

### SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

#### 1.1. Product Identifier

Product Form	: Substance
Product Name	: Frostbite
Chemical Name	: R1234ze
EC-No.	: 471-480-0
CAS-No.	: 29118-24-9
Product Code	: 3803100, 3803100E, 3803100EE
Formula	: C3H2F4
Synonyms	: 1,3,3,3-tetrafluoropropene, (1E)- / (1E)-1,3,3,3-Tetrafluoroprop-1-ene / (E)-1,3,3,3-Tetrafluoro-1-propene / (E)-1,3,3,3-Tetrafluoroprop-1-ene / (E)-1,3,3,3-Tetrafluoropropene / E-HFO-1234ze / HFC-1234ze(E) / HFO-1234ze(E) / 1-Propene, 1,3,3,3-tetrafluoro-, (1E) / trans-1,3,3,3-Tetrafluoroprop-1-ene / trans-1,3,3,3-Tetrafluoropropene / trans-1,3,3,3-Tetrafluoropropylene

#### 1.2. Relevant Identified Uses of the Substance or Mixture and Uses Advised Against

##### 1.2.1. Relevant Identified Uses

Use of the Substance/Mixture : Laboratory use.

##### 1.2.2. Uses Advised Against

Uses Advised Against : Restricted to professional users.

#### 1.3. Details of the Supplier of the Safety Data Sheet

##### Supplier

Leica Biosystems Richmond Inc.  
5205 Rt. 12  
Richmond, Illinois 60071  
United States

[lbsna-lbs-qa@leicabiosystems.com](mailto:lbsna-lbs-qa@leicabiosystems.com)

##### Importer

LBS Deutschland GmbH Heidelberger  
Straße 17-19 D-69226 Nussloch  
Tel: +49 6224 143 0

#### 1.4. Emergency Telephone Number

Emergency Number : CHEMTREC  
Europe: +44 20 3885 0382  
Within USA and Canada: 1-800-424-9300  
International: +1-703-527-3887 (Collect calls accepted)

### SECTION 2: HAZARDS IDENTIFICATION

#### 2.1. Classification of the Substance or Mixture

##### Classification According to Regulation (EC) No. 1272/2008

Aerosol, Category 3 H229

#### 2.2. Label Elements

##### Labelling According to Regulation (EC) No. 1272/2008 [CLP]

Signal Word (CLP)	: Warning
Hazard Statements (CLP)	: H229 - Pressurised container: May burst if heated.
Precautionary Statements (CLP)	: P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P251 - Do not pierce or burn, even after use. P410+P412 - Protect from sunlight. Do not expose to temperatures exceeding 50 °C/122 °F.

#### 2.3. Other Hazards

Other Hazards Not Contributing to the Classification : Exposure may aggravate pre-existing eye, skin, or respiratory conditions.  
Asphyxiating gas at high concentrations.

This substance/mixture does not meet the PBT/vPvB criteria of REACH regulation, annex XIII

The substance/mixture does not contain substance(s) at a concentration equal to or greater than 0,1% by weight that are present in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties or identified as having

# Frostbite

## Safety Data Sheet

According to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2020/878

endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605.

### SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

#### 3.1. Substances

Name	Product Identifier	%	Classification According to Regulation (EC) No. 1272/2008
1-Propene, 1,3,3,3-tetrafluoro-, (1E)-	(CAS-No.) 29118-24-9 (EC-No.) 471-480-0	100	Press. Gas (Liq.), H280

Full text of H-statements: see section 16

#### 3.2. Mixtures

Not applicable

### SECTION 4: FIRST AID MEASURES

#### 4.1. Description of First-aid Measures

- First-Aid Measures General** : Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).
- First-Aid Measures After Inhalation** : When symptoms occur: go into open air and ventilate suspected area. Obtain medical attention if breathing difficulty persists.
- First-Aid Measures After Skin Contact** : Remove contaminated clothing. If frostbite or freezing from exposure to gas/liquid escaping the container occurs: Drench affected area with water for at least 5 minutes. Obtain medical attention if irritation develops or persists.
- First-Aid Measures After Eye Contact** : Rinse cautiously with water for at least 5 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention if irritation develops or persists. If frostbite or freezing occurs, immediately flush with plenty of lukewarm water to GENTLY warm the affected area. Do not use hot water. Do not rub affected area. Get immediate medical attention.
- First-Aid Measures After Ingestion** : Though risk of ingestion is extremely unlikely, in case of frostbite or freeze burns due to oral exposure seek immediate medical attention.

#### 4.2. Most Important Symptoms and Effects Both Acute and Delayed

- Symptoms/Effects** : May cause frostbite on contact with the liquid. Asphyxiant gas.
- Symptoms/Effects After Inhalation** : In elevated concentrations may cause asphyxiation, central nervous system effects, and increased breathing rate. Symptoms of asphyxiation include headache, dizziness, rapid breathing, increased pulse, mood changes, tremors, cyanosis, muscular weakness, narcosis, numbness of the extremities, unconsciousness and death.
- Symptoms/Effects After Skin Contact** : Prolonged exposure may cause skin irritation. Contact with gas/liquid escaping the container can cause frostbite and freeze burns.
- Symptoms/Effects After Eye Contact** : May cause slight irritation to eyes. Contact with gas/liquid escaping the container can cause frostbite, freeze burns, and permanent eye damage.
- Symptoms/Effects After Ingestion** : Not considered a potential route of exposure, but contact with gas/liquid escaping the container can cause freeze burns and frostbite.
- Chronic Symptoms** : None expected under normal conditions of use.

