Klübersynth® CH 2-100
High-temperature chain oil

Description
Klübersynth CH 2-100 is a synthetic high-temperature chain oil ensuring reliable lubrication at high temperatures. Owing to a special additive package this product offers high pressure resistance and wear protection. Klübersynth CH 2-100 shows a low evaporation loss at high temperatures.

Application
Klübersynth CH 2-100 has been designed for drive, control and transport chains subject to high temperatures and loads. It is particularly suitable for use in the insulating materials industry, i.e. for chains in glass wool or mineral wool hardening furnaces. Other applications include:
- conveyors, e.g. in the automotive industry
- driers, e.g. gypsum plate driers
- coating installations
- food processing industry, e.g. automatic baking machines

Application notes
Apply Klübersynth CH 2-100 by drip-feeding, automatic lubrication devices, oil feeder or by brush.

Minimum shelf life
The minimum shelf life is approx. 36 months if the product is stored in its unopened original container in a dry place.

Pack size
- 5 l metal canister
- 20 l metal canister
- 200 l drum
- 400 ml spray can

Product data

<table>
<thead>
<tr>
<th>Base oil</th>
<th>ester oil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colour</td>
<td>yellow</td>
</tr>
<tr>
<td>Service temperature range*, °C, approx.</td>
<td>0 to 250</td>
</tr>
<tr>
<td>Density, DIN 51 757 (ASTM-D 1298), at 20 °C, g/ml, approx.</td>
<td>0.96</td>
</tr>
<tr>
<td>Kinematic viscosity, DIN 51 562, at 40 °C, mm²/s</td>
<td>90 – 110</td>
</tr>
<tr>
<td></td>
<td>at 100 °C, mm²/s</td>
</tr>
<tr>
<td>Flash point, DIN ISO 2592, Cleveland (open cup), °C</td>
<td>&gt; 270</td>
</tr>
<tr>
<td>Pour point, DIN ISO 3016, °C</td>
<td>≤ – 30</td>
</tr>
<tr>
<td>Copper corrosion, DIN EN ISO 2160, 24 h / 150 °C; rating degree</td>
<td>2 – 150</td>
</tr>
</tbody>
</table>

Klübersynth CH 2-100
- Lubricates up to 250 °C
- Good wear protection
- High pressure resistance
- Low evaporation loss at high temperatures
- Compatible with paints

* Service temperatures are guide values which depend on the lubricant's composition, the intended use and the application method. Lubricants change their consistency, apparent dynamic viscosity or viscosity depending on the mechano-dynamical loads, time, pressure and temperature. These changes in product characteristics may affect the function of a component.

The data in this product information is based on our general experience and knowledge at the time of printing and is intended to give information of possible applications to a reader with technical experience. It constitutes neither an assurance of product properties nor does it release the user from the obligation of performing preliminary tests with the selected product. We recommend contacting our Technical Consulting Staff to discuss your specific application. If required and possible we will be pleased to provide a sample for testing.

Klüber products are continually improved. Therefore, Klüber Lubrication reserves the right to change all the technical data in this product information at any time without notice.

Klüber Lubrication, a member of the Freudenberg group

Publisher and Copyright:
Klüber Lubrication München KG
Klüber Lubrication München KG
Geisenhauenerstraße 7, 81379 München, Deutschland
Tel +49 89 7876-0, Telefax +49 89 7876-333, www.klueber.com

Product information 5.285 e
Article number: 002 118
Edition 12.03, replaces edition 02.01
GATE-WPP
Material Safety Data Sheet
According to 91/155 EEC

Printing date 27.07.2005 Reviewed on 07.07.2005

1 Identification of the substance/preparation and of the company/undertaking

- **Product details**
  - **Trade name:** Klübersynth CH 2-100
  - **Article number:** 002118
  - **Application of the substance / the preparation** Lubricating oil

- **Manufacturer/Supplier:**
  KLÜBER LUBRICATION MÜNCHEN KG
  Geisenhausenerstrasse 7
  D-81379 München
  Tel.: 0049 (0) 897876-0
  Fax: 0049 (0) 897876-333

- **Further information obtainable from:** Material Compliance Management
- **Information in case of emergency:** 0049 (0) 897876-700

2 Composition/information on ingredients

- **Chemical characterization**
  - **Description:** ester oil
  - **Dangerous components:** Void
  - **Additional information:** For the wording of the listed risk phrases refer to section 16.

3 Hazards identification

- **Hazard description:** Not applicable.
- **Information concerning particular hazards for human and environment:**
  The product does not have to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.
- **Classification system:**
  The classification is according to the latest editions of the EU-lists, and extended by company and literature data.

4 First-aid measures

- **After inhalation:** Supply fresh air; consult doctor in case of complaints.
- **After skin contact:** Wash off with soap and plenty of water.
- **After eye contact:**
  Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
- **After swallowing:** If symptoms persist consult doctor.

5 Fire-fighting measures

- **Suitable extinguishing agents:**
  Water haze
  Foam
  Fire-extinguishing powder
  Carbon dioxide
  Use fire extinguishing methods suitable to surrounding conditions.

(Contd. on page 2)
Trade name: Klübersynth CH 2-100

- **Protective equipment:** Standard procedure for chemical fires.
- **Additional information**
  Dispose of fire debris and contaminated fire fighting water in accordance with official regulations.

### 6 Accidental release measures

- **Person-related safety precautions:** Particular danger of slipping on leaked/spilled product.
- **Measures for environmental protection:** Do not allow to enter sewers/surface or ground water.
- **Measures for cleaning/collection:**
  Dispose of the material collected according to regulations.
  Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
- **Additional information:** No dangerous substances are released.

### 7 Handling and storage

- **Handling:**
  - **Information for safe handling:** No special measures required.
  - **Information about fire - and explosion protection:** No special measures required.
- **Storage:**
  - **Requirements to be met by storerooms and receptacles:**
    Store in cool, dry conditions in well sealed receptacles.
  - **Information about storage in one common storage facility:**
    Store away from foodstuffs.
    Store away from oxidizing agents.
  - **Further information about storage conditions:** None.

### 8 Exposure controls/personal protection

- **Additional information about design of technical facilities:** No further data; see item 7.
- **Ingredients with limit values that require monitoring at the workplace:**
  The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.
- **Additional information:** The lists valid during the making were used as basis.
- **Personal protective equipment:**
  - **General protective and hygienic measures:**
    Immediately remove all soiled and contaminated clothing
    Avoid contact with the skin.
    Avoid close or long term contact with the skin.
    Be sure to clean skin thoroughly after work and before breaks.
  - **Respiratory protection:** Not required.
  - **Protection of hands:** Preventive skin protection by use of skin-protecting agents is recommended.
  - **Material of gloves**
    The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
  - **Penetration time of glove material**
    The exact break trough time has to be found out by the manufacturer of the protective gloves and has to be observed.
  - **Eye protection:** Goggles recommended during refilling

(Contd. on page 3)
9 Physical and chemical properties

· General Information
  Form: Fluid
  Colour: Yellow
  Odour: Product specific

· Change in condition
  Pour point: -30°C (DIN ISO 3016)
  Flash point: ~ 270°C (DIN ISO 2592)
  Danger of explosion: Product does not present an explosion hazard.

