

# Safety data sheet

according to Regulation (EC) No. 1907/2006 and (EU) 2020/878

**Trade name:** Thermex FF  
**Revised on:** 26/06/2023  
**Print date:** 26/06/2023

**Version:** DE 3.0  
**Replaces version DE**  
**2.1**



**SCHÄFER**

## 1. Designation of the product and company name

### 1.1 Name of the product:

#### Designation on the label / trade name:

Thermex FF

#### Other designations:

Fluorine-free exothermic riser systems  
Silicate bonded moulding

#### Note:

The product is not subject to registration according to REACH Regulation, Article 2(7).

### 1.2 Use of the product:

#### 1.2.1 Identified uses:

The product is intended for the professional user.  
Auxiliaries for the foundry industry, use in the form of finished products

#### 1.2.2 Uses advised against:

Uses outside of the identified uses.  
No applications in the private sector.

### 1.3 Identification of the company:

#### Supplier (manufacturer / dealer):

For Germany / EU domestic:

GTP Schäfer GmbH  
Benzstrasse 15  
41515 Grevenbroich  
Germany

#### Email (competent person):

[info@gtp-schaefer.de](mailto:info@gtp-schaefer.de)

#### Contact point for information:

GTP Schäfer GmbH  
Benzstrasse 15  
41515 Grevenbroich  
Germany

Phone: +49 2181 233 94-0

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Email: [info@gtp-schaefer.de](mailto:info@gtp-schaefer.de)

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## 1.4 Emergency number:

GTP Schäfer GmbH  
Benzstrasse 15  
41515 Grevenbroich

Phone: +49 2181 233 94-0 (This number is only available during office hours.)

Mobile: +49 172 2026764

## 2. Possible hazards

### 2.1 Classification:

This product (material) contains hazardous ingredients or mixtures (see chapter 3.2) which, however, are not intended to be released under normal or reasonably foreseeable conditions of use.

The product (material) is not classified as hazardous within the meaning of Ordinance (EG) 1272/2008 and is not included under the labelling area of this ordinance; there are also not sufficient data available for classification.

### 2.2 Additional hazard warnings for humans and the environment:

The product (material) releases hazardous substances when thermally decomposed as intended.

Can form ammonia, nitrous gases (nitrogen oxides), hydrogen, carbon monoxide/dioxide, magnesium oxide, soot during the casting process, possibly also after ignition, alone or in contact with water, acids or alkalis, depending on the respective reaction conditions.

Avoid release to the environment in excess of immission control limits for the intended use.

May cause harmful effects if swallowed, inhaled or if in contact with skin.

The products are difficult to extinguish after ignition (high fire temperature).

## 3. Composition / information on the ingredients:

### 3.1 Product information:

#### Description:

Moulding (product) bonded with silicate (potassium and sodium salts of silicic acid) made of aluminium grit, potassium nitrate, iron oxide, magnesium, silicon dioxide (quartz sand), (light) chamotte and other fillers.

### 3.2 Hazardous ingredients:

Chemical name	CAS No.:	EC no.:	INDEX No.:	REACH Reg. no.:	Content (%)	Classification according to Ordinance (EG) 1272/2008			Identification	Safety instructions	Remark
						Signal values	Category	Hazard warnings H-statements			
Magnesium powder	7439-95-4	231-104-6	012-002-00-9	01-21195372 03-49	≤ 8	Hazard	Flam. Solid 1; Self Heat. 1; Water React. Flam. Gas 2	H228 H252 H261	GHS02	210, 231+232, 240	Exists in bound form
Aluminium foil grit	7429-90-5	231-072-3	013-002-00-1	01-21195294 3-45	≤ 30	Hazard	Flam. Solid 1; Water React. Flam. Gas 2	H228 H261	GHS02	210, 233, 280 402+404	Exists in bound form
Potassium nitrate	7757-79-1	231-818-8	n/a	01-21194882 24-35	≤ 14	Caution:	Oxide. Solid 3	H272	GHS03	210,220,221 280, 370+378	Exists in bound form

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Silicate:				01- 21194487 25-31			Met. Corr. 1; Skin Corr. 1B; STOT Single Exp. 3	H290 H314 H335	GHS05 GHS07	261,262,280, 301+330+331	Exists in bound form
Sodium silicate	08/09/ 1344	215- 687-4	n/a		≤ 20	Hazard					
Potassium silicate	1312- 76-1	215- 199-1		01- 21194568 88-17		Hazard	Met. Corr. 1; Skin Corr. 1B; STOT Single Exp. 3	H290 H314 H335	GHS05 GHS07	303+361+353 305+351+338	

n/a = no information

## No hazardous ingredients:

Chemical name	CAS No.:	EC no.:	INDEX No.:	REACH Reg. no.:	Content (%)	Classification according to Ordinance (EG) 1272/2008			Identification  Pictogram	Safety instructions  P-statements	Remark
						Signal values	Category	Hazard notices H-statements			
Iron oxide (Di-iron trioxide)	1309- 37-1	215- 168-2	n/a	01- 21194576 14-35	≤ 8	n/a	n/a	n/a	n/a	n/a	Exists in bound form
Chamotte (calcined kaolinite)	92704- 41-1	296- 473-8	n/a	01- 21195277 79-22	≤ 50	n/a	n/a	n/a	n/a	n/a	Exists in bound form
Light chamotte (andalusite)	n/a	n/a	n/a	n/a	≤ 50	n/a	n/a	n/a	n/a	n/a	Exists in bound form
Silicon dioxide (quartz sand)	14808- 60-7	238- 878-4	n/a	01- 21207705 09-45	≤ 40	n/a	n/a	n/a	n/a	260.270, 314	Exists in bound form

n/a = no information

**3.3 Remark:** Classifications not completely written out in this section are listed in chapter 16, as well as safety instructions for the ingredients used.