#### 4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed

If exposed or concerned, get medical advice and attention. If medical advice is needed, have product container or label at hand.

### SECTION 5: FIREFIGHTING MEASURES

#### 5.1. Extinguishing Media

- Suitable Extinguishing Media** : Not flammable. Use extinguishing media appropriate for surrounding fire.
- Unsuitable Extinguishing Media** : None known.

#### 5.2. Special Hazards Arising From the Substance or Mixture

- Fire Hazard** : Not considered flammable but may burn at high temperatures.
- Explosion Hazard** : Container may explode in heat of fire.
- Reactivity** : Hazardous reactions will not occur under normal conditions.
- Hazardous Combustion Products** : Carbon oxides (CO, CO<sub>2</sub>). Fluorine compounds.

#### 5.3. Advice for Firefighters

- Precautionary Measures Fire** : Exercise caution when fighting any chemical fire.
- Firefighting Instructions** : Use water spray or fog for cooling exposed containers. Fight fire remotely due to the risk of explosion.
- Protection During Firefighting** : Do not enter fire area without proper protective equipment, including respiratory protection.

# Frostbite

Safety Data Sheet

According to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2020/878

## SECTION 6: ACCIDENTAL RELEASE MEASURES

### 6.1. Personal Precautions, Protective Equipment and Emergency Procedures

**General Measures** : Do not get in eyes, on skin, or on clothing. Do not breathe gas.

#### 6.1.1. For Non-Emergency Personnel

**Protective Equipment** : Use appropriate personal protective equipment (PPE).

**Emergency Procedures** : Evacuate unnecessary personnel.

#### 6.1.2. For Emergency Responders

**Protective Equipment** : Equip cleanup crew with proper protection.

**Emergency Procedures** : Evacuate unnecessary personnel, isolate, and ventilate area. Upon arrival at the scene, a first responder is expected to recognise the presence of dangerous goods, protect oneself and the public, secure the area, and call for the assistance of trained personnel as soon as conditions permit.

### 6.2. Environmental Precautions

Prevent entry to sewers and public waters.

### 6.3. Methods and Materials for Containment and Cleaning Up

**For Containment** : Stop leak, if possible without risk. As an immediate precautionary measure, isolate spill or leak area in all directions.

**Methods for Cleaning Up** : Clean up spills immediately and dispose of waste safely. Stop the source of the release, if safe to do so. Consider the use of water spray to disperse vapors. Isolate the area until gas has dispersed. Ventilate and gas test area before entering. Allow liquid to evaporate. Contact competent authorities after a spill.

### 6.4. Reference to Other Sections

See Section 8 for exposure controls and personal protection and Section 13 for disposal considerations.

## SECTION 7: HANDLING AND STORAGE

### 7.1. Precautions for Safe Handling

**Additional Hazards When Processed** : Pressurised container: May burst if heated. Do not pierce or burn, even after use. Asphyxiating gas at high concentrations.

**Precautions for Safe Handling** : Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Avoid prolonged contact with eyes, skin and clothing. Do not breathe gas.

**Hygiene Measures** : Handle in accordance with good industrial hygiene and safety procedures.

### 7.2. Conditions for Safe Storage, Including Any Incompatibilities

**Technical Measures** : Store and use with adequate ventilation. Do not pierce or burn, even after use. Comply with applicable regulations.

**Storage Conditions** : Store in accordance with applicable national storage class systems. Keep/Store away from direct sunlight, extremely high or low temperatures and incompatible materials. Keep only in the original container in a cool, well ventilated place away from ignition sources. Protect from sunlight. Do not expose to temperatures exceeding 50°C/ 122°F.

**Incompatible Materials** : Alkali metals. Strong oxidisers.

**Heat and ignition sources** : Intense heat may cause container to burst.

**Information on mixed storage** : Refer to Section 10 on Incompatible Materials.

### 7.3. Specific End Use(s)

Laboratory use.

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

### 8.1. Control Parameters

Please see section 16 for the legal basis of limit value information in section 8.1, including the national legislation or provision which gives rise to a given limit.

