



**Safety Data Sheet**

according to UK REACH Regulation

**TFE**

Revision date: 21.02.2023

Product code: SOL-015

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**Pictograms:**

**Hazard statements**

H226	Flammable liquid and vapour.
H301+H331	Toxic if swallowed or if inhaled.
H318	Causes serious eye damage.
H360F	May damage fertility.
H373	May cause damage to organs through prolonged or repeated exposure.

**Precautionary statements**

P201	Obtain special instructions before use.
P280	Wear protective gloves/protective clothing/eye protection/face protection/hearing protection.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308+P313	IF exposed or concerned: Get medical advice/attention.

**Special labelling of certain mixtures**

Restricted to professional users.

**Additional advice on labelling**

Warning - substance not yet tested completely.

**2.3. Other hazards**

In use may form flammable/explosive vapour-air mixture.

PBT: This substance does not meet the PBT/vPvB criteria of REACH, Annex XIII.

**SECTION 3: Composition/information on ingredients**
**3.1. Substances**
**Chemical characterization**

2,2,2-Trifluoroethan-1-ol

Sum formula:	CF <sub>3</sub> CH <sub>2</sub> OH
Molecular weight:	100,04 g/mol

**Hazardous components**

CAS No	Chemical name	Quantity
	EC No	Index No
	REACH No	
	Classification (GB CLP Regulation)	
75-89-8	2,2,2-Trifluoroethan-1-ol	<= 100 %
	200-913-6	01-2119488763-23-XXXX
	Flam. Liq. 3, Repr. 1A, Acute Tox. 3, Acute Tox. 3, Eye Dam. 1, STOT RE 2; H226 H360F H331 H301 H318 H373	

Full text of H and EUH statements: see section 16.

**Specific Conc. Limits, M-factors and ATE**

CAS No	EC No	Chemical name	Quantity
	Specific Conc. Limits, M-factors and ATE		
75-89-8	200-913-6	2,2,2-Trifluoroethan-1-ol	<= 100 % %
	inhalation: LC50 = 3,25 mg/l (vapours); inhalation: ATE = 0,5 mg/l (dusts or mists); dermal: LD50 = > 2000 mg/kg; oral: LD50 = 153 mg/kg		

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**SECTION 4: First aid measures****4.1. Description of first aid measures****General information**

First aider: Pay attention to self-protection! Remove affected person from the danger area and lay down. In case of accident or unwellness, seek medical advice immediately (show directions for use or safety data sheet if possible).

**After inhalation**

Provide fresh air. If breathing is irregular or stopped, administer artificial respiration. No mouth-to-mouth or mouth-to-nose resuscitation. Use Ambu bag or ventilator. Call a physician immediately. Remove casualty to fresh air and keep warm and at rest. In case of irregular breathing or respiratory arrest provide artificial respiration.

In all cases of doubt, or when symptoms persist, seek medical advice.

**After contact with skin**

Wash with plenty of water. Immediately remove any contaminated clothing, shoes or stockings. Medical treatment necessary. After contact with skin, wash immediately with plenty of water and soap.

In all cases of doubt, or when symptoms persist, seek medical advice.

**After contact with eyes**

In case of contact with eyes flush immediately with plenty of flowing water for 10 to 15 minutes holding eyelids apart and consult an ophthalmologist.

**After ingestion**

Do NOT induce vomiting. Adverse human health effects and symptoms: Gastric perforation. Call a physician immediately. Rinse mouth thoroughly with water.

Never give anything by mouth to an unconscious person or a person with cramps.

**4.2. Most important symptoms and effects, both acute and delayed**

No information available.

**4.3. Indication of any immediate medical attention and special treatment needed**

Treat symptomatically.

**SECTION 5: Firefighting measures****5.1. Extinguishing media****Suitable extinguishing media**

Water spray jet, Carbon dioxide (CO<sub>2</sub>), Foam, Extinguishing powder. Suitable extinguishing media: Water spray, alcohol resistant foam, Dry extinguishing powder, Carbon dioxide (CO<sub>2</sub>), Sand.