## 4. First aid measures:

### 4.1 General information:

Even if the product (substance) is not classified as dangerous, first aid and medical treatment may be required in case of accidents (e.g. intake) and even if poisoning is suspected.

### 4.2 In case of inhalation:

After inhalation of large quantities of dust or thermal decomposition products (e.g. nitrous gases, ammonia, carbon monoxide/dioxide), remove the affected person to fresh air and keep calm.

In case of irritation of the respiratory tract / breathing difficulties, consult a doctor immediately.

### 4.3 In case of contact with the skin:

In case of skin contact, wash thoroughly with plenty of soap and water.

In case of skin reactions, redness or pain, consult a doctor.

### 4.4 In case of contact with eyes:

In case of contact with eyes (dusts/thermal decomposition products), immediately rinse with running water for 10 to 15 minutes with the eyelids open and consult an ophthalmologist. For contact lens wearers, remove contact lenses immediately and rinse eyes.

If eye irritation occurs, consult an ophthalmologist.

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## 4.5 In case of swallowing:

If large quantities of dust are swallowed or inhaled, have them drink immediately.  
Do not induce vomiting.  
If swallowed, rinse the mouth with plenty of water (only if the person is conscious) and get medical help immediately.

## 4.6 Self-protection of the first aider:

When rescuing from a danger area: Pay attention to self-protection!

## 4.7 Information for the doctor:

### Symptoms:

After inhalation of dust:

No acute symptoms expected.

After inhalation of thermal decomposition products:

Ammonia: Cough, breathing difficulties, nausea, feeling sick, later inflammation of the respiratory tract.  
Nitrous Oxides: Depending on the concentration, rapid narcotic effect up to oxygen deprivation symptoms. The development of pneumonia (with or without preceding pulmonary oedema) can still occur after 10-30 days as a late consequence of acute poisoning. Damage to the blood count / neurological damage.

Di-iron(III) oxide: Inflammatory reactions; later siderosis

Magnesium oxide: Metal Smoke Fever

In case of contact with the skin:

Ammonia: Irritation to burns

In case of contact with eyes:

Ammonia: Tear irritation, burning / stabbing pain in the eye

Di-iron(III) oxide: mechanical irritation of the mucous membrane of the eye

After ingestion:

Di-iron(III) oxide: Damage to the gastrointestinal tract, liver and cardiovascular system

Potassium nitrate: Gastrointestinal disturbances, reduction in heart rate, drop in blood pressure, slackening of the blood vessel muscles

Magnesium dust: Digestive disorders, loss of appetite and weight

### Hazards:

See symptoms

### Treatment:

The following literature sources, as well as other information, can provide information on treatment by a doctor:

BGHM: Nitrous gases in welding and allied processes; 02-2017; DGUV-Information 209-047

BG-Information "Nitric Acid Nitrogen Oxides, Nitrous Gases" 03-1998, ZH 1/214

IFA-DGUV-Gestis substance database

Kühn / Birett

Treat symptomatically

## 5. Fire-fighting measures

### 5.1 Suitable extinguishing agents:

Sand, dry extinguishing agent

Cover with the aforementioned extinguishing agents and allow to react in a controlled manner, as far as this is possible without danger.

### 5.2 Unsuitable extinguishing agents for safety reasons:

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Water: when extinguishing with water, danger of formation of hydrogen or other flammable gases due to violent chemical reactions / high combustion temperature

Carbon dioxide extinguishing gases: Decomposition process continues auto-oxidatively.

## 5.3 Special hazards caused by substances or mixtures contained /the product itself, its combustion products or resulting gases:

Heating or thermal decomposition may result in the release of toxic / corrosive gases or vapours.  
See also chapter 2.2

## 5.4 Special protective equipment for fire fighting:

Use suitable respirator (filter types A, B, K, NO-P2 or combination filter ABEK-P2)  
If necessary, wear self-contained breathing apparatus.  
Wear suitable personal protective equipment when fighting fires.

## 5.5 Additional information:

Decomposition processes also continue under water.  
Strong exothermic decomposition.  
Secure the source of the fire and allow it to burn down in a controlled manner.  
Collect contaminated extinguishing water separately. Do not allow to enter drains, soil or bodies of water.  
Cool surrounding areas if possible.

## 6. Measures in case of unintentional release:

### 6.1 Safety measures related to persons:

Avoid contact with eyes, inhalation and ingestion of dusts; dust mask recommended.  
Avoid the formation of dust; vacuum up dust without raising dust.  
Keep ignition sources away.

### 6.2 Environmental protection measures:

Do not allow product or product residues to enter drains, water bodies or soil.  
Ensure waste is collected and stored securely in closed containers.