1-Propene, 1,3,3,3-tetrafluoro-, (1E)- (29118-24-9)		
Germany	OEL TWA (Legal Basis:TRGS 900)	4700 mg/m <sup>3</sup> (the risk of damage to the embryo or fetus can be excluded when AGW and BGW values are observed)
Germany	OEL TWA (Legal Basis:TRGS 900)	1000 ppm (the risk of damage to the embryo or fetus can be excluded when AGW and BGW values are observed)
Slovenia	OEL TWA (Legal Basis:No. 79/19)	4700 mg/m <sup>3</sup>
Slovenia	OEL TWA (Legal Basis:No. 79/19)	1000 ppm
Slovenia	OEL STEL (Legal Basis:No. 79/19)	9400 mg/m <sup>3</sup>
Slovenia	OEL STEL (Legal Basis:No. 79/19)	2000 ppm

# Frostbite

## Safety Data Sheet

According to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2020/878

1-Propene, 1,3,3,3-tetrafluoro-, (1E)- (29118-24-9)		
Switzerland	OEL STEL (Legal Basis:OLVSNAIF)	9400 mg/m <sup>3</sup>
Switzerland	OEL STEL (Legal Basis:OLVSNAIF)	2000 ppm
Switzerland	OEL TWA (Legal Basis:OLVSNAIF)	4700 mg/m <sup>3</sup>
Switzerland	OEL TWA (Legal Basis:OLVSNAIF)	1000 ppm

### 8.2. Exposure Controls

#### Appropriate Engineering Controls

: Suitable eye/body wash equipment should be available in the vicinity of any potential exposure. Ensure adequate ventilation, especially in confined areas. Ensure all national/local regulations are observed. Oxygen detectors should be used when asphyxiating gases may be released.

#### Personal Protective Equipment

: Gloves. Protective clothing. Protective goggles. Insufficient ventilation: wear respiratory protection. Respiratory protection of the dependent type. Personal protective equipment should be chosen in accordance with Regulation (EU) 2016/425, CEN standards, and in discussion with the supplier of the protective equipment.



#### Materials for Protective Clothing

: Chemically resistant materials and fabrics.

#### Hand Protection

: Wear protective gloves.

#### Eye Protection

: Chemical goggles or safety glasses.

#### Skin and Body Protection

: Wear suitable protective clothing.

#### Respiratory Protection

: Use a NIOSH-approved self-contained breathing apparatus whenever exposure may exceed established Occupational Exposure Limits.

#### Thermal Hazard Protection

: If material is cold, wear thermally resistant protective gloves.

#### Environmental Exposure Controls

: Avoid unnecessary release into the environment.

#### Other Information

: When using, do not eat, drink or smoke.

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

### 9.1. Information on Basic Physical and Chemical Properties

Physical State	: Gas
Colour, Appearance	: Colourless liquified gas
Odour	: Odourless
Odour Threshold	: No data available
pH	: Not applicable
Evaporation Rate	: No data available
Melting Point	: Not applicable
Freezing Point	: Not applicable
Boiling Point	: -19 °C (-2,2 °F)
Flash Point	: No data available
Auto-Ignition Temperature	: 368 °C (694,4 °F)
Decomposition Temperature	: No data available
Flammability	: No data available
Vapour Pressure	: 427,1 kPa
Relative Vapour Density At 20°C	: No data available
Relative Density	: 3,92
Solubility	: Water: 373 mg/l
Partition Coefficient n-Octanol/Water	: 1,6
Viscosity	: No data available
Explosive Properties	: No data available
Oxidising Properties	: None
Explosive Limits	: No data available
Particle Aspect Ratio	: Not applicable
Particle Aggregation State	: Not applicable
Particle Agglomeration State	: Not applicable
Particle Specific Surface Area	: Not applicable
Particle Dustiness	: Not applicable

# Frostbite

## Safety Data Sheet

According to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2020/878

### 9.2. Other Information

% of flammable ingredients : 0 %

## SECTION 10: STABILITY AND REACTIVITY

### 10.1. Reactivity

Hazardous reactions will not occur under normal conditions.

### 10.2. Chemical Stability

Pressurised container: may burst if heated.

### 10.3. Possibility of Hazardous Reactions

Hazardous polymerisation will not occur.

### 10.4. Conditions to Avoid

Direct sunlight, extremely high or low temperatures, heat, hot surfaces, sparks, open flames, incompatible materials, and other ignition sources.

### 10.5. Incompatible Materials

Alkali metals. Strong oxidisers.

### 10.6. Hazardous Decomposition Products

Thermal decomposition may produce: Carbon oxides (CO, CO<sub>2</sub>). Fluorine compounds.

## SECTION 11: TOXICOLOGICAL INFORMATION

### 11.1. Information On Hazard Classes As Defined In Regulation (EC) No 1272/2008

Likely Routes of Exposure	: Dermal, Ingestion, Inhalation, Eye contact
Acute Toxicity (Oral)	: Not classified. (Based on available data, the classification criteria are not met)
Acute Toxicity (Dermal)	: Not classified. (Based on available data, the classification criteria are not met)
Acute Toxicity (Inhalation)	: Not classified. (Based on available data, the classification criteria are not met)

1-Propene, 1,3,3,3-tetrafluoro-, (1E)- (29118-24-9)	
LC50 Inhalation Rat	> 207000 ppm/4h

