









Classification and Labelling of Substances


Environmental hazards

Classification according to Dir. 67/548/EEC

Aquatic environment

	Very toxic to aquatic organisms	
	Harmful to aquatic organisms	
	May cause long-term adverse effects in the aquatic environment	
	Very toxic to aquatic organisms,	} may cause long-term adverse effects in the aquatic environment
	Toxic to aquatic organisms,	
	Harmful to aquatic organisms,	

Non - aquatic environment

	Dangerous for the ozone layer
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Classification acc. to Reg. (EC) No 1272/2008

Annex I, PART 4: ENVIRONMENTAL HAZARDS

Classification categories for hazardous to the aquatic environment

Acute (short-term) aquatic hazard

Category 1

Chronic (long-term) aquatic hazard

Category 1

Category 2

Category 3

'Safety net' classification

Category 4

PART 5: ADDITIONAL EU HAZARD CLASS

Hazardous to the ozone layer

Translation table

Regulation (EC) No 1272/2008 – Annex VII Table 1.1

67/548/EEC	(EC) No 1272/2008	Hazard Statement
N; R50	Aquatic Acute 1	H400
N; R50-53	Aquatic Acute 1 Aquatic Chronic 1	H400 H410
N; R51-53	Aquatic Chronic 2	H411
R52-53	Aquatic Chronic 3	H412
R53	Aquatic Chronic 4	H413
N; R59	Ozone	EUH059

Comparison of classification elements

67/548/EEC

AQUATIC ENVIRONMENT

“dangerous for the environment”

- Risk-Phrases
(R50; R52; R53;
R50-53; R51-53; R52-R53)

NON-AQUATIC ENVIRONMENT

- “ Dangerous for the ozone layer “(R59)

CLP - Regulation

ENVIRONMENTAL HAZARD

“hazardous to the aquatic environment “

Categories: acute cat.1
chronic cat. 1, cat.2, cat.3, cat.4

- Hazard Statement
(H400; H410; H411; H412; H413)
- #### **ADDITIONAL EU HAZARD CLASS**
- “ Hazardous to the ozone layer “
(EUH059)

Comparison of labelling elements

67/548/EEC

- Symbol
- Indication of danger:
Dangerous for the environment
- Risk-phrases
- Safety-phrases



CLP - Regulation



- GHS - Pictogram
 - Signal-Word:
Danger, Warning
- Hazard Statement (H)
- Precautionary Statement (P)
Prevention, Reaktion, Disposal

What`s new?

Aquatic Toxicity

- **freshwater** and **marine species** toxicity data and
- **other species** (e.g. *Lemna spp.*) can be considered as equivalent data

Bioaccumulation

Using a higher **cut-off** value of $\log Kow \geq 4$ and $BCF \geq 500$ is intended to identify substances with a **potential to bioconcentrate**

Rapidly degradalbe vs readily degradable

Declassification from chronic categories **2 & 3** (NOECs >1 mg/L)

Classification categories

Acute (short-term) aquatic hazard

Acute Category 1 ¹⁾

96 hr LC₅₀ (for fish) ≤ 1 mg/l and/or

48 hr EC₅₀ (for crustacea) ≤ 1 mg/l and/or

72 or 96 hr E_rC₅₀
(for algae or other aquatic plants) ≤ 1 mg/l ²⁾

1) When classifying substances as Acute Category 1 and/or Chronic Category 1 it is necessary at the same time to indicate an appropriate **M-factor**.

2) Classification shall be based on the **ErC₅₀** [= EC₅₀ (growth rate)].

Classification categories

Chronic (long-term) aquatic hazard

Chronic Category 1 ¹⁾

LC₅₀, EC₅₀ and/or E_rC₅₀ ≤ 1 mg/l

Chronic Category 2

LC₅₀, EC₅₀ and/or E_rC₅₀ >1 to ≤ 10 mg/l

Chronic Category 3

LC₅₀, EC₅₀ and/or E_rC₅₀ >10 to ≤ 100 mg/l

and the substance is **not rapidly degradable** and/or the experimentally determined **BCF ≥ 500** (or, if absent, the **log K_{ow} ≥ 4**).

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- 1) When classifying substances as Acute Category 1 and/or Chronic Category 1 it is necessary at the same time to indicate an appropriate **M-factor**.