### 6.3 Procedure for cleaning:

Do not rinse away with water or aqueous cleaning agents, hydrogen evolution may occur.  
Collect mechanically (avoid the development of dust) and place in suitable containers for disposal.  
Do not soak up with sawdust or other flammable materials  
Treat the material taken up according to the section Disposal.

### 6.4 Additional information:

Attention is drawn to the observance of the protective measures in Chapters 7, 8 and 13.

## 7. Handling and storage:

### 7.1 Handling:

Only remove the packaging in layers immediately before use.  
Observe product information / technical data sheet

#### 7.1.1 Advice for safe handling:

Only intended use, e.g. in metallurgical processes, is permissible.  
Avoid dust formation.  
Keep away from water.  
Ensure sufficient ventilation, especially in closed rooms.  
The usual precautionary measures when handling chemicals / hazardous substances must be observed.  
Wash hands and face thoroughly before breaks and at the end of work.

#### Safety measures:

#### Technical measures:

Measures to prevent aerosol and dust formation:

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Handle products in a way that avoids abrasion and dust formation (e.g. no pouring handling).

Measures to protect the environment:

Effectively extract any thermal decomposition products that arise and, if necessary, feed them to an exhaust air purification system.

Treat product residues in accordance with legal regulations.

**Specific requirements or handling rules:**

Do not eat, drink, smoke or have a cold in the workplace.

Wash hands and/or face before breaks and after work.

Keep away from food, drink and animal feed.

Do not inhale dusts and thermal decomposition products.

Only use the product in quantities corresponding to operational requirements.

## 7.1.2 Information about fire and explosion protection:

Protect from impermissible heat exposure.

Keep away from sources of ignition - No smoking, no naked flame

Do not store in the immediate vicinity of the casting line or melting and furnace equipment.

Avoid dust deposits / remove dust deposits regularly.

Observe the usual preventive fire protection measures.

## 7.2 Storage:

### 7.2.1 Technical measures and storage conditions:

Keep away from sources of ignition - No smoking, no naked flame

Do not carry out high temperature work

Store in tightly closed containers in a cool and dry place.

### 7.2.2 Packing materials:

Store only in original packaging (cardboard trays).

### 7.2.3 Requirements for storage rooms and containers:

No special requirements; do not store outside; dry storage.

### 7.2.4 Notes on storage together:

Do not store together with:

food and feed

Explosive substances (Storage class 1)

Highly flammable substances (storage class 5.1A)

Contaminable substances (storage class 6.2)

Radioactive substances (Storage class 7)

Do not store together with strong acids and alkalis. Store separately from oxidising agents and reducing agents.

Observation of restrictions and requirements for combined storage according to TRGS 509 / TRGS 510 with:

Compressed, liquefied or gases dissolved under pressure (storage class 2A)

Aerosol dispensers (storage class 2B)

Flammable liquid or explosive substances (storage class 3A)

Explosive solids (Storage class 4.1A)

Substances liable to spontaneous combustion (storage class 4.2)

Substances which, in contact with water, emit flammable gases (storage class 4.3)

Flammable substances (storage class 5.1 B)

Flammable substances containing ammonium nitrate (storage class 5.1 C)

Organic peroxides (storage class 5.2)

Flammable highly acute toxic substances (cat. 1 and 2) (storage class 6.1A)

Non-flammable highly acute toxic substances (cat. 1 and 2) (storage class 6.1 B)

### 7.2.5 Further information on storage conditions:

Storage temperature (°C): + 5 to + 30 °C

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Rel. Humidity (%): Store dry / protect from moisture  
Storage stability: No information  
Maximum storage period: Max. recommended storage period is 1 year. Experience has shown that the product can also be used beyond the specified maximum storage period. A warranty for the guaranteed product properties cannot be assumed after the maximum storage period has expired.  
Storage class: 11 - flammable solids (acc. to TRGS 509 / TRGS 510) (recommended)

## 7.2.6 Specific use:

Recommendation: Observe product information / technical data sheet

## 8. Limitation and monitoring of exposure / personal protective equipment:

### 8.1 Exposure limits:

#### 8.1.1 Components with workplace limit values to be monitored or biological limit values:

##### 8.1.1.1 Occupational exposure limits:

Related to thermal decomposition products / dust emissions

Air limits:

Limit type (country of origin)	Working material	EC no.	CAS no.	Occupational exposure limit		Recommend ed monitoring procedures	Peak limit	Source
Germany	Dust (for dust with a density of 1 g/cm <sup>3</sup> )	n/a	n/a	4 mg/m <sup>3</sup> (inhalable aerosol fraction)	0.3 mg/m <sup>3</sup> (alveolar aerosol fraction)	n/a	No exceeding of the level of twice the general dust limit value	DFG
Germany	Magnesium oxide	215-171- 9	1309-48-4	4 mg/m <sup>3</sup> (inhalable aerosol fraction)	0.3 mg/m <sup>3</sup> (alveolar aerosol fraction)	n/a	15 min, max. 4 times / shift, interval 1 h	DFG
Germany	Aluminium	231-072- 3	7429-90-5	4 mg/m <sup>3</sup> (inhalable aerosol fraction)	1.5 mg/m <sup>3</sup> (alveolar aerosol fraction)	n/a	No exceeding of the level of twice the general dust limit value	DFG

