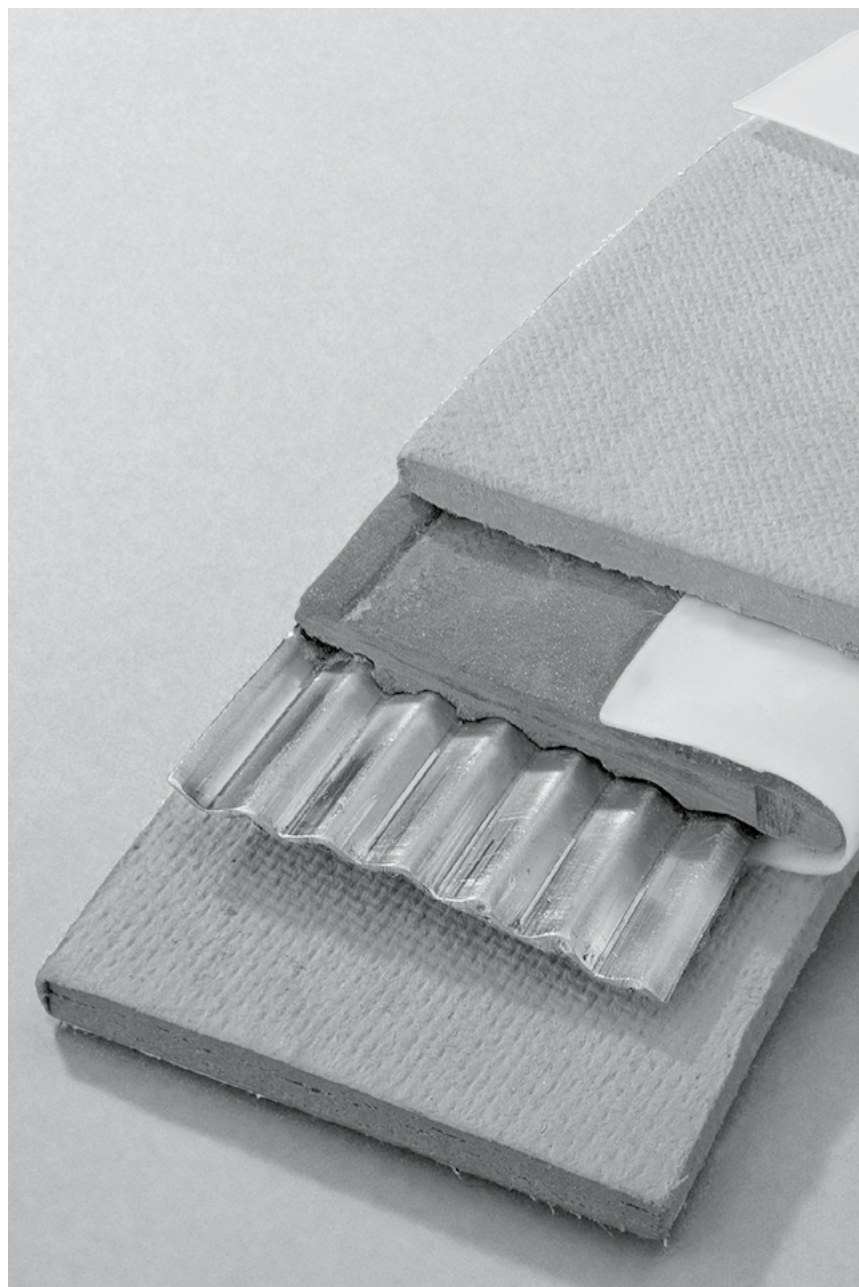


# Gasket System 3000 AF3000/GR3000/UF3000



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with TA Luft (Clean Air Act)

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with TA Luft (Clean Air Act)

**Annex 4** Certificate of conformity  
FDA Title 21 § 177.1550

**Operating Instructions & Safety Data Sheet  
conforms to Regulation (EC) No. 1907/2006 (REACH)**

## 1 General

### 1.1 Introduction

The gaskets may only be installed, commissioned and serviced by authorized technical personnel in machine/plant construction and in strict compliance with the present instructions as well as the valid standards and provisions. The failure to observe these instructions – no matter whether intentionally or negligently – releases the manufacturer from all liability and warranty claims.

The present operating instructions are designed to familiarize users with the gaskets and their use. The operating instructions should be available to the operating and maintenance personnel and should be read and understood prior to any assembly and maintenance work.

By knowing the present operating instructions, you can avoid damages to the gasket system and achieve a faultless operation.

The figures and data contained in the present operating instructions are subject to change and further development. The latest edition will always supersede all previous ones.

### 1.2 Scope

The gasket system 3000 is used for sealing glasslined flange connections on reactors and storage tanks and for pipelines. The gasket system should only be used within its admissible operating conditions.

## 2 Safety

The safety instructions refer exclusively to the scope of delivery. Please also note the safety instructions valid for your reactor/system and the liquids to be sealed.

### 2.1 Warnings and symbols

In the operating instructions, the danger symbol is used to draw your attention to especially important information.



**Compliance with these mandatory instructions helps to avoid personal injury and damage to property.**

### 2.2 Safety instructions



**Please note the following instructions: Do not practice any working methods which may endanger safety.**

**In the case of malfunctions, the reactor/system shall be immediately stopped and protected against unauthorized restart! Malfunctions shall be immediately corrected!**

**If the gaskets are worn or defective, leakage may occur. This leakage may cause risks to your plant as well as to man and the environment. Therefore, you should ensure regular inspections and suitable protection and collection facilities, if necessary.**

**Hot system elements need to be protected against accidental contact.**

**Ensure a safe, environmentally sound disposal of operating and auxiliary substances and replacement parts in accordance with the valid regulations.**

**PTFE or fluoro-carbon caoutchouk may never be burnt or ignited because they produce highly toxic vapors. If fluoro-carbon caoutchouk was nevertheless burnt, you have to wear protective gloves because of the possible presence of hydrofluoric acid.**

**Please note that hydrofluoric acid attacks glasslined surfaces very strongly.**

## 3 Transport and storage

In order to guarantee an as-new condition of the gaskets, maintain the following storage conditions:

- dry and dust-free
- gaskets should be preferably stored in a lying position. If suspended for storage, provide large supporting area.
- Do not use standing storage.
- steady temperature and ventilation
- protection against direct influences of heat and ultra-violet light

#### 4 Construction

In addition to the general demands on gaskets for glasslined apparatus (resistance to chemicals and temperature, leakage proofness and elasticity), the capability of the gaskets of being adjusted to the properties of the glasslined flange surfaces is of special importance.

Pfäudler supplies special gaskets for all glasslined apparatus and systems. The gasket system consists of the following components:

##### ■ PTFE envelope

chemically modified polytetrafluoroethylene with excellent chemical, thermal and dielectric properties, tested with a stabilized DC voltage of 7000 V in accordance with the GKV guidelines. FDA approval under Title 2, Code of Federal Regulations #177.1550.

##### ■ Corrugated ring

austenitic stainless steel characterized by high chemical resistance to aggressive substances.

##### ■ Gasket insert

AF3000: asbestos-free soft material based on viton-bound aramid fibers. GR3000: high-quality, adhesive-free, bound expanded graphite.

##### ■ PTFE internal envelope and UF3000 filler material

for gasket types WKT and WKTV.

Discoloration of the PTFE envelope during operation has no influence on its functional properties.

##### Important:

**We recommend using only Pfäudler-approved gasket systems in combination with glasslined flange connections. Other gaskets might put the entire system at risk.**

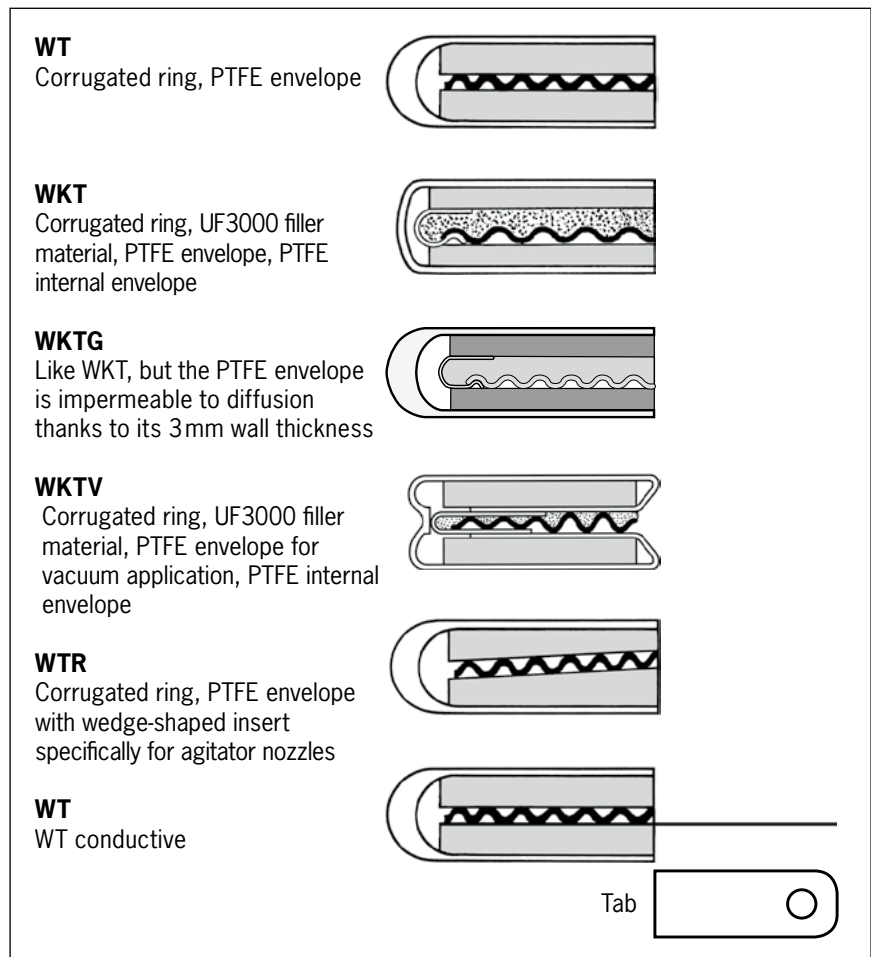


Figure 1 Gasket shapes and explanation of abbreviations

#### 5 Technical data

##### Conventional gaskets

Compressibility 35–45%  
Resilience min. 20%

##### WT conductive

Compressibility 35–45%  
Surface resistivity  $<10^9 \Omega$   
at 23°C and 50% rel. humidity  
Temperature –60/+230 °C  
Pressure 40 bar  
Surface pressure  $\Delta p_u$  when installed 8 N/mm<sup>2</sup>  
Surface pressure  $\Delta p_u$  when installed 60 N/mm<sup>2</sup>

Table 1 Temperature range

| Insert material          | AF3000                                  | GR3000   |
|--------------------------|-----------------------------------------|----------|
| Gasket type              | Temperature in gasket sealing area [°C] |          |
| WT, WKT, WKTV, WTR, WKTV | –60/+230                                | –60/+230 |

Table 2 Pressure

| Gasket type              | Diameter*           | max. pressure [bar] |
|--------------------------|---------------------|---------------------|
| WT, WKT, WKTV, WTR, WKTV | DN 25 ... DN 150    | 40                  |
|                          | DN 200 ... DN 800   | 25                  |
|                          | DN 1000 ... DN 1200 | 16                  |
|                          | DN 1400 ... DN 2000 | 10                  |
|                          | DN 2200             | 6                   |

\*The larger dimension is to be used with respect to the pressure on oval gaskets.

## 6 Installation of the gaskets

### 6.1 General instructions

The gaskets should always be placed on dry, clean sealing surfaces. Tighten all screwed connections evenly with the prescribed torque.



**For the proper torques, please refer to Operating Instructions 318 or the assembly drawing.**

The gasket types with a corrugated ring are equipped with holding brackets. If a used gasket is installed, its original position can be restored by this feature. Furthermore, the gaskets no longer slip off from inclined nozzles. For manhole covers, the holding brackets are shifted and clamped in below the circumferential VA ring. For assembly and reactor covers, the holding brackets are fastened to the profiled ring using grooved drive studs.

### 6.2 Installation of the agitator nozzle gasket type WTR

The WTR gasket design was specifically developed to compensate for inclinations of agitator nozzles. The gasket is equipped with two wedge-shaped inserts. By turning the inserts against each other, the gasket thickness can be modified. Thus, an inclination of the agitator nozzle can be compensated. The required total thickness of the gasket is obtained by installing an additional gasket insert, if necessary. When not pressed, the asbestos-free gasket should be 2.5 to 3.0 mm higher than the distance between the glass surfaces of the agitator nozzle and the intermediate flange when mounted (refer to Fig. 3). When tightened with the prescribed torque, the gasket will thus be prestressed to the extent necessary to ensure proper functioning.

#### 6.2.1 Installation on agitator nozzles without leveling ring

The distance between the top edge of the agitator support and the glass surface of the agitator nozzle is 20 mm when delivered from the factory (measured at the highest point of the agitator nozzle). The chamber size is reduced to 5 mm by the offset of the intermediate flange.

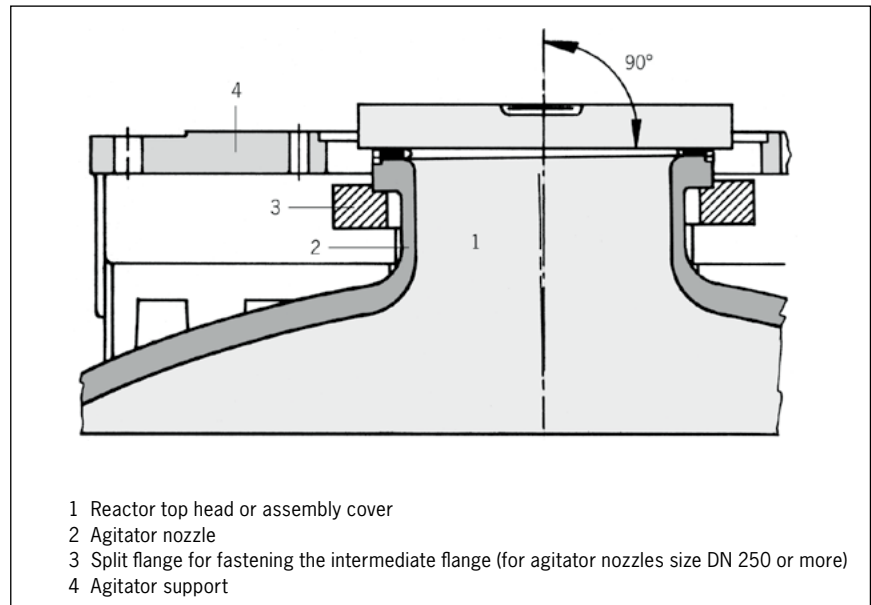


Figure 2 Before installing the intermediate flange

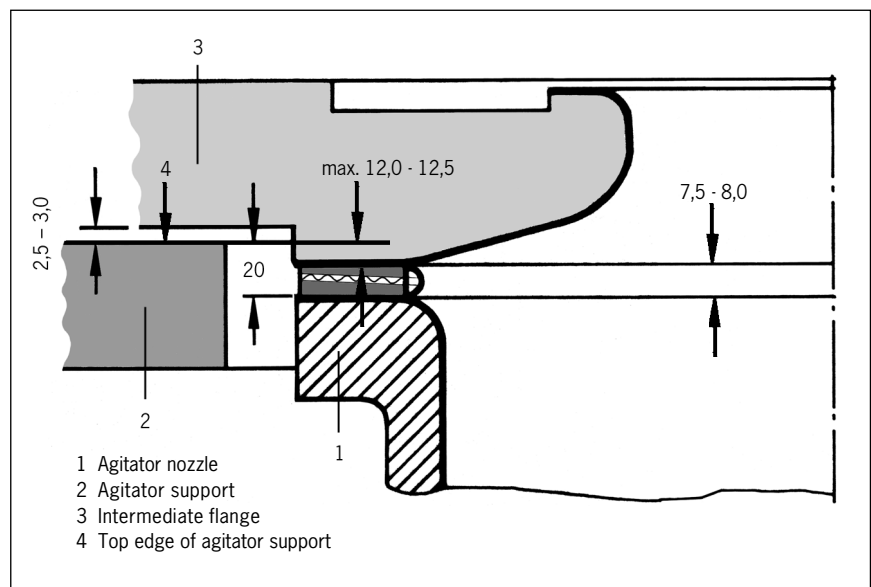


Figure 3

#### Procedure:

- ▼ Place WTR gasket on the nozzle.
- ▼ Ensure a horizontal alignment on all sides of the gasket by turning one of the gasket inserts in the upper side of the gasket. Use a water level to measure levelness in two directions at an angle of 90°.
- ▼ Measure the distance from the upper edge of the agitator support in several locations around the gasket's perimeter. The distance should be identical

in all points and should be 12.0-12.5 mm in order to achieve the necessary compression of the gasket.

