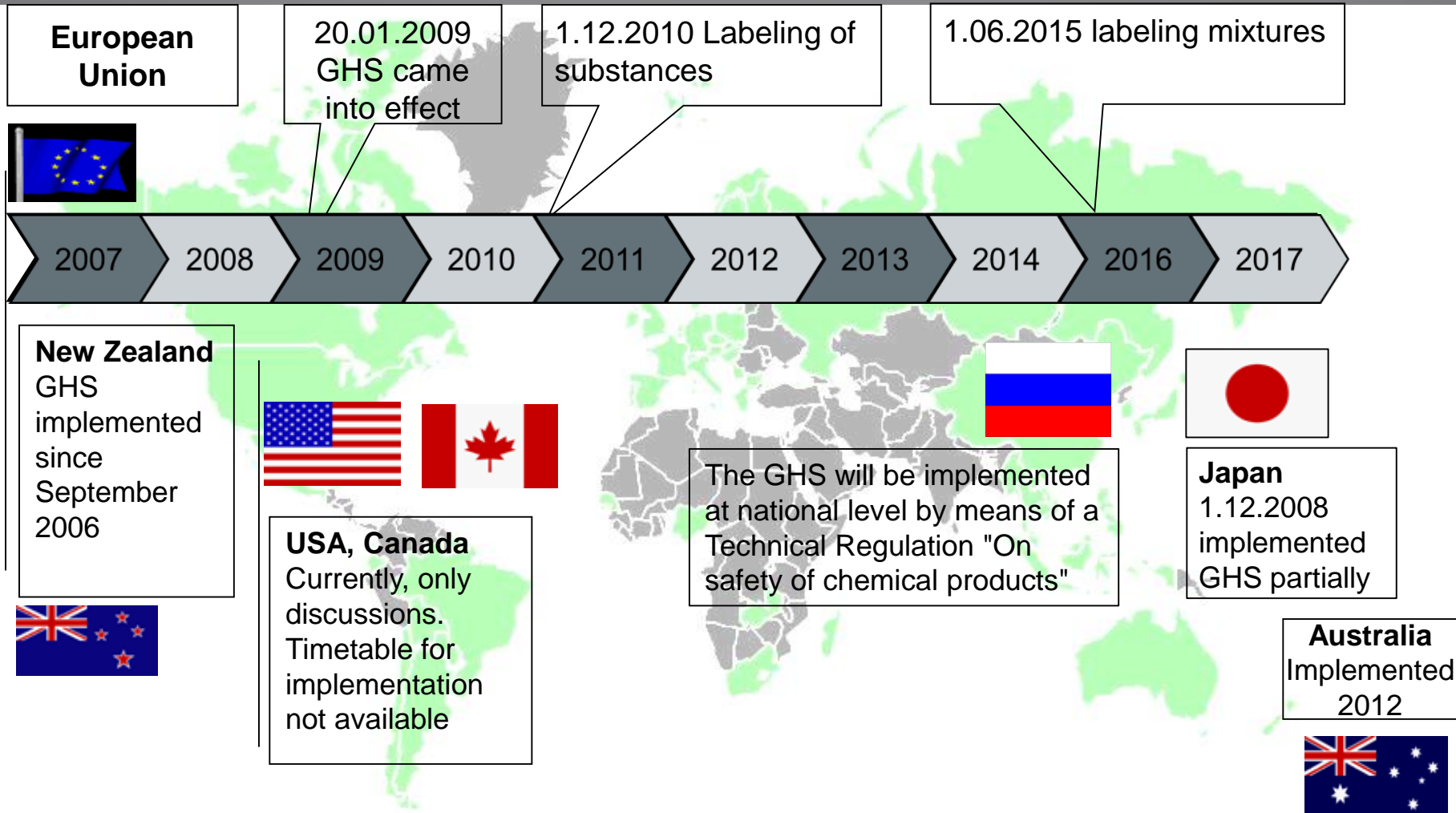


DBEST Integrated Facility Management

Instruction „Global Harmonized System (GHS)“ - Classification and labeling of chemicals in the EU

Beijing, July 2014

Implementation of GHS



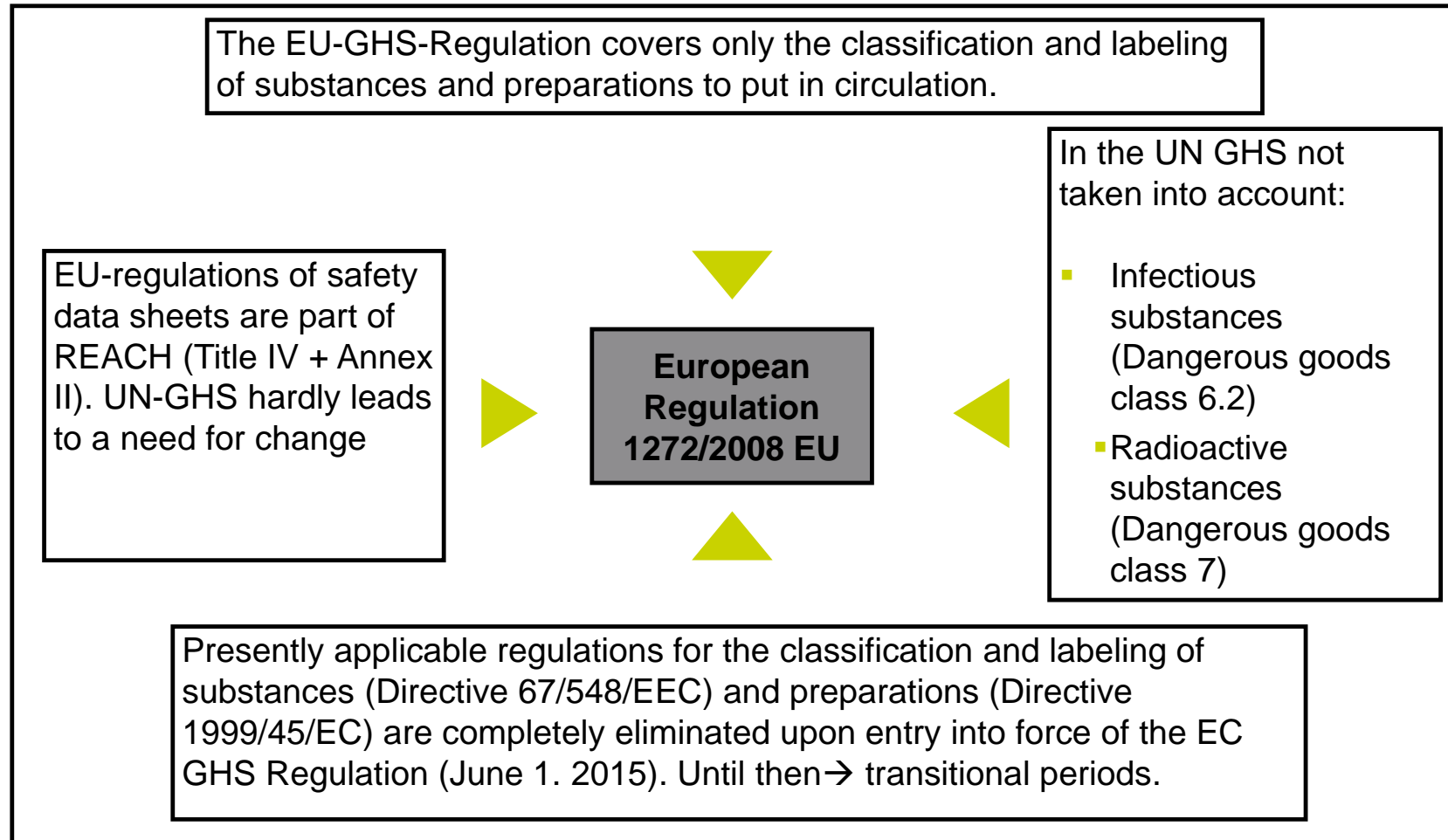
Worldwide harmonization - Why?

