



Conforms to Regulation (EC) No. 1907/2006 (REACH), Annex II, as amended by Commission Regulation (EU) 2015/830

# SAFETY DATA SHEET

## Silencer F2 Express

### SECTION 1: Identification of the substance/mixture and of the company/ undertaking

#### 1.1 Product identifier

**Product name** : Silencer F2 Express  
**Product code** : 58231  
**Product description** : Not available.  
**Product type** : Liquid.

#### 1.2 Relevant identified uses of the substance or mixture and uses advised against

Restricted to professional users.

**Material uses** : Water treatment agent.

#### 1.3 Details of the supplier of the safety data sheet

**Supplier** : **Fernox**  
**2 Genesis Business Park**  
**Albert Drive**  
**Sheerwater**  
**Woking GU21 5RW**

**Information contact** : +44 (0) 330 100 7750  
+44 (0) 330 100 7751  
europeanregulatory@macdermid.com

#### 1.4 Emergency telephone number

##### Supplier

**Telephone number** : +44 (0) 330 100 7750  
**Hours of operation** : 24/7

### SECTION 2: Hazards identification

#### 2.1 Classification of the substance or mixture

**Product definition** : Mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Aerosol 1, H222, H229

**Ingredients of unknown toxicity** :

**Ingredients of unknown ecotoxicity** :

Classification according to Directive 1999/45/EC [DPD]

Europe

**Date of issue/Date of revision** : 30.11.2016

A MacDermid Performance Solutions Business  
A Platform Specialty Products Company



## SECTION 2: Hazards identification


The product is classified as dangerous according to Directive 1999/45/EC and its amendments.

**Classification** : F+; R12  
**Physical/chemical hazards** : Extremely flammable.

See Section 16 for the full text of the R phrases or H statements declared above.

See Section 11 for more detailed information on health effects and symptoms.

### 2.2 Label elements

**Hazard pictograms** : 

**Signal word** : Danger  
**Hazard statements** : Extremely flammable aerosol.  
 Pressurized container: may burst if heated.

#### Precautionary statements

**Prevention** : Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Do not spray on an open flame or other ignition source. Do not pierce or burn, even after use.  
**Response** : Not applicable.  
**Storage** : Protect from sunlight. Do not expose to temperatures exceeding 50 °C/122 °F.  
**Disposal** : Not applicable.  
**Hazardous ingredients** :  
**Supplemental label elements** : Contains 1,2-benzisothiazol-3(2H)-one. May produce an allergic reaction.

### 2.3 Other hazards

**Other hazards which do not result in classification** : None known.

## SECTION 3: Composition/information on ingredients

**Substance/mixture** : Mixture

Product/ingredient name	Identifiers	%	Classification		Type
			67/548/EEC	Regulation (EC) No. 1272/2008 [CLP]	
<b>Europe</b> 1,2-benzisothiazol-3(2H)-one	EC: 220-120-9 CAS: 2634-33-5 Index: 613-088-00-6	≥0.01 - <0.05	Xn; R22 Xi; R41, R38 R43 N; R50  <b>See Section 16 for the full text of the R-phrases declared above.</b>	Acute Tox. 4, H302 Skin Irrit. 2, H315 Eye Dam. 1, H318 Skin Sens. 1, H317 Aquatic Acute 1, H400  <b>See Section 16 for the full text of the H statements declared above.</b>	[1]
<b>Austria</b>					

**SECTION 3: Composition/information on ingredients**

propane	EC: 200-827-9 CAS: 74-98-6 Index: 601-003-00-5	≥3 - <5	F+; R12	Flam. Gas 1, H220 Press. Gas, H280	[2]
butane	REACH #: 01-2119474691-32 EC: 203-448-7 CAS: 106-97-8 Index: 601-004-00-0	≥3 - <5	F+; R12	Flam. Gas 1, H220  Press. Gas, H280	[2]
<b>Belgium</b>					
propane	EC: 200-827-9 CAS: 74-98-6 Index: 601-003-00-5	≥3 - <5	F+; R12	Flam. Gas 1, H220 Press. Gas, H280	[2]
butane	REACH #: 01-2119474691-32 EC: 203-448-7 CAS: 106-97-8 Index: 601-004-00-0	≥3 - <5	F+; R12	Flam. Gas 1, H220  Press. Gas, H280	[2]
<b>Bulgaria</b>					
propane	EC: 200-827-9 CAS: 74-98-6 Index: 601-003-00-5	≥3 - <5	F+; R12	Flam. Gas 1, H220 Press. Gas, H280	[2]
butane	REACH #: 01-2119474691-32 EC: 203-448-7 CAS: 106-97-8 Index: 601-004-00-0	≥3 - <5	F+; R12	Flam. Gas 1, H220  Press. Gas, H280	[2]
<b>Croatia</b>					
propane-1,2-diol	REACH #: 01-2119456809-23 EC: 200-338-0 CAS: 57-55-6	≥5 - <10	Not classified.	Not classified.	-
butane	REACH #: 01-2119474691-32 EC: 203-448-7 CAS: 106-97-8 Index: 601-004-00-0	≥3 - <5	F+; R12	Flam. Gas 1, H220  Press. Gas, H280	[2]
<b>Denmark</b>					
propane	EC: 200-827-9 CAS: 74-98-6 Index: 601-003-00-5	≥3 - <5	F+; R12	Flam. Gas 1, H220 Press. Gas, H280	[2]
butane	REACH #: 01-2119474691-32 EC: 203-448-7 CAS: 106-97-8 Index: 601-004-00-0	≥3 - <5	F+; R12	Flam. Gas 1, H220  Press. Gas, H280	[2]
<b>Estonia</b>					
propane	EC: 200-827-9 CAS: 74-98-6 Index: 601-003-00-5	≥3 - <5	F+; R12	Flam. Gas 1, H220 Press. Gas, H280	[2]
butane	REACH #: 01-2119474691-32 EC: 203-448-7 CAS: 106-97-8 Index: 601-004-00-0	≥3 - <5	F+; R12	Flam. Gas 1, H220  Press. Gas, H280	[2]
<b>Finland</b>					

