Detailed information

Manufacturing in accordance with GMP standards.

Speciality lubricants for the pharmaceutical industry
Stringent requirements

To support you in compliance with the stringent Good Manufacturing Practice guidelines applying in the pharmaceutical industry, Klüber Lubrication has developed special lubricants and has them registered as NSF H1.

The control of contamination risks is a major issue in the GMP guidelines. Contamination means the intrusion of any undesirable materials into a product. Risk control therefore includes all auxiliary substances – including lubricants – which may come into contact with the product in applications where this is technically not always avoidable.

To make manufacturing processes more reliable, H1 lubricants should be used exclusively. This prevents the risk of lubricants being mixed up, and contamination of the pharmaceutical products with non-H1 lubricants becomes impossible.

Clean solutions

All lubricants from Klüber Lubrication listed in this brochure conform with the requirements set forth in FDA 21 CFR 178.3570 and are registered as NSF H1. Furthermore, all our production sites manufacturing H1 lubricants and the H1 lubricants manufactured there are certified by NSF according to the new international standard ISO 21469. This standard lays down hygiene requirements for the formulation, manufacture and use of lubricants that could have unintentional contact with the pharmaceutical product. It also requires the lubricant manufacturers to develop a hygiene strategy with a view to chemical, physical and biological risks in the intended lubricant applications.

In close cooperation with the machine makers, we develop lubricants that are closely tuned to the specified friction- and lubrication points. Due to their excellent performance, the quantity of our lubricants that has to be applied can often be reduced. Exact dosage also supports compliance with the guidelines.

High-performance H1 lubricants from Klüber Lubrication

Speciality lubricants made by Klüber Lubrication help to increase productivity, reliability and economical operation of your machinery. Each of our H1 lubricants was developed with the goal to make it optimally suited for specific application requirements. Depending on the application, the following characteristics were emphasised:

- high resistance to ageing and oxidation
- optimised wear protection
- good corrosion protection
- good water resistance for protection against wash-out during cleaning and additional anticorrosive effect
- good load-carrying capacity

The result is a significant extension of the component life and much longer maintenance intervals, and depending on the application reduced energy consumption. Our experts will be pleased to advise you in detail about which lubricant from our range offers the optimum properties to fulfil the requirements of the application. We also provide product information leaflets on request.

Thorough consulting

For this brochure, we have selected a range of products that have proven successful in applications in the pharmaceutical industry. As a rule, we would always recommend consulting by our experts prior to choosing a lubricant. To optimise your lubricant management, Klüber Lubrication has developed a special service programme called KlüberEfficiencySupport.

Just contact us!
<table>
<thead>
<tr>
<th>Pharmaceutical machine</th>
<th>Machine component</th>
<th>Lubricants from Klüber Lubrication, in compliance with FDA 21 CFR 178.3570, NSF H1 registered</th>
<th>Technical data</th>
<th>Information on composition</th>
<th>Offers the following benefits for this application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tablet press</td>
<td>Tablet punches and bronze guides</td>
<td>Klüberpharma UH1 4-220, 4-460</td>
<td>ISO VG 220, 460 acc. to DIN 51519</td>
<td>Special synthetic oil</td>
<td>– Especially designed for the lubrication of tablet presses, in particular for high-volume production</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Klüberoil 4 UH1-100 N</td>
<td>ISO VG 100 acc. to DIN 51519</td>
<td>Synthetic hydrocarbon oils, ester oil</td>
<td>– For the lubrication of punches made of e.g. POM or special steel</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Klübersynth UH1 14-151</td>
<td>Consistency grade NLGI 1 acc. to DIN 51818</td>
<td>Synthetic hydrocarbon oils/ aluminium complex soap</td>
<td>– Neutral towards many NBR elastomer types</td>
</tr>
<tr>
<td>Man-shaft bearing/ rotor bearing</td>
<td>Klübersynth UH1 14-222 2)</td>
<td>Consistency grade NLGI 2 acc. to DIN 51818</td>
<td>Base oil viscosity acc. to DIN 51562</td>
<td>Synthetic hydrocarbon oils/ aluminium complex soap</td>
<td>– Neutral towards many NBR elastomer types</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Klüberfood 4 NH1 series</td>
<td>Available in ISO VG 32, 46, 68, 100 acc. to DIN 51519</td>
<td>Hydraulic oils based on synthetic hydrocarbon oils</td>
<td>– Contains additives improving the ageing resistance; has a demulcenting effect; very low foaming tendency; compatible with many NBR and FPM elastomer types</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Klübersynth UH1 6 series</td>
<td>Available in ISO VG 100, 150, 220, 320, 460, 680 acc. to DIN 51519</td>
<td>Synthetic polyglycol long-term gear and high-temperature oils</td>
<td>– Especially for the lubrication of steel-bronze worm gears, but also for all types of spur and bevel gears at elevated temperatures</td>
</tr>
<tr>
<td>Tool assembly and tablet punch preservation</td>
<td>Klüberoil 4 UH1-1500 N Spray</td>
<td>ISO VG 1500 acc. to DIN 51519</td>
<td>Service temperature range: −25 °C to 120 °C</td>
<td>Synthetic oil</td>
<td>– Facilitates punch assembly</td>
</tr>
</tbody>
</table>