Skin Corrosion/Irritation	: Not classified. (Based on available data, the classification criteria are not met)
Eye Damage/Irritation	: Not classified. (Based on available data, the classification criteria are not met)
Respiratory or Skin Sensitisation	: Not classified. (Based on available data, the classification criteria are not met)
Germ Cell Mutagenicity	: Not classified. (Based on available data, the classification criteria are not met)
Carcinogenicity	: Not classified. (Based on available data, the classification criteria are not met)
Reproductive Toxicity	: Not classified. (Based on available data, the classification criteria are not met)
Specific Target Organ Toxicity (Single Exposure)	: Not classified. (Based on available data, the classification criteria are not met)
Specific Target Organ Toxicity (Repeated Exposure)	: Not classified. (Based on available data, the classification criteria are not met)
Aspiration Hazard	: Not classified. (Based on available data, the classification criteria are not met)
Symptoms/Injuries After Inhalation	: In elevated concentrations may cause asphyxiation, central nervous system effects, and increased breathing rate. Symptoms of asphyxiation include headache, dizziness, rapid breathing, increased pulse, mood changes, tremors, cyanosis, muscular weakness, narcosis, numbness of the extremities, unconsciousness and death.
Symptoms/Injuries After Skin Contact	: Prolonged exposure may cause skin irritation. Contact with gas/liquid escaping the container can cause frostbite and freeze burns.
Symptoms/Injuries After Eye Contact	: May cause slight irritation to eyes. Contact with gas/liquid escaping the container can cause frostbite, freeze burns, and permanent eye damage.
Symptoms/Injuries After Ingestion	: Not considered a potential route of exposure, but contact with gas/liquid escaping the container can cause freeze burns and frostbite.
Chronic Symptoms	: None expected under normal conditions of use.

### 11.2. Information On Other Hazards

Based on available data this substance/the substances in this mixture not listed below do(es) not have endocrine disrupting properties with respect to humans as it does not meet the criteria set out in section A of Regulation (EU) No 2017/2100 and/or the criteria set out in Regulation (EU) 2018/605, or the substance(s) are not required to be disclosed.

## SECTION 12: ECOLOGICAL INFORMATION

### 12.1. Toxicity

**Hazardous To The Aquatic Environment, Short-Term (Acute)** : Not classified. (Based on available data, the classification criteria are not met)

# Frostbite

## Safety Data Sheet

According to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2020/878

**Hazardous To The Aquatic Environment, Long-Term (Chronic)** : Not classified. (Based on available data, the classification criteria are not met)

### 12.2. Persistence and Degradability

Frostbite (29118-24-9)	
Persistence and Degradability	Not established.

### 12.3. Bioaccumulative Potential

Frostbite (29118-24-9)	
Bioaccumulative Potential	Not established.

### 12.4. Mobility in Soil

No additional information available

### 12.5. Results of PBT and vPvB Assessment

Does not contain any PBT/vPvB substances  $\geq 0,1\%$  assessed in accordance with REACH Annex XIII

### 12.6. Endocrine Disrupting Properties

Based on available data this substance/the substances in this mixture not listed below do(es) not have endocrine disrupting properties with respect to non-target organisms as it does not meet the criteria set out in section B of Regulation (EU) No 2017/2100 and/or the criteria set out in Regulation (EU) 2018/605, or the substance(s) are not required to be disclosed.

### 12.7. Other Adverse Effects

**Other Information** : Avoid release to the environment.

## SECTION 13: DISPOSAL CONSIDERATIONS






### 13.1. Waste Treatment Methods

**Product/Packaging Disposal Recommendations** : Dispose of contents/container in accordance with local, regional, national, territorial, provincial, and international regulations. Do not pierce or burn, even after use.

**Ecology - Waste Materials** : Avoid release to the environment.

## SECTION 14: TRANSPORT INFORMATION

The shipping description(s) stated herein were prepared in accordance with certain assumptions at the time the SDS was authored, and can vary based on a number of variables that may or may not have been known at the time the SDS was issued. In accordance with ADR / RID / IMDG / IATA / ADN

ADR	IMDG	IATA	ADN	RID
<b>14.1. UN Number or ID Number</b>				
UN 1950	UN 1950	UN 1950	UN 1950	UN 1950
<b>14.2. UN Proper Shipping Name</b>				
AEROSOLS	AEROSOLS	Aerosols, non-flammable	AEROSOLS	AEROSOLS
<b>14.3. Transport Hazard Class</b>				
2.2	2.2	2.2	2.2	2.2
				
<b>14.4. Packing Group</b>				
Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
<b>14.5. Environmental Hazards</b>				
Dangerous for the environment : No	Dangerous for the environment : No Marine pollutant : No	Dangerous for the environment : No	Dangerous for the environment : No	Dangerous for the environment : No

### 14.6. Special Precautions For User

No additional information available

### 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

#### 15.1.1. EU-Regulations

##### 15.1.1.1. REACH Annex XVII Information

Not listed on REACH Annex XVII

# Frostbite

## Safety Data Sheet

According to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2020/878

### 15.1.1.2. REACH Candidate List Information

Not listed on the REACH Candidate List

### 15.1.1.3. POP (2019/1021) - Persistent Organic Pollutants Information

Not listed on the POP list (Regulation EU 2019/1021)

### 15.1.1.4. PIC Regulation EU (649/2012) - Export and Import of Hazardous Chemicals Information

Not listed on the PIC list (Regulation EU 649/2012)

