

**SECTION 1: Identification of the substance/mixture and of the company/undertaking****1.1 Product identifier****Trade name: Reserva Module****Article number:** 4,240,370**1.2 Relevant identified uses of the substance or mixture and uses advised against****Application of the substance / the mixture** DC home storage for PV systems**1.3 Details of the supplier of the safety data sheet****Manufacturer/Supplier:****Fronius International GmbH**

Fronius Straße 5

A-4642 Sattledt

T: +43 7242 241 0

Further information obtainable from: pv-support@fronius.com**1.4 Emergency telephone number:**

+43 7242 241 0

Available:

Mo - Th: 08:00 - 16:00 h (CET)

Fr: 08:00 - 12:00 h (CET)

Call the national emergency number!**SECTION 2: Hazards identification****2.1 Classification of the substance or mixture****Classification according to Regulation (EC) No 1272/2008**

The product is not classified, according to the GB CLP regulation.

2.2 Label elements**Labelling according to Regulation (EC) No 1272/2008** void**Hazard pictograms** void**Signal word** void**Hazard statements** void**Additional information:**

The product itself is declared as an article in sense of UK REACH (EC) No. 1907/2006 and is not subject to the provisions of labeling in sense of the regulation (EC) No. 1272/2008.

2.3 Other hazards

Lithium-ion batteries are gas-tight and harmless if the manufacturer's instructions are observed during use and handling.

Never use chargers that are not suitable for the type of battery with rechargeable batteries. The limits for maximum current load, charging and discharging voltage must be strictly adhered to! Do not short-circuit. Do not damage mechanically (pierce, deform, disassemble, etc.). Do not heat or burn above the permissible temperature. Keep batteries away from small children. Always store batteries in a dry and cool place.

Lithium-ion batteries are safe to use when used properly and within the parameters specified by the manufacturer. Incorrect handling or circumstances resulting in improper operation may result in leakage of

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battery contents and decomposition products, resulting in severe reactions hazardous to health and the environment. In principle, contact with leaked battery components can pose a risk to health and the environment. Sufficient body and respiratory protection is therefore required in contact with conspicuous batteries (leakage of contents, deformation, discoloration, dents, etc.). Lithium-ion batteries can react very violently in combination with fire, for example. Battery components with considerable energy can be emitted.

As with other batteries, lithium batteries can continue to be a source of danger even when they are supposedly discharged.

Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

Determination of endocrine-disrupting properties

The product does not contain substances with endocrine-disrupting properties ≥ 0.1 %(w/w).

SECTION 3: Composition/information on ingredients
3.2 Mixtures
Description:

Rechargeable lithium-ion batteries are articles from which no substance is released when used properly.

Nominal voltage = 102.4 V

Nominal power = 3159.04 Wh

Nominal capacity = 30.85 Ah

Weight per module = 35.5 kg

Dangerous components:

CAS: 15365-14-7 EC number: 604-917-2	Lithium iron phosphate	15 - 40%
CAS: 105-37-3 EINECS: 203-291-4 Index number: 607-028-00-8	ethyl propionate Flam. Liq. 2, H225 Skin Irrit. 2, H315; Eye Irrit. 2, H319; STOT SE 3, H335	15 - 40%
CAS: 7440-50-8 EINECS: 231-159-6	copper foil substance with a Community workplace exposure limit	10 - 30%
CAS: 7429-90-5 EINECS: 231-072-3	aluminium foil substance with a Community workplace exposure limit	10 - 30%
CAS: 7782-42-5 EINECS: 231-955-3	Graphite	7 - 25%
CAS: 9011-17-0 EC number: 618-470-6	Fluoropolymer (VDF/HFP) Aquatic Chronic 2, H411	3 - 15%
CAS: 96-49-1 EINECS: 202-510-0	ethylene carbonate STOT RE 2, H373 Acute Tox. 4, H302; Eye Irrit. 2, H319	0 - 15%
CAS: 108-32-7 EINECS: 203-572-1 Index number: 607-194-00-1	propylene carbonate Eye Irrit. 2, H319	0 - 15%

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CAS: 21324-40-3 EINECS: 244-334-7	Lithium hexafluorophosphate(1-) Acute Tox. 3, H301 STOT RE 1, H372 Skin Corr. 1A, H314	0 - 15%
CAS: 9002-88-4	Polyethylene	0 - 5%

Additional information: For the wording of the listed hazard phrases refer to section 16.**SECTION 4: First aid measures****4.1 Description of first aid measures****General information:**

In normal cases no specific measures needed.