1) In addition to Klübersynth UH1 6 polyglycol gear oils in the pharmaceutical industry, we offer FDA-compliant Klüberoil 4 UH1 N gear oils based on PAO for normal temperatures as well as the FDA-compliant NLGI 00 grade fluid gear grease Klübersynth UH1 14-1600. Please do not hesitate to contact us for technical support.

2) Both types of lubricant have proven highly successful in this application. Due to its adhesive qualities and specific consistency, Klübersynth UH1 14-222 improves surface protection. Klübersynth UH1 14-151 is characterised by very good pumpability in centralised lubricating systems. Our experts will be pleased to advise you with a view to the specific parameters of your application.
# Pharmaceutical processing machines

<table>
<thead>
<tr>
<th>Pharmaceutical machine</th>
<th>Machine component</th>
<th>Lubricants from Klüber Lubrication, in compliance with FDA 21 CFR 178.3570, NSF H1 registered</th>
<th>Technical data</th>
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</tr>
</thead>
</table>
| Blister packaging machine | Deep-drawing unit, film sealing unit and elevation guides near the heated plates unit | BARRIERTA L 55/2 | Available in the NLGI grades 0, 1, 2 and 3 acc. to DIN 51818  
Base oil viscosity at 40 °C approx. 420 mm²/s acc. to DIN 51562 pt. 1  
Service temperature range NLGI 0, 1, 2: −40 °C to 260 °C, NLGI 3: −30 °C to 260 °C | High-temperature grease based on PFPE/PTFE | – Resists to very high operating temperatures up to 260 °C  
– BARRIERTA base oils are manufactured exclusively for Klüber Lubrication and show excellent long-term stability and high purity level ¹ |
| Guide rails, racks, drives and cardan shafts | Klübersynth UH1 14-151 | Consistency NLGI 1 acc. to DIN 51818  
Base oil viscosity acc. to DIN 51562 pt. 1 at 40 °C approx. 150 mm²/s  
Service temperature range: −65 °C to 120 °C | Synthetic hydrocarbon oils/aluminium complex soap | – Special high-performance lubricating grease for a wide range of applications  
– Can be applied by means of centralised lubrication systems. However, due to the many different types of installations and application conditions, pumpability in these systems has to be checked with the manufacturer of the installation in each individual case. We would be pleased to provide support |
| Chains² | Klüberoil 4 UH1-1500 N Spray | ISO VG 1500 acc. to DIN 51619  
Service temperature range of the active agent: −25 °C to 120 °C | Synthetic hydrocarbon oils, ester oil | – Easy spray application. The active agent easily penetrates into the chain links due to the aerosol formation  
Please refer to the safety data sheets for safe handling methods  
– Also for spindles |
| Moulds for the deep-drawing film | PARALIQ 91 | Kinematic viscosity at 40 °C 13.0 – 15.6 mm²/s acc. to DIN 51562 pt. 1  
Service temperature range: 0 to 120 °C | Ester oil | – Tried and tested as release agent for moulds in blister machines used for the deep-drawing of film (bottom film)  
– Also available as spray for easy application |
| Cartoning machine | Guide rails, racks, drives, spindles, cardan shafts | Klübersynth UH1 14-151 | Consistency grade NLGI 1 acc. to DIN 51818  
Base oil viscosity acc. to DIN 51562 pt. 1 at 40 °C approx. 150 mm²/s  
Service temperature range: −45 °C to 120 °C | Synthetic hydrocarbon oils/aluminium complex soap | – Special high-performance lubricating grease for a wide range of applications  
– Neutral towards many NBR elastomer types  
– Can be applied by means of centralised lubrication systems. However, due to the many different types of installations and application conditions, pumpability in these systems has to be checked with the manufacturer of the installation in each individual case. We would be pleased to provide support |
| Chains² | Klüberoil 4 UH1-1500 N Spray | ISO VG 1500 acc. to DIN 51619  
Service temperature range of the active agent: −30 °C to 120 °C | Synthetic hydrocarbon oils, ester oil | – Easy spray application. The active agent easily penetrates into the chain links due to the aerosol formation  
Please refer to the safety data sheets for safe handling methods  
– Also for spindles |