· Density at 20°C: ~ 0.96 g/cm³

· Solubility in / Miscibility with water: Insoluble.

· Viscosity:
  Kinematic at 40°C: ~ 100 mm²/s (DIN 51562)

10 Stability and reactivity

· Thermal decomposition / conditions to be avoided:
  No decomposition if used and stored according to specifications.

· Materials to be avoided: oxidizing agents

· Dangerous reactions: No dangerous reactions known.

· Dangerous decomposition products: none under normal use

11 Toxicological information

· Additional toxicological information:
  Prolonged skin contact may cause skin irritation and/or dermatitis.

12 Ecological information

· Ecotoxicological effects:

· Behaviour in sewage processing plants: The product can be mechanically separated.

· General notes: Do not allow product to reach ground water, water course or sewage system.

13 Disposal considerations

· Product:
  Waste disposal key: For this product no waste disposal key according the European Waste Catalogue (EWC) can be determined, as only the purpose of application defined by the user enables an allocation. The waste code number has to be determined in accordance with the local waste disposer.

· Uncleaned packaging:
  Recommendation: Empty contaminated packagings thoroughly. They may be recycled after thorough and proper cleaning.

14 Transport information

· Land transport ADR/RID (cross-border)
  ADR/RID class: -
Trade name: Klübersynth CH 2-100

- Maritime transport IMDG:
  - IMDG Class: -
  - Marine pollutant: No
- Air transport ICAO-TI and IATA-DGR:
  - ICAO/IATA Class: -
- Transport/Additional information:
  Not classified as dangerous according to the above specifications.

15 Regulatory information

- Labelling according to EU guidelines:
  The product is not subject to classification according to the calculation methods of the "General Classification Guideline for Preparations of the EU" as issued in the latest valid version.
- Special labelling of certain preparations:
  Contains 4,4'-isopropylidenediphenol. May produce an allergic reaction.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- Department issuing MSDS: Material Compliance Management
- Contact: Tel.: +49 (0) 897876-1564
- * Data compared to the previous version altered.
WOLFRAKOTE® TOP PASTE
Metal free high-temperature paste

Description
WOLFRAKOTE TOP PASTE is a high-temperature paste suitable for a temperature range between –25 and 1000 °C.

It has a chemical composition of hydrocarbon oil and inorganic solid lubricants.

Above a temperature of 200 °C WOLFRAKOTE TOP PASTE functions as a dry lubricant.

The paste contains no lead, nickel, cadmium, barium or halogens.

Application
WOLFRAKOTE TOP PASTE has proven effective for the initial lubrication of chains. It is also suitable for screws, bolts and hinges subject to high temperatures because it prevents burning-in.

In pressure die casting of nonferrous metals WOLFRAKOTE TOP PASTE is used as a burn-in dressing for pouring ladles, dies, ingates and runners. It is also suitable as a separating paste for electric heating cartridges in hot chamber machines, and as an assembly and separating paste for die sets, ejectors, core slides and core pullers.

Application notes
NOTE: Always apply WOLFRAKOTE TOP PASTE in a thin layer!

Clean the friction point with a solvent and remove all residues and separating layers, such as corrosion protection agents, to ensure optimum adhesion of WOLFRAKOTE TOP PASTE, then apply the paste evenly across the entire surface. In the case of machine screws make sure that the paste is also applied to the underside of the screw head. Thus it is possible to obtain an optimum preload force during tightening and to disassemble the parts even when they were subject to high temperatures.

If WOLFRAKOTE TOP PASTE is applied for the first time to a screw that has already been subject to high temperatures, remove any residues in the thread and on the underside of the screw head.

Minimum shelf life
The minimum shelf life is approx. 12 months if the product is stored in its unopened original container in a dry place.

Minimum shelf life
750 g can
600 g grease cartridge
30 kg drum

WOLFRAKOTE TOP PASTE
• Metal free high-temperature paste suitable up to 1000 °C
• Prevents burning-in of bolts, hinges and screw connections
• Functions as a long-term dressing in the pressure die casting of nonferrous metals and prevents sticking of the molten metal for a long time; easy relubrication without machine shutdown
• Facilitates die assembly and disassembly after an extended period of production
• Meets the specification of automobile manufacturers and suppliers (e.g. FORD ESA-M1C194-A, LUCAS TS 2-33-03, BENDIX DT 3.G.02.16)
WOLFRAKOTE® TOP PASTE
Metal free high-temperature paste

Product data

<table>
<thead>
<tr>
<th>Property</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colour</td>
<td>light grey</td>
</tr>
<tr>
<td>Density, DIN 51 757 at 20 °C, g/cm³,</td>
<td>approx. 1.3</td>
</tr>
<tr>
<td>Consistency, NLGI grade</td>
<td>1</td>
</tr>
<tr>
<td>Flow pressure, DIN 51 805, at – 25 °C,</td>
<td>mbar &lt; 1400</td>
</tr>
<tr>
<td>Four-ball test, DIN 51 350 Pt 4, N</td>
<td>&gt; 3600</td>
</tr>
</tbody>
</table>

*Service temperatures are guide values which depend on the lubricant’s composition, the intended use and the application method. Lubricants change their consistency, apparent dynamic viscosity or viscosity depending on the mechano-dynamical loads, time, pressure and temperature. These changes in product characteristics may affect the function of a component.
1 Identification of the substance/preparation and of the company/undertaking

- Product details
- Trade name: WOLFRAKOTE TOP PASTE
- Article number: 089003
- Application of the substance / the preparation: Lubricant
- Manufacturer/Supplier:
  KLÜBER LUBRICATION MÜNCHEN KG
  Geisenhausenerstrasse 7
  D-81379 München
  Tel.: 0049 (0) 897876-0
  Fax: 0049 (0) 897876-333
  Notfallauskunft: 0049 (0) 897876-700
- Further information obtainable from: Material Compliance Management

2 Composition/information on ingredients

- Chemical characterization
- Description:
  Synthetic hydrocarbon oil
  mineral oil
  solid lubricant
- Dangerous components: Void

3 Hazards identification

- Hazard description: Not applicable.
- Information concerning particular hazards for human and environment:
  The product does not have to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.
- Classification system:
  The classification is according to the latest editions of the EU-lists, and extended by company and literature data.

4 First-aid measures

- After inhalation: Supply fresh air; consult doctor in case of complaints.
- After skin contact: Wash off with soap and plenty of water.
- After eye contact:
  Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.

(Contd. on page 2)
5 Fire-fighting measures

- **Suitable extinguishing agents:**
  - Water haze
  - Foam
  - Fire-extinguishing powder
  - Carbon dioxide
- **For safety reasons unsuitable extinguishing agents:** Water with full jet
- **Special hazards caused by the substance, its products of combustion or resulting gases:**
  - In case of fire, the following can be released:
    - Carbon monoxide (CO)
    - Hydrocarbons
- **Protective equipment:**
  - Do not inhale explosion gases or combustion gases.
  - Standard procedure for chemical fires.
- **Additional information**
  - Cool endangered receptacles with water spray.
  - Dispose of fire debris and contaminated fire fighting water in accordance with official regulations.