It always applies:

In case of discomfort or doubt, seek medical advice.

If unconscious, use a stable lateral position and do not administer anything through mouth.

The following measures apply to contact with the contents of a damaged battery:

After inhalation:

Supply fresh air; consult doctor in case of complaints.

In case of unconsciousness place patient stably in side position for transportation.

After skin contact:

Immediately wash with water and soap and rinse thoroughly.

Take off contaminated clothing and wash it before reuse.

Seek medical treatment in case of complaints.

After eye contact:

Rinse opened eye for several minutes under running water.

Remove contact lenses, if present and easy to do. Continue rinsing.

Consult an ophthalmologist or eye clinic immediately.

After swallowing:

Rinse mouth thoroughly with cold water. Do not induce vomiting. If the patient is fully conscious, give one or two glass of water to drink. Get medical attention immediately.

4.2 Most important symptoms and effects, both acute and delayed

No further relevant information available.

4.3 Indication of any immediate medical attention and special treatment needed

Depending on the condition of the patients, the doctor must assess the symptoms and the overall general condition.

SECTION 5: Firefighting measures**5.1 Extinguishing media****Suitable extinguishing agents:**CO₂, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.**For safety reasons unsuitable extinguishing agents:** Water with full jet**5.2 Special hazards arising from the substance or mixture**

Batteries may burst at high temperatures, which may result in flammable, toxic and/or corrosive vapours.

May form hydrofluoric acid if the electrolyte comes into contact with water.

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In case of fire, the following can be released:

COx

Hydrogen fluoride (HF)

Lithium oxides

5.3 Advice for firefighters**Protective equipment:**

Wear self-contained respiratory protective device.

Wear fully protective suit.

Additional information

Switch off the power supply.

Remove container from fire, if possible without risk.

Cool endangered receptacles with water spray.

Ensure good ventilation.

SECTION 6: Accidental release measures**6.1 Personal precautions, protective equipment and emergency procedures**

Restricted access to the affected area until cleaning work is completed.

Wear protective equipment. Keep unprotected persons away.

Ensure adequate ventilation

Avoid skin and eye contact with damaged batteries.

Do not breathe dust/fume/gas/mist/vapours/spray.

6.2 Environmental precautions: Do not allow to enter sewers/ surface or ground water.

6.3 Methods and material for containment and cleaning up:

If the battery is damaged:

Cover leaked material with inert absorbent material (sand or soil) and dispose of in suitable containers.

Clean again.

Ensure adequate ventilation.

If the battery pack is in water, there is a risk of a weak electric shock. When the water is electrolysed, hydrogen is produced. Good ventilation must be ensured to prevent the concentration of hydrogen and an explosion of the hydrogen in the enclosed space as a result. If possible, remove the battery or battery pack from the water and inform the local police.

6.4 Reference to other sections

See Section 7 for information on safe handling.

See Section 8 for information on personal protection equipment.

See Section 13 for disposal information.

SECTION 7: Handling and storage**7.1 Precautions for safe handling**

In any case, the warnings on batteries and the instructions for use of devices and other applications must be carefully observed.

Use only the recommended battery types.

Lithium-ion batteries should preferably be stored at room temperature and dry (max. 40°C), large temperature fluctuations should be avoided. (e.g. do not store near heaters, do not permanently expose to sunlight).

Never open, mechanically damage or burn the battery!

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One of the most important risks when transporting batteries and battery-powered equipment is the short circuit of the battery caused by the contact of the two poles of the battery with other batteries, metal objects or other electrical conductors. Therefore, the packaged battery (cells) and batteries must be adequately separated to prevent short circuits and electrode damage.