**SECTION 3: Composition/information on ingredients**

propane	EC: 200-827-9 CAS: 74-98-6 Index: 601-003-00-5	≥3 - <5	F+; R12	Flam. Gas 1, H220 Press. Gas, H280	[2]
butane	REACH #: 01-2119474691-32 EC: 203-448-7 CAS: 106-97-8 Index: 601-004-00-0	≥3 - <5	F+; R12	Flam. Gas 1, H220  Press. Gas, H280	[2]
<b>France</b>					
butane	REACH #: 01-2119474691-32 EC: 203-448-7 CAS: 106-97-8 Index: 601-004-00-0	≥3 - <5	F+; R12	Flam. Gas 1, H220  Press. Gas, H280	[2]
<b>Germany</b>					
propane	EC: 200-827-9 CAS: 74-98-6 Index: 601-003-00-5	≥3 - <5	F+; R12	Flam. Gas 1, H220 Press. Gas, H280	[2]
butane	REACH #: 01-2119474691-32 EC: 203-448-7 CAS: 106-97-8 Index: 601-004-00-0	≥3 - <5	F+; R12	Flam. Gas 1, H220  Press. Gas, H280	[2]
<b>Greece</b>					
propane	EC: 200-827-9 CAS: 74-98-6 Index: 601-003-00-5	≥3 - <5	F+; R12	Flam. Gas 1, H220 Press. Gas, H280	[2]
butane	REACH #: 01-2119474691-32 EC: 203-448-7 CAS: 106-97-8 Index: 601-004-00-0	≥3 - <5	F+; R12	Flam. Gas 1, H220  Press. Gas, H280	[2]
<b>Hungary</b>					
butane	REACH #: 01-2119474691-32 EC: 203-448-7 CAS: 106-97-8 Index: 601-004-00-0	≥3 - <5	F+; R12	Flam. Gas 1, H220  Press. Gas, H280	[2]
<b>Ireland</b>					
propane-1,2-diol	REACH #: 01-2119456809-23 EC: 200-338-0 CAS: 57-55-6	≥5 - <10	Not classified.	Not classified.	[2]
propane	EC: 200-827-9 CAS: 74-98-6 Index: 601-003-00-5	≥3 - <5	F+; R12	Flam. Gas 1, H220 Press. Gas, H280	[2]
butane	REACH #: 01-2119474691-32 EC: 203-448-7 CAS: 106-97-8 Index: 601-004-00-0	≥3 - <5	F+; R12	Flam. Gas 1, H220  Press. Gas, H280	[2]
<b>Latvia</b>					