### 15.1.1.5. REACH Annex XIV Information

Not listed on REACH Annex XIV (Authorisation List)

### 15.1.1.6. Substances Depleting the Ozone layer (1005/2009) Information

No additional information available

### 15.1.1.7. EC Inventory Information

No additional information available

### 15.1.1.8. Other Information

No additional information available

### 15.1.2. National Regulations

No additional information available

### 15.1.3. International Inventory Lists

#### 1-Propene, 1,3,3,3-tetrafluoro-, (1E)- (29118-24-9)

Listed on the United States TSCA (Toxic Substances Control Act) inventory - Status: Active  
Listed on the Canadian DSL (Domestic Substances List)  
Listed introduction on Australian Industrial Chemicals Introduction Scheme (AICIS Inventory)  
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory  
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)  
Listed on KECL/KECI (Korean Existing Chemicals Inventory)  
Listed on the Japanese ISHL (Industrial Safety and Health Law)  
Listed on the TCSI (Taiwan Chemical Substance Inventory)  
Listed on the NCI (Vietnam - National Chemical Inventory)  
Listed on Thailand Existing Chemicals Inventory (DIW)

### 15.2. Chemical Safety Assessment

No chemical safety assessment has been carried out

## SECTION 16: OTHER INFORMATION

**Date of Preparation or Latest Revision** : 03/09/2024

**Data Sources** : Information and data obtained and used in the authoring of this safety data sheet could come from database subscriptions, official government regulatory body websites, product/ingredient manufacturer or supplier specific information, and/or resources that include substance specific data and classifications according to GHS or their subsequent adoption of GHS.

**Other Information** : According to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2020/878

#### Full Text of H-statements:

Aerosol 3	Aerosol, Category 3
H229	Pressurised container: May burst if heated.
H280	Contains gas under pressure; may explode if heated.
Press. Gas (Liq.)	Gases under pressure : Liquefied gas

#### Classification and Procedure Used to Derive the Classification for Mixtures According to Regulation (EC) 1272/2008 [CLP]:

Aerosol 3	Expert judgement
-----------	------------------

# Frostbite

## Safety Data Sheet

According to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2020/878

### Indication of Changes

Section	Change	Date Changed	Version
1	Language modified	03/09/2024	2.0
3	Data modified	03/09/2024	2.0
4	Language modified	03/09/2024	2.0
6	Language modified	03/09/2024	2.0
7	Language modified	03/09/2024	2.0
8	Data modified; Language modified	03/09/2024	2.0
9	Data modified	03/09/2024	2.0
10	Language modified	03/09/2024	2.0
11	Data modified; Language modified	03/09/2024	2.0
12	Data modified; Language modified	03/09/2024	2.0
13	Language modified	03/09/2024	2.0
14	Classification modified	03/09/2024	2.0
15	Language modified	03/09/2024	2.0
16	Language modified	03/09/2024	2.0

### Abbreviations and Acronyms

ACGIH – American Conference of Governmental Industrial Hygienists  
ADN – European Agreement Concerning the International Carriage of Dangerous Goods by Inland Waterways  
ADR – European Agreement Concerning the International Carriage of Dangerous Goods by Road  
ATE - Acute Toxicity Estimate  
BCF - Bioconcentration Factor  
BEI - Biological Exposure Indices (BEI)  
BOD – Biochemical Oxygen Demand  
CAS No. - Chemical Abstracts Service Number  
CLP – Classification, Labeling and Packaging Regulation (EC) No 1272/2008  
COD – Chemical Oxygen Demand  
EC – European Community  
EC50 - Median Effective Concentration  
EEC – European Economic Community  
EINECS – European Inventory of Existing Commercial Chemical Substances  
EmS-No. (Fire) - IMDG Emergency Schedule Fire  
EmS-No. (Spillage) - IMDG Emergency Schedule Spillage  
EU – European Union  
ErC50 - EC50 in Terms of Reduction Growth Rate  
GHS – Globally Harmonized System of Classification and Labeling of Chemicals  
IARC - International Agency for Research on Cancer  
IATA - International Air Transport Association  
IBC Code - International Bulk Chemical Code  
IMDG - International Maritime Dangerous Goods  
IPRV - Ilgalaikio Poveikio Ribinis Dydis  
IOELV – Indicative Occupational Exposure Limit Value  
LC50 - Median Lethal Concentration  
LD50 - Median Lethal Dose  
LOAEL - Lowest Observed Adverse Effect Level  
LOEC - Lowest-Observed-Effect Concentration  
Log Koc - Soil Organic Carbon-water Partitioning Coefficient  
Log Kow - Octanol/water Partition Coefficient  
Log Pow - Ratio of the equilibrium concentration (C) of a dissolved substance in a two-phase system consisting of two largely immiscible solvents, in this case octanol and water  
MAK – Maximum Workplace Concentration/Maximum Permissible Concentration  
MARPOL - International Convention for the Prevention of Pollution