Do not allow broken battery cells to come into contact with water. When handling battery packs of over 50 V, the operating personnel require appropriate insulation protection.

Observe protective measures and safety instructions.

Information about fire - and explosion protection:

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

7.2 Conditions for safe storage, including any incompatibilities**Storage:****Requirements to be met by storerooms and receptacles:**

Store in dry conditions.

Store in a cool location.

Protect from heat and direct sunlight.

Store in accordance with local/regional/national/international regulations.

Information about storage in one common storage facility:

Store away from oxidising agents.

Do not store together with acids.

Further information about storage conditions: Store in original container.

Recommended storage temperature:

room temperature

Longer storage with a load capacity between 25 and 75 %.

7.3 Specific end use(s) No further relevant information available.**SECTION 8: Exposure controls/personal protection****8.1 Control parameters**

Lithium-ion batteries are products from which no substances are released under normal and reasonably foreseeable conditions of use.

Ingredients with limit values that require monitoring at the workplace:**CAS: 7429-90-5 aluminium foil**

WEL	Long-term value: 10* 4** mg/m ³ *inhalable dust **respirable dust
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CAS: 7440-50-8 copper foil

WEL	Short-term value: 2** mg/m ³ Long-term value: 0.2* 1** mg/m ³ *fume **dusts and mists (as Cu)
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Regulatory information WEL: EH40/2020

DNELs**CAS: 7429-90-5 aluminium**

Oral	Long-term exposure - systemic effects	7.9 mg/kg bw/d (consumer)
Inhalative	Long-term exposure - systemic effects	3.72 mg/m ³ (workers)

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	Long-term exposure - local effects	3.72 mg/m ³ (workers)
CAS: 7440-50-8 copper foil		
Oral	Long-term exposure - systemic effects	0.041 mg/kg bw/d (consumer)
Dermal	Long-term exposure - systemic effects	137 mg/kg bw/d (consumer) 137 mg/kg bw/d (workers)
	short-term exposure - systemic effects	273 mg/kg bw (consumer) 273 mg/kg bw (workers)
Inhalative	Long-term exposure - local effects	1 mg/m ³ (consumer) 1 mg/m ³ (workers)
	short-term exposure - local effects	1 mg/m ³ (consumer) 1 mg/m ³ (workers)
CAS: 108-32-7 propylene carbonate		
Oral	Long-term exposure - systemic effects	10 mg/kg bw/d (consumer)
Dermal	Long-term exposure - systemic effects	10 mg/kg bw/d (consumer) 20 mg/kg bw/d (workers)
	Long-term exposure - local effects	10 mg/cm ² (workers)
Inhalative	Long-term exposure - systemic effects	17.4 mg/m ³ (consumer) 70.53 mg/m ³ (workers)
	Long-term exposure - local effects	10 mg/m ³ (consumer) 20 mg/m ³ (workers)
PNECs		
CAS: 7440-50-8 copper foil		
fresh water		6.3 µg/l
sea water		5.2 µg/l
STP		0.23 mg/l
sediment (fresh water)		87 mg/kg dw
sediment (sea water)		676 mg/kg dw
soil		65 mg/kg dw
CAS: 108-32-7 propylene carbonate		
fresh water		0.9 mg/l
sea water		0.09 mg/l
intermittent release (fresh water)		9 mg/l
STP		7,400 mg/l
soil		0.81 mg/kg dw
intermittent release (sea water)		0.9 mg/l

Additional information: The lists valid during the making were used as basis.

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8.2 Exposure controls

Appropriate engineering controls

No further data; see section 7.

Technical measures and the use of suitable working methods take priority over the use of personal protective equipment.

Individual protection measures, such as personal protective equipment

General protective and hygienic measures:

The usual precautionary measures are to be adhered to when handling chemicals.

Keep away from foodstuffs, beverages and feed.

Do not eat or drink while working.

Avoid skin and eye contact with damaged batteries.