Limit type (country of origin)	Working material	EC no.	CAS no.	Occupational exposure limit		Recommend ed monitoring procedures	Peak limit	Source
				Long-term	Short-term			
Germany	Nitrous oxide (nitrous gases)	233-032- 0	10024-97-2	180 mg/m <sup>3</sup>	360 mg/m <sup>3</sup>	n/a	15 min, max. 4 times / shift, interval 1 h	DFG
Germany	Ammonia	231-635- 3	7664-41-7	14 mg/m <sup>3</sup>	28 mg/m <sup>3</sup>	n/a	15 min, max. 4 times / shift, interval 1 h	DFG
Germany	Carbon monoxide	211-128- 3	630-08-0	35 mg/m <sup>3</sup>	70 mg/m <sup>3</sup>	n/a	15 min, max. 4 times / shift, interval 1 h	DFG

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Germany	Carbon dioxide	204-696-9	124-38-9	9,100 mg/m <sup>3</sup>	18,200 mg/m <sup>3</sup>	n/a	15 min, max. 4 times / shift, interval 1 h	DFG
No adequate product-related data available.								

n/a = no information

When burning products made of Thermex FF, the formation of nitrous gases and ammonia could be detected. Whether the occupational exposure limits are exceeded when using Thermex FF products depends strongly on the conditions. Verification of compliance with occupational exposure limits is recommended at least at first use.

## Biological limits:

Limit type (country of origin)	Working material	EC no.	CAS no.	Parameter	Limit value	Test material	Source	Remark
Germany	Aluminium	231-072-3	7429-90-5	Aluminium	50 µg/g creatinine	Urine	DFG	at the end of the shift (long-term exposure)
Germany	Carbon monoxide	211-128-3	630-08-0	CO-Hb	5%	Blood	DFG	at the end of the shift
No adequate product-related data available.								

n/a = no information

## 8.1.1.2 DNEL- and PNEC values:

DNEL employees				
Exposure route	Duration of action	Endpoint effect	Value	Remark
inhalative / systemic and local	Long-term	repeated exposure	3.72 mg/m <sup>3</sup>	Related to aluminium grit
inhalative / systemic	Long-term	repeated exposure	5.61 mg/m <sup>3</sup>	Related to potash and soda silicate
dermal / systemic	Long-term	repeated exposure	1.49-1.59 mg/kg bw/day	Related to potash and soda silicate
inhalative / systemic	Long-term	repeated exposure	10 mg/m <sup>3</sup>	Related to magnesium powder
inhalative systemic/local	Long-term		3 mg/m <sup>3</sup>	Related to chamotte
inhalative systemic/local	Short-term		3 mg/m <sup>3</sup>	Related to chamotte
No adequate product-related data available.				

DNEL user/consumer				
Exposure route	Duration of action	Endpoint effect	Value	Remark
inhalative / systemic	Long-term	repeated exposure	7.9 mg/kg bw/day	Related to aluminium grit
inhalative / systemic	Long-term	repeated exposure	1.38 mg/m <sup>3</sup>	Related to potash and soda silicate
oral systemic	Long-term	repeated exposure	0.74-0.8 mg/kg bw/day	Related to potash and soda silicate
dermal / systemic	Long-term	repeated exposure	0.74-0.8 mg/kg bw/day	Related to potash and soda silicate
inhalative / systemic	Long-term	repeated exposure	10 mg/m <sup>3</sup>	Related to magnesium powder



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oral systemic	Long-term	repeated exposure	10 mg/kg bw/day	Related to magnesium powder
No adequate product-related data available.				

PNEC			
Protection target	Estimation factor for extrapolation	Value	Remark
Sewage treatment plant	10	18 mg/L	Related to potassium nitrate
Freshwater		7.5 mg/L	Related to potash and soda silicate
Seawater		1 mg/L	Related to potash and soda silicate
Sewage treatment plant	1	348 mg/L	Related to potash and soda silicate
Freshwater	100	0.41 mg/L	Related to magnesium powder
Seawater	100	0.41 mg/L	Related to magnesium powder
Sewage treatment plant	10	10.8 mg/L	Related to magnesium powder
Freshwater sediment		268 mg/kg sediment dw	Related to magnesium powder
Seawater sediment		268 mg/kg sediment dw	Related to magnesium powder
Soil organisms		268 mg/kg soil dw	Related to magnesium powder
Freshwater	10	4.1 mg/L	Related to chamotte
Seawater	100	0.41 mg/l	Related to chamotte
Sewage treatment plant	1	1,400 mg/L	Related to chamotte
No adequate product-related data available.			

bw = body weight (body weight)  
dw = dry weight

## 8.2 Limitation and monitoring of exposure:

### 8.2.1 Limitation and monitoring of exposure at the workplace:

#### Product-related measures to prevent exposure:

Only intended , identified use permitted. Safety instructions for handling are given in Chapter 16.

#### Instructional measures to avoid exposure:

Only intended , identified use permitted. Safety instructions for handling the individual components are given in Chapter 16.

#### Organisational measures to avoid exposure:

Only intended , identified use permitted. It must be determined whether the occupational exposure limits are complied with.

#### Technical measures to avoid exposure:

See Chapter 7. No additional measures are required.

Technical measures and the use of suitable work processes have priority over the use of personal protective equipment.

#### Personal protective equipment:

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Respiratory protection: Normally no personal respiratory protection is required.