Classification in the country or during transport (dangerous goods)	
Transport	Mildly toxic (PGII)
EU	Harmful, Xn
USA	Toxic
Canada	Toxic
Australia	Harmful
India	Not toxic
Japan	Toxic
Malaysia	Harmful
Thailand	Harmful
China	Not dangerous
Korea	Toxic

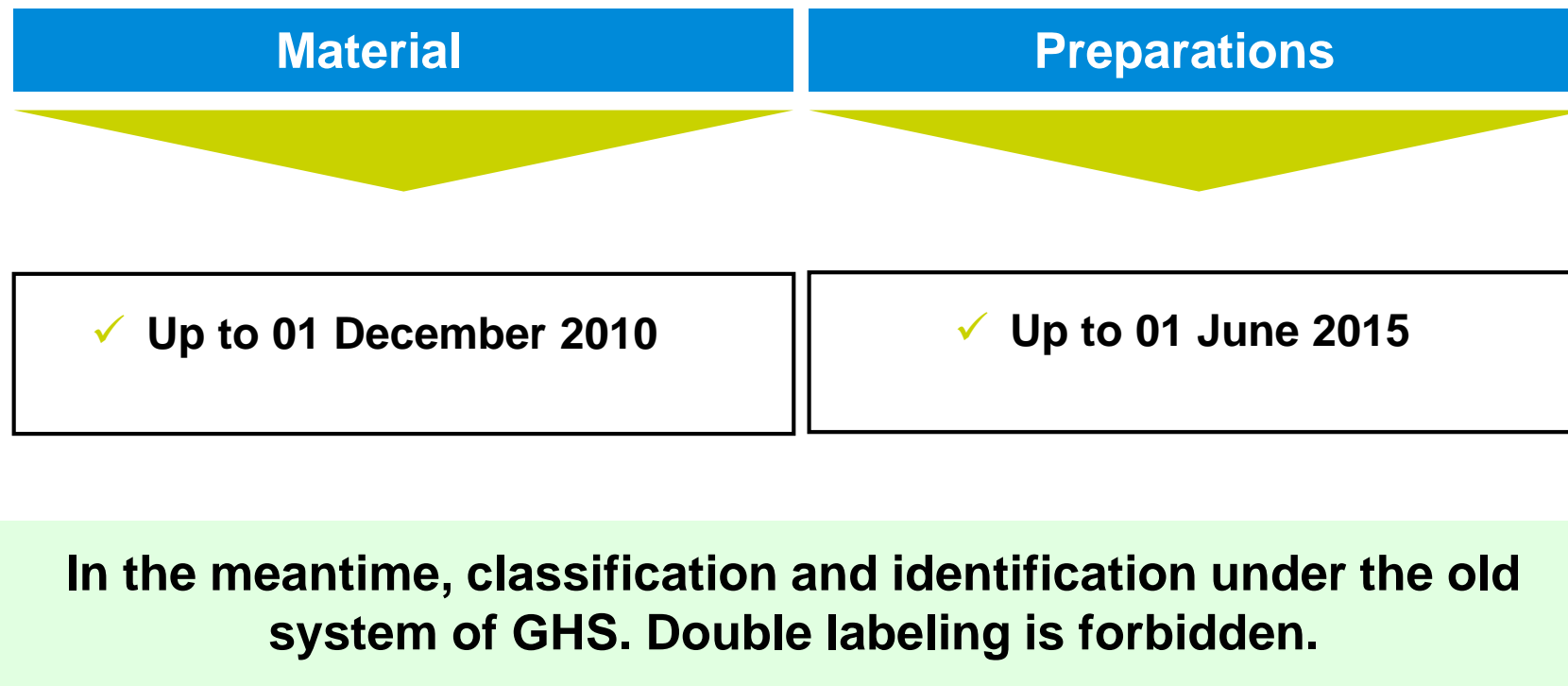
According GHS worldwide: Hazard



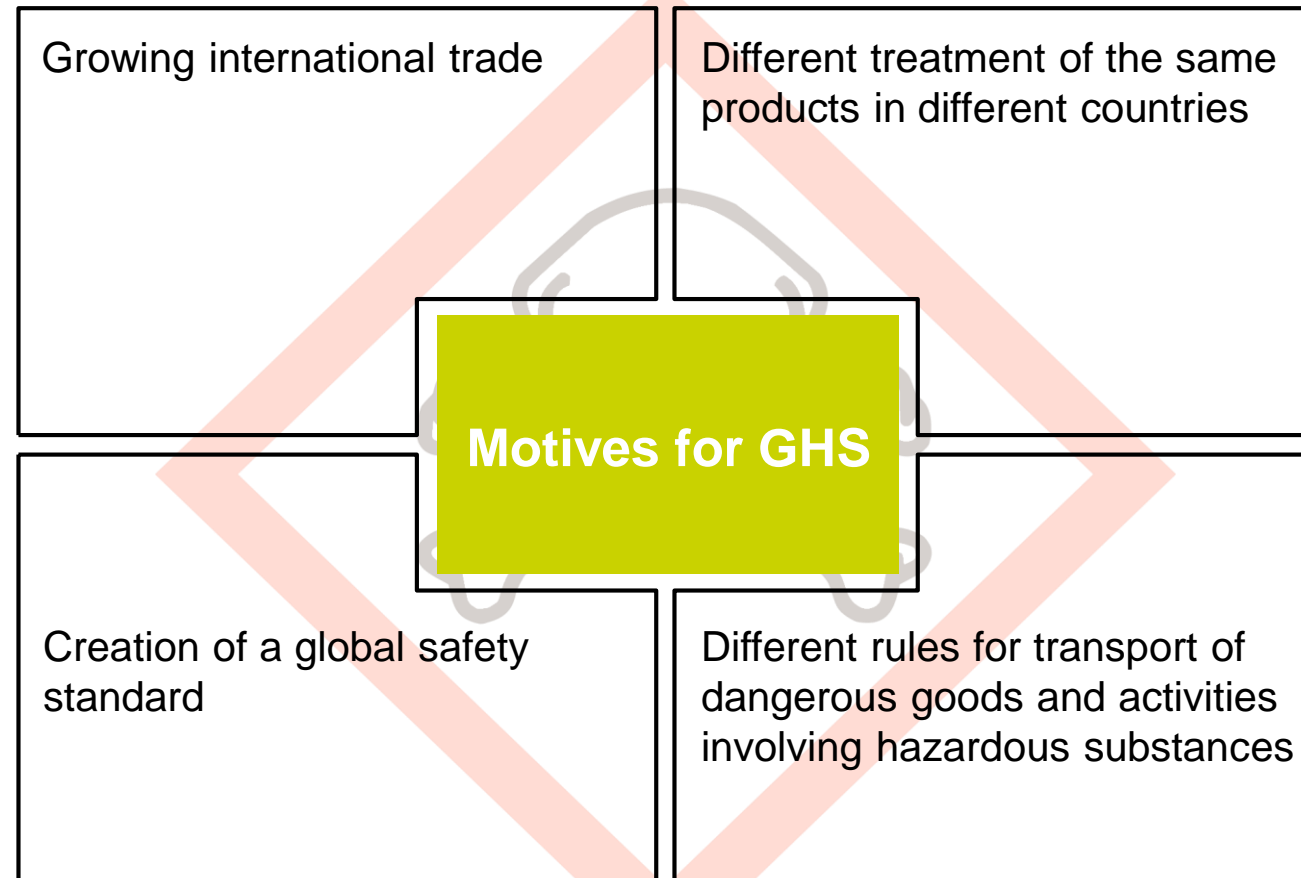
EG-GHS-Regulation 1272/2008



Transition periods for regulation 1272/2008 EU



Motives for GHS

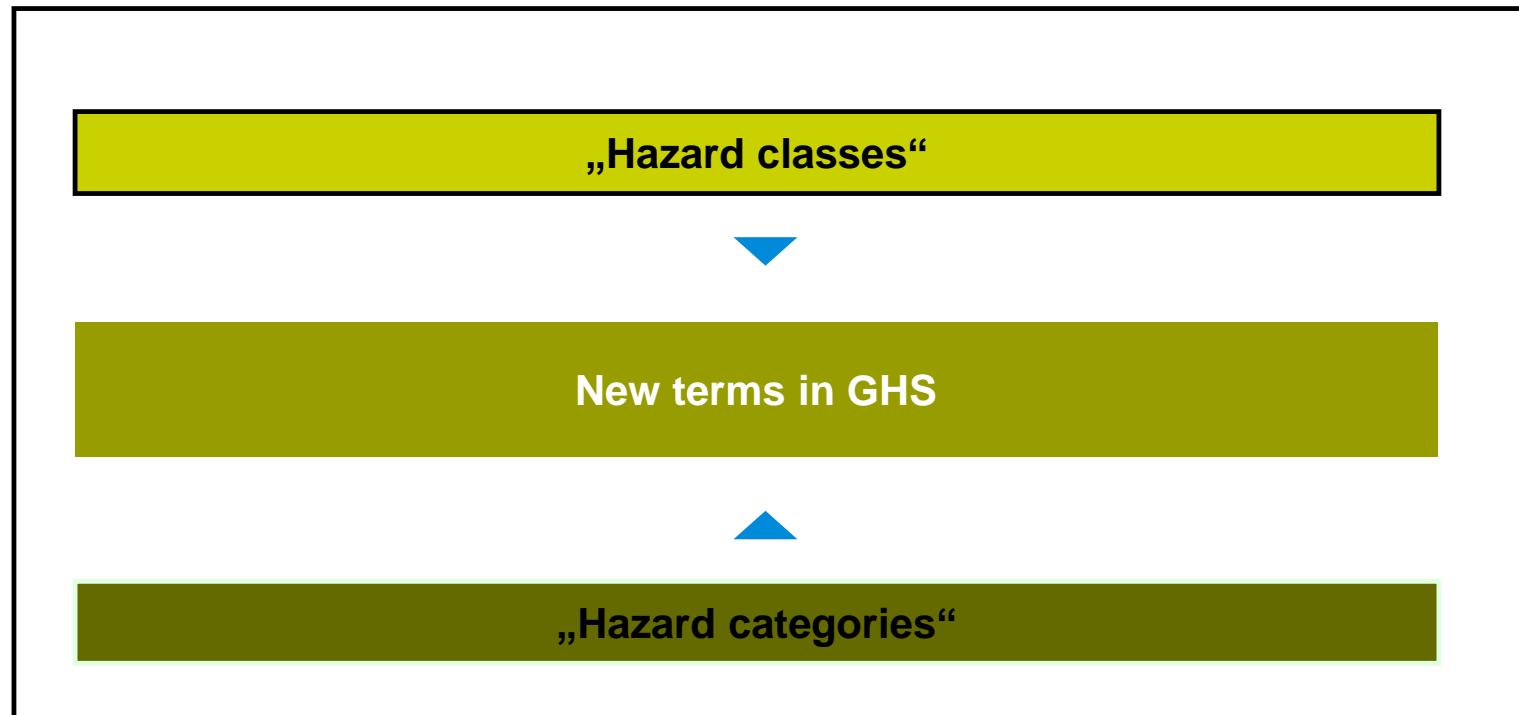


Innovations at a glance

- ✓ New pictograms
- ✓ Skull only for toxic substances
- ✓ New symbol for CMR substances (Carcinogenic, mutagenic or toxic for reproduction)
- ✓ New criteria for classifications
- ✓ Until now: 15 hazard characteristics → In the future: division into 28 **hazard classes** and 80 **hazard categories**
- ✓ 68 **R-statements** are replaced by 71 Hazard-statements (H) → **H-statements**
- ✓ 64 **S-statements** are replaced by 135 Precautionary statements (P) → **P-statements**
- ✓ Signal words - pictograms are supplemented with two possible signal words:
 - „**Danger**“ or
 - „**Warning**“