**Unsuitable extinguishing media**

High power water jet.

**5.2. Special hazards arising from the substance or mixture**

Flammable. Vapours can form explosive mixtures with air. Thermal decomposition can lead to the escape of irritating gases and vapours.

In case of fire may be liberated: Carbon dioxide (CO<sub>2</sub>), Carbon monoxide (CO), Fluorhydric acid, (HF).

**5.3. Advice for firefighters**

In case of fire: Wear self-contained breathing apparatus. In case of fire: Evacuate area. Fight fire remotely due to the risk of explosion.

Use water spray jet to protect personnel and to cool endangered containers.

**Additional information**

Use water spray jet to protect personnel and to cool endangered containers. Suppress gases/vapours/mists with water spray jet. Collect contaminated fire extinguishing water separately. Do not allow entering drains or surface water. Usual measures for fire prevention.

**SECTION 6: Accidental release measures**

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**6.1. Personal precautions, protective equipment and emergency procedures****General advice**

Remove all sources of ignition. Provide adequate ventilation. Avoid dust formation. Do not breathe dust. Avoid contact with skin, eyes and clothes. Use personal protection equipment. Use appropriate respiratory protection.

Remove all sources of ignition. Remove persons to safety. Accumulation in closed or lower lying rooms signifies heightened risk of fire or explosion.

Provide adequate ventilation.

In case of fire: Evacuate area.

**For non-emergency personnel**

Cover drains.

Make sure spills can be contained, e.g. in sump pallets or kerbed areas.

**For emergency responders**

Cover drains.

Stop and contain spill/release if it can be done safely.

**6.2. Environmental precautions**

Do not allow uncontrolled discharge of product into the environment. Explosion risk.

Do not allow to enter into soil/subsoil.

Do not allow to enter into surface water or drains.

**6.3. Methods and material for containment and cleaning up****For containment**

Cover drains.

Stop and contain spill/release if it can be done safely.

**For cleaning up**

Universal binder/ Binder Treat the recovered material as prescribed in the section on waste disposal.

**Other information**

Absorb with liquid-binding material (sand, diatomaceous earth, acid- or universal binding agents). Treat the recovered material as prescribed in the section on waste disposal. Take up mechanically, placing in appropriate containers for disposal. Avoid dust formation.

Clear contaminated areas thoroughly.

Use only antistatically equipped (spark-free) tools.

**6.4. Reference to other sections**

Safe handling: see section 7

Personal protection equipment: see section 8

Disposal: see section 13

Treat the recovered material as prescribed in the section on waste disposal.

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

If handled uncovered, arrangements with local exhaust ventilation have to be used. Avoid dust formation. Do not breathe dust. Provide adequate ventilation. Avoid breathing dust/fume/gas/mist/vapours/spray. Avoid contact with skin, eyes and clothes.

Keep away from sources of ignition - No smoking. Take precautionary measures against static discharges. Use extractor hood (laboratory).

**Advice on protection against fire and explosion**

Keep away from sources of ignition - No smoking. Take precautionary measures against static discharges. Vapours can form explosive mixtures with air. Usual measures for fire prevention.

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**Advice on general occupational hygiene**

Remove contaminated, saturated clothing immediately. Draw up and observe skin protection programme. Wash hands and face before breaks and after work and take a shower if necessary. When using do not eat, drink, smoke, sniff. Remove contaminated, saturated clothing immediately. Draw up and observe skin protection programme. Wash hands and face before breaks and after work and take a shower if necessary.

**7.2. Conditions for safe storage, including any incompatibilities**
**Requirements for storage rooms and vessels**

Keep container tightly closed. Keep locked up. Store in a place accessible by authorized persons only. Provide adequate ventilation as well as local exhaust at critical locations. Keep in a cool, well-ventilated place. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Keep container tightly closed in a cool, well-ventilated place. Handle and store contents under inert gas. Protect from moisture. Keep under argon. storage temperature: at room temperature

**Hints on joint storage**

Do not store together with: Oxidizing agent. Pyrophoric or self-heating substances.