¹) BARRIERTA L 55 greases are resistant to ultraviolet light and can be used for linear guides exposed to UV light in the pharmaceutical industry  
²) We offer a multitude of other FDA-conforming chain oils, e.g. Klüberfood NH1 4-220 N Spray (optimum oil penetration due to medium base oil viscosity), as well as chain oils for high temperatures. Please do not hesitate to contact us for technical support.
### Pharmaceutical Processing Machines

<table>
<thead>
<tr>
<th>Machine Components</th>
<th>Machine Type</th>
<th>Lubricants from Klüber Lubrication, in compliance with FDA 21 CFR 178.3570, NSF H1 registered</th>
<th>Technical Data</th>
<th>Information on Composition</th>
<th>Offers the Following Benefits for this Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coater, fluidized bed system</td>
<td>Seals (e.g. O-rings) of the spray nozzle</td>
<td>PARALIQ GTE 703</td>
<td>Consistency NLGI 3 acc. to DIN 51818</td>
<td>Sealing grease based on silicone oil/PTFE</td>
<td>Good resistance to media (cold and hot steam, vapour, many types of disinfectants and cleaning agents, solvents) Good compatibility with many EPDM and NBR elastomer types</td>
</tr>
<tr>
<td>Capsule filling machine</td>
<td>Cam mechanism</td>
<td>Klüberfood NH1 94-301</td>
<td>Worked penetration 310 – 340 0.1 mm acc. to ISO 2137</td>
<td>Grease based on synthetic hydrocarbon oils, white oil (acc. to EC pharmacopoeia), calcium complex thickener</td>
<td>Increased component availability and extended maintenance intervals due to good wear protection</td>
</tr>
<tr>
<td>Granulating machine</td>
<td>TMG agitator</td>
<td>Klüberol 4 UH1-150 N</td>
<td>ISO VG 150 acc. to DIN 51519</td>
<td>Synthetic hydrocarbon oils, aster oil</td>
<td>Good wear protection thus extending the service life of agitators</td>
</tr>
</tbody>
</table>

### Machine Components

<table>
<thead>
<tr>
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<th>Lubricants from Klüber Lubrication, in compliance with FDA 21 CFR 178.3570, NSF H1 registered</th>
<th>Technical Data</th>
<th>Information on Composition</th>
<th>Offers the Following Benefits for this Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressors</td>
<td>Klüber Summit FG 100...500</td>
<td>Available in ISO VG 32, 46, 68, 100 acc. to DIN 51519</td>
<td>Fully synthetic air compressor oils based on synthetic hydrocarbon oils</td>
<td>Low maintenance and operating costs due to oil change intervals up to 5000 operating hours in oil-injected screw-type compressors Low evaporation and carry-over giving long service life of activated carbon filter Energy savings (reduction of costs and CO₂ emissions) using synthetic hydrocarbons, due to increase in efficiency by 5 % on average</td>
</tr>
<tr>
<td>Pneumatic drives</td>
<td>Pneumatic drives have to meet a variety of requirements depending on speed, design, operating temperature and materials (particularly elastomers). We would be pleased to assist you in selecting the lubricant tailored to your pneumatic machine.</td>
<td>[\text{Details}]</td>
<td>[\text{Details}]</td>
<td>[\text{Details}]</td>
</tr>
<tr>
<td>Pharmaceutical machine</td>
<td>Machine component</td>
<td>Lubricants from Klüber Lubrication, in compliance with FDA 21 CFR 178.3570, NSF H1 registered</td>
<td>Technical data</td>
<td>Information on composition</td>
</tr>
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<tr>
<td>Filling machine (for liquids)</td>
<td>Lever in filling station</td>
<td>Klübersynth UH1 64-1302</td>
<td>Consistency grade NLGI 2 acc. to DIN 51818</td>
<td>Lubricating grease based on synthetic hydrocarbon oils and silicate</td>
</tr>
<tr>
<td></td>
<td>Guides and open sliding points, rolling and plain bearings</td>
<td>Klübersynth UH1 14-151</td>
<td>Consistency grade NLGI 1 acc. to DIN 51818</td>
<td>Grease based on synthetic hydrocarbon oils/aluminium complex soap</td>
</tr>
<tr>
<td></td>
<td>Mixer/piston metering system</td>
<td>Klübersynth UH1 14-222</td>
<td>Consistency grade NLGI 3 acc. to DIN 51818</td>
<td>Grease based on synthetic hydrocarbon oil/aluminium complex soap</td>
</tr>
<tr>
<td></td>
<td>Seals, O-rings for filler heads</td>
<td>PARALIQ GTE 703</td>
<td>Consistency grade NLGI 3 acc. to DIN 51818</td>
<td>Sealing grease based on silicone oil/PTFE</td>
</tr>
<tr>
<td></td>
<td>Chains</td>
<td>Klüberoil 4 UH1-1500 N Spray</td>
<td>150 VG 1500 acc. to DIN 51519</td>
<td>Synthetic hydrocarbon oils, ester oil</td>
</tr>
</tbody>
</table>