6 Accidental release measures

- **Person-related safety precautions:** Not required.
- **Measures for environmental protection:**
  - Do not allow to enter sewers/ surface or ground water.
- **Measures for cleaning/collection:**
  - Pick up mechanically.
  - Dispose of the material collected according to regulations.

7 Handling and storage

- **Handling:**
  - **Information for safe handling:** No special measures required.
  - **Information about fire - and explosion protection:** No special measures required.
- **Storage:**
  - **Requirements to be met by storerooms and receptacles:**
    - Store in cool, dry conditions in well sealed receptacles.
  - **Information about storage in one common storage facility:**
    - Store away from foodstuffs.
    - Store away from oxidizing agents.
  - **Further information about storage conditions:** None.

8 Exposure controls/personal protection

- **Additional information about design of technical facilities:** No further data; see item 7.
Material Safety Data Sheet
According to 91/155 EEC

Trade name: WOLFRAKOTE TOP PASTE

Ingredients with limit values that require monitoring at the workplace:
The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.

Additional information: The lists valid during the making were used as basis.

Personal protective equipment:

General protective and hygienic measures:
Immediately remove all soiled and contaminated clothing
Avoid contact with the skin.
Be sure to clean skin thoroughly after work and before breaks.

Respiratory protection: Not required.

Protection of hands:
Preventive skin protection by use of skin-protecting agents is recommended.

Eye protection: Not required.

9 Physical and chemical properties

General Information

Form: Pasty
Colour: Light grey
Odour: Product specific

Change in condition
Drip point: > 250°C (DIN ISO 2176)

Flash point: Not applicable.

Danger of explosion: Product does not present an explosion hazard.

Density at 20°C: 1.3 g/cm³

Solubility in / Miscibility with water: Insoluble.

10 Stability and reactivity

Thermal decomposition / conditions to be avoided:
No decomposition if used and stored according to specifications.

Materials to be avoided: oxidizing agents

Dangerous reactions No dangerous reactions known.

Dangerous decomposition products: none under normal use

11 Toxicological information

Additional toxicological information:
Prolonged skin contact may cause skin irritation and/or dermatitis.

12 Ecological information

Ecotoxic effects:

Behaviour in sewage processing plants: The product can be mechanically separated.
Material Safety Data Sheet
According to 91/155 EEC

Printing date 01.04.2004
Reviewed on 21.01.2004

Trade name: WOLFRAKOTE TOP PASTE

General notes: Do not allow product to reach ground water, water course or sewage system.

13 Disposal considerations

- **Product:**
- **Recommendation:** Can be incinerated in accordance with local and national regulations.
- **Waste disposal key:**
  For this product no waste disposal key according the European Waste Catalogue (EWC) can be determined, as only the purpose of application defined by the user enables an allocation. The waste code number has to be determined in accordance with the local waste disposer.
- **Uncleaned packaging:**
  - **Recommendation:** Empty contaminated packagings thoroughly. They may be recycled after thorough and proper cleaning.

14 Transport information

- **Land transport ADR/RID (cross-border):**
  - **ADR/RID class:** -
- **Maritime transport IMDG:**
  - **IMDG Class:** -
- **Air transport ICAO-TI and IATA-DGR:**
  - **ICAO/IATA Class:** -
- **Transport/Additional information:**
  Not classified as dangerous according to the above specifications.

15 Regulatory information

- **Labelling according to EU guidelines:**
  The product is not subject to classification according to the calculation methods of the "General Classification Guideline for Preparations of the EU" as issued in the latest valid version.
- **Special labelling of certain preparations:**
  Contains N-alkylated benzotriazole. May produce an allergic reaction.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- **Department issuing MSDS:** Material Compliance Management
- **Contact:** Tel.: +49 (0) 897876-564
WOLFRAKOTE® TOP FLUID and WOLFRAKOTE® TOP FLUID S
Solid lubricant suspensions for high-temperature applications

Description
WOLFRAKOTE TOP FLUID and WOLFRAKOTE TOP FLUID S are suspensions containing solid lubricant based on mineral and hydrocarbon oils. Upon evaporation of the base oil at temperatures above 200°C the solid lubricants provide dry lubrication.

Application
WOLFRAKOTE TOP FLUID products are used for the lubrication of conveyor chains in tube annealing furnaces, continuous furnaces or stress-relieving ovens at temperatures > 250°C.

Application notes
WOLFRAKOTE TOP FLUID
Initial lubrication by brush. Relubrication by automatic metering systems.
Recommended chain temperature for relubrication: 100 – 150°C

WOLFRAKOTE TOP FLUID S
Initial lubrication by immersion at the chain manufacturer. Relubrication by automatic metering systems.
Recommended chain temperature for relubrication: < 100°C*

WARNING: WOLFRAKOTE TOP FLUID S contains a solvent. Keep away from sources of ignition and observe safety data sheet.
To prevent solid lubricants from settling provide automatic metering systems with a stirrer.

Minimum shelf life
The minimum shelf life is approx. 24 months for WOLFRAKOTE TOP FLUID and approx. 12 months for WOLFRAKOTE TOP FLUID S if the product is stored in its unopened original container in a dry, frost-free place.

Pack sizes
5 l canister
25 l bucket

Current material safety data sheets can be downloaded from our website www.klueber.com or requested from Klüber Lubrication.

Product data

<table>
<thead>
<tr>
<th>WOLFRAKOTE TOP FLUID</th>
<th>WOLFRAKOTE TOP FLUID S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Article numbers</td>
<td>985003</td>
</tr>
<tr>
<td>Composition</td>
<td>mineral oil, synthetic hydrocarbon oil, solid lubricants</td>
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<tr>
<td>Solvent</td>
<td>-</td>
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<tr>
<td>- aliphatic hydrocarbon</td>
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</tr>
<tr>
<td>Service temperature range, [°C], approx.</td>
<td>-25 to 1000</td>
</tr>
<tr>
<td>Color</td>
<td>light grey</td>
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<tr>
<td>- grey</td>
<td></td>
</tr>
<tr>
<td>Texture</td>
<td>viscous</td>
</tr>
<tr>
<td>- fluid</td>
<td></td>
</tr>
<tr>
<td>Density at 20 °C [g/cm³], approx.</td>
<td>1.12</td>
</tr>
<tr>
<td>- 1.1</td>
<td></td>
</tr>
<tr>
<td>Runout time, DIN EN ISO with flow cup, nozzle 6mm, [s] approx.</td>
<td>-</td>
</tr>
<tr>
<td>45</td>
<td></td>
</tr>
</tbody>
</table>

Service temperatures are guide values which depend on the lubricant's composition, the intended use and the application method. Lubricants change their consistency, apparent dynamic viscosity or viscosity depending on the mechano-dynamical loads, time, pressure and temperature. These changes in product characteristics may affect the function of a component.