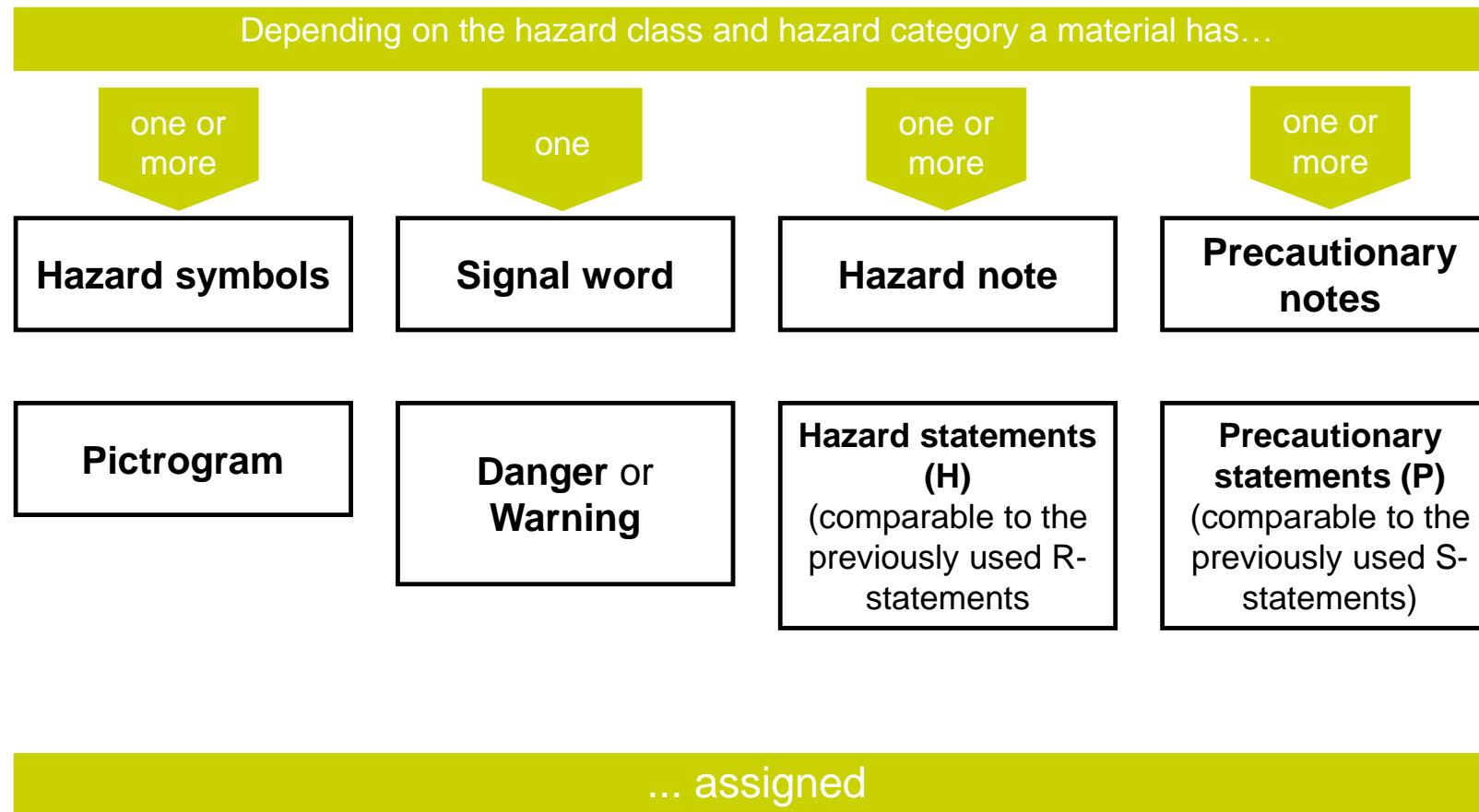


New terms in GHS

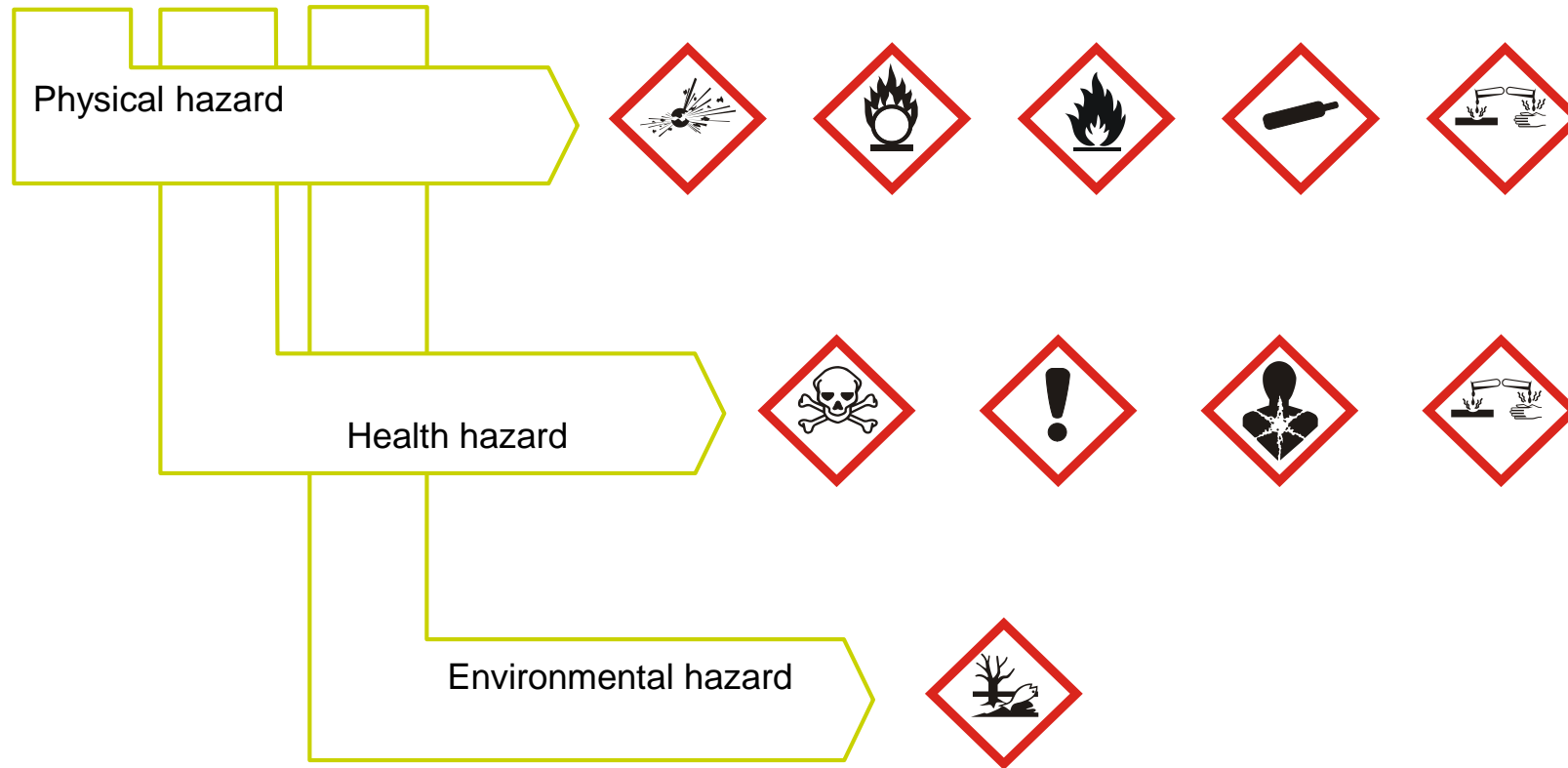


28 risk classes, which modify in 1 - 5 risk categories

New terms in GHS



New pictograms in GHS





Symbol	GHS 01	GHS 02	GHS 03	GHS 04	GHS 05
--------	--------	--------	--------	--------	--------

Hazard class	Physical hazard	Symbol
Explosive substances / mixtures and articles containing explosives	Explosives	GHS 01
Flammable gases	Flammable gases	GHS 02
Flammable aerosols	Flammable aerosols	GHS 02
Oxidizing gases	Oxidizing gases	GHS 03
Gases under pressure	Gases under pressure	GHS 04
Flammable liquids	Flammable liquids	GHS 02



Symbol	GHS 01	GHS 02	GHS 03	GHS 04	GHS 05
--------	--------	--------	--------	--------	--------

Hazard class	Physikal hazard	Symbol
Flammable solids	Flammable solids	GHS 02
Self-reactive substances and mixtures	Self-reactive substances and mixtures	GHS 01 + 02
Pyrophoric liquids	Pyrophoric liquids	GHS 02
Pyrophoric solids	Pyrophoric solids	GHS 02
Self-heating substances and mixtures	Self-heating substances and mixtures	GHS 02



Symbol	GHS 01	GHS 02	GHS 03	GHS 04	GHS 05
--------	--------	--------	--------	--------	--------

Hazard class	Physikal hazard	Symbol
Substances and mixtures which in contact with water emit flammable gases	Substances and mixtures which in contact with water emit flammable gases	GHS 02
Oxidizing acting liquids	Oxidizing acting liquids	GHS 03
Oxidizing acting solids	Oxidizing acting solids	GHS 03