1) We offer a multitude of other high-performance, FDA-conforming lubricants for rolling and plain bearings, e.g. Klübersynth UH1 14-31 for application in deep-freezing tunnels or Klübersynth UH1 64-62 showing excellent low- and high-temperature stability as well as excellent water resistance. We would be pleased to provide detailed information.

2) We offer a multitude of other FDA-conforming chain oils, e.g. Klüberfood NH1 4-220 N Spray (optimum oil penetration due to medium base oil viscosity, as well as chain oils for high temperatures. Please do not hesitate to contact us for technical support.
**Pharmaceutical processing machines**

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<th>Lubricants from Klüber Lubrication, in compliance with FDA 21 CFR 178.3570, NSF H1 registered</th>
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<th>Information on composition</th>
<th>Offers the following benefits for this application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peeler centrifuge</td>
<td>Peeling knife/broad-</td>
<td>Klübersynth UH1 64-1302 Consistency grade NLGI 2 acc. to DIN 51818 Base oil viscosity at 40 °C:</td>
<td>Lubricating grease based on synthetic hydrocarbon oils and silicone</td>
<td>– Good resistance to media allows extended maintenance intervals even when in contact with cleaning agents</td>
<td></td>
</tr>
<tr>
<td></td>
<td>peeling machine</td>
<td>approx. 1300 mm²/s acc. to DIN 51562 pt. 1 Service temperature range: −10 °C to 140 °C</td>
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</tr>
<tr>
<td></td>
<td>(rolling and plain</td>
<td></td>
<td></td>
<td></td>
<td>- Neutral towards many NBR elastomer types</td>
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<tr>
<td></td>
<td>bearings)</td>
<td></td>
<td></td>
<td></td>
<td>- Good compatibility with many EPDM and NBR elastomer types</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- Good resistance to media (cold and hot steam, vapour, many types of disinfectants and cleaning agents, solvents)</td>
</tr>
<tr>
<td>Deep groove ball</td>
<td>Klübersynth UH1 14-151</td>
<td>Consistency grade NLGI 1 acc. to DIN 51818 Base oil viscosity acc. to DIN 51562 pt. 1 at 40 °C:</td>
<td>Synthetic hydrocarbon oils/ aluminium complex soap</td>
<td></td>
<td></td>
</tr>
<tr>
<td>bearings and shaft</td>
<td></td>
<td>approx. 150 mm²/s acc. to DIN 51562 pt. 1 Service temperature range: −45 °C to 120 °C</td>
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<tr>
<td>seal</td>
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</tr>
<tr>
<td>Separator</td>
<td>Sealing rings (drum)</td>
<td>PARA LIQ GTE 703 Consistency grade NLGI 3 acc. to DIN 51818 Base oil viscosity at 25 °C:</td>
<td>Silicone oil/PTFE sealing grease</td>
<td>– Good adhesion to the friction point, also when subject to humidity</td>
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<tr>
<td></td>
<td></td>
<td>approx. 1350 mm²/s acc. to DIN 51562 pt. 1 Service temperature range: −50 °C to 120 °C</td>
<td></td>
<td>– Compatible with high-alloy steels (e.g. A2-70)</td>
<td></td>
</tr>
<tr>
<td>Lock of drum cover</td>
<td>Klüberpaste UHI 96-402</td>
<td>Consistency grade NLGI 2 acc. to DIN 51818 Service temperature range: −30 °C to 1,200 °C</td>
<td>Fully synthetic base oils/ solid lubricants</td>
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<tr>
<td>connected to the lower</td>
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<tr>
<td>drum part (trapezoid thread)</td>
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<tr>
<td>Autoclave</td>
<td>Door seal</td>
<td>BARRIERTA L 55/2 Consistency grade NLGI grades 0, 1, 2 and 3 acc. to DIN 51818 Base oil viscosity at 40 °C:</td>
<td>PFPE/PTFE high-temperature grease</td>
<td>– Resists very high operating temperatures up to 260 °C</td>
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<tr>
<td></td>
<td></td>
<td>approx. 420 mm²/s acc. to DIN 51562 pt. 1, Service temperature range NLGI 0, 1, 2:</td>
<td></td>
<td>– Compatible with most elastomer types</td>
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<tr>
<td></td>
<td></td>
<td>−40 °C to 260 °C, NLGI 3: −30 °C to 260 °C</td>
<td></td>
<td>– BARRIERTA base oils are manufactured exclusively for Klüber Lubrication and show excellent long-term stability and high purity levels 2)</td>
<td></td>
</tr>
</tbody>
</table>