- ▼ If the value measured is greater, insert an additional (plane) gasket insert of suitable thickness. Gasket inserts will be attached to spare part order.
- ▼ Put the intermediate flange in place and tighten it with the prescribed torque.

### 6.2.2 Installation on agitator nozzles with a leveling ring

For agitator nozzles sized DN 250 or more, the two-piece, wedge-shaped leveling ring is adjusted on the agitator nozzle already in the factory and pinned down. The support area is orthogonal to the agitator shaft.

When replacing a complete cover and nozzle of a reactor with an assembly cover (series CE, E, DG), the leveling ring must be readjusted. Please call a service technician for performing this type of work.

#### Gasket installation procedure:

- ▼ Measure dimension  $z$  = distance between the glassed surface on the bottom side of the intermediate flange and the support area of the leveling ring;  $z$  may be negative if the glassed surface is **above** the level of the support area.
- ▼ Determine dimension  $a$  in 4 to 6 points.  $a$  is the distance between the leveling ring and the glassed surface of the agitator nozzle. The sum of  $a$  and  $z$  is the chamber size  $y$  available to the gasket when compressed.
- ▼ Place WTR gasket on the nozzle.
- ▼ Ensure a horizontal alignment on all sides of the gasket by turning one of the gasket inserts in the upper side of the gasket (water level).
- ▼ Measure the height of the gasket in several locations around the gasket's perimeter. The height should be identical in all points and should be  $y + 2.5\text{mm}$  to  $y + 3.0\text{mm}$  in order to achieve the necessary compression of the gasket.
- ▼ If the gasket height is lower, insert an additional (plane) gasket insert of suitable thickness.  
Gasket inserts will be attached to spare part order.
- ▼ Put the intermediate flange in place and tighten it with the prescribed torque.

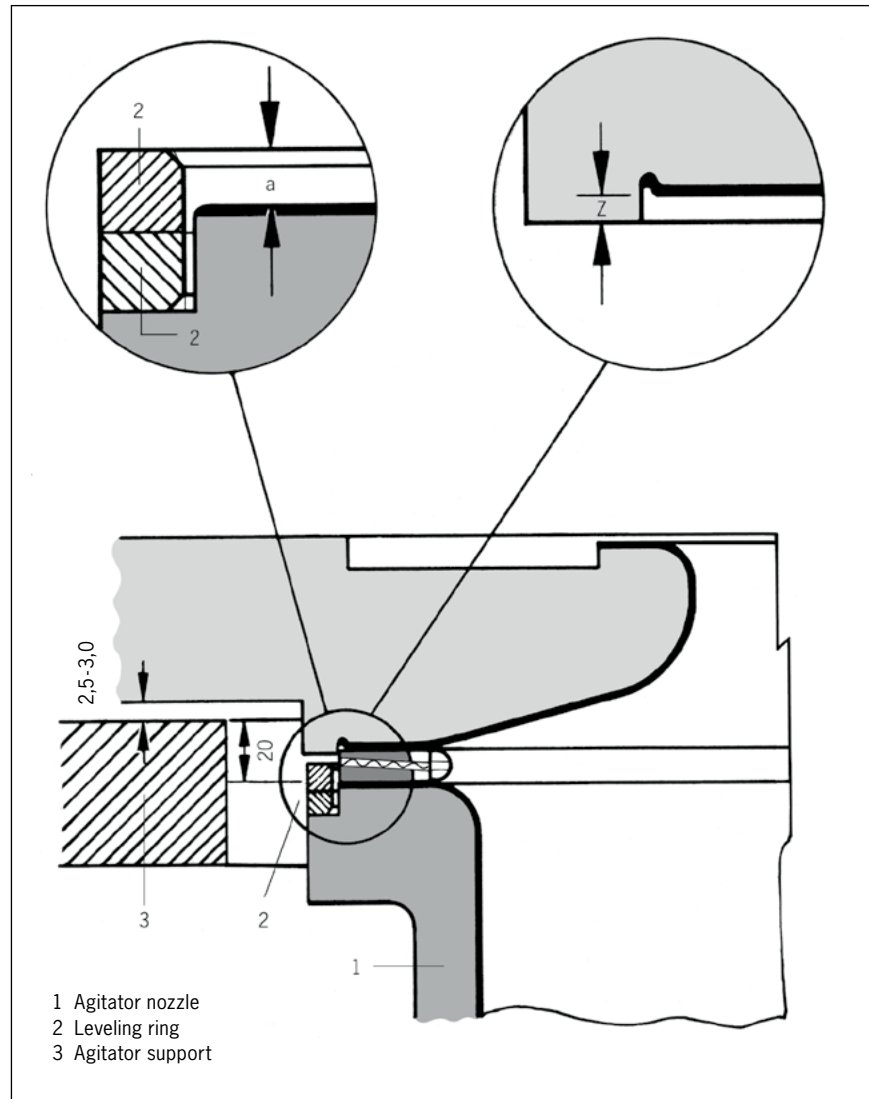


Figure 4

## **7 Gasket packing using the UF3000 filler material for gasket types WKT and WKTV**

### **7.1 Construction and properties of the system**

PTFE is extremely resistant to chemicals. It is furthermore characterized by high thermal resistance and strength within a broad temperature range. It is only attacked by molten alkalis and fluorine at high temperatures.

Together with the corrugated ring, the gasket inserts form a strong, elastic combination which prevents the gasket from being pushed out even at high internal pressures or from being drawn in if a vacuum is present. The system has been matched to the special features of the glassed flange surfaces.

The two-component UF3000 filler material is pressed out of the double cartridge using the specially provided compressed air gun CP3000 and mixed in a spray nozzle that functions as a static mixer.

The UF3000 is automatically shaped to optimally fit all surface tolerances and differences in shape of the flange surfaces. When cured, it forms a stable, highly solid filler material. After curing, the gasket has the same elasticity at all points around its perimeter. Bending stress in the glasslined flange as a consequence of dif-

ferent setting behaviors around the flange perimeter cannot occur.

Contrary to soft filler materials, UF3000 ensures that once the gasket fit is reached, it does not change even at different pressures or temperatures.

The mechanical skills for properly applying the filler material are easy to learn. Nevertheless, we recommend attending a training course by a service technician on location or at Pfaudler's in Schwetzingen. Contrary to packings consisting of ground or cut fitting pieces the quality of which largely depends on the workmanship of the fitter, the gasket can be optimally adjusted to the glasslined flange faces when observing the handling instructions.

**! In order to avoid damages to the PTFE envelope of the gasket (Fig. 5, item 1) by the filler material, the WKT and WKTV gaskets have a special PTFE internal envelope. Therefore, the filler material should only be injected into the PTFE internal envelope (Fig. 5, item 4) provided for this purpose.**

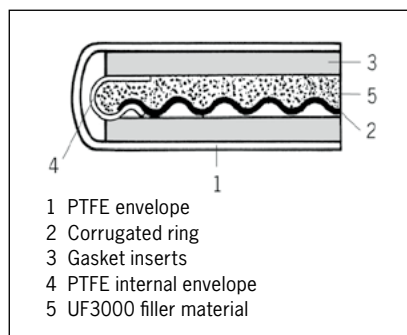


Figure 5 Principle of UF3000 with shapes WKT/WKTV

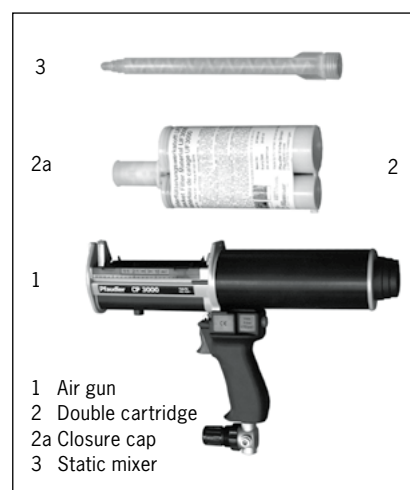


Figure 6 CP3000 air gun

### **7.2 Installation and packing procedure**

The installation of the gasket and the application of the UF3000 packing require very few tools and appliances:

- CP3000 air gun, part no. 021 936-
- UF3000 double cartridge with static mixer, part no. 021 937- (the static mixer may also be ordered separately by specifying part no. 021 937M)
- customary water bucket
- customary thermometer for water bath, min. measuring range 30 ... 50°C

#### **Technical features of the CP3000 air gun**

- Air connection, internal thread 1/4". A highly flexible pressure hose DN 6 or 1/4" must be used.
- Compressed air supply max. 8 bar
- Max. operating pressure of the air gun 6 bar (can be adjusted on pressure regulator)
- Sound level < 83 dBA
- For explosion protection, refer to Annex 3, EC Declaration of Conformity

**! Risk of getting hands or fingers squeezed in between the feed pistons and the housing.**

**When the safety device is intact and has not been manipulated, the feed pistons can be moved back and forth by the air pressure with the double cartridge installed only.**

**Cut off the air supply to put the air gun out of operation or clean it.**

**If it is necessary to clean the internal shell, the feed pistons may be moved manually.**

**The air gun may only be operated if a water separator/oiler is fitted to the air connection.**

**Do not alter or remove the pressure controller. Only Pfaudler original spare parts may be used for replacement.**

The air gun shall be checked for any defects or damages and should only be used if in perfect condition.

Damaged air guns should be taken out of service immediately and send to Pfaudler for repair. Do not try to modify or repair the air gun.

The air gun hose should be positioned in a way to avoid any tripping or tangling.

Take care when connecting and disconnecting the air gun hose.

All users and people nearby must wear safety glasses. The user also has to wear gloves.

Please handle and store the air gun with care.

The air gun or the static mixer must not be pointed at people or animals when ready for use.

### 7.3 Storage and transport of the UF3000 filler material

Shelf life: refer to label print

Storage temperature: +2 ... 40 °C

Transport temperature: Short-term deviations from the storage temperature are possible.



**Dry storage: After re-using close the cartridge again, it is durable for 6 months.**

### 7.4 Standard consumption values

UF3000 is sufficient for a gasket perimeter of approx. 1 m, but any residues remaining in the last double cartridge opened may be reused. For this purpose, simply remove the static mixer and close the double cartridge again. A used static mixer must be disposed of because once mixed, the material cures inside the mixer.

The series of pictures (refer to Section 7.6) is used to describe the proper use by the example of a main flange gasket.

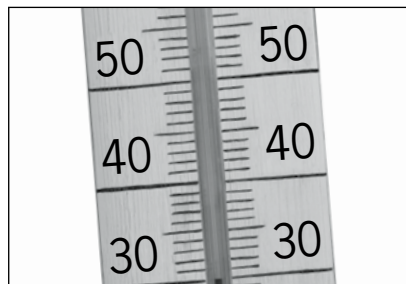
Number of double cartridges  
= gasket diameter D in meters x  $\pi$   
= 0.5 x 3.14  
= 1.57 Double cartridges

Figure 7 Consumption shown by the example of a gasket size DN 500

## 7.5 Processing notes

### Temperature of the filler material

- The temperature of the UF3000 filler material should be 40 ±10 °C when injecting the material.



- At higher temperatures, injection becomes easier, and the curing process is accelerated.
- If the temperature of the filler material is below 30 °C, it should be warmed before use. This is done most efficiently by immersing the double cartridge into a bucket of hot water for approx. 30 min.
- If the specified temperature is exceeded, the mixed filler material cures very quickly.
- Temperatures lower than the desired temperatures prevent a smooth injection due to the high viscosity of the material.

Table 3 UF3000 curing time

| Ambient temperature [°C] | Curing time [h] |
|--------------------------|-----------------|
| 5                        | approx. 7       |
| 15                       | approx. 4       |
| 25                       | approx. 2       |

### Ambient temperature

- The curing time of the UF3000 two-component filler material depends on the ambient temperature.
- At especially low ambient temperatures (< 5 °C), it is easily possible to cure the UF3000 filler material within a few minutes with the help of the apparatus heating system. When curing, the temperature at the gasket should not exceed 60 °C.



**Only the static mixer provided may be used. The static mixer must not be modified**

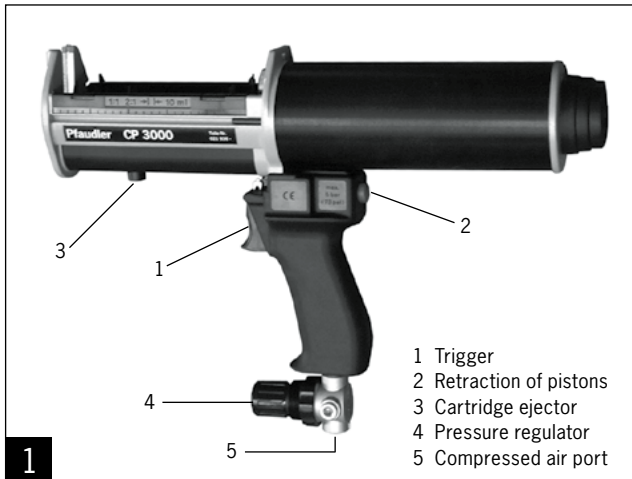
**Only the outer tip may be cut off in order to reach a broader application area. The remaining intact mixer field ensures faultless mixing even without the tip.**

As the filler material AF3000 cures quickly, it is advisable to place the agitator inside the reactor already before injecting the gasket and lowering the cover of a two-piece reactor.

The filler material must be allowed to cure without being disturbed. However, you may start setting up the drive or connecting the piping, for example, while the material cures.

Of course, our service technicians are also available on request for all works described.

## 7.6 Installation and packing of a gasket with UF3000



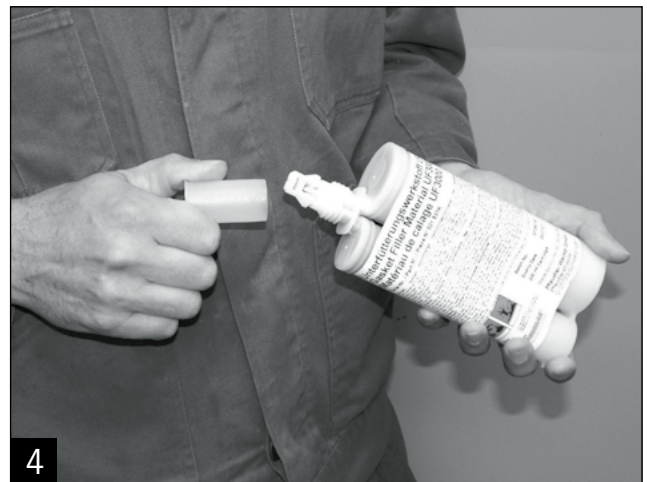
CP3000 air gun control elements



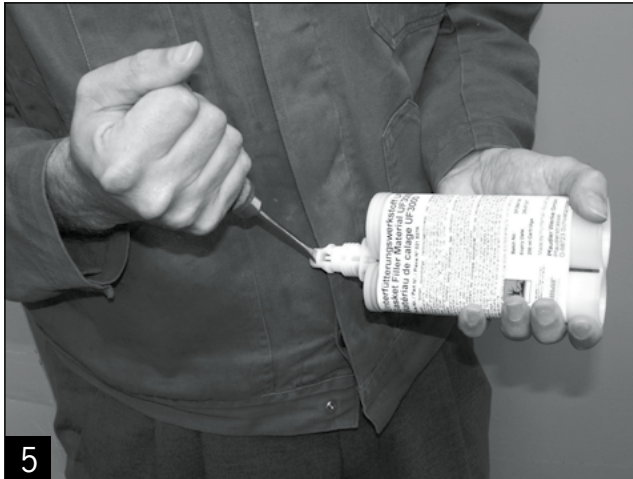
Placing cover in position on a trial basis. Use intermediate layer to protect the glass!  
Estimate gap width in order to determine the necessary quantity of UF3000.



The temperature of the UF3000 filler material should be  $40 \pm 10^\circ\text{C}$  when injecting the material. Warm up the filler material, if necessary (refer to Section 7.5).



Insert double cartridge into the half-shell of the air gun, note that the larger cartridge must be on top.



5 Unscrew cap from double cartridge ...



6 ... and screw on static mixer until it is firm.  
Connect compressed air to the air gun.



Press trigger on air gun. The ejection speed can be adjusted at the pressure regulator (Fig. 1, item 4).

**⚠ Excessive pressure may lead to extreme contamination of the air gun in the area of the feed pistons (especially if the double cartridge has not been pre-warmed), because the components of the filler material may emerge backwards through the cartridge piston due to the ram pressure on the static mixer.**

The UF3000 filler material is injected evenly corresponding to the estimated sealing gap width until the internal envelope is completely filled. It is advisable to use a support to inject the filler material into the suspended gasket.



Gaskets with a large, unwieldy diameter can also be injected with filler material while lying on the actual reactor flange.