Organic peroxides	Organic peroxides	GHS 01 + 02
Corrosive to metals	Corrosive to metals	GHS 05



Symbol	GHS 06	GHS 07	GHS 08	GHS 05
--------	--------	--------	--------	--------

Hazard class	Health hazard	Symbol
Acute toxicity	Acute toxicity	GHS 06 + 07
Skin corrosion/ irritation	Skin corrosion/ irritation	GHS 05 + 07
Serious eye damage/ irritation	Serious eye damage/ irritation	GHS 05 + 07
Respiratory and skin sensitization	Respiratory and skin sensitization	GHS 07 + 08
Germ cell mutagenicity	Germ cell mutagenicity	GHS 08
carcinogenicity	carcinogenicity	GHS 08



Symbol	GHS 06	GHS 07	GHS 08	GHS 05
--------	--------	--------	--------	--------







Hazard class	Health hazard	Symbol
Reproductive toxicity	Reproductive toxicity	GHS 08
Specific target organ (systemic) toxicity from single exposure	Specific target organ (systemic) toxicity from single exposure	GHS 07 + 08
Specific target organ (systemic) toxicity from repeated exposure	Specific target organ (systemic) toxicity from repeated exposure	GHS 08
Aspiration hazards	Aspiration hazards	GHS 08







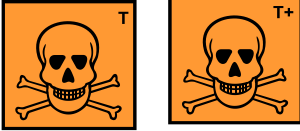
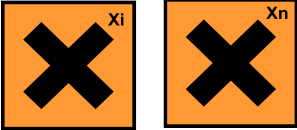
Symbol GHS 09

Hazard class	Environmental hazard	Symbol
Hazardous to the aquatic environment	Hazardous to the aquatic environment	GHS 09
a) Acute aquatic hazard	Acute aquatic hazard	GHS 09
b) Chronic aquatic hazard	Chronic aquatic hazard	GHS 09
Additional EU Hazard Class (not included in GHS)		
For the ozone layer dangerous substances and preparations (R59)	-	-