Respiratory protection is required for:

If technical extraction or ventilation measures are not possible or insufficient, respiratory protection must be worn (thermal decomposition products / dust).

Exceedance of the respective occupational exposure limit concentration of thermal decomposition products / dust.

For riser production:

Filter unit with filter or blower filter unit type: P2 or FFP2

Intended use:

Filter unit with filter or blower filter unit type:

Filter types A, B, K, NO-P2 / combination filter ABEK-P2 or fan assisted breathing apparatus (at least TH2P).

Self-contained breathing apparatus:

Use at concentrations above the application limit of filter devices, at oxygen contents below 17 vol% or in unclear conditions.

The wearing time limits according to GefStoffV in connection with the rules for the use of respirators (BGR 190) must be observed.

Hand protection:

Normally no hand protection necessary.

The use of water-insoluble skin protection products is recommended.

In case of frequent hand contact:

Gloves for protection against mechanical hazards according to DIN EN 388

The wearing time limits according to GefStoffV in connection with the rules for the use of protective gloves (BGR 195) must be observed.

Eye protection:

In case of dust accumulation: Dust goggles with side protection (according to EN 166).

Body protection:

Not required. Normal long-sleeved work clothes are sufficient.

Hygiene:

Hands, forearms and face should be washed after handling the product, especially before breaks or at the end of work activities.

## 8.2.2 Limitation and monitoring of environmental exposure:

### Product-related measures to prevent exposure:

No special measures required.

### Instructional measures to avoid exposure:

Only handle the product within the scope of its intended use.

### Organisational measures to avoid exposure:

Low-dust handling.

Only use the product (material) in the required quantities.

### Technical measures to avoid exposure:

Effective extraction of thermal decomposition products at the point of origin.

## 9. Physical and chemical properties:

### 9.1 General information

Appearance: Product defined form

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State of aggregation: firm Colour: Red-brown / grey Odour: odourless

## 9.2 Important health, safety and environmental information:

Exothermic decomposition of the product after ignition without melting with possible release of e.g. CO, CO<sub>2</sub>, NO, soot.  
Health hazardous dust

## 9.3 Safety-relevant basic data:

	Value	Method	Remark
pH value (20°C):	approx. 9 - 10	DIN 19260	Measurement in aqueous suspension
Melting point / range (°C):	Not applicable		Not applicable, as decomposition occurs
Boiling point / range (°C):	Not applicable		
Flash point (°C):	Not applicable		
Ignition temperature (°C):	250a) or 900b)	DIN 51794	Product is not self-igniting
Vapour pressure:	Not applicable		Not applicable, as composed of non-volatile inorganic and high molecular weight organic solids
Density (g/cm <sup>3</sup> ):	1,200 - 1,400	DIN 51757	
Bulk density (kg/m <sup>3</sup> ):	Not determined		
Water solubility (20°C in g/l):	practically insoluble		Solubility of inorganic components to be expected
Partition coefficient n-octanol / water (log Pow):	Not determined		
Viscosity, dynamic (mPa*s):	Not applicable		Not applicable, as solid
Dust explosion ability:	Product is not dust explosive		
Explosive limits	Not applicable		
Lower:			
Upper:			

a)at 1-hour temperature exposure b)at approx. 10-second temperature exposure

## 10. Stability and reactivity:

### 10.1 Conditions to avoid:

When heated / exposed to heat:  
Risk of ignition

The product as delivered is not dust explosive; however, any fine dusts that may be produced have an increased flammability.

### 10.2 Substances to avoid:

Acids and oxidising agents  
See also chapter 7.2.4.

### 10.3 Hazardous decomposition products:

Ammonia  
nitrous gases (nitrogen oxides)  
Carbon monoxide / dioxide  
Magnesium oxide  
Hydrogen  
Carbon black  
Exposure limit values for individual substances are listed in chapter 8.

## 11. Toxicological information

### 11.1 Toxicokinetics, metabolism and distribution:

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## Human toxicological data:

	Effective dose	Species	Method	Remark
No sufficient, product-related, classification-relevant data available.				

## 11.2 Acute effects (toxicological effects):

	Effective dose	Species	Method	Remark
Acute oral toxicity	LD <sub>50/14d</sub> : >15,900 mg/kg	Rat	OECD 401	Related to aluminium grit
Acute oral toxicity	LD <sub>50/14d</sub> : >2,000 mg/kg	Rat	OECD 425	Related to potassium nitrate
Acute oral toxicity	LD <sub>50</sub> : >5,000 mg/kg	Rat	EPA OPPTS 870.1100	Related to potassium silicate
Acute oral toxicity	LD <sub>50</sub> : 3,400 mg/kg	Rat	OECD 401	Related to sodium silicate
EU B.1	Related to di-iron trioxide	Acute oral toxicity	LD <sub>50/14d</sub> : >5,000 mg/kg	Rat
Acute dermal toxicity	LD <sub>50/24h</sub> : > 5,000 mg/kg	Rat	OECD 402	Related to potassium nitrate
Acute dermal toxicity	LD <sub>50/24h</sub> : > 5,000 mg/kg	Rat	EPA OPPTS 870.1200	Related to potassium silicate
Acute inhalation toxicity:	LC <sub>50/4h</sub> : > 0.527 mg/m <sup>3</sup>	Rat	OECD 403	Related to potassium nitrate
Acute inhalation toxicity:	LC <sub>50/4h</sub> : > 888 mg/m <sup>3</sup>	Rat	OECD 403	Related to aluminium grit
OECD 403	In relation to Di-iron trioxide	Acute inhalation toxicity	LC <sub>50/4h</sub> : 5.05 g/m <sup>3</sup>	Rat
Acute inhalation toxicity:	LC <sub>50/4h</sub> : > 2,060 mg/m <sup>3</sup>	Rat	EPA OPPTS 870.1300	Related to potassium silicate
Acute inhalation toxicity	LC <sub>50/4h</sub> : > 2.07 g/m <sup>3</sup>	Rat	EPA OPP 81-3	Related to chamotte
No sufficient, product-related, classification-relevant data available.				