**Further information on storage conditions**

Keep/Store only in original container.

**7.3. Specific end use(s)**

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.

**SECTION 8: Exposure controls/personal protection**
**8.1. Control parameters**
**DNEL/DMEL values**

CAS No	Substance		
DNEL type	Exposure route	Effect	Value
75-89-8	2,2,2-Trifluoroethan-1-ol		
Worker DNEL, long-term	inhalation	systemic	0,1 mg/m <sup>3</sup>
Worker DNEL, long-term	dermal	systemic	0,06 mg/kg bw/day
Consumer DNEL, long-term	inhalation	systemic	0,025 mg/m <sup>3</sup>

**PNEC values**

CAS No	Substance	
Environmental compartment	Value	
75-89-8	2,2,2-Trifluoroethan-1-ol	
Freshwater	0,119 mg/l	
Freshwater (intermittent releases)	1,19 mg/l	
Marine water	0,0119 mg/l	
Freshwater sediment	0,486 mg/kg	
Marine sediment	0,0486 mg/kg	
Micro-organisms in sewage treatment plants (STP)	100 mg/l	
Soil	0,0273 mg/kg	

**Additional advice on limit values**

No data available

**8.2. Exposure controls**

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**Appropriate engineering controls**

If handled uncovered, arrangements with local exhaust ventilation have to be used.

The receiver of our product is singularly responsible for adhering to existing laws and regulations.

**Individual protection measures, such as personal protective equipment**
**Eye/face protection**

Suitable eye protection: goggles. Wear eye/face protection. Tightly fitting safety goggles. Face shield (8-inch minimum). Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Safety shower and eye bath.

**Hand protection**

When handling with chemical substances, protective gloves must be worn with the CE-label including the four control digits. The quality of the protective gloves resistant to chemicals must be chosen as a function of the specific working place concentration and quantity of hazardous substances. For special purposes, it is recommended to check the resistance to chemicals of the protective gloves mentioned above together with the supplier of these gloves. Wear suitable gloves.

The quality of the protective gloves resistant to chemicals must be chosen as a function of the specific working place concentration and quantity of hazardous substances.

For special purposes, it is recommended to check the resistance to chemicals of the protective gloves mentioned above together with the supplier of these gloves.

**Skin protection**

Use of protective clothing.

**Respiratory protection**

In case of inadequate ventilation wear respiratory protection. If technical exhaust or ventilation measures are not possible or insufficient, respiratory protection must be worn.

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

**Thermal hazards**

Flammable liquid and vapour.

**Environmental exposure controls**

Discharge into the environment must be avoided. Do not allow to enter into surface water or drains.

**SECTION 9: Physical and chemical properties**
**9.1. Information on basic physical and chemical properties**

Physical state:	liquid
Colour:	colourless
Odour:	like: Alcohol.
Odour threshold:	not determined

	<b>Test method</b>
Melting point/freezing point:	-44 °C
Boiling point or initial boiling point and boiling range:	77-80 °C
Flammability:	not determined
Lower explosion limits:	5,5 vol. %

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Upper explosion limits:	42 vol. %
Flash point:	29 °C
Auto-ignition temperature:	480 °C
Decomposition temperature:	not determined
pH-Value:	5,0 - 7,5
Viscosity / kinematic:	not determined
Water solubility: (at 20 °C)	completely miscible
Solubility in other solvents Soluble in: Alcohol, Ether, Chloroform	
Dissolution rate:	not determined
Partition coefficient n-octanol/water:	log Pow: 0,41
Dispersion stability:	not determined
Vapour pressure: (at 25 °C)	93 hPa
Density (at 25 °C):	1,373 g/cm <sup>3</sup>
Relative density:	not determined
Bulk density:	not applicable
Relative vapour density:	3,45 Air. = 1,0
Particle characteristics:	not applicable

**9.2. Other information****Information with regard to physical hazard classes**

## Explosive properties

The product is not: Explosive.