1) Please note that the centrifugal forces acting on this type of bearing place particularly high demands on the bearing grease. Klübersynth UH1 14-151 has proven successful in certain types of centrifuges. When selecting the bearing grease it should be checked which special greases from Klüber Lubrication perform best under the respective operating conditions (type of centrifuge, speed factor \( n \cdot \sqrt{d_z} \) of the bearing, bearing type). Please contact us!

2) BARRIERTA L 55 greases are resistant to ultraviolet light and can be used for linear guides exposed to UV light in the pharmaceutical industry.
Speciality lubricants for machine-independent components and special applications

### Component Lubricants from Klüber Lubrication, in compliance with FDA 21 CFR 178.3570, NSF H1 registered

**Component**
- Mechanical seals, e.g. in agitators
- Valves (double-chamber valves, stop valves etc.)
- Seal lubrication under hygienic conditions

**Technical data**
- Klüberfluid NH1 4-005
  - ISO VG 5 acc. to DIN 51519
  - Service temperature range: −40 °C to 150 °C
- Klüberol 4 UH1-15 AF
  - Oil viscosity at 40 °C approx. 18 mm²/s acc. to DIN 51562 pt. 1
  - Service temperature range: −40 °C to 110 °C
- PARAULIQ P 12
  - Oil viscosity at 40 °C approx. 20 mm²/s acc. to DIN 51562 pt. 1
  - Service temperature range: −10 °C to 120 °C
- PARAULIQ GB 363
  - Worked penetration 215-245 0.1 mm acc. to DIN ISO 2137
  - Base oil viscosity at 40 °C: approx. 2400 mm²/s acc. to DIN 51562 pt. 1
  - Service temperature range: −30 °C to 140 °C
- Klüberfood NH1 87-703 Hyg
  - Consistency NLGI 3 acc. to DIN 51818
  - Base oil viscosity at 25 °C: approx. 1550 mm²/s acc. to DIN 51562 pt. 1
  - Service temperature range: −45 °C to 150 °C

**Information on composition**
- Synthetic hydrocarbon oils
- Synthetic hydrocarbon oils
- Medical white oil acc. to the European Pharmacopoeia
- White oil (acc. to EU pharmacopoeia)/synthetic hydrocarbon oil/silicates
- Sealing grease based on silicone oil/PTFE

**Benefits**
- The suitable viscosity for mechanical seals depends on the speed (normal speeds range between 1500 and 3000 rpm). Please contact us!
- Neutral towards many NBR and FKM elastomer types