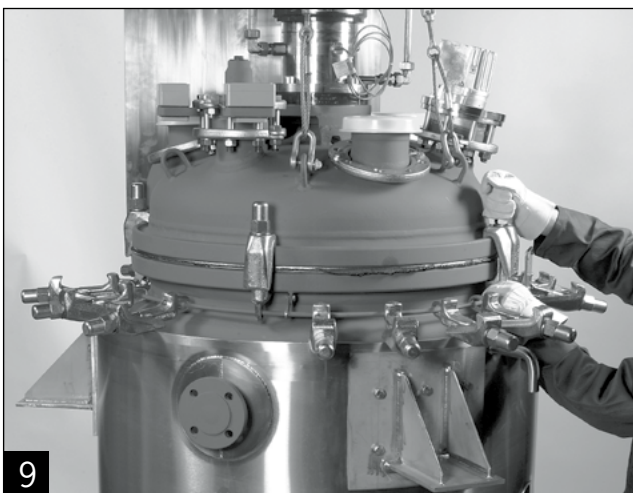
In order to remove the double cartridge from the air gun, first move the feed pistons backward by operating the red button (Fig. 1, item 2), and then press the ejection mechanism (Fig. 1, item 3).

If several double cartridges are needed to fill a gasket, **one** static mixer may be used for all cartridges. When the gasket has been filled, remove the last cartridge from the air gun and isolate the air supply.

**Open, but not totally empty double cartridges may be closed with the cap and re-used later.**

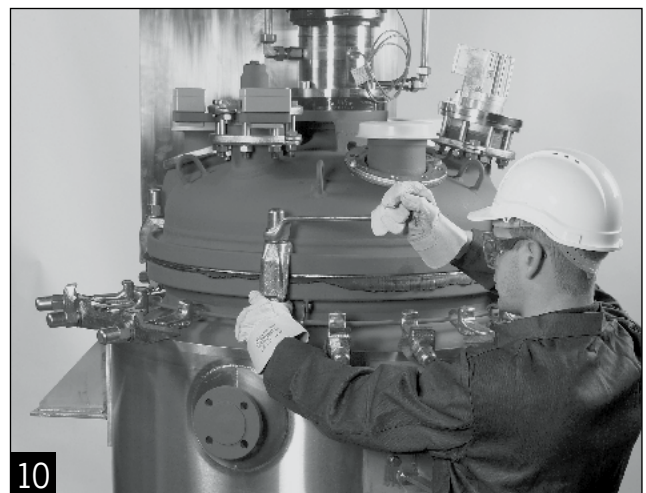


**For the disposal of the used static mixers and the double cartridges, refer to Section 10.**

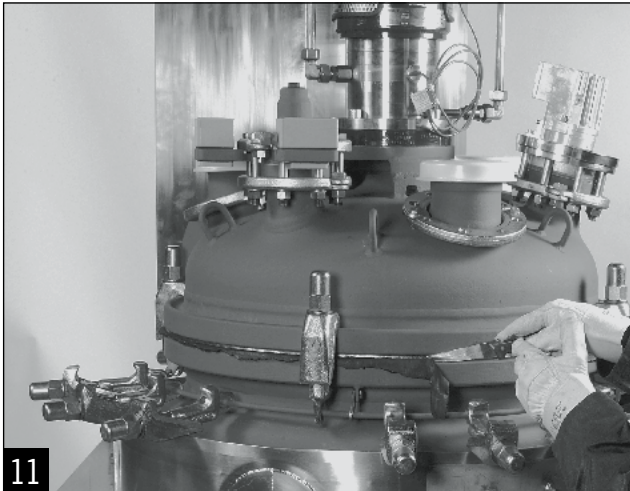


Put the gasket filled with UF3000 in place and slowly lower the cover.

**Caution: Place large covers down lightly due to their inherent weight and secure them in this position with a hoist until the filler material has finished curing.**



Shaping and position control are achieved with the help of individual clamps. The position of the cover can still be influenced in this way.



11

The excess filler material is pressed out and can be cut off once it has lost its sticky properties. **The thickness of the filler material should be  $\geq 2\text{ mm}$  around the entire flange perimeter.** When the filler material has totally cured, apply the clamps one by one.



12

Finally tighten the clamps several times one by one with the prescribed torque.

**Before performing this step, you must ensure that the filler material can no longer be deformed plastically.**

**In order to close the cartridge again**



13

To close the double cartridge again, please use original, unscrewed cap (pic. 5). Dry storage: After re-using close the cartridge again, it is durable for 6 months (Chapter 7.3).

## 8 Starting up new gaskets

Even when packed with UF3000, the reliability and useful life of the gasket during operation will depend decisively on the start-up procedure for the reactor after the gasket has been replaced. It is necessary to re-tighten the clamps several times during the start-up phase in order to compensate for the settling amount of the new gasket – by the way, this is independent of the filler material. However, with the help of UF3000, you can achieve that the gasket settles faster and more evenly.

The following method has proven its worth in practice:

- ▼ When the clamps have been tightened with the nominal torque, a pressure test with water must be performed. Afterwards, correct the clamp tightening torque while the reactor is **de-pressurized**. For the maximum permitted tightening torques of the flange connections, please refer to Operating Instructions 318.
- ▼ Then perform a second pressure test with water. For this purpose, heat up the reactor to its operating temperature and keep it at this temperature for approx. 12 to 16 hours. Then re-tighten the clamps to their nominal torque while the reactor is **de-pressurized and at ambient temperature**.
- ▼ Now the apparatus can be started up. It is advisable to check the tightening torques of the clamps after the first, second and approx. tenth batch. If necessary, re-tighten the clamps with the nominal torque.

A gasket that has been started up according to these instructions will justify the efforts by a long useful life and high operational reliability.

We recommend providing a splash protection (e.g. sleeve) around flange connections.

## 9 Maintenance

Once it has been installed, the gasket is practically maintenance-free. An occasional visual inspection of the exposed part of the PTFE envelope in the reactor for mechanical damages and the outer perimeter of the gasket for signs of leaks will be sufficient (use leak detection spray, if necessary).

The tightening torques of the clamps should be checked every six months in the course of apparatus maintenance (refer to Operating Instructions 318).

## 10 Health and safety at work

 **Please note the detailed instructions and information concerning the UF3000 filler material given in the material safety data sheet (Annex 1).**

When both components of the filler material have been mixed and cured, the material is neutral and does not pose and risks to health or the environment.

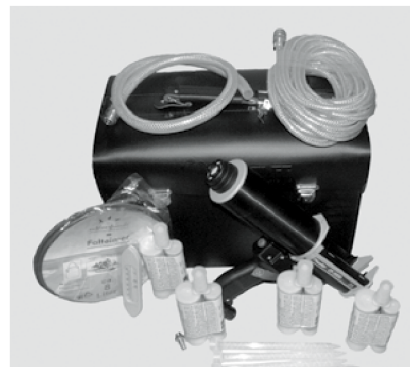
## 11 Faults: causes and correction

If you notice a leak, check the prescribed torque at the **de-pressurized reactor at ambient temperature** and re-tighten the clamps, if necessary. **It may be necessary to observe additional, specific safety measures.**

If the leakage of the gasket system cannot be corrected by these measures, the gasket must be replaced. **Again, take all specific precautions that might be necessary.**

## 12 Related documents

- Material safety data sheet for UF3000 filler material (in Annex)
- Operating instructions 318, Tightening torques for bolts on Pfaudler apparatuses
- Technical Information No. 651
- Optional: CP3000 Service KitCP 3000 (TNr. 021 375). Ask for more information. XXXXXXXXXX
- Chemical Resistance of PTFE TI 951



## **PFAUDLER UF 3000 A**

|         |                |              |                                 |
|---------|----------------|--------------|---------------------------------|
| Version | Revision Date: | SDS Number:  | Date of last issue: 11.05.2015  |
| 1.1     | 18.03.2021     | 400001010475 | Date of first issue: 11.05.2015 |

Print Date 29.06.2021

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

#### **1.1 Product identifier**

Trade name : PFAUDLER UF 3000 A

Unique Formula Identifier (UFI) : AYG3-E0EV-800A-8QC6

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

Use of the Substance/Mixture : Epoxy constituents

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

Company : Huntsman Advanced Materials (Europe)BVBA  
Address : Everslaan 45  
3078 Everberg  
Belgium

Telephone : +41 61 299 20 41  
Telefax : +41 61 299 20 40

E-mail address of person responsible for the SDS : [REDACTED]@huntsman.com

#### **1.4 Emergency telephone number**

Emergency telephone number : Berlin: 0049 30 19 24 0 & 0049 30 30 68 6 7 11  
Bonn: 0049 228 19 27 0 & 0049 228 28 7 3 32 11  
Erfurt: 0049 361 73 07 30  
Freiburg: 0049 761 16 24 0  
Göttingen: 0049 51 19 24 0 & 0049 551 38 31 80  
Homburg: 0049 6841 19 24 0  
Mainz: 0049 6131 19 24 0 & 0049 6131 23 24 66  
München: 0049 89 19 24 0  
Nürnberg: 0049 911 39 8 2 45 1  
EUROPE: [REDACTED]  
France ORFILA: +33(0)145425959  
ASIA: +65 6336-6011  
China: +86 20 39377888  
+86 532 83889090  
India: + 91 22 42 87 5333  
Australia: 1800 786 152  
New Zealand: 0800 767 437  
USA: [REDACTED]

### **SECTION 2: Hazards identification**

#### **2.1 Classification of the substance or mixture**

**Classification (REGULATION (EC) No 1272/2008)**

Skin irritation, Category 2

H315: Causes skin irritation.

**PFAUDLER UF 3000 A**

|         |                |              |                                 |
|---------|----------------|--------------|---------------------------------|
| Version | Revision Date: | SDS Number:  | Date of last issue: 11.05.2015  |
| 1.1     | 18.03.2021     | 400001010475 | Date of first issue: 11.05.2015 |

Print Date 29.06.2021

|                                      |                                                        |
|--------------------------------------|--------------------------------------------------------|
| Serious eye damage, Category 1       | H318: Causes serious eye damage.                       |
| Skin sensitisation, Category 1       | H317: May cause an allergic skin reaction.             |
| Chronic aquatic toxicity, Category 2 | H411: Toxic to aquatic life with long lasting effects. |

**2.2 Label elements**
**Labelling (REGULATION (EC) No 1272/2008)**

Hazard pictograms :



|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Signal word              | : Danger                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Hazard statements        | : H315 Causes skin irritation.<br>H317 May cause an allergic skin reaction.<br>H318 Causes serious eye damage.<br>H411 Toxic to aquatic life with long lasting effects.                                                                                                                                                                                                                                                                                                         |
| Precautionary statements | : <b>Prevention:</b><br>P261 Avoid breathing mist or vapours.<br>P264 Wash skin thoroughly after handling.<br>P273 Avoid release to the environment.<br>P280 Wear protective gloves/ eye protection/ face protection.<br><br><b>Response:</b><br>P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/ doctor.<br>P391 Collect spillage. |

Hazardous components which must be listed on the label:

Phenol, polymer with formaldehyde, glycidyl ether

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol (BPFDEGE)

1,4-Bis(2,3-epoxypropoxy)butane

2-Propenoic acid, reaction products with dipentaerythritol

**Additional Labelling:**

EUH205 Contains epoxy constituents. May produce an allergic reaction.

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### 2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

Ecological information: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Toxicological information: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

## SECTION 3: Composition/information on ingredients

### 3.2 Mixtures

#### Hazardous components

| Chemical name                                                                                  | CAS-No.<br>EC-No.<br>Index-No.<br>Registration number      | Classification                                                                                                                                                                                                                         | Concentration<br>(% w/w) |
|------------------------------------------------------------------------------------------------|------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| Phenol, polymer with formaldehyde, glycidyl ether                                              | 28064-14-4<br>Polymer                                      | Skin Irrit. 2; H315<br>Eye Irrit. 2; H319<br>Skin Sens. 1; H317<br>Aquatic Chronic 2; H411                                                                                                                                             | >= 25 -<br>< 30          |
| Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol (BPFEDGE) | -<br>-<br>01-2119454392-40                                 | Skin Irrit. 2; H315<br>Skin Sens. 1; H317<br>Aquatic Chronic 2; H411                                                                                                                                                                   | >= 2,5 -<br>< 10         |
| 1,4-Bis(2,3-epoxypropoxy)butane                                                                | 2425-79-8<br>219-371-7<br>603-072-00-7<br>01-2119494060-45 | Acute Tox. 4; H302<br>Acute Tox. 4; H332<br>Acute Tox. 4; H312<br>Skin Irrit. 2; H315<br>Eye Dam. 1; H318<br>Skin Sens. 1; H317<br>Aquatic Chronic 3; H412<br><br>Acute toxicity estimate<br><br>Acute dermal toxicity: 1<br>100 mg/kg | >= 3 - <<br>10           |
| 2-Propenoic acid, reaction products with dipentaerythritol                                     | 1384855-91-7<br>-<br>01-2119980666-22                      | Eye Irrit. 2; H319<br>Skin Sens. 1A; H317<br>Aquatic Chronic 3; H412                                                                                                                                                                   | >= 2,5 -<br>< 10         |

For explanation of abbreviations see section 16.

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**SECTION 4: First aid measures**
**4.1 Description of first aid measures**

- |                            |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------------------|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| General advice             | : | Move out of dangerous area.<br>Consult a physician.<br>Show this safety data sheet to the doctor in attendance.<br>Treat symptomatically.<br>Get medical attention if symptoms occur.                                                                                                                                                                                                                                                                     |
| Protection of first-aiders | : | First Aid responders should pay attention to self-protection and use the recommended protective clothing<br>If potential for exposure exists refer to Section 8 for specific personal protective equipment.<br>Avoid inhalation, ingestion and contact with skin and eyes.<br>No action shall be taken involving any personal risk or without suitable training.<br>It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. |
| If inhaled                 | : | Call a physician or poison control centre immediately.<br>If inhaled, remove to fresh air.<br>Get medical attention if symptoms occur.                                                                                                                                                                                                                                                                                                                    |
| In case of skin contact    | : | If skin irritation persists, call a physician.<br>If on skin, rinse well with water.<br>If on clothes, remove clothes.                                                                                                                                                                                                                                                                                                                                    |
| In case of eye contact     | : | Small amounts splashed into eyes can cause irreversible tissue damage and blindness.<br>In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.<br>Continue rinsing eyes during transport to hospital.<br>Remove contact lenses.<br>Keep eye wide open while rinsing.<br>If eye irritation persists, consult a specialist.                                                                                      |
| If swallowed               | : | Keep respiratory tract clear.<br>Never give anything by mouth to an unconscious person.<br>If symptoms persist, call a physician.<br>Take victim immediately to hospital.                                                                                                                                                                                                                                                                                 |

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

None known.

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

|           |   |                        |
|-----------|---|------------------------|
| Treatment | : | Treat symptomatically. |
|-----------|---|------------------------|

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### **SECTION 5: Firefighting measures**

#### **5.1 Extinguishing media**

Suitable extinguishing media : Water spray  
Alcohol-resistant foam  
Carbon dioxide (CO<sub>2</sub>)  
Dry chemical

Unsuitable extinguishing media : Exercise caution when using a high volume water jet as it may scatter and spread fire

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

Specific hazards during firefighting : Do not allow run-off from fire fighting to enter drains or water courses.

Hazardous combustion products : Carbon dioxide (CO<sub>2</sub>)  
Carbon monoxide  
Carbon oxides

#### **5.3 Advice for firefighters**

Special protective equipment for firefighters : Wear self-contained breathing apparatus for firefighting if necessary.

Specific extinguishing methods : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Further information : Collect contaminated fire extinguishing water separately. This must not be discharged into drains.  
Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

### **SECTION 6: Accidental release measures**

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

Personal precautions : Use personal protective equipment.  
Ensure adequate ventilation.  
Refer to protective measures listed in sections 7 and 8.

#### **6.2 Environmental precautions**

Environmental precautions : Prevent product from entering drains.  
Prevent further leakage or spillage if safe to do so.  
If the product contaminates rivers and lakes or drains inform respective authorities.

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

Methods for cleaning up : Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).

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Keep in suitable, closed containers for disposal.

**6.4 Reference to other sections**

For disposal considerations see section 13., See Section 1 for emergency contact information., For personal protection see section 8.

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

- Advice on safe handling : Repeated or prolonged skin contact may cause skin irritation and/or dermatitis and sensitisation of susceptible persons. Persons suffering from asthma, eczema or skin problems should avoid contact, including dermal contact, with this product.  
Do not breathe vapours/dust.  
Avoid exposure - obtain special instructions before use.  
Avoid contact with skin and eyes.  
For personal protection see section 8.  
Smoking, eating and drinking should be prohibited in the application area.  
To avoid spills during handling keep bottle on a metal tray.  
Dispose of rinse water in accordance with local and national regulations.
- Advice on protection against fire and explosion : Normal measures for preventive fire protection.
- Hygiene measures : When using do not eat or drink. When using do not smoke.  
Wash hands before breaks and at the end of workday.