## Sustaining combustion:

Sustaining combustion

## Oxidizing properties

The product is not: oxidising.

**Other safety characteristics**

## Evaporation rate:

not determined

## Solvent content:

100,00 %

## Solid content:

not determined  
No data available

## Viscosity / dynamic:

not determined

## Flow time:

not determined

**SECTION 10: Stability and reactivity****10.1. Reactivity**

Flammable liquid and vapour.

Forms explosive mixtures with air at elevated temperatures.

**10.2. Chemical stability**

Stable under recommended storage conditions.

**10.3. Possibility of hazardous reactions**

No hazardous reaction when handled and stored according to provisions.

**10.4. Conditions to avoid**

Keep away from sources of heat (e.g. hot surfaces), sparks and open flames. Vapours can form explosive mixtures with air. Protect from moisture.

Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

Keep away from sources of ignition - No smoking.

**10.5. Incompatible materials**

Oxidizing agents, strong.

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Strong acid

**10.6. Hazardous decomposition products**

Thermal decomposition can lead to the escape of irritating gases and vapours.

In case of fire may be liberated: Carbon dioxide (CO<sub>2</sub>), Carbon monoxide (CO), Hydrogen fluoride (HF)**Further information**

In case of fire: See chapter 5.

**SECTION 11: Toxicological information****11.1. Information on hazard classes as defined in GB CLP Regulation****Toxicokinetics, metabolism and distribution**

No data available

**Acute toxicity**

Toxic if swallowed.

Toxic if inhaled.

CAS No	Chemical name				
	Exposure route	Dose	Species	Source	Method
75-89-8	2,2,2-Trifluoroethan-1-ol				
	oral	LD50 153 mg/kg	Rat	Study report (1998)	OECD Guideline 401
	dermal	LD50 > 2000 mg/kg	Rat	Study report (2010)	OECD Guideline 402
	inhalation (4 h) vapour	LC50 3,25 mg/l	Rat		OECD Guideline 403
	inhalation dust/mist	ATE 0,5 mg/l			

**Irritation and corrosivity**

Causes serious eye damage. (On basis of test data)

Skin corrosion/irritation: Based on available data, the classification criteria are not met.

Skin corrosion/irritation:

Skin - rabbit.

Result: No skin irritation - 4 h

OECD 404

Serious eye damage/eye irritation:

eyes - Rabbit.

Result: Serious eye damage/eye irritation - Danger of very serious irreversible effects.

OECD 405

**Sensitising effects**

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

Skin sensitisation:

Method: OECD Guideline 429 (Skin Sensitisation: Local Lymph Node Assay) Species: Mouse Result:

negative. Literature: ECHA Dossier

**Carcinogenic/mutagenic/toxic effects for reproduction**



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May damage fertility. (2,2,2-Trifluoroethan-1-ol)

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

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

Germ cell mutagenicity:

Ames test negative.

Salmonella typhimurium

OECD 471 (Ames test)

Mutagenicity (mammalian cell test): Chromosomal aberrations mammalian cells

Chinese hamster ovary cells

OECD 473

Result: negative

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

**STOT-single exposure**

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

**STOT-repeated exposure**

May cause damage to organs through prolonged or repeated exposure. (On basis of test data)

**Aspiration hazard**

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

**Specific effects in experiment on an animal**

No data available

**Practical experience**

No data available

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

No data available

**Other information**

Ardor, Coughing, shortage of breath, Headache, Nausea, vomiting, Pulmonary oedema.

Symptoms may be delayed.

**Further information**

This substance is classified as hazardous according to Regulation (EC) No 1272 (2008).

Special hazards arising from the substance or mixture.