### Glossary of Data Source Abbreviations

ATSDR: Agency for Toxic Substances and Disease Registry (U.S. Department of Health and Human Services)  
AU\_WES: Australia WES  
CHEMVIEW: ChemView (U.S. Environmental Protection Agency)  
EC\_RAR: European Commission Renewal Assessment Report  
EC\_SCOEL: European Commission Scientific Committee on Occupational Exposure Limits  
ECETOC: European Centre for Ecotoxicology and Toxicology of Chemicals Reports  
ECHA\_API: European Chemicals Agency API  
ECHA\_RAC: ECHA Committee for Risk Assessment

NDS - Najwyższe Dopuszczalne Stezenie  
NDSCh - Najwyższe Dopuszczalne Stezenie Chwilowe  
NDSP - Najwyższe Dopuszczalne Stezenie Pulpowe  
NOAEL - No-Observed Adverse Effect Level  
NOEC - No-Observed Effect Concentration  
NRD - Nevirsytinas Ribinis Dydis  
NTP – National Toxicology Program  
OEL - Occupational Exposure Limits  
PBT - Persistent, Bioaccumulative and Toxic  
PEL - Permissible Exposure Limit  
pH – Potential Hydrogen  
REACH – Registration, Evaluation, Authorisation, and Restriction of Chemicals  
RID – Regulations Concerning the International Carriage of Dangerous Goods by Rail  
SADT - Self Accelerating Decomposition Temperature  
SDS - Safety Data Sheet  
STEL - Short Term Exposure Limit  
STOT - Specific Target Organ Toxicity  
TA-Luft - Technische Anleitung zur Reinhaltung der Luft  
TEL TRK – Technical Guidance Concentrations  
ThOD – Theoretical Oxygen Demand  
TLM - Median Tolerance Limit  
TLV - Threshold Limit Value  
TPRD - Trumpalaikio Poveikio Ribinis Dydis  
TRGS 510 - Technische Regel für Gefahrstoffe 510 - Lagerung von Gefahrstoffen in ortsbeweglichen Behältern  
TRGS 552 – Technische Regeln für Gefahrstoffe - N-Nitrosamine  
TRGS 900 - Technische Regel für Gefahrstoffe 900 – Arbeitsplatzgrenzwerte  
TRGS 903 - Technische Regel für Gefahrstoffe 903 - Biologische Grenzwerte  
TSCA - Toxic Substances Control Act  
TWA - Time Weighted Average  
VOC – Volatile Organic Compounds  
VLA-EC - Valor Límite Ambiental Exposición de Corta Duración  
VLA-ED - Valor Límite Ambiental Exposición Diaria  
VLE – Valeur Limite D'exposition  
VME – Valeur Limite De Moyenne Exposition  
vPvB - Very Persistent and Very Bioaccumulative  
WEL – Workplace Exposure Limit  
WGK - Wassergefährdungsklasse

FOOD\_JOURN: Food Research Journal (1956)  
IARC: The International Agency for Research on Cancer  
IDLH: National Institute for Occupational Health and Safety Immediately Dangerous to Life or Health Value Profiles  
IUCLID: International Uniform Chemical Information Database  
JAPAN\_GHS: Japan GHS Basis for Classification Data  
JP\_J-CHECK: Japan J-Check  
KR\_NIER: South Korea National Institute of Environmental Research Evaluations  
NICNAS: Australia National Industrial Chemicals Notification and Assessment Scheme



# Frostbite

## Safety Data Sheet

According to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2020/878

EFSA: European Food Safety Authority  
EPA: U.S. Environmental Protection Agency  
EPA\_AEGL: Acute Exposure Guideline Levels (U.S. Environmental Protection Agency)  
EPA\_FIFRA: Federal Insecticide, Fungicide, and Rodenticide Act Reregistration Eligibility Decision (U.S. Environmental Protection Agency)  
EPA\_HPVC: High Production Volume Chemicals (U.S. Environmental Protection Agency)  
EPA\_TRED: Risk Assessment for Tolerance Reassessment Eligibility Decision (U.S. Environmental Protection Agency)  
EU\_CLH: European Union Harmonised Classification and Labelling Proposal  
EU\_RAR: European Union Risk Assessment Report

NIOSH: National Institute for Occupational Health and Safety (U.S. Department of Health and Human Services)  
NLM\_CIP: National Library of Medicine ChemID plus database  
NLM\_HSDB: National Library of Medicine Hazardous Substance Data Bank  
NLM\_PUBMED: National Library of Medicine PubMed database  
NTP: National Toxicology Program  
NZ\_CCID: New Zealand Chemical Classification and Information Database  
OECD\_EHSP: Environment, Health, and Safety Publication (Organisation for Economic Co-operation and Development)  
OECD\_SIDS: Screening Information Data Sets (Organisation for Economic Co-operation and Development)  
WHO: World Health Organization

### Limit Value Legal Basis\*

\*Includes the below and any related regulations/provisions, and subsequent amendments

**EU - 2019/1831 EU in accor. with 98/24/EC** - Directive 2019/1831/EU of October 24, 2019 establishing a fifth list of indicative occupational exposure limit values pursuant to Council Directive 98/24/EC, and amending Commission Directives 2000/39/EC.