**SECTION 3: Composition/information on ingredients**

propane-1,2-diol	REACH #: 01-2119456809-23 EC: 200-338-0 CAS: 57-55-6	≥5 - <10	Not classified.	Not classified.	[2]
propane	EC: 200-827-9 CAS: 74-98-6 Index: 601-003-00-5	≥3 - <5	F+; R12	Flam. Gas 1, H220 Press. Gas, H280	[2]
butane	REACH #: 01-2119474691-32 EC: 203-448-7 CAS: 106-97-8 Index: 601-004-00-0	≥3 - <5	F+; R12	Flam. Gas 1, H220 Press. Gas, H280	[2]
<b>Lithuania</b>					
propane-1,2-diol	REACH #: 01-2119456809-23 EC: 200-338-0 CAS: 57-55-6	≥5 - <10	Not classified.	Not classified.	[2]
<b>Norway</b>					
propane-1,2-diol	REACH #: 01-2119456809-23 EC: 200-338-0 CAS: 57-55-6	≥5 - <10	Not classified.	Not classified.	[2]
propane	EC: 200-827-9 CAS: 74-98-6 Index: 601-003-00-5	≥3 - <5	F+; R12	Flam. Gas 1, H220 Press. Gas, H280	[2]
butane	REACH #: 01-2119474691-32 EC: 203-448-7 CAS: 106-97-8 Index: 601-004-00-0	≥3 - <5	F+; R12	Flam. Gas 1, H220 Press. Gas, H280	[2]
<b>Poland</b>					
propane	EC: 200-827-9 CAS: 74-98-6 Index: 601-003-00-5	≥3 - <5	F+; R12	Flam. Gas 1, H220 Press. Gas, H280	[2]
butane	REACH #: 01-2119474691-32 EC: 203-448-7 CAS: 106-97-8 Index: 601-004-00-0	≥3 - <5	F+; R12	Flam. Gas 1, H220 Press. Gas, H280	[2]
<b>Portugal</b>					
propane	EC: 200-827-9 CAS: 74-98-6 Index: 601-003-00-5	≥3 - <5	F+; R12	Flam. Gas 1, H220 Press. Gas, H280	[2]
butane	REACH #: 01-2119474691-32 EC: 203-448-7 CAS: 106-97-8 Index: 601-004-00-0	≥3 - <5	F+; R12	Flam. Gas 1, H220 Press. Gas, H280	[2]
<b>Romania</b>					
propane	EC: 200-827-9 CAS: 74-98-6 Index: 601-003-00-5	≥3 - <5	F+; R12	Flam. Gas 1, H220 Press. Gas, H280	[2]
<b>Slovenia</b>					

**SECTION 3: Composition/information on ingredients**

propane	EC: 200-827-9 CAS: 74-98-6 Index: 601-003-00-5	≥3 - <5	F+; R12	Flam. Gas 1, H220 Press. Gas, H280	[2]
butane	REACH #: 01-2119474691-32 EC: 203-448-7 CAS: 106-97-8 Index: 601-004-00-0	≥3 - <5	F+; R12	Flam. Gas 1, H220  Press. Gas, H280	[2]
<b>Spain</b>					
propane	EC: 200-827-9 CAS: 74-98-6 Index: 601-003-00-5	≥3 - <5	F+; R12	Flam. Gas 1, H220 Press. Gas, H280	[2]
butane	REACH #: 01-2119474691-32 EC: 203-448-7 CAS: 106-97-8 Index: 601-004-00-0	≥3 - <5	F+; R12	Flam. Gas 1, H220  Press. Gas, H280	[2]
<b>Switzerland</b>					
propane	EC: 200-827-9 CAS: 74-98-6 Index: 601-003-00-5	≥3 - <5	F+; R12	Flam. Gas 1, H220 Press. Gas, H280	[2]
butane	REACH #: 01-2119474691-32 EC: 203-448-7 CAS: 106-97-8 Index: 601-004-00-0	≥3 - <5	F+; R12	Flam. Gas 1, H220  Press. Gas, H280	[2]
<b>Turkey</b>					
propane	EC: 200-827-9 CAS: 74-98-6 Index: 601-003-00-5	≥3 - <5	F+; R12	Flam. Gas 1, H220 Press. Gas, H280	[2]
butane	REACH #: 01-2119474691-32 EC: 203-448-7 CAS: 106-97-8 Index: 601-004-00-0	≥3 - <5	F+; R12	Flam. Gas 1, H220  Press. Gas, H280	[2]
<b>United Kingdom (UK)</b>					
propane-1,2-diol	REACH #: 01-2119456809-23 EC: 200-338-0 CAS: 57-55-6	≥5 - <10	Not classified.	Not classified.	[2]
butane	REACH #: 01-2119474691-32 EC: 203-448-7 CAS: 106-97-8 Index: 601-004-00-0	≥3 - <5	F+; R12	Flam. Gas 1, H220  Press. Gas, H280	[2]

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Type

[1] Substance classified with a health or environmental hazard

[2] Substance with a workplace exposure limit

[3] Substance meets the criteria for PBT according to Regulation (EC) No. 1907/2006, Annex XIII

[4] Substance meets the criteria for vPvB according to Regulation (EC) No. 1907/2006, Annex XIII

[5] Substance of equivalent concern



## SECTION 4: First aid measures

### 4.1 Description of first aid measures

- Eye contact** : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention if irritation occurs.
- Inhalation** : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
- Skin contact** : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.
- Ingestion** : Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

### 4.2 Most important symptoms and effects, both acute and delayed

#### Potential acute health effects

- Eye contact** : No known significant effects or critical hazards.
- Inhalation** : No known significant effects or critical hazards.
- Skin contact** : No known significant effects or critical hazards.
- Ingestion** : No known significant effects or critical hazards.

#### Over-exposure signs/symptoms

- Eye contact** : No specific data.
- Inhalation** : No specific data.
- Skin contact** : No specific data.
- Ingestion** : No specific data.

### 4.3 Indication of any immediate medical attention and special treatment needed

- Notes to physician** : In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
- Specific treatments** : No specific treatment.

## SECTION 5: Firefighting measures

### 5.1 Extinguishing media

- Suitable extinguishing media** : Use an extinguishing agent suitable for the surrounding fire.
- Unsuitable extinguishing media** : None known.