RTECS: KM5250000

Caution! To the best of our knowledge the toxicological properties of this material have not been thoroughly investigated. Other dangerous properties can not be excluded.

Handle in accordance with good industrial hygiene and safety practice.

**SECTION 12: Ecological information****12.1. Toxicity**

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

The product is not: Ecotoxic.

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CAS No	Chemical name					
	Aquatic toxicity	Dose	[h]   [d]	Species	Source	Method
75-89-8	2,2,2-Trifluoroethan-1-ol					
	Acute fish toxicity	LC50	119 mg/l	96 h	Pimephales promelas	REACH Registration Dossier OECD Guideline 203
	Acute algae toxicity	ErC50	> 974 mg/l	72 h	Raphidocelis subcapitata	REACH Registration Dossier OECD Guideline 201
	Acute bacteria toxicity	(EC50	> 1000 mg/l)	3 h	activated sludge of a predominantly domestic sewage	Study report (2010) OECD Guideline 209

#### 12.2. Persistence and degradability

CAS No	Chemical name				
	Method	Value	d	Source	
	Evaluation				
75-89-8	2,2,2-Trifluoroethan-1-ol				
	Biodegradability: aerobic.	0 %	28	OECD 310	
	Not readily biodegradable (according to OECD criteria)				

#### 12.3. Bioaccumulative potential

##### Partition coefficient n-octanol/water

CAS No	Chemical name	Log Pow
75-89-8	2,2,2-Trifluoroethan-1-ol	< 0,3

#### 12.4. Mobility in soil

No data available

#### 12.5. Results of PBT and vPvB assessment

This substance does not meet the PBT/vPvB criteria of UK REACH.

#### 12.6. Endocrine disrupting properties

This substance does not have endocrine disrupting properties with respect to non-target organisms.

#### 12.7. Other adverse effects

Warning - substance not yet tested completely.

#### Further information

Avoid release to the environment.

### SECTION 13: Disposal considerations

#### 13.1. Waste treatment methods

##### Disposal recommendations

Do not allow to enter into surface water or drains. Dispose of waste according to applicable legislation.

Consult the appropriate local waste disposal expert about waste disposal.

Handle contaminated packages in the same way as the substance itself.

##### Contaminated packaging

Hazardous waste according to Directive 2008/98/EC (waste framework directive). Handle contaminated packages in the same way as the substance itself.

### SECTION 14: Transport information

#### Land transport (ADR/RID)

**14.1. UN number or ID number:** UN 1986

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**14.2. UN proper shipping name:**

ALCOHOLS, FLAMMABLE, TOXIC, N.O.S. (2,2,2-Trifluoroethan-1-ol)

**14.3. Transport hazard class(es):**

3

**14.4. Packing group:**

III

Hazard label:

3+6.1



Classification code:

FT1

Special Provisions:

274

Limited quantity:

5 L

Excepted quantity:

E1

Transport category:

3

Hazard No:

36

Tunnel restriction code:

D/E

**Inland waterways transport (ADN)****14.1. UN number or ID number:**

UN 1986

**14.2. UN proper shipping name:**

ALCOHOLS, FLAMMABLE, TOXIC, N.O.S. (2,2,2-Trifluoroethanol)

**14.3. Transport hazard class(es):**

3

**14.4. Packing group:**

III

Hazard label:

3+6.1



Classification code:

FT1

Special Provisions:

274 802

Limited quantity:

5 L

Excepted quantity:

E1

**Marine transport (IMDG)****14.1. UN number or ID number:**

UN 1986

**14.2. UN proper shipping name:**

ALCOHOLS, FLAMMABLE, TOXIC, N.O.S. (2,2,2-Trifluoroethanol)

**14.3. Transport hazard class(es):**

3

**14.4. Packing group:**

III

Hazard label:

3+6.1



Special Provisions:

223 274

Limited quantity:

5 L

Excepted quantity:

E1

EmS:

F-E, S-D

**Air transport (ICAO-TI/IATA-DGR)****14.1. UN number or ID number:**

UN 1986

**14.2. UN proper shipping name:**

ALCOHOLS, FLAMMABLE, TOXIC, N.O.S. (2,2,2-Trifluoroethanol)

**14.3. Transport hazard class(es):**

3

**14.4. Packing group:**

III

Hazard label:

3+6.1



Special Provisions:

A3

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Limited quantity Passenger:	2 L	
Passenger LQ:	Y343	
Excepted quantity:	E1	
IATA-packing instructions - Passenger:		355
IATA-max. quantity - Passenger:		60 L
IATA-packing instructions - Cargo:		366
IATA-max. quantity - Cargo:		220 L

**14.5. Environmental hazards**

ENVIRONMENTALLY HAZARDOUS: No

**14.6. Special precautions for user**

Warning: Combustible liquid. Acute Toxicity.

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

not applicable

**SECTION 15: Regulatory information****15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture****EU regulatory information**

Restrictions on use (REACH, annex XVII):

Entry 40

2010/75/EU (VOC):	100 % (1373 g/l)
2004/42/EC (VOC):	100 % (1373 g/l)
Information according to 2012/18/EU (SEVESO III):	H2 ACUTE TOXIC
Additional information:	P5c

**National regulatory information**

Employment restrictions: Observe restrictions to employment for juveniles according to the 'juvenile work protection guideline' (94/33/EC). Observe employment restrictions under the Maternity Protection Directive (92/85/EEC) for expectant or nursing mothers.

Water hazard class (D): 1 - slightly hazardous to water

**15.2. Chemical safety assessment**

For this substance a chemical safety assessment has not been carried out.

**SECTION 16: Other information****Changes**

This data sheet contains changes from the previous version in section(s):  
1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16.

**Abbreviations and acronyms**

ADR: Accord européen sur le transport 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 Harmonized 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

LC50: Lethal concentration, 50%

LD50: Lethal dose, 50%

CLP: Classification, labelling and Packaging

REACH: Registration, Evaluation and Authorization of Chemicals

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GHS: Globally Harmonised System of Classification, Labelling and Packaging of Chemicals

UN: United Nations

DNEL: Derived No Effect Level

DMEL: Derived Minimal Effect Level

PNEC: Predicted No Effect Concentration

ATE: Acute toxicity estimate

LL50: Lethal loading, 50%

EL50: Effect loading, 50%

EC50: Effective Concentration 50%

ErC50: Effective Concentration 50%, growth rate

NOEC: No Observed Effect Concentration

BCF: Bio-concentration factor

PBT: persistent, bioaccumulative, toxic

vPvB: very persistent, very bioaccumulative

RID: Regulations concerning the international carriage of dangerous goods by rail

ADN: European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (Accord européen relatif au transport international des marchandises dangereuses par voies de navigation intérieures)

EmS: Emergency Schedules

MFAG: Medical First Aid Guide

ICAO: International Civil Aviation Organization

MARPOL: International Convention for the Prevention of Marine Pollution from Ships

IBC: Intermediate Bulk Container

VOC: Volatile Organic Compounds

SVHC: Substance of Very High Concern

For abbreviations and acronyms, see: ECHA Guidance on information requirements and chemical safety assessment, chapter R.20 (Table of terms and abbreviations).

**Relevant H and EUH statements (number and full text)**

H226	Flammable liquid and vapour.
H301	Toxic if swallowed.
H301+H331	Toxic if swallowed or if inhaled.
H318	Causes serious eye damage.
H331	Toxic if inhaled.
H360F	May damage fertility.
H373	May cause damage to organs through prolonged or repeated exposure.

**Further Information**

The information is based on the present level of our knowledge. It does not, however, give assurance of product properties and establishes no contract legal rights. The receiver of our product is singularly responsible for adhering to existing laws and regulations.