Comparison NEW - OLD

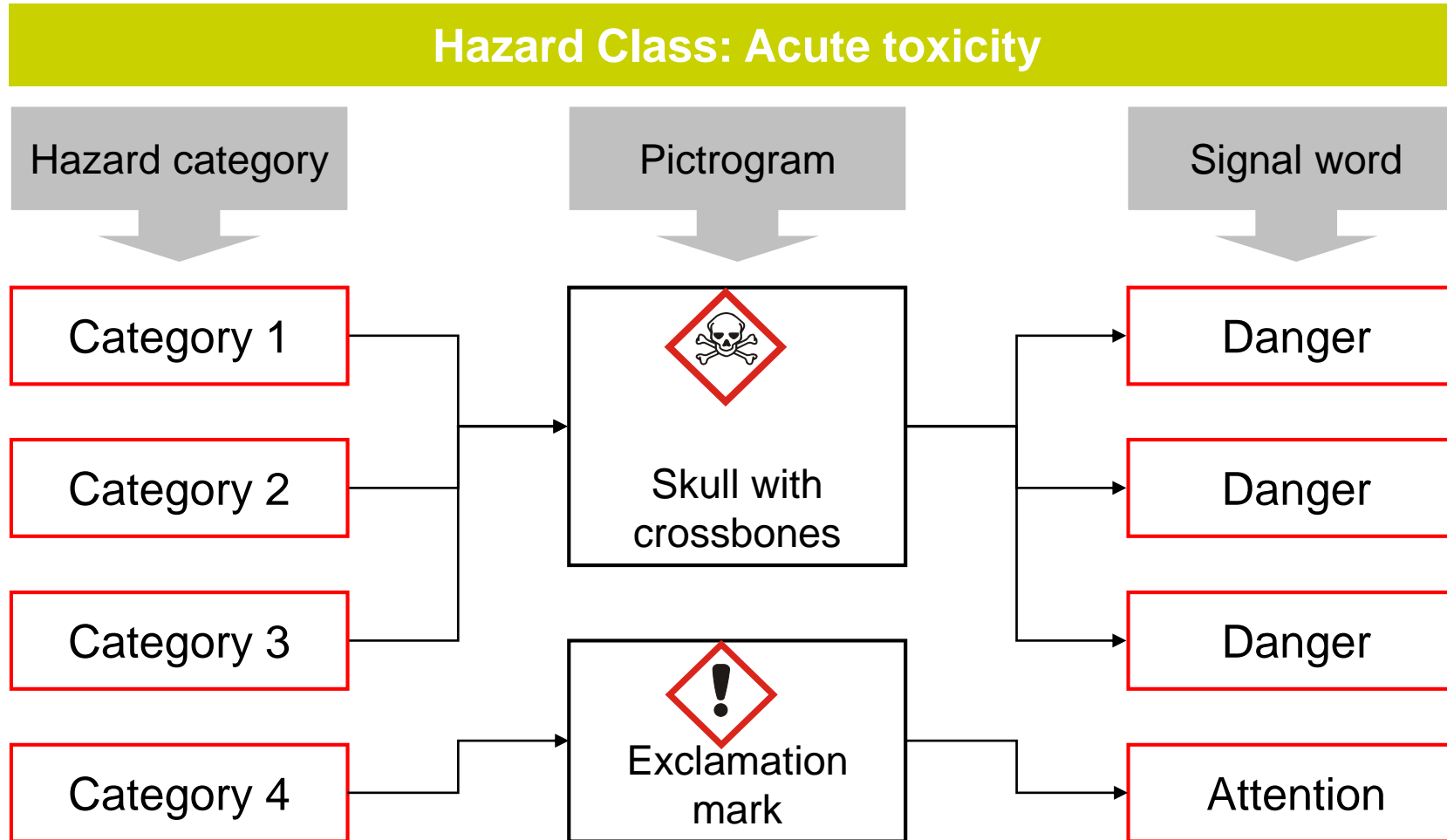
Pictogram	Designation	Description	Previous symbol
	GHS 01 Exploding bomb	Explosive materials	
	GHS 02 Flame	Flammable materials	
	GHS 03 Flame over circle	Oxidizing substances	

Comparison NEW - OLD

Pictogram	Designation	Description	Previous symbol
	GHS 04 gas bottle	Gases under pressure	None
	GHS 05 corrosivity	<ul style="list-style-type: none"> ✓ Corrosive to the skin (category 1) ✓ Serious eye damage (category 1) ✓ Corrosive to metals (category 1) 	
	GHS 06 Skull and crossbones	Acute toxicity (category 1, 2 + 3)	
No correspondence		Acidly Harmful	

Comparison NEW - OLD

Pictogram	Designation	Description	Previous symbol
	GHS 07 exclamation mark	<ul style="list-style-type: none"> ✓ Acute toxicity (category 4) ✓ Irritation of the skin (category 2) ✓ Eye irritation (category 2) ✓ Skin sensitization ✓ Specific target organ toxicity (category 3) 	No correspondence
	GHS 08 Health hazard	<ul style="list-style-type: none"> ✓ C – carcinogenic ✓ M – Mutagen ✓ R – Toxic to reproduction ✓ Respiratory sensitization ✓ Specific target organ toxicity (category 1 + 2) ✓ Aspiration hazard (category 1) 	No correspondence
	GHS 09 Environment	Hazardous to the aquatic environment	