Avoid inhalation of spilled material.

Take off contaminated clothing and wash it before reuse.

Protective clothing needs to be selected specifically for the workplace, depending on concentrations and quantities of the hazardous substances handled. The chemical resistance of the protective equipment should be enquired at the respective supplier.

Eye wash bottles and emergency showers should be provided in the immediate area near the workplace.

Respiratory protection: Not required when handling undamaged batteries.

Hand protection

Not required when handling undamaged batteries.

Wear protective gloves made of chloroprene or rubber if batteries are damaged.

Material of gloves

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation.

Penetration time of glove material

The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

Eye/face protection

Not required when handling undamaged batteries.

Wear protective goggles if batteries are damaged.

Body protection: Not required when handling undamaged batteries.

Environmental exposure controls Do not allow to enter sewers/ surface or ground water.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

General Information

Physical state	Solid
Colour:	Grey
Odour:	Odourless
Odour threshold:	No information available.
Melting point/freezing point:	No information available.

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Boiling point or initial boiling point and boiling range	No information available.
Flammability	Not determined.
Lower and upper explosion limit	
Lower:	No information available.
Upper:	No information available.
Flash point:	Not applicable.
Decomposition temperature:	No information available.
pH	Not applicable.
Viscosity:	
Kinematic viscosity	Not applicable.
Dynamic:	Not applicable.
Solubility	
water:	Insoluble.
Partition coefficient n-octanol/water (log value)	No information available.
Vapour pressure:	Not applicable.
Density and/or relative density	
Density:	No information available.
Vapour density	Not applicable.

9.2 Other information**Appearance:**

Form:	Solid
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Important information on protection of health and environment, and on safety.

Ignition temperature:	No information available.
Explosive properties:	No information available.
Change in condition	
Oxidising properties	No information available.
Evaporation rate	Not applicable.

Information with regard to physical hazard classes

Explosives	void
Flammable gases	void
Aerosols	void
Oxidising gases	void
Gases under pressure	void
Flammable liquids	void
Flammable solids	void
Self-reactive substances and mixtures	void
Pyrophoric liquids	void
Pyrophoric solids	void
Self-heating substances and mixtures	void
Substances and mixtures, which emit flammable gases in contact with water	void

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Oxidising liquids	void
Oxidising solids	void
Organic peroxides	void
Corrosive to metals	void
Desensitised explosives	void

SECTION 10: Stability and reactivity

10.1 Reactivity No hazardous reactions known if stored and used as prescribed.

10.2 Chemical stability No decomposition if used and stored according to specifications.

10.3 Possibility of hazardous reactions No further relevant information available.

10.4 Conditions to avoid

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

Do not expose the rechargeable Li-Ion battery to mechanical shock.

Do not disassemble, crush, short-circuit, or connect with incorrect polarity. Avoid mechanical or electrical abuse.

Do not allow to come into contact with water or acidic substances.

10.5 Incompatible materials:

If the battery leaks or is damaged, avoid contact with strong oxidising agents, mineral acids, strong alkalis and halogenated hydrocarbons.

10.6 Hazardous decomposition products:

No decomposition if used and stored according to specifications.

With open cells there is the possibility of the release of hydrofluoric acid and carbon monoxide.

Irritating or toxic gases.

Peroxides

SECTION 11: Toxicological information**11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008**

Inhalation: No probable route of exposure of the product itself. Inhalation of substances leaked from damaged batteries may irritate the respiratory tract and damage organs during prolonged or repeated exposure.

Skin contact: Contact with the undamaged battery does not present a hazard. Skin contact with damaged batteries may cause burns.

Eye contact: Contact with the undamaged battery does not constitute a hazard. Eye contact with spills from the damaged battery may cause burns.

Ingestion: No probable route of exposure of the product itself. Ingestion of spills may cause burns to the esophagus and stomach. Harmful if swallowed.

The product is declared as an article and is not subject to the GB CLP classification and labelling requirements.

Acute toxicity Based on available data, the classification criteria are not met.