**EU - 2019/1243/EU, and 98/24/EC** - Council Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work and amendment Regulation (EU) 2019/1243.

**Austria - BGBl. II Nr. 254/2018** - Ordinance on Limit Values for Workplace Substances and on Carcinogens from the Federal Ministry of Economics and Labour, Published in 2003, Appendix 1: Substance List, Published through: Ministry of Economics and Labour of the Republic of Austria amended through the Government Gazette II (BGBl. II) No 119/2004) & BGBl. II No. 242/2006, BGBl. II No. 243/2007, lastly changed through BGBl. I Nr. 51/2011), BGBl. II Nr. 186/2015, BGBl. II Nr. 288/2017 amended by BGBl. II Nr. 254/2018.

**Austria - BLV BGBl. II Nr. 254/2018** - Ordinance on health monitoring at the workplace 2008, published through BGBl. II Nr. 224/2007 by Austria Minister for Labor and Social Affairs, Lastly changed through BGBl. II Nr. 254/2018

**Belgium - Royal Decree 21/01/2020** - Royal decree amending title 1 relating to chemical agents in Book VI of the code of well-being at work, with regard to the list of limit values of exposure to chemical agents and title 2 relating to carcinogens, mutagens and reprotoxics of Book VI of the code of well-being at work (1)

**Bulgaria - Reg. No. 13/10** -

Regulation No. 13 of December 30, 2003 on the Protection of Workers from Hazards Related to Exposure to Chemical Agents at Work Labor Code, Annex No.1 Limit values of chemical agents in the air of the working environment, and Annex № 2 Biological limit values of chemical agents and their metabolites (bio markers of exposure) or bio markers of effect Amended by: 71/2006, 67/2007, 2/2012, 46/2015, 73/2018, 5/2020), and Regulation No.10 of September 26, 2003 on the Protection of Workers from the Risks Associated with Exposure to Carcinogens and Mutagens at Work Annex No.1 Occupational Exposure Limits, Amended by: 8/2004, 46/2015, 5/2020

**Croatia - OG No. 91/2018** - Regulation on the Protection of Workers from Exposure to Hazardous Chemicals at Work, the Limit Values of Exposure and the Biological Limit Values. Official Gazette No. 91 of October 12, 2018

**Cyprus - KDP 16/2019** - Government of Cyprus Cabinet of Ministers Regulation 268/2001 - Safety and Health in the Working Environment (Chemical Substances) Article 38, As amended by Regulation 16/2019 and Cabinet of Ministers Regulation 153/2001 - Safety and Health in the Working Environment (Chemical Substances-Carcinogens), as amended by Regulation 493/2004 - Safety and Health in the Working Environment (Chemical Substances - Carcinogens) AND Law 47(I) 2000 - Occupational Health and Safety (Asbestos), as amended by Decree 316/2006.

**Czech Republic - Reg. 41/2020** - Regulation 41/2020 amending Regulation 361/2007 of Coll. establishing Occupation Exposure Limits as amended

**Czech Republic - Decree No. 107/2013** - Decree No. 107/2013 Coll., amending Decree No. 432/2003 Coll., laying down the conditions for the application of the work into categories, limit values for the parameters of biological exposure tests, collection of biological material conditions for the implementation of biological exposure tests and requirements for reporting work with asbestos and biological agents

**Denmark - BEK No. 698 of 28/05/2020** - Order on Limit Values for Substances and Materials, The Statutory Order No. 507 of May 17, 2011, Appendix 1 - Limits for air pollution, etc. and Appendix 3 - Biological Exposure Values, Amended by: No. 986 of October 11, 2012, No. 655 of May 31, 2018, No. 1458 December 13, 2019, No. 698 of May 28, 2020

**Estonia - Regulation No. 105** - Health and Safety Requirements for the Use of

**Greece - PWHSE** - Occupational Exposure Limits - Protection of workers' health and safety from exposure to certain chemical substances during the workday, (latest amendment 82/2018) and Occupation Exposure Limits - Protection of workers' health and safety from exposure to certain carcinogenic and mutagenic chemical substances (latest amendment 26/2020), and Presidential Decree 212/2006 - Protection of workers that are exposed to asbestos.

**Hungary - Decree 05/2020** - 5/2020. (II. 6.) ITM decree on the protection of the health and safety of workers from the risks related to chemical agents

**Ireland - 2020 COP** - 2020 Code of Practice for the Chemical Agents Regulations, Schedule 1

**Italy - Decree 81** - Title IX, Annex XLIII and XXXVIII, Professional Exposure Limits and Annex XXXIX Mandatory Biological Limit Values and Health Monitoring, Article 1, Law 123 of August 3, 2007, Legislative Decree 81 of April 9, 2008, Last amended: January 2020

**Italy - IMDFN1** - Ministerial Decree of August 20, 1999 Final Note (1)

**Latvia - Reg. No. 325** - Cabinet of Ministers Regulation No. 325 - Labour Protection Requirements when Coming in Contact with Chemical Substances at Workplaces, Amended by Cabinet of Ministers Regulation No. 92, 163, 407 and No. 11.