## SECTION 5: Firefighting measures

### 5.2 Special hazards arising from the substance or mixture

- Hazards from the substance or mixture** : Extremely flammable aerosol. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. Gas may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back, causing fire or explosion. Bursting aerosol containers may be propelled from a fire at high speed. Runoff to sewer may create fire or explosion hazard.
- Hazardous combustion products** : Decomposition products may include the following materials:  
carbon dioxide  
carbon monoxide  
nitrogen oxides  
metal oxide/oxides

### 5.3 Advice for firefighters

- Special precautions for fire-fighters** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.
- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.

## SECTION 6: Accidental release measures

### 6.1 Personal precautions, protective equipment and emergency procedures

- For non-emergency personnel** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. In the case of aerosols being ruptured, care should be taken due to the rapid escape of the pressurised contents and propellant. If a large number of containers are ruptured, treat as a bulk material spillage according to the instructions in the clean-up section. Do not touch or walk through spilt material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
- For emergency responders** : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

### 6.2 Environmental precautions

- : Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

### 6.3 Methods and material for containment and cleaning up

- Small spill** : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
- Large spill** : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations. Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilt product.





## SECTION 6: Accidental release measures

- 6.4 Reference to other sections** : See Section 1 for emergency contact information.  
See Section 8 for information on appropriate personal protective equipment.  
See Section 13 for additional waste treatment information.

## SECTION 7: Handling and storage

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

### 7.1 Precautions for safe handling

- Protective measures** : Put on appropriate personal protective equipment (see Section 8). Pressurised container: protect from sunlight and do not expose to temperature exceeding 50°C. Do not pierce or burn, even after use. Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapour or mist. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Empty containers retain product residue and can be hazardous. Do not reuse container.
- Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

- 7.2 Conditions for safe storage, including any incompatibilities** : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Eliminate all ignition sources. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination.

### 7.3 Specific end use(s)

- Recommendations** : Not available.
- Industrial sector specific solutions** : Not available.

## SECTION 8: Exposure controls/personal protection

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

### 8.1 Control parameters

#### Occupational exposure limits

Product/ingredient name	Exposure limit values
<p><b>Europe</b> No exposure limit value known.</p> <p><b>Austria</b> propane</p> <p>butane</p>	<p><b>GKV_MAK (Austria, 12/2011).</b> TWA: 1000 ppm 8 hours. TWA: 1800 mg/m<sup>3</sup> 8 hours. CEIL: 2000 ppm, 3 times per shift, 60 minutes. CEIL: 3600 mg/m<sup>3</sup>, 3 times per shift, 60 minutes.</p> <p><b>GKV_MAK (Austria, 12/2011).</b> TWA: 800 ppm 8 hours. CEIL: 3800 mg/m<sup>3</sup>, 3 times per shift, 60 minutes.</p>



**SECTION 8: Exposure controls/personal protection**

	<p>CEIL: 1600 ppm, 3 times per shift, 60 minutes. TWA: 1900 mg/m<sup>3</sup> 8 hours.</p>
<b>Belgium</b>	
propane	<b>Lijst Grenswaarden / Valeurs Limites (Belgium, 4/2014).</b> TWA: 1000 ppm 8 hours. Form: gas
butane	<b>Lijst Grenswaarden / Valeurs Limites (Belgium, 4/2014).</b> TWA: 1000 ppm 8 hours. Form: gas
<b>Bulgaria</b>	
propane	<b>България Министерство на труда и социалната политика и Министерство на здравеопазването (Bulgaria, 1/2012).</b> Limit value 8 hours: 1800 mg/m <sup>3</sup> 8 hours.
butane	<b>България Министерство на труда и социалната политика и Министерство на здравеопазването (Bulgaria, 1/2012).</b> Limit value 8 hours: 1900 mg/m <sup>3</sup> 8 hours.
<b>Croatia</b>	
propane-1,2-diol	<b>MinGoRP GVI/KGVI (Croatia, 6/2013).</b> ELV: 10 mg/m <sup>3</sup> 8 hours. Form: particulates ELV: 474 mg/m <sup>3</sup> 8 hours. Form: total vapour and particulates ELV: 150 ppm 8 hours.
butane	<b>MinGoRP GVI/KGVI (Croatia, 6/2013).</b> STELV: 1810 mg/m <sup>3</sup> 15 minutes. STELV: 750 ppm 15 minutes. ELV: 1450 mg/m <sup>3</sup> 8 hours. ELV: 600 ppm 8 hours.
<b>Czech Republic</b>	
No exposure limit value known.	
<b>Denmark</b>	
propane	<b>Arbejdstilsynet (Denmark, 10/2012).</b> TWA: 1000 ppm 8 hours. TWA: 1800 mg/m <sup>3</sup> 8 hours.
butane	<b>Arbejdstilsynet (Denmark, 10/2012).</b> TWA: 500 ppm 8 hours. TWA: 1200 mg/m <sup>3</sup> 8 hours.
<b>Estonia</b>	
propane	<b>Töökeskkonna keemiliste ohutegurite piirnormid määrus nr 293 (Estonia, 1/2008).</b> TWA: 1800 mg/m <sup>3</sup> 8 hours. TWA: 1000 ppm 8 hours.
butane	<b>Töökeskkonna keemiliste ohutegurite piirnormid määrus nr 293 (Estonia, 1/2008).</b> TWA: 1500 mg/m <sup>3</sup> 8 hours. TWA: 800 ppm 8 hours.
<b>Finland</b>	
propane	<b>Työterveyslaitos, Sosiaali- ja terveysministeriö (Finland, 3/2014).</b> TWA: 800 ppm 8 hours. TWA: 1500 mg/m <sup>3</sup> 8 hours. STEL: 1100 ppm 15 minutes. STEL: 2000 mg/m <sup>3</sup> 15 minutes.
butane	<b>Työterveyslaitos, Sosiaali- ja terveysministeriö (Finland, 3/2014).</b> STEL: 1000 ppm 15 minutes. TWA: 800 ppm 8 hours.
<b>France</b>	