New elements for labeling

Hazard Statements previous R-statements

The new terms

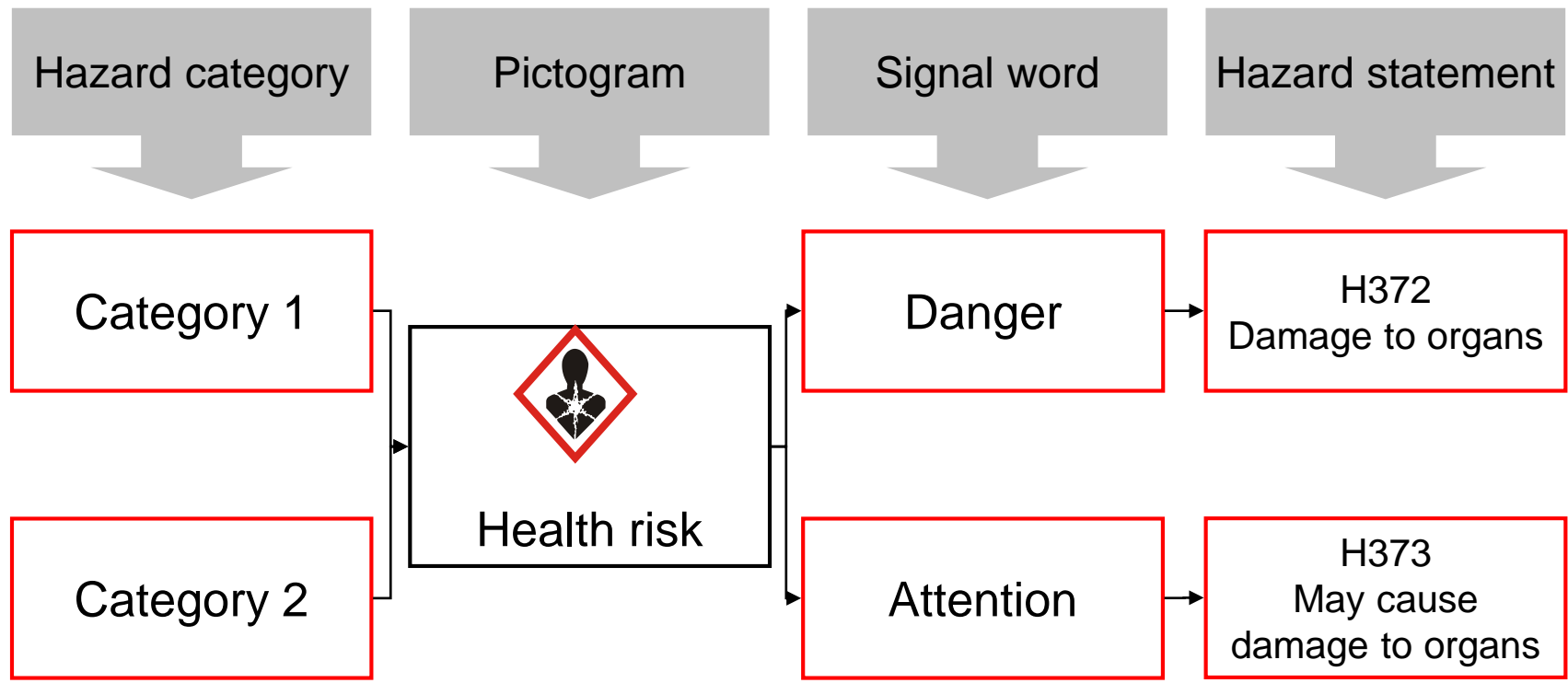
The label needs in addition to a hazard pictogram and a signal word a warning of danger (hazard statements). These statements are comparable to the previously used "R" statements.

Hazard Statements

The hazard statement informs about the risk of the exposure and the category. Hazard statements are coded. The code consists a H (Hazard Statement) and a three digit number. Begins the code with the following number:

- 2 indicates a physical hazard,
 - 3 stands for health hazards and
 - 4 indicates notes on environmental hazards.
- example: „Causes severe eye-damage“ (H318).

Hazard Class: Specific target organ toxicity (repeated exposure)



New elements for labeling

Precautionary Statements previous S-statements

The new terms

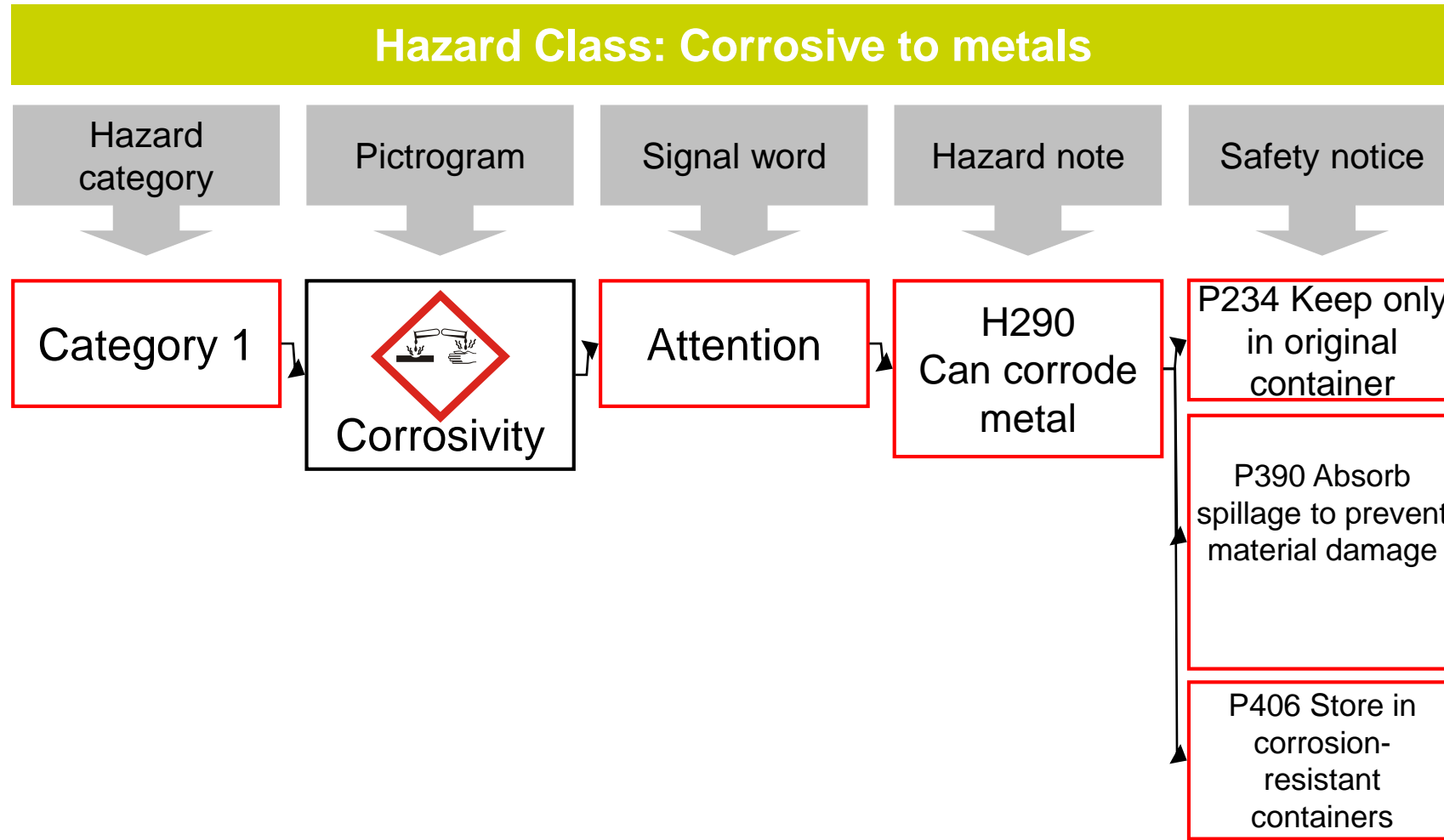
The label needs in addition to a hazard pictogram and a signal word a warning of danger (hazard statements). These rates are comparable to the previously used "S" statements.