**Lithuania - HN 23:2011** - Lithuanian Hygiene Standard HN 23:2011 Occupational Exposure Limit Values, Amended by Order V-695/A1-272.

**Luxembourg - A-N 684** - Grand-Ducal Regulation of 20 July 2018 amending the Grand-Ducal Regulation of 14 November 2016 concerning the protection of the safety and health of employees against the risks associated with chemical agents in the workplace. Official journal of the Grand-Duke of Luxembourg, A-N°684 of 2018

**Malta - MOSHAA Ch. 424** - Malta Occupational Health and Safety Authority Act: Chapter 424 as amended by: Legal Notice 353, 53, 198, and 57.

**Netherlands- OWCRIV** - Occupational Working Conditions Regulation, Limit Values for substances harmful to health, Annex XVIII, Updated from August 1, 2020.

**Norway - FOR-2020-04-060695** - Regulations concerning action and limit values for physical and chemical agents in the working environment and classified biological agents, FOR-2011-12-06-1358, Updated by: FOR-2020-04-06-695, FOR-2020-03-23-402, FOR-2018-12-20-2186, FOR-2018-08-21-1255, FOR-2017-12-20-2353.

**Poland - Dz. U. 2020 Nr. 61** - Regulation of the Minister of Family, Labor and Social Policy of June 12, 2018 on the Highest Allowable Concentrations and Intensities of Factors Harmful to Health in the Work Environment Dz.U. 2018 Nr. 1286 of June 12, 2018, Annex 1 - List of values of the highest permissible chemical concentrations and dust factors harmful to health in the work environment, amended by: Dz. U. 2020 Nr. 61.

**Portugal - Portuguese Norm NP 1796:2014** - Occupational exposure limits and biological exposure indices to chemical agents. Table 1 - Occupational exposure limits and biological exposure indices to chemical agents (OELs), Law Decree 35/2020.

**Romania - Gov. Dec. No 1.218** - Governmental Decision No. 1.218 from 06/09/2006 on the minimum health and safety requirements for protection of workers from the risks related to exposure to chemical agents, Annex No. 1 Mandatory National Occupational Exposure Limit Values for Chemical Agents. Amended by Decision no. 157, 584, 359, and 1.

**Slovakia - Gov. Decree 33/2018** - Government Decree of Slovak Republic 33/2018 on January 17, 2018 amending Government Decree of Slovak Republic 355/2006 about protection of health of employees when working with chemical agents

**Slovenia - No. 79/19** - Regulation for protection of workers against risks related to carcinogenic or mutagenic substances exposure. Annex III -

# Frostbite

## Safety Data Sheet

According to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2020/878

---

Dangerous Chemicals and Materials Containing Them and Occupational Exposure Limits to Chemical Agents

Government of the Republic, Regulation No. 105 of 20 March 2001, Amended 17 October 2019, and 17 January, 2020.

**Finland - HTP-ARVOT 2020** - Concentrations Known to be Hazardous, 654/2020 OEL values 2020 Publications of Ministry of Social Affairs and Health 2020:24 Annexes1, 2 and 3.

**France - INRS ED 984** - Occupational Exposure Limit Values to Chemical Agents in France Published 2016 by the INRS National Institute of Research and Safety Health and safety of work, revised, updated by: Decree 2016-344, JORF No 0119, and Decree 2019-1487.

**France - Decree 2009-1570** - Decree 2009-1570 of December 15, 2009, relative to the control of chemical risk on workplaces.

**Germany - TRGS 900** - Occupational Exposure Limits, Technical Rules for Dangerous Substances, latest amendment March, 2020

**Germany - TRGS 903** - Biological Threshold Limits (BGW-Values), Technical Rules for Dangerous Substances, latest amendment March, 2020

**Gibraltar - LN. 2018/131** - Factories (Control of Chemical Agents at Work) Regulations 2003 LN. 2003/035, amended by LN. 2008/035, LN. 2008/050, LN. 2012/021, LN. 2015/143, LN. 2018/181.

Classification and binding levels of carcinogenic or mutagenic substances for occupational exposure. The Official Journal of the Republic of Slovenia, No. 101/2005. Amended by 38/15, 79/19. Regulation for protection of workers against risks related to exposure to chemical substances at the workplace. Republic of Slovenia, No. 100/2001 . Annex I - List of Binding Occupational Exposure Limit Values. Amended by 39/05, 53/07, 102/10, 38/15, 78/18, 78/19

**Spain - AFS 2018:1** - NATIONAL INSTITUTE FOR HEALTH AND SAFETY AT WORK. Occupational exposure limits for chemical agents in Spain. Tables 1 and 3. Latest edition Feb. 2019

**Sweden - AFS 2018:1** - Statute Book of the Swedish Work Environment Authority, AFS 2018:1  
The Swedish Work Environment Authority's Ordinance and General Guidance on Hygienic Limit Values

**Switzerland - OLVSNAlF** - Occupational Limit Values 2020 Swiss National Accident Insurance Fund. List of Biological Limit Values (BAT-Werte) and List of MAK Values.

*This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.*

EU GHS SDS (2020/878)