**7.2 Conditions for safe storage, including any incompatibilities**

- Requirements for storage areas and containers : Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Observe label precautions. Keep in properly labelled containers.
- Advice on common storage : For incompatible materials please refer to Section 10 of this SDS.
- Storage class (TRGS 510) : 10, Combustible liquids
- Further information on storage stability : Stable under normal conditions.
- Recommended storage temperature : 2 - 40 °C

**7.3 Specific end use(s)**

- Specific use(s) : No data available

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### SECTION 8: Exposure controls/personal protection

#### 8.1 Control parameters

Contains no substances with occupational exposure limit values.

#### Derived No Effect Level (DNEL) according to Regulation (EC) No. 1907/2006:

| Substance name                  | End Use   | Exposure routes | Potential health effects   | Value                  |
|---------------------------------|-----------|-----------------|----------------------------|------------------------|
| 1,4-Bis(2,3-epoxypropoxy)butane | Workers   | Inhalation      | Long-term systemic effects | 4,7 mg/m <sup>3</sup>  |
|                                 | Workers   | Dermal          | Long-term systemic effects | 6,66 mg/kg bw/day      |
|                                 | Consumers | Inhalation      | Long-term systemic effects | 1,16 mg/m <sup>3</sup> |
|                                 | Consumers | Dermal          | Long-term systemic effects | 3,33 mg/kg bw/day      |
|                                 | Consumers | Oral            | Long-term systemic effects | 0,33 mg/kg bw/day      |

#### Predicted No Effect Concentration (PNEC) according to Regulation (EC) No. 1907/2006:

| Substance name                                                | Environmental Compartment | Value                         |
|---------------------------------------------------------------|---------------------------|-------------------------------|
| 1,4-Bis(2,3-epoxypropoxy)butane                               | Fresh water               | 0,024 mg/l                    |
| Remarks:                                                      | Assessment Factors        |                               |
|                                                               | Marine water              | 0,002 mg/l                    |
|                                                               | Assessment Factors        |                               |
|                                                               | Sewage treatment plant    | 100 mg/l                      |
|                                                               | Assessment Factors        |                               |
|                                                               | Fresh water sediment      | 0,084 mg/kg dry weight (d.w.) |
|                                                               | Equilibrium method        |                               |
|                                                               | Marine sediment           | 0,008 mg/kg dry weight (d.w.) |
|                                                               | Equilibrium method        |                               |
|                                                               | Soil                      | 0,003 mg/kg dry weight (d.w.) |
|                                                               | Equilibrium method        |                               |
|                                                               | Oral                      | 0,028 mg/kg                   |
| Siloxanes and Silicones, di-Me, reaction products with silica | Fresh water sediment      | > 100 mg/kg                   |
|                                                               | Assessment Factors        |                               |
|                                                               | Soil                      | 23 mg/kg                      |
|                                                               | Assessment Factors        |                               |

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**8.2 Exposure controls****Personal protective equipment**

- |                          |                                                                                                                                                                                                                                                                                                                                                                                  |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Eye protection           | : Eye wash bottle with pure water<br>Tightly fitting safety goggles<br>Wear face-shield and protective suit for abnormal processing problems.                                                                                                                                                                                                                                    |
| Hand protection          |                                                                                                                                                                                                                                                                                                                                                                                  |
| Remarks                  | : 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. The suitability for a specific workplace should be discussed with the producers of the protective gloves.                                                                              |
| Skin and body protection | : Impervious clothing<br>Choose body protection according to the amount and concentration of the dangerous substance at the work place.                                                                                                                                                                                                                                          |
| Respiratory protection   | : <b>W A R N I N G !</b> This product contains quartz, which has been classified by IARC as carcinogenic for humans (Group 1), and which can cause silicosis and lung cancer following exposure to respirable dust. It is therefore important to take particular care to avoid inhalation exposure when mechanically processing cured material (e.g. grinding, sanding, sawing). |

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

- |                              |                                                             |
|------------------------------|-------------------------------------------------------------|
| Physical state               | : paste                                                     |
| Colour                       | : beige                                                     |
| Odour                        | : slight                                                    |
| Odour Threshold              | : No data is available on the product itself.               |
| pH                           | : substance/mixture is non-soluble (in water)               |
| Melting point/freezing point | : No data is available on the product itself.               |
| Boiling point                | : > 200 °C                                                  |
| Flash point                  | : > 200 °C<br>Method: Pensky-Martens closed cup, closed cup |
| Evaporation rate             | : No data is available on the product itself.               |
| Flammability (solid, gas)    | : No data is available on the product itself.               |
| Burning rate                 | : No data is available on the product itself.               |

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Upper explosion limit / Upper flammability limit : No data is available on the product itself.

Lower explosion limit / Lower flammability limit : No data is available on the product itself.

Vapour pressure : < 0,002 hPa (20 °C)

Relative vapour density : No data is available on the product itself.

Relative density : No data is available on the product itself.

Density : 1,65 g/cm<sup>3</sup> (40 °C)

Solubility(ies)  
Water solubility : practically insoluble (20 °C)

Solubility in other solvents : No data is available on the product itself.

Partition coefficient: n-octanol/water : No data is available on the product itself.

Auto-ignition temperature : No data is available on the product itself.

Decomposition temperature : > 200 °C

Viscosity  
Viscosity, dynamic : 200 000 - 400 000 mPa.s (40 °C)

Explosive properties : No data is available on the product itself.

Oxidizing properties : No data is available on the product itself.

### 9.2 Other information

No data available

## SECTION 10: Stability and reactivity

### 10.1 Reactivity

No dangerous reaction known under conditions of normal use.

### 10.2 Chemical stability

Stable under normal conditions.

### 10.3 Possibility of hazardous reactions

Hazardous reactions : No hazards to be specially mentioned.

### 10.4 Conditions to avoid

Conditions to avoid : None known.

### 10.5 Incompatible materials

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Materials to avoid : None known.

**10.6 Hazardous decomposition products**

No hazardous decomposition products are known.

**SECTION 11: Toxicological information****11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008****Acute toxicity**Acute oral toxicity - Product : Acute toxicity estimate : > 2 000 mg/kg  
Method: Calculation methodAcute inhalation toxicity - : Acute toxicity estimate : > 5 mg/l  
Product Exposure time: 4 h  
Test atmosphere: dust/mist  
Method: Calculation methodAcute dermal toxicity - : Acute toxicity estimate : > 2 000 mg/kg  
Product Method: Calculation methodAcute toxicity (other routes of : No data available  
administration)**Skin corrosion/irritation****Components:**

Phenol, polymer with formaldehyde, glycidyl ether:

Species: Rabbit

Method: OECD Test Guideline 404

Result: Irritating to skin.

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol (BPFDE):

Species: Rabbit

Method: OECD Test Guideline 404

Result: Irritating to skin.

1,4-Bis(2,3-epoxypropoxy)butane:

Species: Rabbit

Method: OECD Test Guideline 404

Result: Skin irritation

GLP: yes

2-Propenoic acid, reaction products with dipentaerythritol:

Species: Rabbit

Method: OECD Test Guideline 404

Result: No skin irritation

**Serious eye damage/eye irritation****Components:**

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Phenol, polymer with formaldehyde, glycidyl ether:

Species: Rabbit

Method: OECD Test Guideline 405

Result: Irritating to eyes.

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol (BPFEDGE):

Species: Rabbit

Method: OECD Test Guideline 405

Result: No eye irritation

1,4-Bis(2,3-epoxypropoxy)butane:

Species: Rabbit

Assessment: Risk of serious damage to eyes.

Method: OECD Test Guideline 405

GLP: yes

2-Propenoic acid, reaction products with dipentaerythritol:

Species: Rabbit

Method: OECD Test Guideline 405

Result: Eye irritation

### Respiratory or skin sensitisation

#### Components:

Phenol, polymer with formaldehyde, glycidyl ether:

Exposure routes: Skin

Species: Mouse

Method: OECD Test Guideline 429

Result: May cause sensitisation by skin contact.

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol (BPFEDGE):

Exposure routes: Skin

Species: Mouse

Method: OECD Test Guideline 429

Result: May cause sensitisation by skin contact.

1,4-Bis(2,3-epoxypropoxy)butane:

Exposure routes: Skin

Species: Guinea pig

Method: OECD Test Guideline 406

Result: May cause sensitisation by skin contact.

GLP: yes

2-Propenoic acid, reaction products with dipentaerythritol:

Test Type: Local lymph node assay (LLNA)

Exposure routes: Skin

Species: Mouse

Method: OECD Test Guideline 429

Result: The product is a skin sensitizer, sub-category 1A.

#### Components:

1,4-Bis(2,3-epoxypropoxy)butane:

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Assessment: Harmful if inhaled.

**Germ cell mutagenicity****Components:**

Phenol, polymer with formaldehyde, glycidyl ether:

 Genotoxicity in vitro : Metabolic activation: with and without metabolic activation  
 Result: positive

 : Concentration: 0 - 5000 ug/plate  
 Metabolic activation: with and without metabolic activation  
 Result: positive

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol (BPFEDGE):

 Genotoxicity in vitro : Metabolic activation: with and without metabolic activation  
 Method: OECD Test Guideline 471  
 Result: positive

 : Metabolic activation: with and without metabolic activation  
 Method: OECD Test Guideline 473  
 Result: positive

 : Metabolic activation: with and without metabolic activation  
 Method: OECD Test Guideline 476  
 Result: positive

1,4-Bis(2,3-epoxypropoxy)butane:

 Genotoxicity in vitro : Test Type: reverse mutation assay  
 Concentration: 10 - 5000 ug/plate  
 Metabolic activation: with and without metabolic activation  
 Method: OECD Test Guideline 471  
 Result: positive  
 GLP: yes  
 Remarks: Not classified due to data which are conclusive although insufficient for classification.

 : Test Type: Chromosome aberration test in vitro  
 Test system: Chinese hamster lung cells  
 Concentration: 1 - 100 µg/L  
 Metabolic activation: with and without metabolic activation  
 Method: OECD Test Guideline 473  
 Result: positive  
 GLP: yes  
 Remarks: Not classified due to data which are conclusive although insufficient for classification.

: Test Type: In vitro mammalian cell gene mutation test

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Test system: Chinese hamster lung cells  
Metabolic activation: with and without metabolic activation  
Method: OECD Test Guideline 476  
Result: positive  
GLP: no  
Remarks: Not classified due to data which are conclusive although insufficient for classification.

2-Propenoic acid, reaction products with dipentaerythritol:

Genotoxicity in vitro : Test Type: Ames test  
Test system: Salmonella tryphimurium and E. coli  
Metabolic activation: with and without metabolic activation  
Method: OECD Test Guideline 471  
Result: negative

### Components:

Phenol, polymer with formaldehyde, glycidyl ether:

Genotoxicity in vivo : Cell type: Germ  
Application Route: Oral  
Result: negative

Cell type: Somatic  
Application Route: Oral  
Dose: 0 - 5000 mg/kg  
Result: negative

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol (BPFEDGE):

Genotoxicity in vivo : Cell type: Somatic  
Application Route: Oral  
Exposure time: 48 h  
Dose: 2000 mg/kg  
Method: OECD Test Guideline 474  
Result: negative

Cell type: Somatic  
Application Route: Oral  
Dose: 2000 mg/kg  
Method: OECD Test Guideline 486  
Result: negative

1,4-Bis(2,3-epoxypropoxy)butane:

Genotoxicity in vivo : Test Type: In vivo micronucleus test  
Test species: Mouse (male)  
Cell type: Somatic  
Application Route: Oral  
Exposure time: 4 d  
Dose: 187.5 - 750 mg/kg

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Method: OECD Test Guideline 474  
Result: negative  
GLP: yes

Test Type: unscheduled DNA synthesis assay  
Test species: Rat  
Cell type: Liver cells  
Application Route: Oral  
Method: OECD Test Guideline 486  
Result: negative

2-Propenoic acid, reaction products with dipentaerythritol:

Genotoxicity in vivo : Test Type: Micronucleus test  
Test species: Mouse (male and female)  
Method: OECD Test Guideline 474  
Result: negative

**Components:**

1,4-Bis(2,3-epoxypropoxy)butane:

Germ cell mutagenicity- : Weight of evidence does not support classification as a germ  
Assessment cell mutagen., Animal testing did not show any mutagenic  
effects.

**Carcinogenicity****Components:**

Phenol, polymer with formaldehyde, glycidyl ether:

Species: Rat, male and female  
Application Route: Oral  
Exposure time: 24 month(s)  
Dose: 15 mg/kg  
Frequency of Treatment: 7 daily  
Method: OECD Test Guideline 453  
Result: negative

Species: Mouse, male  
Application Route: Dermal  
Exposure time: 24 month(s)  
Dose: .1 mg/kg  
Frequency of Treatment: 3 daily  
Method: OECD Test Guideline 453  
Result: negative

Species: Rat, female  
Application Route: Dermal  
Exposure time: 24 month(s)  
Dose: 1 mg/kg  
Frequency of Treatment: 5 daily  
Method: OECD Test Guideline 453  
Result: negative

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2-Propenoic acid, reaction products with dipentaerythritol:

Species: Rat, male and female

Application Route: inhalation (vapour)

Dose: 0, 12.8, 32 or 80 ppm

12,8 ppm

Method: OECD Test Guideline 451

Carcinogenicity - : No data available  
Assessment

### Reproductive toxicity

#### Components:

Phenol, polymer with formaldehyde, glycidyl ether:

Effects on fertility : Species: Rat, male and female

Application Route: Oral

Method: OECD Test Guideline 416

Result: No effects on fertility and early embryonic development were detected.

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol (BPFDE):

Species: Rat, male and female

Application Route: Oral

Method: OECD Test Guideline 416

Result: No effects on fertility and early embryonic development were detected.

#### Components:

Phenol, polymer with formaldehyde, glycidyl ether:

Effects on foetal : Species: Rabbit, female

development

Application Route: Dermal

General Toxicity Maternal: No observed adverse effect level:  
30 mg/kg body weight

Result: No teratogenic effects

Species: Rabbit, female

Application Route: Oral

General Toxicity Maternal: No observed adverse effect level:  
60 mg/kg body weight

Method: OECD Test Guideline 414

Result: No teratogenic effects

Species: Rat, female

Application Route: Oral

General Toxicity Maternal: No observed adverse effect level:  
180 mg/kg body weight

Method: OECD Test Guideline 414

Result: No teratogenic effects

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol (BPFDE):

Species: Rabbit, female

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Application Route: Dermal  
General Toxicity Maternal: No observed adverse effect level:  
30 mg/kg body weight  
Result: No teratogenic effects

**1,4-Bis(2,3-epoxypropoxy)butane:**

Test Type: Pre-natal  
Species: Rat, female  
Application Route: Oral  
Dose: 0/30/100/300 mg/kg bw/day  
Duration of Single Treatment: 17 d  
General Toxicity Maternal: No observed adverse effect level:  
300 mg/kg body weight  
Developmental Toxicity: No observed adverse effect level:  
300 mg/kg body weight  
Method: OECD Test Guideline 414  
GLP: yes  
Remarks: Information given is based on data obtained from  
similar substances.

Reproductive toxicity - : No data available  
Assessment

**STOT - single exposure**

No data available

**STOT - repeated exposure**

No data available

**Repeated dose toxicity****Components:**

Phenol, polymer with formaldehyde, glycidyl ether:  
Species: Rat, male and female  
NOAEL: 50 mg/kg  
Application Route: Ingestion  
Exposure time: 14 WeeksNumber of exposures: 7 d  
Method: Subchronic toxicity

Species: Rat, male and female  
NOEL: 10 mg/kg  
Application Route: Skin contact  
Exposure time: 13 WeeksNumber of exposures: 5 d  
Method: Subchronic toxicity

Species: Mouse, male  
NOAEL: 100 mg/kg  
Application Route: Skin contact  
Exposure time: 13 WeeksNumber of exposures: 3 d  
Method: Subchronic toxicity

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol  
(BPFDEG):

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Species: Rat, male and female  
NOAEL: 250 mg/kg  
Application Route: Ingestion  
Exposure time: 13 Weeks Number of exposures: 7 d  
Method: Subchronic toxicity

1,4-Bis(2,3-epoxypropoxy)butane:  
Species: Rat, male and female  
NOAEL: 200 mg/kg  
Application Route: Oral  
Exposure time: 28 d Number of exposures: daily  
Dose: 25, 100, 200, 400 mg/kg  
Method: Subacute toxicity

Species: Rat, male and female  
NOAEL: 263 mg/kg  
Application Route: Oral  
Exposure time: 90 h Number of exposures: daily  
Dose: 0,30,100,300 mg/kg bw/day  
Method: OECD Test Guideline 408  
GLP: yes  
Remarks: Information given is based on data obtained from similar substances.