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+49 89 7876-0, Telefax +49 89 7876-333, www.klueber.com

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Material Safety Data Sheet
According to 91/155 EEC

Printing date 13.11.2006
Reviewed on 13.11.2006

1 Identification of the substance/preparation and of the company/undertaking

- Product details
- Trade name: WOLFRAKOTE TOP FLUID
- Article number: 985003
- Application of the substance / the preparation: Lubricant
- Manufacturer/Supplier:
  KLÜBER LUBRICATION MÜNCHEN KG
  Geisenhausenerstrasse 7
  D-81379 München
  Tel.: 0049 (0) 897876-0
  Fax: 0049 (0) 897876-333
- Further information obtainable from: Material Compliance Management
- Information in case of emergency: 0049 (0) 89 7876 700 (24 hrs)

2 Composition/information on ingredients

- Chemical characterization
- Description:
  Synthetic hydrocarbon oil
  mineral oil
  solid lubricant
- Dangerous components: Void

3 Hazards identification

- Hazard description: Not applicable.
- Information concerning particular hazards for human and environment:
  The product does not have to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.
- Classification system:
  The classification is according to the latest editions of the EU-lists, and extended by company and literature data.

4 First-aid measures

- After inhalation: Supply fresh air; consult doctor in case of complaints.
- After skin contact: Wash off with soap and plenty of water.
- After eye contact:
  Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
- After swallowing: If symptoms persist consult doctor.

5 Fire-fighting measures

- Suitable extinguishing agents:
  Water haze
  Foam
  Fire-extinguishing powder

(Contd. on page 2)
Trade name: WOLFRAKOTE TOP FLUID

<table>
<thead>
<tr>
<th>Material Safety Data Sheet</th>
</tr>
</thead>
<tbody>
<tr>
<td>According to 91/155 EEC</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6 Accidental release measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Person-related safety precautions: Not required.</td>
</tr>
<tr>
<td>Measures for environmental protection: Do not allow to enter sewers/surface or ground water.</td>
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<tr>
<td>Measures for cleaning/collection: Pick up mechanically. Dispose of the material collected according to regulations.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>7 Handling and storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Handling:</td>
</tr>
<tr>
<td>Information for safe handling: No special measures required.</td>
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<tr>
<td>Information about fire - and explosion protection: No special measures required.</td>
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<td>Storage:</td>
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<td>Requirements to be met by storerooms and receptacles: Store in cool, dry conditions in well sealed receptacles.</td>
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<td>Information about storage in one common storage facility: Store away from foodstuffs. Store away from oxidizing agents.</td>
</tr>
<tr>
<td>Further information about storage conditions: None.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>8 Exposure controls/personal protection</th>
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</thead>
<tbody>
<tr>
<td>Additional information about design of technical facilities: No further data; see item 7.</td>
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<td>Personal protective equipment:</td>
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<tr>
<td>General protective and hygienic measures: Immediately remove all soiled and contaminated clothing Avoid contact with the skin. Be sure to clean skin thoroughly after work and before breaks.</td>
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<td>Respiratory protection: Not required.</td>
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<tr>
<td>Protection of hands: Preventive skin protection by use of skin-protecting agents is recommended.</td>
</tr>
<tr>
<td>Eye protection: Not required.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>9 Physical and chemical properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Information</td>
</tr>
<tr>
<td>Form: Viscous</td>
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</tbody>
</table>
Trade name: WOLFRAKOTE TOP FLUID

| Colour:       | Light grey       |
| Odour:        | Product specific |
| Change in condition
  Drip point: | -°C (DIN ISO 2176) |
| Flash point:  | not applicable   |
| Danger of explosion: | Product does not present an explosion hazard. |
| Density at 20°C: | ~ 1.12 g/cm³ |
| Solubility in / Miscibility with water: | Insoluble. |

10 Stability and reactivity

- Thermal decomposition / conditions to be avoided:
  No decomposition if used and stored according to specifications.
- Materials to be avoided: oxidizing agents
- Dangerous reactions: No dangerous reactions known.
- Dangerous decomposition products: none under normal use

11 Toxicological information

- Additional toxicological information:
  Prolonged skin contact may cause skin irritation and/or dermatitis.

12 Ecological information

- Ecotoxicological effects:
- Behaviour in sewage processing plants: The product can be mechanically separated.
- General notes: Do not allow product to reach ground water, water course or sewage system.

13 Disposal considerations

- Product:
  - Recommendation: Can be incinerated in accordance with local and national regulations.
- Waste disposal key:
  For this product no waste disposal key according the European Waste Catalogue (EWC) can be determined, as only the purpose of application defined by the user enables an allocation. The waste code number has to be determined in accordance with the local waste disposer.
- Uncleaned packaging:
  - Recommendation:
    Empty contaminated packagings thoroughly. They may be recycled after thorough and proper cleaning.

14 Transport information

- Land transport ADR/RID (cross-border)
  - ADR/RID class: -
- Maritime transport IMDG:
  - IMDG Class: -
- Air transport ICAO-TI and IATA-DGR:
  - ICAO/IATA Class: -
Trade name: WOLFRAKOTE TOP FLUID

- Transport/Additional information:
  Not classified as dangerous according to the above specifications.

15 Regulatory information

- Labelling according to EU guidelines:
  The product is not subject to classification according to the calculation methods of the "General Classification Guideline for Preparations of the EU" as issued in the latest valid version.

- Special labelling of certain preparations:
  Contains N-alkylated benzotriazole. May produce an allergic reaction.

16 Other information

- This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- Department issuing MSDS: Material Compliance Management
- Contact: +49(0)897876-1564
- * Data compared to the previous version altered.
WOLFRAKOTE SSP Spray
Lubricating, assembly and screw paste up to 1400 °C

Description
WOLFRAKOTE SSP Spray is a high-temperature paste which can be applied in a temperature range from –15 to +1400 °C. It is based on hydrocarbon oil and inorganic solid lubricants. Above 200°C, WOLFRAKOTE SSP Spray provides dry lubrication. For the manufacture of this product no raw materials based on lead, nickel, barium, cadmium, chromium or halogen are used.

Application
WOLFRAKOTE SSP Spray is used as lubricating, assembly and screw paste up to 1400°C. Spray application provides a thin, uniform lubricating film. WOLFRAKOTE SSP Spray can also be used for the lubrication of bolts and hinges subject to high temperatures as it prevents seizure.

Application notes
Optimum adhesion of WOLFRAKOTE SSP Spray is achieved by pre-cleaning the friction point with a solvent to remove any residues or anti-corrosion films. After cleaning, spray a thin and uniform layer. When WOLFRAKOTE SSP Spray is used for machine screws, also the underside of the screw head should be lubricated in order to ensure the correct preload force for screwing-in and easy unscrewing even when exposed to high temperatures.

Before applying WOLFRAKOTE SSP Spray for the first time to screws that had already been exposed to high temperatures remove any residues on the thread or the underside of the screw head. According to our experience the temperature of the product should be between –10°C and +40°C when being applied. Shake aerosol can before use and provide for adequate ventilation during application as explosive mixtures may form.