Precautionary Statements

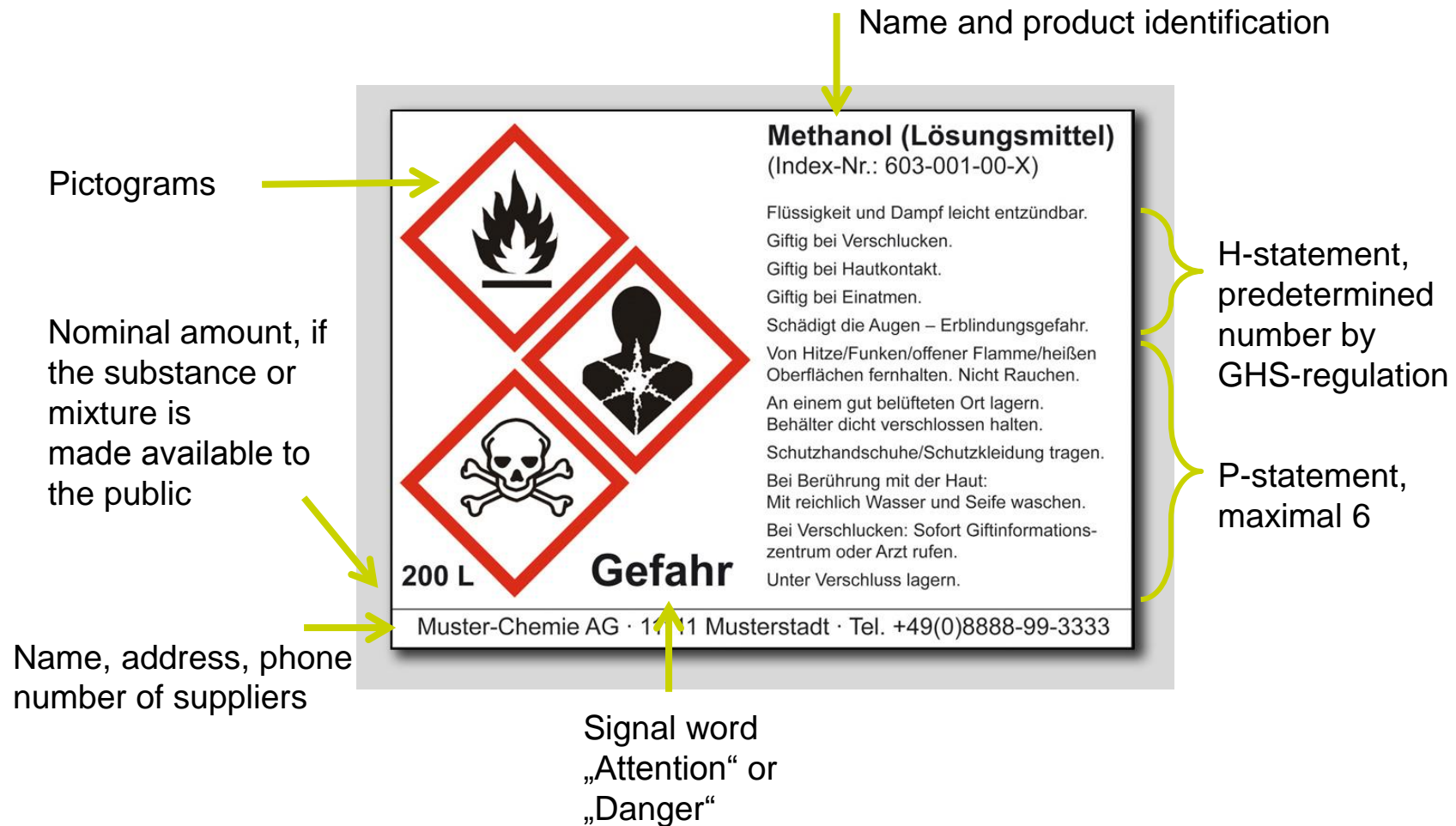
Precautionary statements describe the necessary steps to protect against hazards. Sometimes you need different references. They are coded with a P (for Precautionary Statement) and a three digit number. The first digit represents the type of evidence.

- 1 General safety advice (for private consumers)
- 2 Safety advice for prevention
- 3 Security advice on counter measures
- 4 Safety advice for storage
- 5 Safety advice for disposal

example: „Protect from moisture “ (P232) or „Wear protective gloves “ (P280)







New labels: Label elements



Classification of hazardous materials

Example: acetone

Old labeling		New labeling	
European Union (still in force)		GHS (already in force)	
F; R11	Highly flammable	Flammable liquids category 2	
Xi; R36	Irritating to eyes	(H225: Highly flammable liquid and vapor)	
R66	Repeated exposure may cause skin dryness or cracking	Serious eye damage / eye irritation category 2 (H319; Causes severe eye irritation)	
R67	Vapours may cause drowsiness and dizziness	Specific target organ toxicity-single exposure category 3 (H336: May cause drowsiness and dizziness)	
		Special EU labeling information (EUH066: Repeated exposure may cause skin dryness or cracking)	
 		 	



Chemicals legislation

Material GL 67/548/EU

- Appendix I: substance list
- Appendix II: Hazard symbols and – designations
- Appendix III: R-Statements
- Appendix IV: S-Statements

Preparations GL 1999/45/EU

- Appendix II and III: limits

Safety Data Sheet GL 91/155/EU

- Appendix construction →

Content remains → more detailed

**Local law regulation
(Hazardous substances)**

Operational changes:

- Labels
- Renew „Material Safety Data Sheets (MSDS)“
- Update risk assessments (COSHH)
- Update „Hazardous Substances Register“
- Updating operating instructions for handling Hazardous substances
- Check requirements for the activities (f.e. PPE)
- Concept of protection levels