**SECTION 8: Exposure controls/personal protection**

butane

**Ministère du travail (France, 7/2012). Notes: Ministry of Labour (Brochure INRS Ed 984, July 2012). Indicative exposure limits**  
 TWA: 800 ppm 8 hours.  
 TWA: 1900 mg/m<sup>3</sup> 8 hours.

**Germany**

propane

**TRGS900 AGW (Germany, 4/2014).**  
 TWA: 1800 mg/m<sup>3</sup> 8 hours.  
 PEAK: 7200 mg/m<sup>3</sup> 15 minutes.  
 TWA: 1000 ppm 8 hours.  
 PEAK: 4000 ppm 15 minutes.  
**MAK-Werte Liste (Germany, 6/2014).**  
 TWA: 1000 ppm 8 hours.  
 PEAK: 4000 ppm, 4 times per shift, 15 minutes.  
 TWA: 1800 mg/m<sup>3</sup> 8 hours.  
 PEAK: 7200 mg/m<sup>3</sup>, 4 times per shift, 15 minutes.

butane

**TRGS900 AGW (Germany, 4/2014).**  
 TWA: 2400 mg/m<sup>3</sup> 8 hours.  
 PEAK: 9600 mg/m<sup>3</sup> 15 minutes.  
 TWA: 1000 ppm 8 hours.  
 PEAK: 4000 ppm 15 minutes.  
**MAK-Werte Liste (Germany, 6/2014).**  
 TWA: 1000 ppm 8 hours.  
 PEAK: 4000 ppm, 4 times per shift, 15 minutes.  
 TWA: 2400 mg/m<sup>3</sup> 8 hours.  
 PEAK: 9600 mg/m<sup>3</sup>, 4 times per shift, 15 minutes.

**Greece**

propane

**Υπουργείο Εργασίας και Κοινωνικών Υποθέσεων (Greece, 2/2012).**  
 TWA: 1000 ppm 8 hours.  
 TWA: 1800 mg/m<sup>3</sup> 8 hours.

butane

**Υπουργείο Εργασίας και Κοινωνικών Υποθέσεων (Greece, 2/2012).**  
 TWA: 1000 ppm 8 hours.  
 TWA: 2350 mg/m<sup>3</sup> 8 hours.

**Hungary**

butane

**25/2000. (IX. 30.) EüM-SzCsM együttes rendelet (Hungary, 12/2011).**  
 TWA: 2350 mg/m<sup>3</sup> 8 hours.  
 PEAK: 9400 mg/m<sup>3</sup> 15 minutes.

**Ireland**

propane-1,2-diol

**NAOSH (Ireland, 12/2011).**  
 OELV-8hr: 10 mg/m<sup>3</sup> 8 hours. Form: particulate  
 OELV-8hr: 470 mg/m<sup>3</sup> 8 hours. Form: vapour and particulates  
 OELV-8hr: 150 ppm 8 hours. Form: vapour and particulates

propane

**NAOSH (Ireland, 12/2011). Oxygen Depletion [Asphyxiant].**  
 OELV-8hr: 1000 ppm 8 hours.

butane

**NAOSH (Ireland, 12/2011).**  
 OELV-8hr: 1000 ppm 8 hours.

**Italy**

No exposure limit value known.