Classification categories

Safety Net - Classification

Chronisch Category 4

Available data do not allow classification under the above criteria - nevertheless some grounds for concern exist:

- **poorly soluble substances** for which no acute toxicity is recorded at levels up to the water solubility³, and which are not rapidly degradable and have an experimentally determined **BCF \geq 500** (or, if absent, a log **Kow \geq 4**), indicating a potential to bioaccumulate, will be classified in this category unless **NOECs > water solubility or > 1 mg/l**, or evidence of **rapid degradation** in the environment.

Multiplying factors

- Multiplying factors for **highly toxic components < 1 mg/L** to give an increased weight to very toxic substances
- for substances classified as hazardous to the aquatic environment, **acute category 1 or chronic category 1**
- M-factors are used to derive by **the summation method** the classification of a **mixture**

L(E)C₅₀ Value	Multiplying factor (M)
$0,1 < L(E)C_{50} \leq 1$	1
$0,01 < L(E)C_{50} \leq 0,1$	10
$0,001 < L(E)C_{50} \leq 0,01$	100
$0,0001 < L(E)C_{50} \leq 0,001$	1000
$0,00001 < L(E)C_{50} \leq 0,0001$	10000
(continue in factor 10 intervals)	

Multiplying factors

(EC) No 1272/2008, Annex VI, Table 3.1 vs. Table 3.2

List of harmonised classification and labelling of hazardous substances


Example from Table 3.1

Index No	International Chemical Identification	EC No	CAS No	Classification		Labelling			Specific Conc. Limits, M-factors	Notes
				Hazard Class and Category Code(s)	Hazard statement Code(s)	Pictogram, Signal Word Code(s)	Hazard statement Code(s)	Suppl. Hazard statement Code(s)		
015-132-00-4	S-(chlorophenylthiomethyl) O,O-dimethylphosphorodithioate; methylcarbophenothione	—	953-17-3	Acute Tox. 3 * Acute Tox. 3 * Aquatic Acute 1 Aquatic Chronic 1	H311 H301 H400 H410	GHS06 GHS09 Dgr	H311 H301 H410		M = 1000	



Example from Table 3.2

Index No	International Chemical Identification	EC No	CAS No	Classification	Labelling	Concentration Limits	Notes
015-132-00-4	S-(chlorophenylthiomethyl) O,O-dimethylphosphorodithioate; methylcarbophenothione	—	953-17-3	T; R24/25 N; R50-53	T; N R: 24/25-50/53 S: (1/2-)28-36/37-45-60-61	N; R50-53: C ≥ 0,025 % N; R51-53: 0,0025 % ≤ C < 0,025 % R52-53: 0,00025 % ≤ C ≤ 0,0025 %	

Label elements (1)

ACUTE	
	Category 1
GHS-Pictogram	
Signal Word	Warning
Hazard Statement	H400: Very toxic to aquatic life
Precautionary Statement	P273 (Avoid release to the environment)
- Prevention	
- Reaction	P391 (Collect spillage)
- Storage	-
- Disposal	P501 (Dispose of contents/container to ...)

Label elements (2)

CHRONIC				
	Category 1	Category 2	Category 3	Category 4
Pictogram			No pictogram is used	No pictogram is used
Signal Word	Warning	No signal word is used	No signal word is used-	No signal word is used-
Hazard Statement	H400: Very toxic to aquatic life	H411: Toxic to aquatic life with long lasting effects	H412: Harmful to aquatic life with long lasting effects	H413: May cause long lasting harmful effects to aquatic life
Precautionary Statement - Prevention	P273	P273	P273	P273
- Reaction	P391	P391		
- Storage				14
- Disposal	P501	P501	P501	P501

67/548/EEC versus CLP

RL 67/548/EEC	(EC) No 1907/2006
R52	---
Bioaccumulation	
BCF \geq 100	BCF \geq 500
Log Kow \geq 3	Log Kow \geq 4
R52-R53 – only degradation	Chronic cat 3: additionally BCF/Log Kow
Degradation	
readily	rapidly
Declassification: NOEC > 1mg/l (Fish, Crustacea)	
R52-53 and R53	Chronic 2,3,4
Testorganism	
---	Freshwater and marine species, aquatic plants (<i>Lemna spp.</i>)

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