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LD/LC50 values relevant for classification:		
ATE (Acute Toxicity Estimates)		
Oral	LD50	≥ 667 mg/kg
CAS: 105-37-3 ethyl propionate		
Oral	LD50	3,500 mg/kg (Rabbit)
CAS: 7429-90-5 aluminium		
Oral	LD50	15,900 mg/kg (rat)
Inhalative	LC50/4h	> 888 mg/m ³ (rat)
CAS: 7440-50-8 copper foil		
Oral	LD50	> 2,000 mg/kg (rat)
CAS: 7782-42-5 Graphite		
Oral	LD50	> 2,000 mg/kg (rat)
CAS: 96-49-1 ethylene carbonate		
Oral	LD50	10,000 mg/kg (rat)
CAS: 108-32-7 propylene carbonate		
Oral	LD50	> 5,000 mg/kg (rat)
Dermal	LD50	> 2,000 mg/kg (Rabbit)

Primary irritant effect:

Skin corrosion/irritation The electrolyte contained in the cell or battery causes skin burns.

Serious eye damage/irritation The electrolyte contained in the cell or battery causes serious eye damage.

Respiratory or skin sensitisation Based on available data, the classification criteria are not met.

Germ cell mutagenicity Based on available data, the classification criteria are not met.

Carcinogenicity Based on available data, the classification criteria are not met.

Reproductive toxicity Based on available data, the classification criteria are not met.

STOT-single exposure Based on available data, the classification criteria are not met.

STOT-repeated exposure

The electrolyte contains lithium hexafluorophosphate(1-).

The electrolyte contained in the cell or Battier damages the organs during prolonged or repeated exposure.

Aspiration hazard Based on available data, the classification criteria are not met.

Additional toxicological information:**CAS: 108-32-7 propylene carbonate**

Oral	NOAEL	1,000 mg/kg bw/d (rat) OECD 414
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Other information: There is no danger from the undamaged battery.

Repeated dose toxicity**CAS: 108-32-7 propylene carbonate**

Oral	NOAEL	> 5,000 mg/kg bw/d (rat) OECD 408
Inhalative	NOAEC	100 ppm (rat) OECD 413

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11.2 Information on other hazards**Endocrine disrupting properties**

None of the ingredients is listed.

SECTION 12: Ecological information**12.1 Toxicity****Aquatic toxicity:****CAS: 108-32-7 propylene carbonate**

EC50 (48 h)	1,000 mg/l (daphnia) (Daphnia magna)
LC50 (96 h)	1,000 mg/l (fish) (Cyprinus carpio)
NOEC (72 h)	900 mg/l (algae) (Desmodesmus subspicatus)
LC50 (72 h)	900 mg/l (algae) (Desmodesmus subspicatus)

12.2 Persistence and degradability No further relevant information available.**12.3 Bioaccumulative potential** No further relevant information available.**12.4 Mobility in soil** No further relevant information available.**12.5 Results of PBT and vPvB assessment****PBT:** Not applicable.**vPvB:** Not applicable.**12.6 Endocrine disrupting properties**

The product does not contain substances with endocrine disrupting properties.

12.7 Other adverse effects**Additional ecological information:****General notes:**

Avoid release to the environment.

Water hazard class 2 (German Regulation) (Self-assessment): hazardous for water

Do not allow product to reach ground water, water course or sewage system.

SECTION 13: Disposal considerations**13.1 Waste treatment methods****Recommendation**

Must not be disposed together with household garbage. Do not allow product to reach sewage system.

Dispose only through authorized companies in accordance with local regulations.

European waste catalogue

Notes: The European Waste Catalogue (EWC) classifies waste materials and categorises them according to what they are and how they were produced. This may cause other classifications. The final decision belongs to the last user.