### **Components:**

1,4-Bis(2,3-epoxypropoxy)butane:  
Repeated dose toxicity - : Harmful if inhaled.  
Assessment

### **Aspiration toxicity**

No data available

## 11.2 Information on other hazards

### **Endocrine disrupting properties**

#### **Product:**

Assessment : The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

### **Experience with human exposure**

General Information: No data available

Inhalation: No data available

Skin contact: No data available

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Eye contact: No data available

Ingestion: No data available

**Toxicology, Metabolism, Distribution**

No data available

**Neurological effects**

No data available

**Further information**

Ingestion: No data available

---

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

Phenol, polymer with formaldehyde, glycidyl ether:

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 1,5 mg/l  
Exposure time: 96 h  
Test Type: static test  
Test substance: Fresh water  
Method: OECD Test Guideline 203

Toxicity to daphnia and other : EC50 (Daphnia magna (Water flea)): 1,7 mg/l  
aquatic invertebrates Exposure time: 48 h  
Test Type: static test  
Test substance: Fresh water  
Method: OECD Test Guideline 202

EC50 (Daphnia magna (Water flea)): 2,7 mg/l  
Exposure time: 48 h  
Test Type: static test  
Test substance: Fresh water

Toxicity to algae/aquatic : EC50 (Selenastrum capricornutum (green algae)): 9,4 mg/l  
plants Exposure time: 72 h  
Test Type: static test  
Test substance: Fresh water

Toxicity to microorganisms : IC50 (activated sludge): > 100 mg/l  
Exposure time: 3 h  
Test Type: static test  
Test substance: Fresh water

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Toxicity to fish (Chronic toxicity) : GLP: yes

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC: 0,3 mg/l  
Exposure time: 21 d  
Species: Daphnia magna (Water flea)  
Test Type: semi-static test  
Test substance: Fresh water  
Method: OECD Test Guideline 211

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol (BPFGE):

Toxicity to fish : LC50 (Fish): 2,54 mg/l  
Exposure time: 96 h  
Method: Calculation method

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 2,55 mg/l  
Exposure time: 48 h  
Method: Calculation method

Toxicity to algae/aquatic plants : EC50 (Selenastrum capricornutum (green algae)): 1,8 mg/l  
Exposure time: 72 h  
Test Type: static test  
Test substance: Fresh water  
Method: OECD Test Guideline 201

Toxicity to microorganisms : IC50 (activated sludge): > 100 mg/l  
Exposure time: 3 h  
Test Type: static test  
Test substance: Fresh water

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC: 0,3 mg/l  
Exposure time: 21 d  
Species: Daphnia magna (Water flea)  
Test Type: semi-static test  
Test substance: Fresh water  
Method: OECD Test Guideline 211  
Remarks: Information given is based on data obtained from similar substances.

1,4-Bis(2,3-epoxypropoxy)butane:

Toxicity to fish : LC50 (Brachydanio rerio (zebrafish)): 24 mg/l  
End point: mortality  
Exposure time: 96 h  
Test Type: static test  
Analytical monitoring: no  
Test substance: Fresh water  
Method: OECD Test Guideline 203  
GLP: no

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 75 mg/l  
End point: Immobilization  
Exposure time: 24 h  
Test Type: static test  
Analytical monitoring: no  
Test substance: Fresh water

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 Method: OECD Test Guideline 202  
 GLP: no

Toxicity to algae/aquatic plants : EL50 (*Pseudokirchneriella subcapitata* (green algae)): > 160 mg/l  
 Exposure time: 72 h  
 Test Type: static test  
 Analytical monitoring: yes  
 Test substance: Fresh water  
 Method: OECD Test Guideline 201  
 GLP: yes

NOELR (*Pseudokirchneriella subcapitata* (green algae)): 40 mg/l  
 Exposure time: 72 h  
 Test Type: static test  
 Analytical monitoring: yes  
 Test substance: Fresh water  
 Method: OECD Test Guideline 201  
 GLP: yes

Toxicity to microorganisms : IC50 (activated sludge): > 100 mg/l  
 Exposure time: 3 h  
 Test Type: static test  
 Analytical monitoring: no  
 Test substance: Fresh water  
 Method: OECD Test Guideline 209  
 GLP: no

2-Propenoic acid, reaction products with dipentaerythritol:

Toxicity to fish : LL50 (*Cyprinus carpio* (Carp)): 13 mg/l  
 Exposure time: 96 h  
 Test Type: static test  
 Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates : EC50 (*Daphnia magna* (Water flea)): 18 mg/l  
 Exposure time: 48 h  
 Test Type: static test  
 Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : EL50 (*Pseudokirchneriella subcapitata* (green algae)): > 100 mg/l  
 Exposure time: 72 h  
 Test Type: static test  
 Method: OECD Test Guideline 201  
 GLP: yes

**12.2 Persistence and degradability**
**Components:**

Phenol, polymer with formaldehyde, glycidyl ether:

Biodegradability : Inoculum: Sewage (STP effluent)  
 Concentration: 20 mg/l  
 Result: Not readily biodegradable.

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Biodegradation: 5 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301F

Stability in water : Degradation half life (DT50): 4,83 d (25 °C)  
pH: 4  
Method: OECD Test Guideline 111  
Remarks: Fresh water

Degradation half life (DT50): 7,1 d (25 °C)  
pH: 9  
Method: OECD Test Guideline 111  
Remarks: Fresh water

Degradation half life (DT50): 3,58 d (25 °C)  
pH: 7  
Method: OECD Test Guideline 111  
Remarks: Fresh water

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol (BPFEDGE):

Biodegradability : Inoculum: activated sludge  
Concentration: 3 mg/l  
Result: Not biodegradable  
Biodegradation: ca. 0 %  
Exposure time: 28 d  
Method: Directive 67/548/EEC Annex V, C.4.E.

1,4-Bis(2,3-epoxypropoxy)butane:

Biodegradability : Test Type: aerobic  
Inoculum: activated sludge  
Concentration: 20 mg/l  
Result: Not readily biodegradable.  
Biodegradation: 43 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301F  
GLP: yes

Test Type: aerobic  
Inoculum: Sewage (STP effluent)  
Concentration: 20 mg/l  
Result: Not readily biodegradable.  
Biodegradation: 38 %  
Related to: Dissolved organic carbon (DOC)  
Exposure time: 28 d  
Method: OECD Test Guideline 301E  
GLP: no

2-Propenoic acid, reaction products with dipentaerythritol:

Biodegradability : Test Type: aerobic  
Inoculum: activated sludge  
Concentration: 18 mg/l  
Result: Not biodegradable  
Biodegradation: 0 %

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Exposure time: 28 d  
 Method: OECD Test Guideline 301B

**12.3 Bioaccumulative potential**
**Components:**

Phenol, polymer with formaldehyde, glycidyl ether:

Bioaccumulation : Bioconcentration factor (BCF): 31  
 Remarks: Does not bioaccumulate.

Partition coefficient: n-octanol/water : log Pow: 3,242 (25 °C)  
 pH: 7,1  
 Method: OECD Test Guideline 117

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol (BPFDEGE):

Bioaccumulation : Species: Fish  
 Bioconcentration factor (BCF): 150  
 Remarks: Does not bioaccumulate.

Partition coefficient: n-octanol/water : log Pow: 2,7 - 3,6  
 Method: OECD Test Guideline 117

1,4-Bis(2,3-epoxypropoxy)butane:

Partition coefficient: n-octanol/water : log Pow: -0,269 (25 °C)  
 pH: 6,7  
 Method: OECD Test Guideline 117  
 GLP: yes

**12.4 Mobility in soil**
**Components:**

Phenol, polymer with formaldehyde, glycidyl ether:

Distribution among environmental compartments : Koc: 445

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol (BPFDEGE):

Distribution among environmental compartments : Koc: 4460  
 Method: OECD Test Guideline 121

1,4-Bis(2,3-epoxypropoxy)butane:

Distribution among environmental compartments : Koc: 12,59  
 Method: OECD Test Guideline 121

**12.5 Results of PBT and vPvB assessment**
**Product:**

Assessment : This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher..

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### 12.6 Endocrine disrupting properties

**Product:**

Assessment : The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

### 12.7 Other adverse effects

**Product:**

Additional ecological information : An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.  
Toxic to aquatic life with long lasting effects.

## SECTION 13: Disposal considerations

### 13.1 Waste treatment methods

Product : The product should not be allowed to enter drains, water courses or the soil.  
Do not contaminate ponds, waterways or ditches with chemical or used container.  
Send to a licensed waste management company.  
Dispose of as hazardous waste in compliance with local and national regulations.  
Dispose of contents/ container to an approved waste disposal plant.

Contaminated packaging : Empty remaining contents.  
Dispose of as unused product.  
Do not re-use empty containers.

## SECTION 14: Transport information

**IATA**

**14.1 UN number or ID number** : UN 3082

**14.2 UN proper shipping name** : Environmentally hazardous substance, liquid, n.o.s.  
(EPOXY RESIN)

**14.3 Transport hazard class(es)** : 9

**14.4 Packing group** : III

Labels : Miscellaneous

Packing instruction (cargo aircraft) : 964

Packing instruction (passenger aircraft) : 964

**IMDG**

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**14.1 UN number or ID number** : UN 3082  
**14.2 UN proper shipping name** : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (EPOXY RESIN)  
**14.3 Transport hazard class(es)** : 9  
**14.4 Packing group** : III  
 Labels : 9  
 EmS Code : F-A, S-F  
**14.5 Environmental hazards**  
 Marine pollutant : yes

**ADR**

**14.1 UN number or ID number** : UN 3082  
**14.2 UN proper shipping name** : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (EPOXY RESIN)  
**14.3 Transport hazard class(es)** : 9  
**14.4 Packing group** : III  
 Labels : 9  
**14.5 Environmental hazards**  
 Environmentally hazardous : yes

**RID**

**14.1 UN number or ID number** : UN 3082  
**14.2 UN proper shipping name** : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (EPOXY RESIN)  
**14.3 Transport hazard class(es)** : 9  
**14.4 Packing group** : III  
 Labels : 9  
**14.5 Environmental hazards**  
 Environmentally hazardous : yes

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

Not applicable for product as supplied.

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

REACH - List of substances subject to authorisation (Annex XIV) : Not applicable

REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59). : This product does not contain substances of very high concern (Regulation (EC) No 1907/2006 (REACH), Article 57).

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Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances.

E2 ENVIRONMENTAL  
HAZARDS

Water contaminating class : WGK 2 obviously hazardous to water  
(Germany) Classification according to AwSV, Annex 1 (5.2)

TA Luft List (Germany) : Total dust:  
Not applicable  
: Inorganic substances in powdered form:  
Not applicable  
: Inorganic substances in vapour or gaseous form:  
Not applicable  
: Organic Substances:  
Not applicable  
: Carcinogenic substances:  
Not applicable  
: Mutagenic:  
Not applicable  
: Toxic to reproduction:  
Not applicable

Other regulations:

Take note of Directive 94/33/EC on the protection of young people at work or stricter national regulations, where applicable.

### The components of this product are reported in the following inventories:

DSL : This product contains one or several components listed in the Canadian NDSL.

AIIC : On the inventory, or in compliance with the inventory

NZIoC : Not in compliance with the inventory

ENCS : On the inventory, or in compliance with the inventory

KECI : On the inventory, or in compliance with the inventory

PICCS : On the inventory, or in compliance with the inventory

IECSC : On the inventory, or in compliance with the inventory

TCSI : On the inventory, or in compliance with the inventory

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TSCA : All substances listed as active on the TSCA inventory

**Inventories**

AICS (Australia), AIIIC (Australia), DSL (Canada), IECSC (China), ENCS (Japan), KECI (Korea), NZIOC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TSCA (United States of America (USA))

**15.2 Chemical safety assessment**

Chemical Safety Assessments for all substances in this product are either Complete or Not applicable.

**SECTION 16: Other information**
**Full text of H-Statements**

|      |                                                      |
|------|------------------------------------------------------|
| H302 | : Harmful if swallowed.                              |
| H312 | : Harmful in contact with skin.                      |
| H315 | : Causes skin irritation.                            |
| H317 | : May cause an allergic skin reaction.               |
| H318 | : Causes serious eye damage.                         |
| H319 | : Causes serious eye irritation.                     |
| H332 | : Harmful if inhaled.                                |
| H411 | : Toxic to aquatic life with long lasting effects.   |
| H412 | : Harmful to aquatic life with long lasting effects. |

**Full text of other abbreviations**

|                 |                            |
|-----------------|----------------------------|
| Acute Tox.      | : Acute toxicity           |
| Aquatic Chronic | : Chronic aquatic toxicity |
| Eye Dam.        | : Serious eye damage       |
| Eye Irrit.      | : Eye irritation           |
| Skin Irrit.     | : Skin irritation          |
| Skin Sens.      | : Skin sensitisation       |

**Further information**
**Classification of the mixture:**

|                   |      |
|-------------------|------|
| Skin Irrit. 2     | H315 |
| Eye Dam. 1        | H318 |
| Skin Sens. 1      | H317 |
| Aquatic Chronic 2 | H411 |

**Classification procedure:**

|                    |
|--------------------|
| Calculation method |
| Calculation method |
| Calculation method |
| Calculation method |

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IN ALL CASES, IT IS THE RESPONSIBILITY OF THE USER TO DETERMINE THE APPLICABILITY OF SUCH INFORMATION AND RECOMMENDATIONS AND THE SUITABILITY OF ANY PRODUCT FOR ITS OWN PARTICULAR PURPOSE.

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THE PRODUCT MAY PRESENT HAZARDS AND SHOULD BE USED WITH CAUTION. WHILE CERTAIN HAZARDS ARE DESCRIBED IN THIS PUBLICATION, NO GUARANTEE IS MADE THAT THESE ARE THE ONLY HAZARDS THAT EXIST.

Hazards, toxicity and behaviour of the products may differ when used with other materials and are dependent upon the manufacturing circumstances or other processes. Such hazards, toxicity and behaviour should be determined by the user and made known to handlers, processors and end users.

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**SECTION 1: Identification of the substance/mixture and of the company/undertaking****1.1 Product identifier**

Trade name : PFAUDLER UF 3000 B

Unique Formula Identifier (UFI) : NPU3-P0QG-J006-XD68

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

Use of the Substance/Mixture : Hardener

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

Company : Huntsman Advanced Materials (Europe)BVBA  
Address : Everslaan 45  
3078 Everberg  
Belgium

Telephone : +41 61 299 20 41  
Telefax : +41 61 299 20 40

E-mail address of person responsible for the SDS : [REDACTED]@huntsman.com

**1.4 Emergency telephone number**

Emergency telephone number : Berlin: 0049 30 19 24 0 & 0049 30 30 68 6 7 11  
Bonn: 0049 228 19 27 0 & 0049 228 28 7 3 32 11  
Erfurt: 0049 361 73 07 30  
Freiburg: 0049 761 16 24 0  
Göttingen: 0049 51 19 24 0 & 0049 551 38 31 80  
Homburg: 0049 6841 19 24 0  
Mainz: 0049 6131 19 24 0 & 0049 6131 23 24 66  
München: 0049 89 19 24 0  
Nürnberg: 0049 911 39 8 2 45 1  
EUROPE: [REDACTED]  
France ORFILA: +33(0)145425959  
ASIA: +65 6336-6011  
China: +86 20 39377888  
+86 532 83889090  
India: + 91 22 42 87 5333  
Australia: 1800 786 152  
New Zealand: 0800 767 437  
USA: [REDACTED]

**SECTION 2: Hazards identification****2.1 Classification of the substance or mixture****Classification (REGULATION (EC) No 1272/2008)**

Acute toxicity, Category 4

H332: Harmful if inhaled.