**Application Lubricants from Klüber Lubrication, in compliance with FDA 21 CFR 178.3570, NSF H1 registered**

**Application**
- Universal lubricating oils, e.g. for open slide rails

**Technical data**
- Klüberol 4 UH1-1500 N Spray
  - ISO VG 1500 N acc. to DIN 51519
  - Service temperature range of the active agent: −30 °C to 130 °C
- UNISILKON M 2000 Spray
  - Service temperature range of the active agent: −10 °C to 150 °C
- Klüber synth NH1 4-68 Foam Spray
  - Service temperature range of active agent: −35 °C to 130 °C

**Information on composition**
- Synthetic hydrocarbon oils, ester oil
- Silicone spray
- Synthetic oil

**Benefits**
- For metal surfaces
  - Easy spray application. Please refer to the safety data sheets for notes on safe handling
- For non-metallic surfaces like plastic, rubber etc.
  - Particularly for conveyor belts made of plastic, because the product is compatible with most plastics
  - Efficient protection against sticking
  - Easy spray application. Please refer to the safety data sheets for notes on safe handling
- Excellent adhesion enables good lubricity and reduced wear
  - The unique combination of foam and oil enables drip-free overhead application
  - Optimised consumption due to capillary effect leading to slow but thorough lubricant penetration to the friction point

1) Additional benefit of PARAULIQ GB 363: can also be used for filler components, filters, stuffing boxes, rubber membranes and seals.
### Application Problem Lubricants from Klüber Lubrication, in compliance with FDA 21 CFR 178.3570, NSF K1 registered

<table>
<thead>
<tr>
<th>Application</th>
<th>Problem</th>
<th>Lubricants from Klüber Lubrication, in compliance with FDA 21 CFR 178.3570, NSF K1 registered</th>
<th>Benefits</th>
</tr>
</thead>
</table>
| Corrosion protection   | The corrosion resistance of DIN EN 10020 special steel is based on the formation of a very thin passive layer on the steel surface. This passive layer can be destroyed under adverse conditions (e.g. high pH values > 11, chloride ions, leading to intergranular corrosion (welding), crevice corrosion, stress corrosion cracking (e.g. in tube joints) or corrosion fatigue cracking. | Klüberfood NH1 K 32                                                                                                                                | – Good corrosion protection, even with frequent cleaning  
– Repels moisture  
– Also available as spray, therefore easy to apply |
| Assembly               | Particularly in screw connections of the same material there is a risk of cold welding (seizure), which can be prevented by using a Klüberpaste product.                                                                                                                                                                                        | Klüberpaste UH1 96-402                                                                            | – Facilitates disassembly after longer periods of use  
– Prevents cold welding in special steel joints  
– Compatible with high-alloy steels  
– Excellent water resistance, therefore particularly suitable for friction points subject to moisture (guide rails, hinges etc.)  
– Prevents fretting corrosion  
– Protects against corrosion  
– For high temperatures (upper limit 800 °C, > 200 °C dry lubrication) |
| Cleaning and maintenance | Cleaning/degreasing spray for the pharmaceutical industry registered as NSF K1/K3                                                                                                                                                                                                                                                   | Klüberfood NK1 Z 8-001 Spray                                                                 | – Rapid and thorough removal of oils, greases, waxes and resin residues  
– NSF K1 and NSF K3 registered for applications in the pharmaceutical industry  
– Easy spray application |
|                        | Surface cleaning agent for universal use                                                                                                                                                                                                                                                                                               | Klüberfluid NH1 1-002                                                                           | – Removes oils, greases and waxes from metal surfaces  
– Evaporates without residues |
The data in this document is based on our general experience and knowledge at the time of publication 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 field tests with the product selected for a specific application. All data are guide values which depend on the lubricant’s composition, the intended use and the application method. The technical values of lubricants change depending on the mechanical, dynamical, chemical and thermal loads, time and pressure. These changes may affect the function of a component. We recommend contacting us to discuss your specific application. If possible we will be pleased to provide a sample for testing on request. Products from Klüber Lubrication are continually improved. Therefore, Klüber Lubrication reserves the right to change all the technical data in this document at any time without notice.

Klüber Lubrication München SE & Co. KG
Geisenhausenstraße 7
81379 München
Germany

Local first-instance court Munich, Germany
Certificate of registration 46624
Innovative tribological solutions are our passion. Through personal contact and consultation, we help our customers to be successful worldwide, in all industries and markets. With our ambitious technical concepts and experienced, competent staff we have been fulfilling increasingly demanding requirements by manufacturing efficient high-performance lubricants for more than 80 years.