n/a = no information

## Specific target organ toxicity (STOT) at single exposure:

No sufficient, product-related, classification-relevant data available.

## Irritation and corrosion:

	Exposure duration	Species	Valuation	Method	Remark
Primary irritant effect on the skin	24 / 48 / 72 h and 5 d	Rabbit	Slightly - moderately irritant	OECD 404	Related to potassium silicate
Primary irritant effect on the skin	24 / 48 / 72 h	Rabbit	Corrosive	OECD 404	Related to sodium silicate
Primary irritant effect on the skin	24 / 48 / 72 h	Rabbit	No irritation	OECD 404	Related to di-iron trioxide
Irritation of the eyes	7 d	Rabbit	Slightly irritant	OECD 405	Related to potassium silicate
Irritation of the eyes	4 h	Rabbit	Irritant - strong irritant	FHS 16	Related to sodium silicate
Irritation of the eyes	72 h	Rabbit	No irreversible damage	OECD 405	Related to potassium nitrate
Irritation of the eyes	14 d	Rabbit	No irreversible damage	OECD 405	Related to di-iron trioxide
No sufficient, product-related, classification-relevant data available.					

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n/a = no information

## Oral toxicity:

No sufficient, product-related, classification-relevant data available.

## Dermal toxicity:

Contact with dust causes irritation of the skin and mucous membranes.

## Inhalation toxicity:

Inhalation of dusts can lead to irritation of the respiratory tract (nose and throat) and breathing difficulties.

## Irritation of the eyes:

No sufficient product-related data available; contact with dust can cause mechanical irritation and injury.

## Sensitisation:

In case of contact with the skin: No sufficient, product-related, classification-relevant data available.

In case of inhalation: No sufficient, product-related, classification-relevant data available.

## Aspiration hazard:

In case of inhalation: No sufficient, product-related, classification-relevant data available.

## Toxicity after repeated exposure (subacute, sub-chronic, chronic):

No sufficient, product-related, classification-relevant data available.

Sodium silicate showed increased urination and soft stools in rats in a 28-d test according to OECD 407.

## Specific target organ toxicity (STOT) in case of repeated exposure:

No sufficient, product-related, classification-relevant data available.

### Potassium nitrate:

A 28-d test according to OECD 422 with rats resulted in a NOAEL of 1,500 mg/kg bw/d.

## CMR effects (carcinogenic, mutagenic and toxic for reproduction):

### Silicon dioxide (alveolar fraction):

Carcinogenicity: Carcinogen, category 1; carcinogenic and contributing to cancer risk

### Potassium nitrate:

Carcinogenicity: No data available

In-vitro mutagenicity: Negative (mouse lymphoma test according to OECD 476 activated / non-activated)

In-vivo mutagenicity: No clear dose-response effects (rat)

Germ cell mutagenicity: No chromosomal aberration observed.

Reproductive toxicity: A 53-d test according to OECD 422 with rats resulted in a NOAEL of 1,500 mg/kg bw/d (no dose-response effects).

### Silicate:

Carcinogenicity: No data available

In-vitro mutagenicity: Negative (Ames test activated / non-activated; Salmonella typhimurium) (potassium silicate)

Negative (bacteria test activated / non-activated) (sodium silicate)

In-vivo mutagenicity: No cell changes (mouse) (potassium silicate)

No cell changes (mouse) (sodium silicate)

Germ cell mutagenicity: No data available

Reproductive toxicity: No effects (rat) (potassium silicate)

No specific effects (rat) (sodium silicate)

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## Di-iron(III) oxide:

Carcinogenicity: Carcinogenic, category 3; substance data provide evidence of a carcinogenic effect

No sufficient, product-related, classification-relevant data available.

### 11.3 Experiences from practice

Classification relevant observations:

No data available regarding product handling.

Other observations:

No data available regarding product handling.

### 11.4 Information on other hazards / endocrinology:

Observations, information, data on health effects that may be caused by endocrine-disrupting properties are not available with regard to the use of the product.