Do not spray on a naked flame or any incandescent or hot material. Observe additional application notes on the safety data sheet and can label.

Minimum shelf life
The minimum shelf life is approx. 24 months if the product is stored in its unopened original container in a dry, frost-free place. Do not expose aerosol can to direct sunlight and temperatures above 50°C!

Product data

<table>
<thead>
<tr>
<th>Color</th>
<th>grey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service temperature range*, [°C]</td>
<td>-15 to 1400 above 200 °C dry lubrication</td>
</tr>
<tr>
<td>Consistency, NLGI grade</td>
<td>1</td>
</tr>
</tbody>
</table>

* Service temperatures are guide values which depend on the lubricant’s composition, the intended use and the application method. Lubricants change their consistency, apparent dynamic viscosity or viscosity depending on the mechano-dynamical loads, time, pressure and temperature. These changes in product characteristics may affect the function of a component.

Pack sizes
250 ml aerosol can, packed in cardboard packages with 12 cans each.

The data in this product information is based on our general experience and knowledge at the time of printing and is intended to give information of possible applications to a reader with technical experience. It constitutes neither an assurance of product properties nor does it release the user from the obligation of performing preliminary tests with the selected product. We recommend contacting our Technical Consulting Staff to discuss your specific application. If required and possible we will be pleased to provide a sample for testing. Klüber products are continually improved. Therefore, Klüber Lubrication reserves the right to change all the technical data in this product information at any time without notice.

Klüber Lubrication, a member of the Freudenberg group

Publisher and Copyright:
Klüber Lubrication München KG
Geisenhauserstraße 7, 81379 München, Deutschland
+49 89 7876-0, Telefax +49 89 7876-333, www.klueber.com
1 Identification of the substance/preparation and of the company/undertaking

- **Product details**
- **Trade name:** WOLFRAKOTE SSP
- **Article number:** 120002
- **Application of the substance / the preparation**: Lubricant

**Manufacturer/Supplier:**
KLÜBER LUBRICATION MÜNCHEN KG
Geisenhausenstrasse 7
D-81379 München
Tel.: 0049 (0) 897876-0
Fax: 0049 (0) 897876-333

**Further information obtainable from:** Material Compliance Management

**Information in case of emergency:** 0049 (0) 897876-700

2 Composition/information on ingredients

- **Chemical characterization**
- **Description:**
  - mineral oil
  - Synthetic hydrocarbon oil
  - solid lubricant

**Dangerous components:**
- CAS: 68153-99-1
- EINECS: 268-902-9
- N-Tallow-Alkyl-Trimethylene-Diamindioleate
- Xi, N; R 38-41-50
- 0.25-1%

**Additional information:** For the wording of the listed risk phrases refer to section 16.

3 Hazards identification

- **Hazard description:** Not applicable.
- **Information concerning particular hazards for human and environment:**
  The product does not have to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.
- **Classification system:**
  The classification is according to the latest editions of the EU-lists, and extended by company and literature data.

4 First-aid measures

- **After inhalation:** Supply fresh air; consult doctor in case of complaints.
- **After skin contact:** Wash off with soap and plenty of water.
- **After eye contact:**
  Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
- **After swallowing:** If symptoms persist consult doctor.
5 Fire-fighting measures

- Suitable extinguishing agents:
  - Water haze
  - Foam
  - Fire-extinguishing powder
  - Carbon dioxide
- For safety reasons unsuitable extinguishing agents: Water with full jet
- Special hazards caused by the substance, its products of combustion or resulting gases:
  - In case of fire, the following can be released:
    - Carbon monoxide (CO)
    - Hydrocarbons
- Protective equipment:
  - Do not inhale explosion gases or combustion gases.
  - Standard procedure for chemical fires.
- Additional information
  - Cool endangered receptacles with water spray.
  - Dispose of fire debris and contaminated fire fighting water in accordance with official regulations.

6 Accidental release measures

- Person-related safety precautions: Not required.
- Measures for environmental protection: Do not allow to enter sewers/ surface or ground water.
- Measures for cleaning/collecting:
  - Pick up mechanically.
  - Dispose of the material collected according to regulations.

7 Handling and storage

- Handling:
  - Information for safe handling: No special measures required.
  - Information about fire - and explosion protection: No special measures required.
- Storage:
  - Requirements to be met by storerooms and receptacles:
    - Store in cool, dry conditions in well sealed receptacles.
  - Information about storage in one common storage facility:
    - Store away from foodstuffs.
    - Store away from oxidizing agents.
  - Further information about storage conditions: None.

8 Exposure controls/personal protection

- Additional information about design of technical facilities: No further data; see item 7.
- Ingredients with limit values that require monitoring at the workplace:
  - The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.
  - Additional information: The lists valid during the making were used as basis.
- Personal protective equipment:
  - General protective and hygienic measures:
    - Immediately remove all soiled and contaminated clothing
    - Avoid close or long term contact with the skin.
    - Be sure to clean skin thoroughly after work and before breaks.
  - Respiratory protection: Not required.
  - Protection of hands: Preventive skin protection by use of skin-protecting agents is recommended.
Trade name: WOLFRAKOTE SSP

9 Physical and chemical properties

- **General Information**
  - **Form:** Pasty
  - **Colour:** Grey
  - **Odour:** Product specific

- **Change in condition**
  - **Drip point:** -°C

- **Flash point:** Not applicable.

- **Danger of explosion:** Product does not present an explosion hazard.

- **Density at 20°C:** 1.35 g/cm³

- **Solubility in / Miscibility with water:** Insoluble.

10 Stability and reactivity

- **Thermal decomposition / conditions to be avoided:**
  No decomposition if used and stored according to specifications.

- **Materials to be avoided:** oxidizing agents

- **Dangerous reactions:** No dangerous reactions known.

- **Dangerous decomposition products:** none under normal use

11 Toxicological information

- **Additional toxicological information:**
  Prolonged skin contact may cause skin irritation and/or dermatitis.
  The product is not subject to classification according to the calculation method of the General EU Classification Guidelines for Preparations as issued in the latest version.

12 Ecological information

- **Ecotoxic effects:**

- **Behaviour in sewage processing plants:** The product can be mechanically separated.

- **General notes:** Do not allow product to reach ground water, water course or sewage system.

13 Disposal considerations

- **Product:**
  - **Recommendation** Can be incinerated in accordance with local and national regulations.

- **Waste disposal key:**
  For this product no waste disposal key according the European Waste Catalogue (EWC) can be determined, as only the purpose of application defined by the user enables an allocation. The waste code number has to be determined in accordance with the local waste disposer.