**Latvia**

**SECTION 8: Exposure controls/personal protection**

propane-1,2-diol	<b>Ministru kabineta - AER (Latvia, 2/2011).</b> TWA: 7 mg/m <sup>3</sup> 8 hours.
propane	<b>Ministru kabineta - AER (Latvia, 2/2011).</b> TWA: 100 mg/m <sup>3</sup> , (as C) 8 hours. STEL: 300 mg/m <sup>3</sup> , (as C) 15 minutes.
butane	<b>Ministru kabineta - AER (Latvia, 2/2011).</b> TWA: 300 mg/m <sup>3</sup> 8 hours.
<b>Lithuania</b>	
propane-1,2-diol	<b>Lietuvos Higienos Normos HN 23 (Lithuania, 10/2007).</b> TWA: 7 mg/m <sup>3</sup> 8 hours.
<b>Netherlands</b>	
No exposure limit value known.	
<b>Norway</b>	
propane-1,2-diol	<b>FOR-2011-12-06-1358 (Norway, 1/2013).</b> TWA: 79 mg/m <sup>3</sup> 8 hours. TWA: 25 ppm 8 hours.
propane	<b>FOR-2011-12-06-1358 (Norway, 1/2013).</b> TWA: 500 ppm 8 hours. TWA: 900 mg/m <sup>3</sup> 8 hours.
butane	<b>FOR-2011-12-06-1358 (Norway, 1/2013).</b> TWA: 250 ppm 8 hours. TWA: 600 mg/m <sup>3</sup> 8 hours.
<b>Poland</b>	
propane	<b>Rozporządzenie Ministra Pracy i Polityki Społecznej (Dz.U. 2014 poz. 817) (Poland, 6/2014).</b> TWA: 1800 mg/m <sup>3</sup> 8 hours.
butane	<b>Rozporządzenie Ministra Pracy i Polityki Społecznej (Dz.U. 2014 poz. 817) (Poland, 6/2014).</b> TWA: 1900 mg/m <sup>3</sup> 8 hours. STEL: 3000 mg/m <sup>3</sup> 15 minutes.
<b>Portugal</b>	
propane	<b>Instituto Português da Qualidade (Portugal, 3/2007).</b> TWA: 1000 ppm 8 hours.
butane	<b>Instituto Português da Qualidade (Portugal, 3/2007).</b> TWA: 1000 ppm 8 hours. Form: gas TWA: 1000 ppm 8 hours.
<b>Romania</b>	
propane	<b>HG 1218/2006 cu modificările și completările ulterioare (Romania, 1/2012).</b> VLA: 1400 mg/m <sup>3</sup> 8 hours. VLA: 778 ppm 8 hours. Short term: 1800 mg/m <sup>3</sup> 15 minutes. Short term: 1000 ppm 15 minutes.
<b>Slovakia</b>	
No exposure limit value known.	
<b>Slovenia</b>	
propane	<b>Pravilnik o varovanju delavcev pred tveganji zaradi izpostavljenosti kemičnim snovem pri delu (Slovenia, 12/2010).</b> TWA: 1800 mg/m <sup>3</sup> 8 hours. TWA: 1000 ppm 8 hours. KTV: 7200 mg/m <sup>3</sup> , 4 times per shift, 15 minutes. KTV: 4000 ppm, 4 times per shift, 15 minutes.
butane	<b>Pravilnik o varovanju delavcev pred tveganji zaradi izpostavljenosti kemičnim snovem pri delu (Slovenia, 12/2010).</b> TWA: 2400 mg/m <sup>3</sup> 8 hours. TWA: 1000 ppm 8 hours.

**SECTION 8: Exposure controls/personal protection**

<p><b>Spain</b> propane butane</p>	<p>KTV: 9600 mg/m<sup>3</sup>, 4 times per shift, 15 minutes. KTV: 4000 ppm, 4 times per shift, 15 minutes.</p>
<p><b>Sweden</b> No exposure limit value known.</p>	<p><b>INSHT (Spain, 1/2014).</b> TWA: 1000 ppm 8 hours. Form: gas</p>
<p><b>Switzerland</b> propane butane</p>	<p><b>INSHT (Spain, 1/2014).</b> TWA: 1000 ppm 8 hours. Form: gas</p>
<p><b>Turkey</b> propane butane</p>	<p><b>SUVA (Switzerland, 1/2014).</b> TWA: 1000 ppm 8 hours. TWA: 1800 mg/m<sup>3</sup> 8 hours. STEL: 4000 ppm 15 minutes. STEL: 7200 mg/m<sup>3</sup> 15 minutes.</p>
<p><b>United Kingdom (UK)</b> propane-1,2-diol butane</p>	<p><b>SUVA (Switzerland, 1/2014).</b> TWA: 800 ppm 8 hours. TWA: 1900 mg/m<sup>3</sup> 8 hours. STEL: 7200 mg/m<sup>3</sup> 15 minutes. STEL: 3200 ppm 15 minutes.</p>
<p><b>United Kingdom (UK)</b> propane-1,2-diol butane</p>	<p><b>NIOSH REL (United States, 10/2013).</b> TWA: 1000 ppm 10 hours. TWA: 1800 mg/m<sup>3</sup> 10 hours.</p>
<p><b>United Kingdom (UK)</b> propane-1,2-diol butane</p>	<p><b>NIOSH REL (United States, 10/2013).</b> TWA: 800 ppm 10 hours. TWA: 1900 mg/m<sup>3</sup> 10 hours.</p>
<p><b>United Kingdom (UK)</b> propane-1,2-diol butane</p>	<p><b>EH40/2005 WELs (United Kingdom (UK), 12/2011).</b> TWA: 10 mg/m<sup>3</sup> 8 hours. Form: Particulate TWA: 474 mg/m<sup>3</sup> 8 hours. Form: Sum of vapour and particulates TWA: 150 ppm 8 hours. Form: Sum of vapour and particulates</p>
<p><b>United Kingdom (UK)</b> propane-1,2-diol butane</p>	<p><b>EH40/2005 WELs (United Kingdom (UK), 12/2011).</b> STEL: 1810 mg/m<sup>3</sup> 15 minutes. STEL: 750 ppm 15 minutes. TWA: 1450 mg/m<sup>3</sup> 8 hours. TWA: 600 ppm 8 hours.</p>