## 12. Environment-related information:

### 12.1 Ecotoxicity:

Aquatic toxicity	Effective dose	Exposure duration	Species	Method	Valuation	Remark
Acute fish toxicity	LC <sub>50</sub> : 1378 mg/l	96 h	Fish	OECD 203		Related to potassium nitrate
Acute fish toxicity	LC <sub>0</sub> : >146mg/l	48 h	Fish	DIN 38412 Part 15		Related to potassium silicate
Acute fish toxicity	LC <sub>50</sub> : 3185 mg/l	96 h	Fish	OECD 203		Related to sodium silicate
Acute fish toxicity	LC <sub>0</sub> : 10 g/ml	96 h	Fish	OECD 203	no toxic effects	Related to di-iron trioxide
Acute daphnia toxicity	EC <sub>50</sub> : > 490 mg/l	48 h	Daphnie	OECD 202		Related to potassium nitrate
Acute daphnia toxicity	EC <sub>0</sub> : > 146 mg/l	24 h	Daphnie	OECD 202		Related to potassium silicate
Acute daphnia toxicity	EC <sub>50</sub> : 1,700 mg/l	48 h	Daphnie	OECD 202		Related to sodium silicate
Acute daphnia toxicity	EC <sub>50</sub> : ≥ 100 mg/l	48 h	Daphnie	OECD 202	no toxic effects	Related to di-iron trioxide
Acute algal toxicity	EbC <sub>50</sub> : 207 mg/l	72 h	Algae (biomass)	DIN 38412 Part 9		Related to sodium silicate
Acute algal toxicity	ErC <sub>0</sub> : > 345 mg/l	72 h	Alga (growth)	DIN 38412 Part 9		Related to sodium silicate
Acute algal toxicity	NOEC: > 20 mg/l	72 h	Alga	OECD 201	no toxic effects	Related to di-iron trioxide
Algal toxicity	ErC <sub>50</sub> : > 1,700 mg/l	10 d	Saltwater diatoms (growth)	n/a		Related to potassium nitrate
No sufficient, product-related, classification-relevant data available.						

n/a = no information

### 12.2 Mobility:

#### Known or expected distribution to environmental compartments:

No surface tension or adsorption/desorption data available.

### 12.3 Bio-accumulative potential:

Due to the inert character of the product (material) (composed of inorganic substances), no data are available on the bio-accumulation potential, nor on the individual substances.

### 12.4 Persistence and degradability:

No sufficient, product-related data available (inorganic product, not affected by degradation)

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**Di-iron trioxide: Biodegradation test according to ISO 8192: EC<sub>50</sub> / 3 h: > 10 g/l (no significant impairment)**

## 12.5 Result of the determination of the PBT properties:

The PBT properties of the substances used were not determined.

## 12.6 Endocrine disrupting effects on the environment:

No adverse effects known.

## 12.7 Other harmful effects:

No other adverse effects known.

## 13. Notes on disposal

### 13.1 Disposal / waste (product):

#### Unused product:

Contact manufacturer regarding recycling. Check the possibility of recycling.

Otherwise disposal according to the Closed Substance Cycle Waste Management Act (KrWG): hazardous waste according to § 3 Waste Catalogue Ordinance (AVV).

#### Consumed product:

Only dispose of completely reacted and cooled product.

Disposal in accordance with the Closed Substance Cycle Waste Management Act (KrWG).

### 13.2 EAK / AVV waste code:

Suggested list for waste codes/waste designations according to AVV:

#### Unused product:

10 10 05\* casting moulds and sands containing dangerous substances before casting

10 10 06 casting moulds and sand before casting other than those mentioned in 10 10 05\*

#### Consumed product:

10 10 07\* casting moulds and sands containing dangerous substances after casting

10 10 08 foundry moulds and sand after casting other than those mentioned in 10 10 07\*

### 13.3 Packaging:

Non-contaminated and empty packaging can be recycled.

## 14. Transport information

### 14.1 Transport hazard classes:

#### Land transport (ADR (RID)):

Official designation: Not classified for this mode of transport.

Class:

Classification code:

Hazard label:

UN number:

Packing group:

#### Water transport (ADN(R) /IMDG-code):

Official designation: Not classified for this mode of transport.

Class:

Classification code:

Hazard label:

UN number:

Packing group:

EmS:

Marine Pollutant:

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IMDG Code: Product is not transported in bulk.

## Air transport (ICAO-TI / IATA-DGR):

Official designation:	Not classified for this mode of transport.	Hazard label:
Class:		UN number:
Classification code:		Packing group:

## 14.2 Special precautions for the user:

No special precautions required for transport or movement within or outside the premises.

## 15. Legislation

### 15.1 EU Regulations

#### Chemical safety assessment:

For individual substances in this product, risk assessments were carried out and registration dossiers prepared:

- Risk assessments for the potassium and sodium salts contained in the sodium silicate mixture by the OECD;
- Registration dossiers on aluminium, potassium nitrate, magnesium, di-iron trioxide, silicon dioxide and on the potassium and sodium salts contained in the sodium silicate mixture by the European Chemicals Agency (ECHA).

#### Labelling:

##### Hazard symbols and hazard designation:

Hazard-determining components for labelling:	n/a, as not subject to compulsory labelling
H-statements:	n/a, as not subject to compulsory labelling
P-statements:	n/a, as not subject to compulsory labelling
Special labelling of certain products:	n/a, as not subject to compulsory labelling

##### Approval and / or restrictions on use:

###### Approvals:

No information.

###### Usage restrictions:

No information.

### 15.2 National regulations (Germany)

Notes on employment restrictions:

The respective national regulations for the protection of young people at work and the protection of expectant mothers must be observed.