- **Uncleaned packaging:**
  - **Recommendation:** Empty contaminated packagings thoroughly. They may be recycled after thorough and proper cleaning.
14 Transport information

- Land transport ADR/RID (cross-border)
  - ADR/RID class: -
- Maritime transport IMDG:
  - IMDG Class: 9
  - UN Number: 3077
  - Label: 9
  - Packaging group: III
  - EMS Number: F-A,S-F
  - Marine pollutant: Yes (PP)
  - Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (copper)

- Air transport ICAO-TI and IATA-DGR:
  - ICAO/IATA Class: 9
  - UN/ID Number: 3077
  - Packaging group: III
  - Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (copper)

15 Regulatory information

- Labelling according to EU guidelines:
  The product is not subject to classification according to the calculation methods of the "General Classification Guideline for Preparations of the EU" as issued in the latest valid version.

- Special labelling of certain preparations:
  Contains N-alkylated benzotriazole. May produce an allergic reaction.
  Safety data sheet available for professional user on request.

16 Other information

- This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

  Relevant R-phrases
  38 Irritating to skin.
  41 Risk of serious damage to eyes.
  50 Very toxic to aquatic organisms.

- Department issuing MSDS: Material Compliance Management
- Contact: Tel.: +49 (0) 897876-1564
- * Data compared to the previous version altered.
STABURAGS® NBU 8 EP
Rolling bearing and high-pressure grease

**Description:**
STABURAGS NBU 8 EP is a lubricating grease based on mineral oil and barium complex soap. It has been used successfully for many years as a long-term grease for bearings subject to high specific loads. Its good wear protection properties are enhanced by the barium complex thickener. STABURAGS NBU 8 EP protects reliably against corrosion and is resistant to water. It meets the requirements of DIN 51 807, dated May 1970: SKF-R2F test, test run B, 140 °C, and it achieves about 4000 operating hours in the SKF-ROF test at 120 °C.

**Application:**
STABURAGS NBU 8 EP has proven efficient as a rolling bearing and high pressure grease protecting against wear. It is used in traction motors, journal bearings, electric motors, pumps, and tapered roller bearings.

**Application notes:**
The product is applied by brush, spatula or conventional metering systems.

**Minimum shelf life:**
The minimum shelf life is approx. 60 months if the product is stored in the original closed container in a dry place.

**Pack sizes:**
- 400 g cartridge
- 1 kg can
- 25 kg bucket

<table>
<thead>
<tr>
<th>STABURAGS NBU 8 EP</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Good corrosion protection</td>
</tr>
<tr>
<td>• Good resistance to ambient media</td>
</tr>
<tr>
<td>• Good wear protection / EP properties</td>
</tr>
<tr>
<td>• Protects against tribo-corrosion</td>
</tr>
<tr>
<td>• High-pressure grease</td>
</tr>
</tbody>
</table>

**Product data:**

<table>
<thead>
<tr>
<th>Base</th>
<th>mineral oil / barium complex</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colour</td>
<td>light brown</td>
</tr>
<tr>
<td>Service temperature range*, °C, approx.</td>
<td>– 20 to 140</td>
</tr>
<tr>
<td>Density, DIN 51 757, at 20 °C, g/cm³, approx.</td>
<td>0.99</td>
</tr>
<tr>
<td>Drop point, DIN ISO 2176, °C</td>
<td>&gt; 220</td>
</tr>
<tr>
<td>Worked penetration, DIN ISO 2137, at 25 °C, 0.1 mm</td>
<td>265 to 295</td>
</tr>
<tr>
<td>Consistency, NLGI grade, DIN 51 818</td>
<td>2</td>
</tr>
<tr>
<td>Base oil viscosity, DIN 51 561 at 40 °C, mm²/s, approx.</td>
<td>95</td>
</tr>
<tr>
<td>at 100 °C, mm²/s, approx.</td>
<td>12</td>
</tr>
<tr>
<td>Speed factor**, (n x d_m), approx.</td>
<td>500,000</td>
</tr>
<tr>
<td>Apparent viscosity, Klüber viscosity grade***</td>
<td>M</td>
</tr>
</tbody>
</table>

* Service temperatures are guide values which depend on the lubricant’s composition, the intended use and the application method. Lubricants change their consistency, apparent dynamic viscosity or viscosity depending on the mechano-dynamical loads, time, pressure and temperature. These changes in product characteristics may affect the function of a component.

** Speed factors are guide values which depend on the type and size of the rolling bearing type and the local operating conditions, which is why they have to be confirmed in tests carried out by the user in each individual case.

*** Klüber viscosity grades: EL = extra light lubricating grease; L = light lubricating grease; M = medium lubricating grease; S = heavy lubricating grease; ES = extra heavy lubricating grease
1 Identification of the substance/preparation and of the company/undertaking

- **Product details**
  - **Trade name:** STABURAGS NBU 8 EP
  - **Article number:** 017105
  - **Application of the substance / the preparation** Grease

- **Manufacturer/Supplier:**
  KLÜBER LUBRICATION MÜNCHEN KG
  Geisenhausenerstrasse 7
  D-81379 München
  Tel.: 0049 (0) 897876-0
  Fax: 0049 (0) 897876-333

- **Further information obtainable from:**
  Material Compliance Management
  E-Mail: mcm@klueber.com

- **Information in case of emergency:** 0049 (0) 89 7876 700 (24 hrs)

2 Hazards identification

- **Hazard description:** Not applicable.

- **Information concerning particular hazards for human and environment:**
  The product has to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.
  R 52/53 Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

- **Classification system:**
  The classification is according to the latest editions of the EU-lists, and extended by company and literature data.

3 Composition/information on ingredients

- **Chemical characterization**
  - **Description:**
    mineral oil
    barium complex soap

- **Dangerous components:**
  - Barium complex soap
    - CAS: 28984-69-2
    - EINECS: 249-355-5
    - R 52/53
    - 25-50%

  - 2-(Heptadecenyl)-2-oxazoline-4,4-dimethanol
    - CAS: 8006-64-2
    - EINECS: 232-350-7
    - R 52/53
    - ≤ 2.5%

  - Turpentine, oil
    - CAS: 80-56-8
    - EINECS: 201-291-9
    - ≤ 0.25%

  - pin-2(3)-ene
    - CAS: 80-56-8
    - EINECS: 201-291-9
    - ≤ 0.25%

- **Additional information:** For the wording of the listed risk phrases refer to section 16.
4 First-aid measures

- **After inhalation:** Supply fresh air; consult doctor in case of complaints.
- **After skin contact:** Wash off with soap and plenty of water.
- **After eye contact:** Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
- **After swallowing:** If symptoms persist consult doctor.

5 Fire-fighting measures

- **Suitable extinguishing agents:**
  - Water haze
  - Foam
  - Fire-extinguishing powder
  - Carbon dioxide
- **For safety reasons unsuitable extinguishing agents:** Water with full jet
- **Special hazards caused by the substance, its products of combustion or resulting gases:**
  - In case of fire, the following can be released:
    - Carbon monoxide (CO)
    - Hydrocarbons
- **Protective equipment:**
  - Do not inhale explosion gases or combustion gases.
  - Standard procedure for chemical fires.
- **Additional information**
  - Cool endangered receptacles with water spray.
  - Dispose of fire debris and contaminated fire fighting water in accordance with official regulations.