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|                                      |                                                        |
|--------------------------------------|--------------------------------------------------------|
| Skin corrosion, Sub-category 1B      | H314: Causes severe skin burns and eye damage.         |
| Serious eye damage, Category 1       | H318: Causes serious eye damage.                       |
| Skin sensitisation, Category 1       | H317: May cause an allergic skin reaction.             |
| Reproductive toxicity, Category 1B   | H360F: May damage fertility.                           |
| Chronic aquatic toxicity, Category 2 | H411: Toxic to aquatic life with long lasting effects. |

### 2.2 Label elements

#### Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms :



Signal word : Danger

|                   |   |       |                                                  |
|-------------------|---|-------|--------------------------------------------------|
| Hazard statements | : | H314  | Causes severe skin burns and eye damage.         |
|                   |   | H317  | May cause an allergic skin reaction.             |
|                   |   | H332  | Harmful if inhaled.                              |
|                   |   | H360F | May damage fertility.                            |
|                   |   | H411  | Toxic to aquatic life with long lasting effects. |

|                          |   |                           |                                                                                                                                                                            |
|--------------------------|---|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Precautionary statements | : | <b>Prevention:</b>        |                                                                                                                                                                            |
|                          |   | P201                      | Obtain special instructions before use.                                                                                                                                    |
|                          |   | P273                      | Avoid release to the environment.                                                                                                                                          |
|                          |   | P280                      | Wear protective gloves/ protective clothing/ eye protection/ face protection/ hearing protection.                                                                          |
|                          |   | <b>Response:</b>          |                                                                                                                                                                            |
|                          |   | P303 + P361 + P353        | IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.                                                                               |
|                          |   | P304 + P340 + P310        | IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/ doctor.                                                       |
|                          |   | P305 + P351 + P338 + P310 | IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/ doctor. |
|                          |   | P308 + P313               | IF exposed or concerned: Get medical advice/ attention.                                                                                                                    |
|                          |   | P391                      | Collect spillage.                                                                                                                                                          |

Hazardous components which must be listed on the label:

Reaction products of fatty acid dimers and trimers, C18 (unsaturated) alkyl and fatty acids, C18 (unsaturated) alkyl with amines, polyethylenepoly-, triethylenetetramine fraction

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2,2'-Iminodi(ethylamine)

Amines, polyethylenepoly-, pentaethylenehexamine fraction

4,4'-Isopropylidenediphenol

**Additional Labelling:**

Restricted to professional users.

**2.3 Other hazards**

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

Ecological information: This substance/mixture contains components considered to have endocrine disrupting properties for environment, according to REACH Article 57(f), Commission Regulation (EU) 2018/605 or Commission Delegated Regulation (EU) 2017/2100.

Toxicological information: This substance/mixture contains components considered to have endocrine disrupting properties affecting human health, according to REACH Article 57(f), Commission Regulation (EU) 2018/605 or Commission Delegated Regulation (EU) 2017/2100.

**SECTION 3: Composition/information on ingredients**
**3.2 Mixtures****Hazardous components**

| Chemical name                                                                                                                                                                         | CAS-No.<br>EC-No.<br>Index-No.<br>Registration number     | Classification                                                                                                                                                             | Concentration<br>(% w/w) |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| Reaction products of fatty acid dimers and trimers, C18 (unsaturated), alkyl and fatty acids, C18 (unsaturated) alkyl with amines,, polyethylenepoly-, triethylenetetramine fraction, | Not Assigned<br>-<br>01-2119972322-40                     | Skin Irrit. 2; H315<br>Eye Dam. 1; H318<br>Skin Sens. 1A; H317<br>Aquatic Chronic 2; H411                                                                                  | >= 10 -<br>< 20          |
| 2,2'-Iminodi(ethylamine)                                                                                                                                                              | 111-40-0<br>203-865-4<br>612-058-00-X<br>01-2119473793-27 | Acute Tox. 4; H302<br>Acute Tox. 2; H330<br>Acute Tox. 4; H312<br>Skin Corr. 1B; H314<br>Eye Dam. 1; H318<br>Skin Sens. 1; H317<br>STOT SE 3; H335<br>(Respiratory system) | >= 5 - <<br>10           |
| Amines, polyethylenepoly-, pentaethylenehexamine fraction                                                                                                                             | Not Assigned<br>-<br>01-2119485826-22                     | Acute Tox. 4; H302<br>Acute Tox. 4; H312<br>Skin Corr. 1B; H314<br>Eye Dam. 1; H318<br>Skin Sens. 1; H317<br>Aquatic Acute 1; H400                                         | >= 5 - <<br>10           |

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|                             |                                                          |                                                                                                                                                                                     |                |
|-----------------------------|----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
|                             |                                                          | Aquatic Chronic 1;<br>H410                                                                                                                                                          |                |
|                             |                                                          | M-Factor (Acute<br>aquatic toxicity): 1<br>M-Factor (Chronic<br>aquatic toxicity): 1                                                                                                |                |
| 4,4'-Isopropylidenediphenol | 80-05-7<br>201-245-8<br>604-030-00-0<br>01-2119457856-23 | Eye Dam. 1; H318<br>Skin Sens. 1; H317<br>Repr. 1B; H360F<br>STOT SE 3; H335<br>(Respiratory system)<br>Aquatic Chronic 2;<br>H411<br><br>M-Factor (Chronic<br>aquatic toxicity): 1 | >= 3 - <<br>10 |

For explanation of abbreviations see section 16.

## SECTION 4: First aid measures

### 4.1 Description of first aid measures

- General advice : Move out of dangerous area.  
Consult a physician.  
Show this safety data sheet to the doctor in attendance.  
Treat symptomatically.  
Get medical attention if symptoms occur.
- Protection of first-aiders : First Aid responders should pay attention to self-protection and use the recommended protective clothing  
If potential for exposure exists refer to Section 8 for specific personal protective equipment.  
Avoid inhalation, ingestion and contact with skin and eyes.  
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.
- If inhaled : Consult a physician after significant exposure.  
If inhaled, remove to fresh air.  
Get medical attention if symptoms occur.
- In case of skin contact : Immediate medical treatment is necessary as untreated wounds from corrosion of the skin heal slowly and with difficulty.  
If on skin, rinse well with water.  
If on clothes, remove clothes.
- In case of eye contact : Small amounts splashed into eyes can cause irreversible tissue damage and blindness.

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In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.  
 Continue rinsing eyes during transport to hospital.  
 Remove contact lenses.  
 Keep eye wide open while rinsing.  
 If eye irritation persists, consult a specialist.

If swallowed : Keep respiratory tract clear.  
 Do NOT induce vomiting.  
 Never give anything by mouth to an unconscious person.  
 If symptoms persist, call a physician.  
 Take victim immediately to hospital.

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

None known.

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

Treatment : Treat symptomatically.

---

**SECTION 5: Firefighting measures**
**5.1 Extinguishing media**

Suitable extinguishing media : Water spray  
 Alcohol-resistant foam  
 Carbon dioxide (CO<sub>2</sub>)  
 Dry chemical

Unsuitable extinguishing media : Exercise caution when using a high volume water jet as it may scatter and spread fire

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

Specific hazards during firefighting : Do not allow run-off from fire fighting to enter drains or water courses.

**5.3 Advice for firefighters**

Special protective equipment for firefighters : Wear self-contained breathing apparatus for firefighting if necessary.

Specific extinguishing methods : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Further information : Collect contaminated fire extinguishing water separately. This must not be discharged into drains.  
 Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

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### **SECTION 6: Accidental release measures**

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

Personal precautions : Use personal protective equipment.  
Ensure adequate ventilation.  
Refer to protective measures listed in sections 7 and 8.

#### **6.2 Environmental precautions**

Environmental precautions : Prevent product from entering drains.  
Prevent further leakage or spillage if safe to do so.  
If the product contaminates rivers and lakes or drains inform respective authorities.

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

Methods for cleaning up : Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).  
Keep in suitable, closed containers for disposal.

#### **6.4 Reference to other sections**

For disposal considerations see section 13., See Section 1 for emergency contact information., For personal protection see section 8.

### **SECTION 7: Handling and storage**

#### **7.1 Precautions for safe handling**

Advice on safe handling : Repeated or prolonged skin contact may cause skin irritation and/or dermatitis and sensitisation of susceptible persons.  
Persons suffering from asthma, eczema or skin problems should avoid contact, including dermal contact, with this product.  
Avoid formation of aerosol.  
Do not breathe vapours/dust.  
Avoid exposure - obtain special instructions before use.  
Avoid contact with skin and eyes.  
For personal protection see section 8.  
Smoking, eating and drinking should be prohibited in the application area.  
Provide sufficient air exchange and/or exhaust in work rooms.  
To avoid spills during handling keep bottle on a metal tray.  
Dispose of rinse water in accordance with local and national regulations.

Advice on protection against fire and explosion : Normal measures for preventive fire protection.

Hygiene measures : When using do not eat or drink. When using do not smoke.  
Wash hands before breaks and at the end of workday.

#### **7.2 Conditions for safe storage, including any incompatibilities**

Requirements for storage : Keep container tightly closed in a dry and well-ventilated

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areas and containers place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Keep in properly labelled containers.

Advice on common storage : For incompatible materials please refer to Section 10 of this SDS.

Storage class (TRGS 510) : 6.1C, Combustible, acute toxic Cat.3 / toxic compounds or compounds which causing chronic effects

Recommended storage temperature : 2 - 40 °C

Further information on storage stability : Stable under normal conditions.

**7.3 Specific end use(s)**

Specific use(s) : No data available

**SECTION 8: Exposure controls/personal protection**
**8.1 Control parameters**
**Occupational Exposure Limits**

| Components                              | CAS-No.                                                                                                             | Value type (Form of exposure) | Control parameters  | Basis       |
|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------|-------------|
| 4,4'-Isopropylidenediph enol            | 80-05-7                                                                                                             | AGW (Inhalable fraction)      | 5 mg/m <sup>3</sup> | DE TRGS 900 |
| Peak-limit: excursion factor (category) | 1;(I)                                                                                                               |                               |                     |             |
| Further information                     | When there is compliance with the OEL and biological tolerance values, there is no risk of harming the unborn child |                               |                     |             |
|                                         |                                                                                                                     | TWA (inhalable fraction)      | 2 mg/m <sup>3</sup> | 2017/164/EU |
| Further information                     | Indicative                                                                                                          |                               |                     |             |

**Derived No Effect Level (DNEL) according to Regulation (EC) No. 1907/2006:**

| Substance name         | End Use | Exposure routes | Potential health effects   | Value                  |
|------------------------|---------|-----------------|----------------------------|------------------------|
| 2,2'-iminodiethylamine | Workers | Inhalation      | Long-term systemic effects | 15,4 mg/m <sup>3</sup> |
|                        | Workers | Inhalation      | Acute systemic effects     | 92,1 mg/m <sup>3</sup> |
|                        | Workers | Inhalation      | Long-term local effects    | 0,87 mg/m <sup>3</sup> |
|                        | Workers | Inhalation      | Acute local effects        | 2,6 mg/m <sup>3</sup>  |
|                        | Workers | Dermal          | Long-term systemic effects | 11,4 mg/kg             |

**SAFETY DATA SHEET**

according to Regulation (EC) No. 1907/2006

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|                                            |           |            |                                       | bw/day            |
|--------------------------------------------|-----------|------------|---------------------------------------|-------------------|
|                                            | Workers   | Dermal     | Long-term local effects               | 1,1 mg/cm2        |
|                                            | Consumers | Inhalation | Long-term systemic effects            | 4,6 mg/m3         |
|                                            | Consumers | Inhalation | Acute systemic effects                | 27,5 mg/m3        |
|                                            | Consumers | Dermal     | Long-term systemic effects            | 4,88 mg/kg bw/day |
|                                            | Consumers | Dermal     | Acute systemic effects                | 4,88 mg/kg bw/day |
| 3,6,9,12-tetraazatetradecamethylenediamine | Workers   | Inhalation | Systemic effects, Long-term exposure  | 1,59 mg/m3        |
|                                            | Workers   | Dermal     | Systemic effects, Long-term exposure  | 0,91 mg/kg bw/day |
|                                            | Workers   | Dermal     | Local effects, Long-term exposure     | 1,59 mg/cm2       |
|                                            | Workers   | Dermal     | Local effects, Long-term exposure     | 0,44 mg/cm2       |
|                                            | Workers   | Inhalation | Systemic effects, Short-term exposure | 8550 mg/m3        |
|                                            | Consumers | Dermal     | Systemic effects, Long-term exposure  | 4 mg/kg bw/day    |
|                                            | Consumers | Inhalation | Systemic effects, Short-term exposure | 2542 mg/m3        |
|                                            | Consumers | Oral       | Systemic effects, Short-term exposure | 32 mg/kg bw/day   |
|                                            | Consumers | Dermal     | Local effects, Short-term exposure    | 1,59 mg/cm2       |
|                                            | Consumers | Dermal     | Systemic effects, Short-term exposure | 13 mg/kg bw/day   |
|                                            | Consumers | Inhalation | Systemic effects, Long-term exposure  | 0,46 mg/m3        |
|                                            | Consumers | Oral       | Systemic effects, Long-term exposure  | 0,65 mg/kg bw/day |
|                                            | Consumers | Dermal     | Local effects, Long-term exposure     | 0,68 mg/cm2       |
| 2,2'-Iminodi(ethylamine)                   | Workers   | Inhalation | Long-term systemic effects            | 15,4 mg/m3        |
|                                            | Workers   | Inhalation | Acute systemic effects                | 92,1 mg/m3        |
|                                            | Workers   | Inhalation | Long-term local effects               | 0,87 mg/m3        |
|                                            | Workers   | Inhalation | Acute local effects                   | 2,6 mg/m3         |
|                                            | Workers   | Dermal     | Long-term systemic effects            | 11,4 mg/kg bw/day |
|                                            | Workers   | Dermal     | Long-term local                       | 1,1 mg/cm2        |

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|  |           |            |                            |                   |
|--|-----------|------------|----------------------------|-------------------|
|  |           |            | effects                    |                   |
|  | Consumers | Inhalation | Long-term systemic effects | 4,6 mg/m3         |
|  | Consumers | Inhalation | Acute systemic effects     | 27,5 mg/m3        |
|  | Consumers | Dermal     | Long-term systemic effects | 4,88 mg/kg bw/day |
|  | Consumers | Dermal     | Acute systemic effects     | 4,88 mg/kg bw/day |

**Predicted No Effect Concentration (PNEC) according to Regulation (EC) No. 1907/2006:**

| Substance name                                                | Environmental Compartment | Value                         |
|---------------------------------------------------------------|---------------------------|-------------------------------|
| 2,2'-iminodiethylamine                                        | Fresh water               | 0,56 mg/l                     |
|                                                               | Freshwater - intermittent | 0,32 mg/l                     |
|                                                               | Fresh water sediment      | 1072 mg/kg dry weight (d.w.)  |
|                                                               | Marine water              | 0,056 mg/l                    |
|                                                               | Marine sediment           | 107,2 mg/kg dry weight (d.w.) |
|                                                               | Sewage treatment plant    | 6 mg/l                        |
|                                                               | Soil                      | 7,97 mg/kg dry weight (d.w.)  |
| Siloxanes and silicones, di-Me, reaction products with silica | Fresh water sediment      | > 100 mg/kg                   |
| Remarks:                                                      | Assessment Factors        |                               |
|                                                               | Soil                      | 23 mg/kg                      |
|                                                               | Assessment Factors        |                               |
| 3,6,9,12-tetraazatetradecamethylenediamine                    | Fresh water               | 2,5 µg/l                      |
|                                                               | Assessment Factors        |                               |
|                                                               | Marine water              | 2,5 µg/l                      |
|                                                               | Assessment Factors        |                               |
|                                                               | Freshwater - intermittent | 25 µg/l                       |
|                                                               | Assessment Factors        |                               |
|                                                               | Fresh water sediment      | 0,22 mg/kg                    |
|                                                               | Equilibrium method        |                               |
|                                                               | Marine sediment           | 0,14 mg/kg                    |
|                                                               | Equilibrium method        |                               |
|                                                               | Soil                      | 0,18 mg/kg                    |
|                                                               | Equilibrium method        |                               |

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|                                                               |                           |                               |
|---------------------------------------------------------------|---------------------------|-------------------------------|
|                                                               | Sewage treatment plant    | 1,64 mg/l                     |
|                                                               | Secondary Poisoning       | 0,29 mg/kg                    |
|                                                               | Assessment Factors        |                               |
| 2,2'-Iminodi(ethylamine)                                      | Fresh water               | 0,56 mg/l                     |
|                                                               | Freshwater - intermittent | 0,32 mg/l                     |
|                                                               | Fresh water sediment      | 1072 mg/kg dry weight (d.w.)  |
|                                                               | Marine water              | 0,056 mg/l                    |
|                                                               | Marine sediment           | 107,2 mg/kg dry weight (d.w.) |
|                                                               | Sewage treatment plant    | 6 mg/l                        |
|                                                               | Soil                      | 7,97 mg/kg dry weight (d.w.)  |
| Siloxanes and Silicones, di-Me, reaction products with silica | Fresh water sediment      | > 100 mg/kg                   |
|                                                               | Assessment Factors        |                               |
|                                                               | Soil                      | 23 mg/kg                      |
|                                                               | Assessment Factors        |                               |

## 8.2 Exposure controls

### Personal protective equipment

Eye protection : Eye wash bottle with pure water  
Tightly fitting safety goggles  
Wear face-shield and protective suit for abnormal processing problems.

### Hand protection

Material : butyl-rubber  
Break through time : > 8 h

Material : Solvent-resistant gloves (butyl-rubber)

Material : Nitrile rubber  
Break through time : 10 - 480 min

Remarks : 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. The suitability for a specific workplace should be discussed with the producers of the protective gloves.

Skin and body protection : Impervious clothing  
Choose body protection according to the amount and concentration of the dangerous substance at the work place.