**Recommended monitoring procedures** : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to monitoring standards, such as the following: European Standard EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy) European Standard EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents) European Standard EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents) Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

**Derived effect levels**

No DELs available.

**Predicted effect concentrations**

No PECs available.



## SECTION 8: Exposure controls/personal protection

### 8.2 Exposure controls

**Appropriate engineering controls** : The engineering controls also need to keep gas, vapour or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

#### Individual protection measures

**Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

**Eye/face protection** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields. Recommended: safety glasses with side-shields

#### Skin protection

**Hand protection** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated. < 1 hour (breakthrough time): disposable vinyl

**Body protection** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. When there is a risk of ignition from static electricity, wear anti-static protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves. Refer to European Standard EN 1149 for further information on material and design requirements and test methods. Recommended: None assigned.

**Other skin protection** : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

**Respiratory protection** : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. Recommended: None assigned.

**Environmental exposure controls** : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

## SECTION 9: Physical and chemical properties

### 9.1 Information on basic physical and chemical properties

#### Appearance

**Physical state** : Liquid.

**Colour** : Straw.

**Odour** : Characteristic.

**pH** : Not available.

**Melting point/freezing point** : Not available.

**Initial boiling point and boiling range** : Not available.

**Flash point** : Not available.





## SECTION 9: Physical and chemical properties

Upper/lower flammability or explosive limits	: Not available.
Relative density	: Not available.
Solubility(ies)	: Easily soluble in the following materials: cold water and hot water.
Partition coefficient: n-octanol/water	: Not available.
Auto-ignition temperature	: Not available.
	:
VOC content	83.4 % (w/w)

### 9.2 Other information

No additional information.

## SECTION 10: Stability and reactivity

10.1 Reactivity	: No specific test data related to reactivity available for this product or its ingredients.
10.2 Chemical stability	: The product is stable.
10.3 Possibility of hazardous reactions	: Under normal conditions of storage and use, hazardous reactions will not occur.
10.4 Conditions to avoid	: Avoid all possible sources of ignition (spark or flame).
10.5 Incompatible materials	: No specific data.
10.6 Hazardous decomposition products	: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

## SECTION 11: Toxicological information

### 11.1 Information on toxicological effects

#### Acute toxicity

Conclusion/Summary : Not available.

#### Acute toxicity estimates

Not available.

#### Irritation/Corrosion

Conclusion/Summary : Not available.

#### Sensitiser

Conclusion/Summary : Not available.

#### Mutagenicity

Conclusion/Summary : Not available.

#### Carcinogenicity

Conclusion/Summary : Not available.

#### Reproductive toxicity

Conclusion/Summary : Not available.

#### Teratogenicity

Conclusion/Summary : Not available.

#### Specific target organ toxicity (single exposure)





## SECTION 11: Toxicological information

Not available.

### Specific target organ toxicity (repeated exposure)

Not available.

### Aspiration hazard

Not available.

**Information on likely routes of exposure** : Not available.

### Potential acute health effects

**Inhalation** : No known significant effects or critical hazards.

**Ingestion** : No known significant effects or critical hazards.

**Skin contact** : No known significant effects or critical hazards.

**Eye contact** : No known significant effects or critical hazards.

### Symptoms related to the physical, chemical and toxicological characteristics

**Inhalation** : No specific data.

**Ingestion** : No specific data.

**Skin contact** : No specific data.

**Eye contact** : No specific data.

### Delayed and immediate effects as well as chronic effects from short and long-term exposure

#### Short term exposure

**Potential immediate effects** : Not available.

**Potential delayed effects** : Not available.

#### Long term exposure

**Potential immediate effects** : Not available.

**Potential delayed effects** : Not available.

### Potential chronic health effects

Not available.

**Conclusion/Summary** : Not available.

**General** : No known significant effects or critical hazards.

**Carcinogenicity** : No known significant effects or critical hazards.

**Mutagenicity** : No known significant effects or critical hazards.

**Teratogenicity** : No known significant effects or critical hazards.

**Developmental effects** : No known significant effects or critical hazards.

**Fertility effects** : No known significant effects or critical hazards.

**Other information** : Not available.

## SECTION 12: Ecological information

### 12.1 Toxicity

**Conclusion/Summary** : Not available.

### 12.2 Persistence and degradability

**Conclusion/Summary** : Not available.

### 12.3 Bioaccumulative potential

Not available.