6 Accidental release measures

- **Person-related safety precautions:** Not required.
- **Measures for environmental protection:** Do not allow to enter sewers/ surface or ground water.
- **Measures for cleaning/collection:**
  - Pick up mechanically.
  - Dispose of the material collected according to regulations.

7 Handling and storage

- **Handling:**
  - **Information for safe handling:** No special measures required.
  - **Information about fire - and explosion protection:** No special measures required.
- **Storage:**
  - **Requirements to be met by storerooms and receptacles:**
    - Store in cool, dry conditions in well sealed receptacles.
  - **Information about storage in one common storage facility:**
    - Store away from foodstuffs.
    - Store away from oxidizing agents.
- **Further information about storage conditions:** None.

8 Exposure controls/personal protection

- **Additional information about design of technical facilities:** No further data; see item 7.
- **Ingredients with limit values that require monitoring at the workplace:**
  - The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.
- **Additional information:** The lists valid during the making were used as basis.
9 Physical and chemical properties

- General Information
  - Form: Pasty
  - Colour: Light brown
  - Odour: Product specific
  - Change in condition
    - Drip point: > 220°C (DIN ISO 2176)
  - Flash point: not applicable
  - Danger of explosion: Product does not present an explosion hazard.
  - Density at 20°C: ~ 0.99 g/cm³
  - Solubility in / Miscibility with water: Insoluble.
  - Organic solvents: 0.5 %

10 Stability and reactivity

- Thermal decomposition / conditions to be avoided:
  No decomposition if used and stored according to specifications.
- Materials to be avoided: oxidizing agents
- Dangerous reactions: No dangerous reactions known.
- Dangerous decomposition products: none under normal use

11 Toxicological information

- Additional toxicological information:
  Prolonged skin contact may cause skin irritation and/or dermatitis.

12 Ecological information

- Ecotoxic effects:
- Behaviour in sewage processing plants: The product can be mechanically separated.
- General notes:
  Harmful to aquatic organisms
  Do not allow product to reach ground water, water course or sewage system.

13 Disposal considerations

- Product:
- Recommendation: Can be incinerated in accordance with local and national regulations.
Waste disposal key:
For this product no waste disposal key according the European Waste Catalogue (EWC) can be determined, as only the purpose of application defined by the user enables an allocation. The waste code number has to be determined in accordance with the local waste disposer.

Uncleaned packaging:
Recommendation:
Empty contaminated packagings thoroughly. They may be recycled after thorough and proper cleaning.

14 Transport information

- Land transport ADR/RID (cross-border)
  - ADR/RID class: -
- Maritime transport IMDG:
  - IMDG Class: -
- Air transport ICAO-TI and IATA-DGR:
  - ICAO/IATA Class: -
- Transport/Additional information:
  Not classified as dangerous according to the above specifications.

15 Regulatory information

- Labelling according to EU guidelines:
The product has been classified and marked in accordance with EU Directives / Ordinance on Hazardous Materials.
- Risk phrases:
  52/53 Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
- Safety phrases:
  61 Avoid release to the environment. Refer to special instructions/safety data sheets.
- Special labelling of certain preparations:
  Contains Turpentine, oil, 2,5-Bis(octyldithio)-1,3,4-thiadiazole, Amines, C12-14-alkyl, C6-10-alkyl phosphates. May produce an allergic reaction.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- Relevant R-phrases
  10 Flammable.
  20/21/22 Harmful by inhalation, in contact with skin and if swallowed.
  36/38 Irritating to eyes and skin.
  43 May cause sensitisation by skin contact.
  50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
  51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
  52/53 Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
  65 Harmful: may cause lung damage if swallowed.
- Department issuing MSDS: Material Compliance Management
<table>
<thead>
<tr>
<th>Trade name: STABURAGS NBU 8 EP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact: +49(0)897876-1564</td>
</tr>
<tr>
<td>* Data compared to the previous version altered.</td>
</tr>
</tbody>
</table>
The data in this product information is based on our general experience and knowledge at the time of printing and is intended to give information of possible applications to a reader with technical experience. It constitutes neither an assurance of product properties nor does it release the user from the obligation of performing preliminary tests with the selected product. We recommend contacting our Technical Consulting Staff to discuss your specific application. If required and possible we will be pleased to provide a sample for testing. Klüber products are continually improved. Therefore, Klüber Lubrication reserves the right to change all the technical data in this product information at any time without notice.
Klübertemp HM 83-402
High-temperature long-term grease

Description
Klübertemp HM 83-402 is a long-term lubricating grease based on perfluoropolyether oil and PTFE which has been specifically designed for high-temperature lubrication. Owing to the base oil viscosity and the high load-carrying capacity, Klübertemp HM 83-402 is particularly suitable for the initial and relubrication of medium-speed rolling bearings subject to high temperatures and loads.

Application
Klübertemp HM 83-402 has proven effective for lubrication points requiring regular maintenance at temperatures up to 260°C. Klübertemp HM 83-402 contributes to optimum machine operation and allows long relubrication intervals. For automatic lubrication systems the product is available in a lower viscosity (NLGI grade 1).

Typical applications are:
- conveyors
- corrugating machines
- plastics industry
- textile industry
- printing industry.

Klübertemp HM 83-402 is listed in the maintenance and lubrication charts of many leading manufacturers.

Compatibility with plastics and elastomers
Lubricating greases based on fluorinated polyether oils and PTFE are generally regarded as neutral towards elastomers and plastics (with the exception of perfluorinated rubber). Nevertheless compatibility with the materials should be tested, especially prior to series application.

Application notes
For optimum lubrication results, we recommend cleaning the friction points first with white spirit 180/210 and then with Klübertemp HM 83-402.

For initial lubrication, the friction points must be clean and bright (i.e. free from oil, grease or perspiration) and free from contaminants. The various technical sales departments at Klüber Lubrication may be contacted at any time to ensure optimum results with this special lubricating grease.

Minimum shelf life
The minimum shelf life is approx. 60 months if the product is stored in its unopened original container in a dry, frost-free place.

Pack sizes
- 1 kg can
- 800 g cartridge
- 10 kg bucket

Product data

<table>
<thead>
<tr>
<th>Composition</th>
<th>perfluoropolyether oil, PTFE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service temperature range,* [°C]</td>
<td>-30 to 260</td>
</tr>
<tr>
<td>Color</td>
<td>white</td>
</tr>
<tr>
<td>Density at 20 °C, [g/cm³], approx.</td>
<td>1.96</td>
</tr>
<tr>
<td>Consistency, DIN 51 818; NLGI grade</td>
<td>2</td>
</tr>
<tr>
<td>Drop point, DIN ISO 2176**; [°C]</td>
<td>not measurable</td>
</tr>
<tr>
<td>Base oil viscosity, DIN 51 562 part 01, at 40 °C, [mm²/s], approx.</td>
<td>420</td>
</tr>
<tr>
<td>at 100 °C, [mm²/s], approx.</td>
<td>40</td>
</tr>
<tr>
<td>Apparent dynamic viscosity, Klüber viscosity grade ***</td>
<td>S</td>
</tr>
<tr>
<td>Corrosion protection, DIN 51802, (SKF-EMCOR), test duration: 1 week, distilled water</td>
<td>≤ 1</td>
</tr>
<tr>
<td>Four ball tester, welding load, DIN 51350 part 04, [N]</td>
<td>&gt; 8000</td>
</tr>
</tbody>
</table>

* Service temperatures are guide values which depend on the lubricant's composition, the intended use and the application method. Lubricants change their consistency, apparent dynamic viscosity or viscosity depending on the mechano-dynamical loads, time, pressure and temperature. These changes in product characteristics may affect the function of a component.