16 06 05	other batteries and accumulators
HP5	Specific Target Organ Toxicity (STOT)/Aspiration Toxicity
HP6	Acute Toxicity
HP8	Corrosive

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HP14	Ecotoxic
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Uncleaned packaging:**Recommendation:** Dispose of packaging according to regulations on the disposal of packagings.**SECTION 14: Transport information****14.1 UN number or ID number**

ADR/RID/ADN, IMDG, IATA

UN3480

14.2 UN proper shipping name

ADR/RID/ADN

3480 LITHIUM ION BATTERIES

IMDG, IATA

LITHIUM ION BATTERIES

14.3 Transport hazard class(es)

ADR/RID/ADN, IMDG, IATA

**Class**

9 Miscellaneous dangerous substances and articles.

Label

9A

14.4 Packing group

ADR/RID/ADN, IMDG, IATA

not regulated

14.5 Environmental hazards:

Not applicable.

14.6 Special precautions for user

Warning: Miscellaneous dangerous substances and articles.

Hazard identification number (Kemler code):

-

EMS Number:

F-A,S-I

Stowage Category

A

Stowage Code

SW19 For batteries transported in accordance with SP 376 or SP 377 Category C, unless transported on a short international voyage.

14.7 Maritime transport in bulk according to IMO**instruments**

Not applicable.

Transport/Additional information:**ADR/RID/ADN****Limited quantities (LQ)**

0

Excepted quantities (EQ)

Code: E0

Not permitted as Excepted Quantity

Transport category

2

Tunnel restriction code

E

IMDG**Limited quantities (LQ)**

0

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Excepted quantities (EQ)

Code: E0

Not permitted as Excepted Quantity

UN "Model Regulation":

UN 3480 LITHIUM ION BATTERIES

SECTION 15: Regulatory information

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

Regulated explosives precursors

None of the ingredients is listed.

Regulated poisons

None of the ingredients is listed.

Reportable explosives precursors

CAS: 7429-90-5 aluminium foil

Listed

Reportable poisons

None of the ingredients is listed.

Directive 2012/18/EU

Named dangerous substances - ANNEX I None of the ingredients is listed.**15.2 Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

SECTION 16: Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

Relevant phrases

H225 Highly flammable liquid and vapour.

H301 Toxic if swallowed.

H302 Harmful if swallowed.

H314 Causes severe skin burns and eye damage.

H315 Causes skin irritation.

H319 Causes serious eye irritation.

H335 May cause respiratory irritation.

H372 Causes damage to organs through prolonged or repeated exposure.

H373 May cause damage to organs through prolonged or repeated exposure.

H411 Toxic to aquatic life with long lasting effects.

Training hints

Regular training of staff involved in the transport of dangerous goods (in accordance with Chapter 1.3 ADR).

Department issuing SDS:

UmEnA GmbH

<http://umena.at>Email: office@umena.at

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Abbreviations and acronyms:

ADR: Accord relatif au transport international des marchandises dangereuses par route (European Agreement Concerning the International Carriage of Dangerous Goods by Road)

IMDG: International Maritime Code for Dangerous Goods

IATA: International Air Transport Association

GHS: Globally Harmonised System of Classification and Labelling of Chemicals

EINECS: European Inventory of Existing Commercial Chemical Substances

ELINCS: European List of Notified Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

DNEL: Derived No-Effect Level (UK REACH)

PNEC: Predicted No-Effect Concentration (UK REACH)

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

PBT: Persistent, Bioaccumulative and Toxic

vPvB: very Persistent and very Bioaccumulative

ATE: Acute toxicity estimate values

Flam. Liq. 2: Flammable liquids – Category 2

Acute Tox. 3: Acute toxicity – Category 3

Acute Tox. 4: Acute toxicity – Category 4

Skin Corr. 1A: Skin corrosion/irritation – Category 1A

Skin Irrit. 2: Skin corrosion/irritation – Category 2

Eye Irrit. 2: Serious eye damage/eye irritation – Category 2

STOT SE 3: Specific target organ toxicity (single exposure) – Category 3

STOT RE 1: Specific target organ toxicity (repeated exposure) – Category 1

STOT RE 2: Specific target organ toxicity (repeated exposure) – Category 2

Aquatic Chronic 2: Hazardous to the aquatic environment - long-term aquatic hazard – Category 2