## SECTION 12: Ecological information

### 12.4 Mobility in soil

**Soil/water partition coefficient (K<sub>oc</sub>)** : Not available.

**Mobility** : Not available.

### 12.5 Results of PBT and vPvB assessment

**PBT** : Not applicable.

**vPvB** : Not applicable.

**12.6 Other adverse effects** : No known significant effects or critical hazards.

## SECTION 13: Disposal considerations

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

### 13.1 Waste treatment methods

#### Product

**Methods of disposal** : The generation of waste should be avoided or minimised wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction.

**Hazardous waste** : Within the present knowledge of the supplier, this product is not regarded as hazardous waste, as defined by EU Directive 91/689/EEC.

#### European waste catalogue (EWC)





Waste code	Waste designation
16 03 04	inorganic wastes other than those mentioned in 16 03 03

#### Packaging

**Methods of disposal** : The generation of waste should be avoided or minimised wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.

**Special precautions** : This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spill material and runoff and contact with soil, waterways, drains and sewers.

## SECTION 14: Transport information

	ADR/RID	IMDG	IATA
<b>14.1 UN number</b>	1950	1950	1950
<b>14.2 UN proper shipping name</b>	Aerosols, flammable (butane, propane)	Aerosols, flammable (butane, propane)	Aerosols, flammable (butane, propane)
<b>14.3 Transport hazard class(es)</b>	2 	2.1 	2.1 
<b>14.4 Packing group</b>	-	-	

## SECTION 14: Transport information

<b>14.5 Environmental hazards</b>	No.	No.	No.
<b>Additional information</b>	<b>Tunnel code</b> D	<b>Emergency schedules (EmS)</b> F-D, S-U	<b>Passenger and Cargo Aircraft</b> Quantity limitation: 30 kg <b>Cargo Aircraft Only</b> Quantity limitation: 150 kg

**14.6 Special precautions for user** : **Transport within user's premises**: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

**14.7 Transport in bulk according to Annex II of Marpol and the IBC Code** : Not available.

## SECTION 15: Regulatory information

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

#### EU Regulation (EC) No. 1907/2006 (REACH)

##### Annex XIV - List of substances subject to authorisation

##### Substances of very high concern

None of the components are listed.

**Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles** : Not applicable.

##### Other EU regulations

**Europe inventory** : All components are listed or exempted.

##### National regulations

[Austria](#)

[Belgium](#)

[Bulgaria](#)

[Croatia](#)

[Czech Republic](#)

[Denmark](#)

[Estonia](#)

[Finland](#)

[France](#)

[Germany](#)

**Hazard class for water** : 1 Appendix No. 4

[Greece](#)

[Hungary](#)

[Ireland](#)

[Italy](#)

[Latvia](#)

[Lithuania](#)

[Netherlands](#)



## SECTION 15: Regulatory information

[Norway](#)  
[Poland](#)  
[Portugal](#)  
[Romania](#)  
[Slovakia](#)  
[Slovenia](#)

Product/ingredient name	List name	Name on list	Classification	Notes
butane	Slovenia Carcinogen, Mutagen, Reprotoxic chemicals	butan z vsebnostjo >= 0,1% butadiena [203-450-8]	Carc.1, Muta. MUTA2	-

[Spain](#)

[Sweden](#)

[Switzerland](#)

[Turkey](#)

[United Kingdom \(UK\)](#)

Product/ingredient name	List name	Name on list	Classification	Notes
butane	UK Occupational Exposure Limits EH40 - WEL	butane	Carc.	-

**15.2 Chemical safety assessment** : This product contains substances for which Chemical Safety Assessments are still required.

## SECTION 16: Other information

**Date of printing** : 07.12.2016

**Date of issue/ Date of revision** : 30.11.2016

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**Version** : 2.13

### [Notice to reader](#)

☑ Indicates information that has changed from previously issued version.

**Abbreviations and acronyms** : ATE = Acute Toxicity Estimate  
 CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008]  
 DNEL = Derived No Effect Level  
 EUH statement = CLP-specific Hazard statement  
 PNEC = Predicted No Effect Concentration  
 RRN = REACH Registration Number

### [Procedure used to derive the classification according to Regulation \(EC\) No. 1272/2008 \[CLP/GHS\]](#)

Classification	Justification
Aerosol 1, H222, H229	Expert judgment

### [Europe](#)

**Full text of abbreviated H statements** : H222, H229 Extremely flammable aerosol. Pressurized container: may burst if heated.

**Full text of classifications [CLP/GHS]** : Aerosol 1, H222, H229 AEROSOLS - Category 1

**Full text of abbreviated R phrases** : R12- Extremely flammable.

**Full text of classifications [DSD/DPD]** : F+ - Extremely flammable

**Date of issue/Date of revision** : 30.11.2016



To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

Fernox SDS CLP Europe