Major Accident Ordinance (12th Federal Immission Control Ordinance (BImSchV)):

As a product, it is not subject to the 12. BImSchV

Water hazard class:

1 hazardous to water (self-classification according to VwVwS not applicable, as it is a product)

Technical Instructions Air (TA-Luft):

The respective emission limit values must be observed:  
Ammonia: 30 mg/m<sup>3</sup>  
Nitrogen oxides: 350 mg/m<sup>3</sup> (as nitrogen dioxide)  
Total dust, including fine dust: 20 mg/m<sup>3</sup>  
Carbon monoxide: 150 mg/m<sup>3</sup>

Other regulations, restrictions and prohibition ordinances:

TRGS 900 limit values in the air at the workplace; DFG

## 16. Other information

### 16.1 Wording of the H and P statements:

Full text of the H- and P-phrases of the individual components of the product (material) mentioned in chapter 3 as well as abbreviations of the labels of the individual substances mentioned in chapter 2:



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## Hazard warnings:

H228	Flammable solid
H252	Able to self-heat in large quantities; can catch fire
H261	Contact with water produces flammable gases
H272	May intensify fire; oxidiser
H290	May be corrosive to metals
H314	Causes severe skin burns and eye damage
H335	May irritate the respiratory tract

## Safety instructions:

### **Prevention:**

P210	Keep away from heat, sparks, open flames, hot surfaces. Do not smoke.
P220	Keep away from clothing, combustible materials, store away from
P221	Avoid mixing with flammable substances under all circumstances
P231+232	Handle and store contents under inert gas. Protect from moisture
P233	Keep container tightly closed
P240	Grounding the container and the system to be filled
P260	Do not inhale dust, smoke, gas, mist, vapour, aerosol
P261	Avoid inhalation of dust, smoke, gas, mist, vapour, aerosol
P262	Do not get in eyes, on skin or on clothing
P270	Do not eat, drink or smoke after use
P271	Use only outdoors or in well-ventilated areas
P280	Wear protective gloves, clothing, eye protection, face protection

### **Reaction:**

P301+330+331	If swallowed: Rinse out mouth. Do not induce vomiting
P303+361+353	In case of contact with skin (or hair): Remove all soiled, soaked clothing immediately. Wash skin with water, shower.
P305+351+338	In case of contact with the eyes: Rinse gently with water for a few minutes. Remove any contact lenses if possible. Continue rinsing.
P314	If you feel unwell, seek medical advice
P370+P378	In case of fire: Use to extinguish: Special powder for metal fires

### **Storage:**

P402+404	Store in a tightly closed container in a dry place.
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## **16.2 Training notes:**

The employees are to be regularly instructed in accordance with the legal requirements about the scope and the associated hazard.

## **16.3 Recommended restriction of use:**

No private application.

## **16.4 Further information:**

The information in this safety data sheet corresponds to the best of our knowledge at the time of printing. The information is intended to provide points of reference for the safe handling of the product named in this safety data sheet for storage, processing, transport and disposal. The information cannot be transferred to other products. Insofar as the product specified in this safety data sheet is blended, mixed or processed with other materials, or is subjected to processing, the information in this safety data sheet cannot be transferred to the new material produced in this way, unless expressly stated otherwise.

## **16.5 Data sources:**

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- 1.) Current material safety data sheets
- 2.) IFA-DGUV-Gestis substance database "Iron oxide"; search status: 26/06/2023
- 3.) IFA-DGUV-Gestis substance database "Potassium nitrate"; search status: 11/06/2023
- 4.) IFA-DGUV-Gestis substance database "Magnesium oxide"; research dated: 26/06/2023
- 5.) RIGOLETTO database "Catalogue of substances hazardous to water" Federal Environment Agency (UBA);  
revision: 11/04/2023
- 6.) TA Air 2021
- 7.) TRGS 900 Technical Rules for Hazardous Substances - Occupational Exposure Limits; revision: 23/06/2022
- 8.) DFG (German Research Foundation) - MAK- und BAT-Werte-Liste, Mitteilungen 58, Wiley-VCH, 2022
- 9.) ECHA/EU - REACH Registration Dossier Potassium Nitrate, dated 15.09.2022
- 10.) ECHA/EU - REACH Registration Dossier Potash Water Glass, dated 22.06.2023
- 11.) ECHA/EU - REACH registration dossier sodium silicate, dated 31.03.2023
- 12.) ECHA/EU - REACH Registration Dossier Aluminium Grit, dated 7/5/2023
- 13.) **ECHA/EU - REACH Registration Dossier Di-iron(III) oxide, as of 09.05.2023**
- 14.) ECHA/EU - REACH registration dossier magnesium, dated 12.05.2023
- 15.) ECHA/EU - REACH Registration Dossier Calcined Kaolinite (Chamotte), dated 30.12.2021
- 16.) ECHA/EU - REACH Registration Dossier Silicon Dioxide, dated 27/5/2018
- 17.) OECD/ICCA - SIDS Initial Assessment Report "Soluble Silicates", 2006
- 18.) TRGS 509 Technical rules for hazardous substances - Storage of liquid and solid hazardous substances in  
stationary containers; dated: 20/07/2022
- 19.) TRGS 510 Technical Rules for Hazardous Substances - Storage of hazardous substances in portable containers;  
revision: 16/02/2021
- 20.) DGUV I209-095 Dust containing quartz in the foundry industry; dated: 03-2023