Respiratory protection : **W A R N I N G !** This product contains quartz, which has

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been classified by IARC as carcinogenic for humans (Group 1), and which can cause silicosis and lung cancer following exposure to respirable dust. It is therefore important to take particular care to avoid inhalation exposure when mechanically processing cured material (e.g. grinding, sanding, sawing).

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

|                                                  |                                                             |
|--------------------------------------------------|-------------------------------------------------------------|
| Physical state                                   | : paste                                                     |
| Colour                                           | : black                                                     |
| Odour                                            | : amine-like                                                |
| Odour Threshold                                  | : No data is available on the product itself.               |
| pH                                               | : No data is available on the product itself.               |
| Melting point/freezing point                     | : No data is available on the product itself.               |
| Boiling point                                    | : > 200 °C                                                  |
| Flash point                                      | : > 100 °C<br>Method: Pensky-Martens closed cup, closed cup |
| Evaporation rate                                 | : No data is available on the product itself.               |
| Flammability (solid, gas)                        | : No data is available on the product itself.               |
| Burning rate                                     | : No data is available on the product itself.               |
| Upper explosion limit / Upper flammability limit | : No data is available on the product itself.               |
| Lower explosion limit / Lower flammability limit | : No data is available on the product itself.               |
| Vapour pressure                                  | : < 0,5 hPa (20 °C)                                         |
| Relative vapour density                          | : No data is available on the product itself.               |
| Relative density                                 | : No data is available on the product itself.               |
| Density                                          | : 1,85 g/cm <sup>3</sup> (25 °C)                            |
| Solubility(ies)                                  |                                                             |
| Water solubility                                 | : partly soluble (20 °C)                                    |
| Solubility in other solvents                     | : No data is available on the product itself.               |
| Partition coefficient: n-                        | : No data is available on the product itself.               |

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octanol/water

Auto-ignition temperature : No data is available on the product itself.

Decomposition temperature : > 200 °C

Viscosity

Viscosity, dynamic : 400 000 - 600 000 mPa.s (40 °C)

Explosive properties : No data is available on the product itself.

Oxidizing properties : No data is available on the product itself.

**9.2 Other information**

No data available

**SECTION 10: Stability and reactivity**

**10.1 Reactivity**

No dangerous reaction known under conditions of normal use.

**10.2 Chemical stability**

Stable under normal conditions.

**10.3 Possibility of hazardous reactions**

Hazardous reactions : No hazards to be specially mentioned.

**10.4 Conditions to avoid**

Conditions to avoid : None known.

**10.5 Incompatible materials**

Materials to avoid : None known.

**10.6 Hazardous decomposition products**

Carbon oxides

Nitrogen oxides (NO<sub>x</sub>)

Burning produces noxious and toxic fumes.

No hazardous decomposition products are known.

**SECTION 11: Toxicological information**

**11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008**

**Acute toxicity**

Acute oral toxicity - Product : Acute toxicity estimate : > 2 000 mg/kg  
Method: Calculation method

Acute inhalation toxicity - Product : Acute toxicity estimate : 2,65 mg/l  
Exposure time: 4 h  
Test atmosphere: dust/mist  
Method: Calculation method

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Acute dermal toxicity - : Acute toxicity estimate : > 2 000 mg/kg  
Product Method: Calculation method

Acute toxicity (other routes of : No data available  
administration)

**Skin corrosion/irritation****Components:**

Reaction products of fatty acid dimers and trimers, C18 (unsaturated) alkyl and fatty acids, C18 (unsaturated) alkyl with amines, polyethylenepoly-, triethylenetetramine fraction

:

Species: human skin

Assessment: May cause eye and skin irritation.

Method: OECD Test Guideline 431

Result: May cause eye and skin irritation.

Species: human skin

Assessment: Irritant

Method: OECD Test Guideline 439

Result: Irritating to skin.

2,2'-Iminodi(ethylamine):

Species: Rabbit

Assessment: Causes burns.

Result: Causes burns.

Amines, polyethylenepoly-, pentaethylenehexamine fraction:

Species: Rabbit

Method: OECD Test Guideline 404

Result: Corrosive after 3 minutes to 1 hour of exposure

4,4'-Isopropylidenediphenol:

Species: Rabbit

Method: OECD Test Guideline 404

Result: No skin irritation

**Serious eye damage/eye irritation****Components:**

Reaction products of fatty acid dimers and trimers, C18 (unsaturated) alkyl and fatty acids, C18 (unsaturated) alkyl with amines, polyethylenepoly-, triethylenetetramine fraction

:

Species: Rabbit

Method: OECD Test Guideline 405

Result: Corrosive

2,2'-Iminodi(ethylamine):

Species: Rabbit

Assessment: Corrosive

Result: Corrosive

# SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

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Amines, polyethylenepoly-, pentaethylenehexamine fraction:

Species: Rabbit

Assessment: Severe eye irritation

Method: OECD Test Guideline 405

Result: Severe eye irritation

Species: Rabbit

Assessment: Corrosive

Result: Corrosive

4,4'-Isopropylidenediphenol:

Species: Rabbit

Method: OECD Test Guideline 405

Result: Irreversible effects on the eye

### Respiratory or skin sensitisation

#### Components:

Reaction products of fatty acid dimers and trimers, C18 (unsaturated) alkyl and fatty acids, C18 (unsaturated) alkyl with amines, polyethylenepoly-, triethylenetetramine fraction

:

Exposure routes: Skin

Species: Mouse

Method: OECD Test Guideline 429

Result: The product is a skin sensitiser, sub-category 1A.

2,2'-Iminodi(ethylamine):

Exposure routes: Skin

Species: Mouse

Method: OECD Test Guideline 429

Result: May cause sensitisation by skin contact.

Remarks: Causes sensitisation.

Exposure routes: Respiratory Tract

Species: Mouse

Result: Does not cause respiratory sensitisation.

Amines, polyethylenepoly-, pentaethylenehexamine fraction:

Exposure routes: Skin

Species: Guinea pig

Method: OECD Test Guideline 406

Result: May cause sensitisation by skin contact.

4,4'-Isopropylidenediphenol:

Exposure routes: Skin

Species: Mouse

Method: OECD Test Guideline 429

Result: Does not cause skin sensitisation.

Exposure routes: Skin

Species: Humans

Assessment: May cause sensitisation by skin contact.

Result: Causes sensitisation.

Assessment: No data available

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**Germ cell mutagenicity****Components:**

Reaction products of fatty acid dimers and trimers, C18 (unsaturated) alkyl and fatty acids, C18 (unsaturated) alkyl with amines, polyethylenepoly-, triethylenetetramine fraction

:

Genotoxicity in vitro : Metabolic activation: with and without metabolic activation  
 Method: OECD Test Guideline 471  
 Result: negative

: Metabolic activation: with and without metabolic activation  
 Method: OECD Test Guideline 476  
 Result: negative

: Metabolic activation: with and without metabolic activation  
 Method: OECD Test Guideline 487  
 Result: negative

Amines, polyethylenepoly-, pentaethylenehexamine fraction:

Genotoxicity in vitro : Concentration: 16.7 - 1670 ug/plate  
 Metabolic activation: with and without metabolic activation  
 Method: OECD Test Guideline 471  
 Result: positive

: Concentration: .01 - 3 mg/plate  
 Metabolic activation: with and without metabolic activation  
 Method: OECD Test Guideline 471  
 Result: positive

: Concentration: .03 - 5 mg/plate  
 Metabolic activation: with and without metabolic activation  
 Method: OECD Test Guideline 471  
 Result: positive

: Concentration: .1 - 200 µg/L  
 Metabolic activation: negative  
 Method: OECD Test Guideline 482  
 Result: negative

: Metabolic activation: negative  
 Method: OECD Test Guideline 482  
 Result: negative

: Concentration: .2 - .8 mg/ml  
 Metabolic activation: with and without metabolic activation

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Method: OECD Test Guideline 479

Result: positive

: Concentration: .02 - 10 g/kg  
Metabolic activation: with and without metabolic activation  
Method: OECD Test Guideline 476  
Result: Not classified due to inconclusive data.

: Concentration: 0 - 8 mg/kg  
Metabolic activation: with and without metabolic activation  
Method: OECD Test Guideline 476  
Result: positive

: Concentration: 0 - 4 mg/kg  
Metabolic activation: with and without metabolic activation  
Method: OECD Test Guideline 479  
Result: positive

: Concentration: 0 - 10 mg/kg  
Metabolic activation: with and without metabolic activation  
Method: OECD Test Guideline 479  
Result: positive

4,4'-Isopropylidenediphenol:  
Genotoxicity in vitro

: Metabolic activation: with and without metabolic activation  
Result: negative

### Components:

2,2'-Iminodi(ethylamine):  
Genotoxicity in vivo

: Cell type: Somatic  
Application Route: Oral  
Dose: 85 - 850 mg/kg  
Method: OECD Test Guideline 474  
Result: negative

Application Route: Oral  
Result: negative

Amines, polyethylenepoly-, pentaethylenehexamine fraction:  
Genotoxicity in vivo

: Application Route: Oral  
Dose: 2300 - 1400 ppm  
Method: OECD Test Guideline 477  
Result: negative

Application Route: Intraperitoneal injection

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Dose: 185 - 600 mg/kg  
Method: OECD Test Guideline 474  
Result: negative

Application Route: Intraperitoneal injection  
Dose: 150 mg/kg  
Method: OECD Test Guideline 474  
Result: negative

4,4'-Isopropylidenediphenol:  
Genotoxicity in vivo : Method: OECD Test Guideline 474  
Result: negative

Germ cell mutagenicity- : No data available  
Assessment

**Carcinogenicity****Components:**

2,2'-Iminodi(ethylamine):  
Species: Mouse, male  
Application Route: Dermal  
Dose: 56.3 mg/kg  
Frequency of Treatment: 3 daily  
Result: negative

Amines, polyethylenepoly-, pentaethylenehexamine fraction:  
Species: Mouse, male  
Application Route: Dermal  
Exposure time: 104 weeks  
Dose: ca 16.8 mg/kg  
Frequency of Treatment: 3 daily  
Method: OECD Test Guideline 451  
Result: positive

Species: Mouse, male  
Application Route: Dermal  
Exposure time: 24 month(s)  
Dose: 1.25 mg/kg  
Frequency of Treatment: 3 daily  
Method: OECD Test Guideline 451  
Result: negative

4,4'-Isopropylidenediphenol:  
Species: Rat, male and female  
Application Route: Oral  
Exposure time: 103 weeks  
Frequency of Treatment: 7 daily  
Result: negative

Carcinogenicity - : No data available  
Assessment

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### Reproductive toxicity

#### Components:

Reaction products of fatty acid dimers and trimers, C18 (unsaturated) alkyl and fatty acids, C18 (unsaturated) alkyl with amines, polyethylenepoly-, triethylenetetramine fraction

:

Effects on fertility : Species: Rat, male and female  
Application Route: Oral  
Method: OECD Test Guideline 422  
Result: Animal testing did not show any effects on fertility.

2,2'-Iminodi(ethylamine):

Species: Rat, male and female  
Application Route: Oral  
General Toxicity - Parent: No observed adverse effect level:  
30 mg/kg wet weight  
Method: OECD Test Guideline 421

4,4'-Isopropylidenediphenol:

Species: Rat, male and female  
Application Route: Oral  
Method: OECD Test Guideline 416  
Result: Embryotoxic effects and adverse effects on the offspring were detected.

#### Components:

2,2'-Iminodi(ethylamine):

Effects on foetal development : Species: Rat  
Application Route: Oral  
General Toxicity Maternal: No observed adverse effect level:  
100 mg/kg body weight  
Method: OECD Test Guideline 421  
Result: No adverse effects

4,4'-Isopropylidenediphenol:

Species: Rat, female  
Application Route: Oral  
General Toxicity Maternal: No observed adverse effect level:  
< 160 mg/kg body weight  
Method: OECD Test Guideline 416  
Result: No teratogenic effects

#### Components:

4,4'-Isopropylidenediphenol:

Reproductive toxicity - Assessment : Clear evidence of adverse effects on sexual function and fertility, based on animal experiments.

### STOT - single exposure

#### Components:

2,2'-Iminodi(ethylamine):

Target Organs: Respiratory Tract

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Assessment: May cause respiratory irritation.

4,4'-Isopropylidenediphenol:

Assessment: The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with respiratory tract irritation.

**STOT - repeated exposure**

No data available

**Repeated dose toxicity****Components:**

Reaction products of fatty acid dimers and trimers, C18 (unsaturated) alkyl and fatty acids, C18 (unsaturated) alkyl with amines, polyethylenepoly-, triethylenetetramine fraction

:

Species: Rat, male and female

NOAEL: 1000 mg/kg

Application Route: Ingestion

Exposure time: 6 WeeksNumber of exposures: 7 d

Method: Subacute toxicity

2,2'-Iminodi(ethylamine):

Species: Rat, male and female

NOEC: 70 - 80

Application Route: Ingestion

Test atmosphere: vapour

Exposure time: 360 hNumber of exposures: 7 d

Method: Subchronic toxicity

Species: Rat, male and female

NOAEL: 114

Application Route: Skin contact

Exposure time: 9 600 hNumber of exposures: 6 d

Method: Chronic toxicity

Amines, polyethylenepoly-, pentaethylenehexamine fraction:

Species: Rat, female

NOAEL: 50 mg/kg

Application Route: Ingestion

Exposure time: 26 WeeksNumber of exposures: 7 d

Method: Subchronic toxicity

Species: Rat, male

LOAEL: 50 mg/kg

Application Route: Ingestion

Exposure time: 26 WeeksNumber of exposures: 7 d

Method: Subchronic toxicity

4,4'-Isopropylidenediphenol:

Species: Dog, male and female

NOEC: 75 mg/kg, 10

Application Route: Ingestion

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Test atmosphere: dust/mist  
Exposure time: 2 160 hNumber of exposures: 7 d  
Method: Subchronic toxicity

Species: Rat, male and female  
LOAEL: 600 mg/kg  
Application Route: Ingestion  
Exposure time: 672 hNumber of exposures: 7 d  
Method: Subchronic toxicity

Repeated dose toxicity - : No data available  
Assessment

### Aspiration toxicity

No data available

## 11.2 Information on other hazards

### Endocrine disrupting properties

#### Product:

Assessment : This substance/mixture contains components considered to have endocrine disrupting properties affecting human health, according to REACH Article 57(f), Commission Regulation (EU) 2018/605 or Commission Delegated Regulation (EU) 2017/2100.

### Experience with human exposure

General Information: No data available

Inhalation: No data available

Skin contact: No data available

Eye contact: No data available

Ingestion: No data available

### Toxicology, Metabolism, Distribution

No data available

### Neurological effects

No data available

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**Further information**

Ingestion: No data available

---

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

Reaction products of fatty acid dimers and trimers, C18 (unsaturated) alkyl and fatty acids, C18 (unsaturated) alkyl with amines, polyethylenepoly-, triethylenetetramine fraction  
:

- |                                                     |                                                                                                                                                                                    |
|-----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Toxicity to fish                                    | : LC50 (Brachydanio rerio (zebrafish)): 7,07 mg/l<br>Exposure time: 96 h<br>Test Type: semi-static test<br>Test substance: Fresh water<br>Method: OECD Test Guideline 203          |
| Toxicity to daphnia and other aquatic invertebrates | : EC50 (Daphnia magna (Water flea)): 5,18 mg/l<br>Exposure time: 48 h<br>Test Type: static test<br>Test substance: Fresh water<br>Method: OECD Test Guideline 202                  |
| Toxicity to algae/aquatic plants                    | : EC50 (Selenastrum capricornutum (green algae)): 2,43 mg/l<br>Exposure time: 72 h<br>Test Type: static test<br>Test substance: Fresh water<br>Method: OECD Test Guideline 201     |
| Toxicity to microorganisms                          | : EC50 (activated sludge): 421 mg/l<br>Exposure time: 3 h<br>Test Type: static test<br>Test substance: Fresh water<br>Method: OECD Test Guideline 209                              |
| 2,2'-Iminodi(ethylamine):                           |                                                                                                                                                                                    |
| Toxicity to fish                                    | : LC50 : 430 mg/l<br>Exposure time: 96 h<br>Test Type: semi-static test<br>Test substance: Fresh water<br>Method: Directive 67/548/EEC, Annex V, C.1.                              |
| Toxicity to daphnia and other aquatic invertebrates | : EC50 (Daphnia magna (Water flea)): 64,6 mg/l<br>Exposure time: 48 h<br>Test Type: static test<br>Test substance: Fresh water<br>Method: Regulation (EC) No. 440/2008, Annex, C.2 |
|                                                     | EC50 (Daphnia magna (Water flea)): 16 mg/l<br>Exposure time: 48 h<br>Test Type: static test<br>Test substance: Fresh water                                                         |

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Method: DIN 38412

Toxicity to algae/aquatic plants : EbC50 (Selenastrum capricornutum (green algae)): 1 164 mg/l  
Exposure time: 72 h  
Test Type: static test  
Test substance: Fresh water  
Method: OECD Test Guideline 201

Toxicity to fish (Chronic toxicity) : NOEC: 10 mg/l  
Exposure time: 28 d  
Test Type: semi-static test  
Test substance: Fresh water  
Method: OECD Test Guideline 210

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC: 5,6 mg/l  
Exposure time: 21 d  
Species: Daphnia magna (Water flea)  
Test Type: semi-static test  
Test substance: Fresh water  
Method: Directive 67/548/EEC, Annex V, C.20

Toxicity to soil dwelling organisms : EC50: > 1 000 mg/kg  
Exposure time: 56 d  
Species: Eisenia fetida (earthworms)  
Method: OECD Test Guideline 222

Ecotoxicology Assessment  
Acute aquatic toxicity : This product has no known ecotoxicological effects.