** In accordance with DIN 2176 it is not possible to measure the drop point of these high-temperature greases (they do not melt); however, a certain degree of oil separation may occur at temperatures above approx. 170 °C.

*** Klüber viscosity grades: EL = extra light lubricating grease; L = light lubricating grease; M = medium lubricating grease; S = heavy lubricating grease; ES = extra heavy lubricating grease

The data in this product information is based on our general experience and knowledge at the time of printing and is intended to give information of possible applications to a reader with technical experience. It constitutes neither an assurance of product properties nor does it release the user from the obligation of performing preliminary tests with the selected product. We recommend contacting our Technical Consulting Staff to discuss your specific application. If required and possible we will be pleased to provide a sample for testing. Klüber products are continually improved. Therefore, Klüber Lubrication reserves the right to change all the technical data in this product information at any time without notice.

Klüber Lubrication, a member of the Freudenberg group

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Current material safety data sheets may be downloaded from our website www.klueber.com or requested from Klüber Lubrication.
Material Safety Data Sheet
According to 91/155 EEC

1 Identification of the substance/preparation and of the company/undertaking

- Product details
- Trade name: Klübertemp HM 83-402
- Article number: 090081
- Application of the substance / the preparation: Lubricant
- Manufacturer/Supplier:
  KLÜBER LUBRICATION MÜNCHEN KG
  Geisenhausenerstrasse 7
  D-81379 München
  Tel.: 0049 (0) 897876-0
  Fax: 0049 (0) 897876-333
  Notfallauskunft: 0049 (0) 897876-700
- Further information obtainable from: Material Compliance Management

2 Composition/information on ingredients

- Chemical characterization
- Description:
  perfluorinated polyether oil
  PTFE
- Dangerous components: Void

3 Hazards identification

- Hazard description: Not applicable.
- Information concerning particular hazards for human and environment:
  The product does not have to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.
- Classification system:
  The classification is according to the latest editions of the EU-lists, and extended by company and literature data.

4 First-aid measures

- After inhalation: Supply fresh air; consult doctor in case of complaints.
- After skin contact: Wash off with soap and plenty of water.
- After eye contact:
  Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.

(Contd. on page 2)
### 5 Fire-fighting measures

- **Suitable extinguishing agents:**
  Use fire extinguishing methods suitable to surrounding conditions.

- **Special hazards caused by the substance, its products of combustion or resulting gases:**
  In case of fire, the following can be released:
  - traces of fluorinated products

- **Protective equipment:**
  - Do not inhale explosion gases or combustion gases.
  - Standard procedure for chemical fires.

- **Additional information**
  Cool endangered receptacles with water spray.
  Dispose of fire debris and contaminated fire fighting water in accordance with official regulations.

### 6 Accidental release measures

- **Person-related safety precautions:** Not required.

- **Measures for environmental protection:**
  Do not allow to enter sewers/surface or ground water.

- **Measures for cleaning/collection:**
  - Pick up mechanically.
  - Dispose of the material collected according to regulations.

### 7 Handling and storage

- **Handling:**
  - **Information for safe handling:** No special measures required.
  - **Information about fire - and explosion protection:** No special measures required.

- **Storage:**
  - **Requirements to be met by storerooms and receptacles:**
    Store in cool, dry conditions in well sealed receptacles.
  - **Information about storage in one common storage facility:** Store away from foodstuffs.
  - **Further information about storage conditions:** None.

### 8 Exposure controls/personal protection

- **Additional information about design of technical facilities:** No further data; see item 7.

- **Ingredients with limit values that require monitoring at the workplace:**
  The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.

- **Additional information:** The lists valid during the making were used as basis.

- **Personal protective equipment:**
  - **General protective and hygienic measures:**
    Immediately remove all soiled and contaminated clothing

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(Contd. of page 1)

- **After swallowing:** If symptoms persist consult doctor.
Avoid close or long term contact with the skin.
Be sure to clean skin thoroughly after work and before breaks.
Keep away from tobacco products.
· **Respiratory protection:** Not required.
· **Protection of hands:**
  Preventive skin protection by use of skin-protecting agents is recommended.
· **Eye protection:** Not required.

### 9 Physical and chemical properties

- **General Information**
  - **Form:** Pasty
  - **Colour:** White
  - **Odour:** Odourless

- **Change in condition**
  - **Melting point/Melting range:** Not melting

- **Flash point:** Not applicable.
- **Danger of explosion:** Product does not present an explosion hazard.
- **Density at 20°C:** ~ 1.96 g/cm³
- **Solubility in / Miscibility with water:** Insoluble.

### 10 Stability and reactivity

- **Thermal decomposition / conditions to be avoided:**
  No decomposition if used and stored according to specifications.
- **Materials to be avoided:**
  strong bases
  alkali metals
  alkaline earth metals
  Lewis acids
- **Dangerous reactions** No dangerous reactions known.
- **Dangerous decomposition products:** > 280°C danger of forming toxic pyrolysis products.
- **Additional information:**
  Some materials (e.g. titanium, aluminium or alloys of these materials) may cause lower decomposition temperatures.

### 11 Toxicological information

- **Additional toxicological information:**
  Prolonged skin contact may cause skin irritation and/or dermatitis.

### 12 Ecological information

- **Ecotoxic effects:**
- **Behaviour in sewage processing plants:** The product can be mechanically separated.
General notes: Do not allow product to reach ground water, water course or sewage system.

13 Disposal considerations

- **Product:**
- **Recommendation:** Can be incinerated in accordance with local and national regulations.
- **Waste disposal key:**
  For this product no waste disposal key according the European Waste Catalogue (EWC) can be determined, as only the purpose of application defined by the user enables an allocation. The waste code number has to be determined in accordance with the local waste disposer.
- **Uncleaned packaging:**
- **Recommendation:** Empty contaminated packagings thoroughly. They may be recycled after thorough and proper cleaning.

14 Transport information

- **Land transport ADR/RID (cross-border):**
- **ADR/RID class:** -
- **Maritime transport IMDG:**
- **IMDG Class:** -
- **Air transport ICAO-TI and IATA-DGR:**
- **ICAO/IATA Class:** -
- **Transport/Additional information:** Not classified as dangerous according to the above specifications.

15 Regulatory information

- **Labelling according to EU guidelines:**
  The product is not subject to classification according to the calculation methods of the "General Classification Guideline for Preparations of the EU" as issued in the latest valid version.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- **Department issuing MSDS:** Material Compliance Management
- **Contact:** Tel.: +49 (0) 897876-564