Amines, polyethylenepoly-, pentaethylenehexamine fraction:

Toxicity to fish : LC50 (Poecilia reticulata (guppy)): .18 g/l  
Exposure time: 96 h  
Test Type: semi-static test  
Test substance: Fresh water  
Method: Directive 67/548/EEC, Annex V, C.1.

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 17,5 mg/l  
Exposure time: 48 h  
Test Type: static test  
Test substance: Fresh water  
Method: Directive 67/548/EEC, Annex V, C.2.

Toxicity to algae/aquatic plants : EbC50 (Selenastrum capricornutum (green algae)): 0,7 mg/l  
Exposure time: 72 h  
Test Type: static test  
Test substance: Fresh water  
Method: OECD Test Guideline 201

ErC50 (Selenastrum capricornutum (green algae)): 1,7 mg/l  
Exposure time: 72 h  
Test Type: static test  
Test substance: Fresh water  
Method: OECD Test Guideline 201

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|                                                                        |   |                                                                                                                                                                                                                                                                |
|------------------------------------------------------------------------|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| M-Factor (Acute aquatic toxicity)                                      | : | 1                                                                                                                                                                                                                                                              |
| Toxicity to microorganisms                                             | : | EC50 (No information available.): 1 600 mg/l<br>Exposure time: 0,5 h<br>Test Type: static test<br>Test substance: Fresh water<br><br>EC50 (No information available.): 164 mg/l<br>Exposure time: 2 h<br>Test Type: static test<br>Test substance: Fresh water |
| Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) | : | EC10: 1,9 mg/l<br>Exposure time: 21 d<br>Species: Daphnia magna (Water flea)<br>Test Type: semi-static test<br>Test substance: Fresh water<br>Method: OECD Test Guideline 202                                                                                  |
| M-Factor (Chronic aquatic toxicity)                                    | : | 1                                                                                                                                                                                                                                                              |
| 4,4'-Isopropylidenediphenol:                                           |   |                                                                                                                                                                                                                                                                |
| Toxicity to fish                                                       | : | LC50 (Oncorhynchus mykiss (rainbow trout)): 7,5 mg/l<br>Exposure time: 96 h                                                                                                                                                                                    |
| Toxicity to daphnia and other aquatic invertebrates                    | : | EC50 : 3,9 - 10,2 mg/l<br>Exposure time: 48 h<br><br>(Ceriodaphnia dubia (Water flea)):                                                                                                                                                                        |
| Toxicity to algae/aquatic plants                                       | : | EC50 (Selenastrum capricornutum (green algae)): 2,5 - 3,1 mg/l<br>Exposure time: 96 h                                                                                                                                                                          |
| Toxicity to fish (Chronic toxicity)                                    | : | NOEC: 0,016 mg/l<br>Exposure time: 444 d<br>Species: Pimephales promelas (fathead minnow)<br>Test Type: flow-through test<br>Test substance: Fresh water<br>Method: Fish Life Cycle Toxicity<br>Remarks: Toxic to aquatic organisms.                           |
| M-Factor (Chronic aquatic toxicity)                                    | : | 1                                                                                                                                                                                                                                                              |
| Ecotoxicology Assessment                                               |   |                                                                                                                                                                                                                                                                |
| Chronic aquatic toxicity                                               | : | Toxic to aquatic life with long lasting effects.                                                                                                                                                                                                               |

**12.2 Persistence and degradability**
**Components:**

2,2'-Iminodi(ethylamine):

|                  |   |                                                                                      |
|------------------|---|--------------------------------------------------------------------------------------|
| Biodegradability | : | Inoculum: activated sludge<br>Result: Readily biodegradable.<br>Biodegradation: 87 % |
|------------------|---|--------------------------------------------------------------------------------------|

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Exposure time: 21 d  
Method: OECD Test Guideline 301D

Photodegradation : Test Type: Air  
Rate constant: 500000  
Degradation (direct photolysis): 50 %

Amines, polyethylenepoly-, pentaethylenehexamine fraction:

Biodegradability : Result: Not readily biodegradable.  
Biodegradation: 0 %  
Exposure time: 162 d  
Method: OECD Test Guideline 301D

4,4'-Isopropylidenediphenol:

Biodegradability : Result: Not readily biodegradable.  
Biodegradation: 1 - 2 %  
Exposure time: 28 d

### 12.3 Bioaccumulative potential

**Components:**

2,2'-Iminodi(ethylamine):

Bioaccumulation : Species: Cyprinus carpio (Carp)  
Exposure time: 42 d  
Bioconcentration factor (BCF): 0,3 - 6,3  
Test substance: Fresh water  
Method: flow-through test  
Remarks: Bioaccumulation is unlikely.

Partition coefficient: n-octanol/water : log Pow: -1,58 (20 °C)  
pH: 7

Amines, polyethylenepoly-, pentaethylenehexamine fraction:

Partition coefficient: n-octanol/water : log Pow: -3,67

### 12.4 Mobility in soil

**Components:**

2,2'-Iminodi(ethylamine):

Distribution among environmental compartments : Koc: 19111

### 12.5 Results of PBT and vPvB assessment

**Product:**

Assessment : This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher..

### 12.6 Endocrine disrupting properties

**Product:**

Assessment : This substance/mixture contains components considered to have endocrine disrupting properties for environment ,

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according to REACH Article 57(f), Commission Regulation (EU) 2018/605 or Commission Delegated Regulation (EU) 2017/2100.

**12.7 Other adverse effects****Product:**

Additional ecological information : An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.  
Toxic to aquatic life with long lasting effects.

---

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

Product : The product should not be allowed to enter drains, water courses or the soil.  
Do not contaminate ponds, waterways or ditches with chemical or used container.  
Send to a licensed waste management company.  
Dispose of as hazardous waste in compliance with local and national regulations.  
Dispose of contents/ container to an approved waste disposal plant.

Contaminated packaging : Empty remaining contents.  
Dispose of as unused product.  
Do not re-use empty containers.

---

**SECTION 14: Transport information**
**IATA**

**14.1 UN number or ID number** : UN 2735

**14.2 UN proper shipping name** : Amines, liquid, corrosive, n.o.s.  
(DIETHYLENETRIAMINE, PENTAETHYLENE HEXAMINE)

**14.3 Transport hazard class(es)** : 8

**14.4 Packing group** : II

Labels : Corrosive

Packing instruction (cargo aircraft) : 855

Packing instruction (passenger aircraft) : 851

**IMDG**

**14.1 UN number or ID number** : UN 2735

**14.2 UN proper shipping name** : AMINES, LIQUID, CORROSIVE, N.O.S.

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(DIETHYLENETRIAMINE, PENTAETHYLENE HEXAMINE)

**14.3 Transport hazard class(es)** : 8

**14.4 Packing group** : II

Labels : 8

EmS Code : F-A, S-B

**14.5 Environmental hazards**

Marine pollutant : yes

### ADR

**14.1 UN number or ID number** : UN 2735

**14.2 UN proper shipping name** : AMINES, LIQUID, CORROSIVE, N.O.S.

(DIETHYLENETRIAMINE, PENTAETHYLENE HEXAMINE)

**14.3 Transport hazard class(es)** : 8

**14.4 Packing group** : II

Labels : 8

**14.5 Environmental hazards**

Environmentally hazardous : yes

### RID

**14.1 UN number or ID number** : UN 2735

**14.2 UN proper shipping name** : AMINES, LIQUID, CORROSIVE, N.O.S.

(DIETHYLENETRIAMINE, PENTAETHYLENE HEXAMINE)

**14.3 Transport hazard class(es)** : 8

**14.4 Packing group** : II

Labels : 8

**14.5 Environmental hazards**

Environmentally hazardous : no

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

Not applicable for product as supplied.

## SECTION 15: Regulatory information

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

REACH - List of substances subject to authorisation : Not applicable  
(Annex XIV)

REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59) : bisphenol A

Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances.

E2 ENVIRONMENTAL  
HAZARDS

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Water contaminating class (Germany) : WGK 3 highly hazardous to water  
Classification according to AwSV, Annex 1 (5.2)

TA Luft List (Germany) : Total dust:  
Not applicable  
: Inorganic substances in powdered form:  
Not applicable  
: Inorganic substances in vapour or gaseous form:  
Not applicable  
: Organic Substances:  
portionClass 1: 6,97 %

: Carcinogenic substances:  
Not applicable  
: Mutagenic:  
Not applicable  
: Toxic to reproduction:  
Not applicable

Other regulations:

The product is subject to the supply restrictions of the Ordinance on the Prohibition of Chemicals.

Take note of Law on the protection of mothers at work, in education and in studies (Maternity Protection Act - MuSchG).

Take note of Directive 94/33/EC on the protection of young people at work or stricter national regulations, where applicable.

**The components of this product are reported in the following inventories:**

DSL : All components of this product are on the Canadian DSL

AIIC : On the inventory, or in compliance with the inventory

NZIoC : Not in compliance with the inventory

ENCS : On the inventory, or in compliance with the inventory

KECI : On the inventory, or in compliance with the inventory

PICCS : Not in compliance with the inventory

IECSC : On the inventory, or in compliance with the inventory

TCSI : On the inventory, or in compliance with the inventory

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TSCA : All substances listed as active on the TSCA inventory

### Inventories

AICS (Australia), AIIIC (Australia), DSL (Canada), IECSC (China), ENCS (Japan), KECI (Korea), NZIOC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TSCA (United States of America (USA))

### 15.2 Chemical safety assessment

Chemical Safety Assessments for all substances in this product are either Complete or Not applicable.

## SECTION 16: Other information

### Full text of H-Statements

|       |                                                         |
|-------|---------------------------------------------------------|
| H302  | : Harmful if swallowed.                                 |
| H312  | : Harmful in contact with skin.                         |
| H314  | : Causes severe skin burns and eye damage.              |
| H315  | : Causes skin irritation.                               |
| H317  | : May cause an allergic skin reaction.                  |
| H318  | : Causes serious eye damage.                            |
| H330  | : Fatal if inhaled.                                     |
| H335  | : May cause respiratory irritation.                     |
| H360F | : May damage fertility.                                 |
| H400  | : Very toxic to aquatic life.                           |
| H410  | : Very toxic to aquatic life with long lasting effects. |
| H411  | : Toxic to aquatic life with long lasting effects.      |

### Full text of other abbreviations

|                   |                                                                                                                        |
|-------------------|------------------------------------------------------------------------------------------------------------------------|
| Acute Tox.        | : Acute toxicity                                                                                                       |
| Aquatic Acute     | : Short-term (acute) aquatic hazard                                                                                    |
| Aquatic Chronic   | : Chronic aquatic toxicity                                                                                             |
| Eye Dam.          | : Serious eye damage                                                                                                   |
| Repr.             | : Reproductive toxicity                                                                                                |
| Skin Corr.        | : Skin corrosion                                                                                                       |
| Skin Irrit.       | : Skin irritation                                                                                                      |
| Skin Sens.        | : Skin sensitisation                                                                                                   |
| STOT SE           | : Specific target organ toxicity - single exposure                                                                     |
| 2017/164/EU       | : Europe. Commission Directive 2017/164/EU establishing a fourth list of indicative occupational exposure limit values |
| DE TRGS 900       | : Germany. TRGS 900 - Occupational exposure limit values.                                                              |
| 2017/164/EU / TWA | : Limit Value - eight hours                                                                                            |
| DE TRGS 900 / AGW | : Time Weighted Average                                                                                                |

### Further information

#### Classification of the mixture:

|               |      |
|---------------|------|
| Acute Tox. 4  | H332 |
| Skin Corr. 1B | H314 |
| Eye Dam. 1    | H318 |

#### Classification procedure:

|                    |
|--------------------|
| Calculation method |
| Calculation method |
| Calculation method |

**PFAUDLER UF 3000 B**

|         |                |              |                                 |
|---------|----------------|--------------|---------------------------------|
| Version | Revision Date: | SDS Number:  | Date of last issue: 03.02.2020  |
| 1.3     | 18.03.2021     | 400001009288 | Date of first issue: 20.05.2015 |

Print Date 29.06.2021

|                   |       |                    |
|-------------------|-------|--------------------|
| Skin Sens. 1      | H317  | Calculation method |
| Repr. 1B          | H360F | Calculation method |
| Aquatic Chronic 2 | H411  | Calculation method |

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# Zertifikat

Die Flachdichtung mit Einlage vom Typ AF3000 mit PTFE-Hülle und Wellring

der **Pfäudler Werke GmbH**  
**Pfäudlerstraße, 68723 Schwetzingen**

wurde von uns nach den Vorgaben der VDI-Richtlinie 2440 (Ausgabe November 2000) geprüft. Nach 48-stündiger Auslagerung bei 200°C an Luft und anschließender Leckagemessung bei Raumtemperatur und 1 bar Druckdifferenz mittels Helium-Massenspektrometrie erfüllt sie das Leckageratenkriterium

**$1,0 \cdot 10^{-4}$  mbar l / (s·m)**

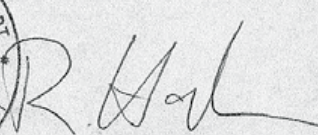
und gilt damit hinsichtlich des oben genannten Leckagekriteriums als

**hochwertig im Sinne der TA Luft.**

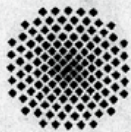
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Prüfungsbericht **9 001 482 002 Dr.Koc/Hh/Gue** vom **16. Juni 2004**  
und den dort niedergelegten Prüf- und Randbedingungen.



Stuttgart, den 16.06.2004

  
Dipl.-Ing. R. Hahn  
**Leiter Referat Dichtungstechnik**

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# Zertifikat

Die Flachdichtung mit Einlage vom Typ GR3000 mit PTFE-Hülle und Wellring

der **Pfautler Werke GmbH**  
**Pfautlerstraße, 68723 Schwetzingen**

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**$1,0 \cdot 10^{-4}$  mbar l / (s·m)**

und gilt damit hinsichtlich des oben genannten Leckagekriteriums als

**hochwertig im Sinne der TA Luft.**

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Prüfungsbericht **9 001 482 003 Dr.Koc/Hh/Gue** vom **24. August 2004**  
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## Declaration of compliance with the order

EN 10204 – 2.1

We herewith confirm that gasket envelopes in contact with the product are made of virginal PTFE. The asbestos free gaskets:

**Pfaudler AF3000/ GR3000**  
**Gasket Types WT, WKT, WKTV, WTR and WKTG**

meet the requirements of the US Food and Drug Administration (FDA). They can be used in applications where the material is in contact with food.

**FDA Title 21 § 177.1550**

**Pfaudler GmbH**



ppa. Michael Theilig  
Technical Manager



i.V. Thorsten Hambsch  
Quality Manager

Waghäusel, 14.06.2022  
HB009E

Pfaudler GmbH  
Louis-Schuler-Straße 1  
68753 Waghäusel, Deutschland  
T: +49 (0) 7254 9212-0 | E: @pfaudler.com | W: [www.gmmpfaudler.com](http://www.gmmpfaudler.com)

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|                                         |                                          |                                          |                                    |                                     |                                          |                                 |
|-----------------------------------------|------------------------------------------|------------------------------------------|------------------------------------|-------------------------------------|------------------------------------------|---------------------------------|
| <b>PFAUDLER</b>                         | <b>NORMAG</b>                            | <b>MAVAG</b>                             | <b>MIXION</b>                      | <b>INTERSEAL</b>                    | <b>EQUILLOY</b>                          | <b>EDLON</b>                    |
| <small>— Glass-Lined Technology</small> | <small>— Lab &amp; Process Glass</small> | <small>— Filtration &amp; Drying</small> | <small>— Mixing Technology</small> | <small>— Sealing Technology</small> | <small>— Alloy Process Equipment</small> | <small>— Fluoropolymers</small> |

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Pfaudler GmbH  
Louis-Schuler-Straße 1  
68753 Waghäusel, Germany  
Phone: +49 (0) 7254 9212-0

**[www.gmmpfaudler.com](http://www.gmmpfaudler.com)**