

# Klüberoil® GEM 1-46 ... 680

## High-performance gear and multi-purpose oils



### Description:

The oils of the Klüberoil GEM 1 series are high-performance gear and multi-purpose oils on a mineral oil basis. They comply with the CLP gear oil requirements, DIN 51 517 Pt 3. They stand out for their good antiwear and anticorrosion properties and their neutrality towards non-ferrous metals. All oils of this series are free from silicone and have a low foaming tendency.

In the tests according to DIN 51 354 Pt 2, A/8.3/90 (FZG test), these oils had a scuffing load stage > 12 and a change in specific weight  $\leq 0.2$  mg/kWh.

### Application:

Klüberoil GEM 1-46 ... 680 oils are suitable for the lubrication of friction points subject to high loads in spur, bevel and worm gears, rolling and sliding bearings, spindles, chains, guideways, joints and toothed couplings. The low-viscosity oils of this series can also be used in hydraulic systems.

### Application notes:

The Klüberoil GEM 1 series can be used for immersion, immersion/circulation, and injection lubrication. In addition, these products can also be applied through a force-feed

system, an automatic lubrication system, by brush or oil can. When using an automatic system, observe the manufacturer's instructions on the maximum viscosity which can be used.

The low-viscosity oils of this series can also be used for oil-mist lubrication.

### Service temperature range\*:

- Lubrication of gears and chains by immersion:

ISO VG 46 to 68:  
from approx.  $-15^{\circ}\text{C}$   
to approx.  $100^{\circ}\text{C}$

ISO VG 100 to 220:  
from approx.  $-5^{\circ}\text{C}$   
to approx.  $100^{\circ}\text{C}$

ISO VG 320 to 680:  
from approx.  $0^{\circ}\text{C}$   
to approx.  $100^{\circ}\text{C}$

- Total loss lubrication depending on relubrication:  
up to approx.  $120^{\circ}\text{C}$

### Klüberoil GEM 1-46 ... 680 oils

- Comply with CLP gear oil requirements
- Free from silicone
- Resistant to ageing and oxidation
- Anti-wear properties
- FZG scuffing load stage > 12

### Minimum shelf life:

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

### Pack sizes:

20 l canister  
200 l drum

\* 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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## High-performance gear and multi-purpose oils

### Product data:

Klüberoil GEM	1-46	1-68	1-100	1-150	1-220	1-320	1-460	1-680
ISO VG DIN 51 519	46	68	100	150	220	320	460	680
Density, DIN 51 757, at 20 °C, g/ml, approx.	0.87	0.88	0.88	0.88	0.89	0.90	0.91	0.93
Kinematic viscosity, DIN 51 561 at 20 °C, mm <sup>2</sup> /s, approx. at 40 °C, mm <sup>2</sup> /s, approx. at 100 °C, mm <sup>2</sup> /s, approx.	130 46 7	200 68 8	330 100 11	570 150 15	820 220 18	1350 320 24	1970 460 29	3200 680 35
Viscosity index, DIN ISO 2909, approx.	100	100	100	95	95	95	95	85
Flash point, DIN ISO 2592, °C	> 200	> 200	> 200	> 200	> 200	> 200	> 200	> 200
Pourpoint, DIN ISO 3016, °C	< – 20	< – 20	< – 10	< – 10	< – 10	< – 10	< – 10	< – 5

### Compatibility with elastomers:

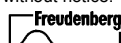
Klüberoil GEM	1-46	1-68	1-100	1-150	1-220	1-320	1-460	1-680
towards SRE NBR 1 at 100 °C / 168 h change in volume % change in hardness (Shore A), approx.	< + 10 – 6	< + 10 – 6	< + 10 – 6	< + 10 – 6	< + 10 – 6	< + 10 – 6	< + 10 – 6	≈ 11 – 6
towards 72 NBR 902 at 100 °C / 168 h change in volume % change in hardness (Shore A), approx.	< + 2 ± 1	< + 3 ± 1	< + 2 ± 1	< + 1 ± 1	< + 1 ± 1	< + 1 ± 1	< + 1 ± 1	≈ + 3 ≈ – 2

# Klüberoil® GEM 1-46 ... 680

## Safety Data Sheet

<p><b>1.1 Product name:</b> Klüberoil GEM a) 1-46, b) 1-68, c) 1-100, d) 1-150, e) 1-220, f) 1-320, g) 1-460, h) 1-680</p> <p><b>Artikel-Nr.:</b> a) 030 149, b) 030 150, c) 030 151, d) 030 152, e) 030 153, f) 030 154, g) 030 155, h) 030 156</p> <p style="text-align: right;"><b>24.04.1998</b></p>	<p><b>9. Physical and chemical properties</b></p> <p>Form liquid</p> <p>Colour a), b), c) yellow; d), e), f), g) h) brown</p> <p>Odour characteristic</p> <p>Pour point, DIN ISO 3016, °C a), b) &lt; - 20; c), d), e), f), g) &lt; - 10; h) &lt; - 5</p> <p>Flash point, DIN ISO 2592, °C a) to h) &gt; 200</p> <p>Flammability not applicable</p> <p>Ignition temperature not applicable</p> <p>Autoflammability not applicable</p> <p>Lower explosion limit not applicable</p> <p>Upper explosion limit not applicable</p> <p>Vapour pressure-first not applicable</p> <p>Density, g/cm<sup>3</sup>, 20 °C, a) 0.87; b), c), d) 0.88; e) 0.89; f) 0.90; g) 0.91; h) 0.93</p> <p>DIN ISO 51 757, approx.</p> <p>Water solubility insoluble</p> <p>pH value not applicable</p> <p>Kinematic viscosity, mm<sup>2</sup>/s, a) 46; b) 68; c) 100; d) 150; e) 220; 40 °C, DIN 51 562, approx. f) 320; g) 460; h) 680</p> <p>Further information none</p>
<p><b>1.2</b> Klüber Lubrication München KG <b>Emergency telephone no.:</b> Geisenhausenerstraße 7 <b>++49 - 89 7876 - 0</b> D-81379 München Tel. ++49 - 89 78 76 - 0 telephone exchange Fax: ++49 - 89 78 76 - 333</p>	<p><b>10. Stability and reactivity</b></p> <p>Conditions to avoid: Do not heat above flash point</p> <p>Materials to avoid: Strong oxidizing agents</p> <p>Hazardous decomposition products: None under normal use</p> <p>Additional information: None</p>
<p><b>2. Composition / information on ingredients</b></p> <p>Chemical characterization (preparation): Mineral oil</p> <p>Additional information: No hazardous ingredients</p>	<p><b>11. Toxicological information</b></p> <p>The toxicological data has been taken from products of similar composition</p> <p>Acute toxicity: LD<sub>50</sub>/oral/rat = &gt; 2 g/kg (literature data)</p> <p>Chronic toxicity: None</p> <p>Human experience: Prolonged skin contact may cause skin irritation and/or dermatitis</p>
<p><b>3. Hazards identification</b></p> <p>No particular hazards known</p>	<p><b>12. Ecological information</b></p> <p>Information on elimination (persistence and degradability): Product is insoluble in water. May be separated out mechanically in purification plants</p> <p>Behaviour in environmental compartments: Ecological injuries are not known or expected under normal use</p> <p>Ecotoxic effects: Aquatic toxicity is unlikely due to low solubility</p> <p>Additional information: Should not be released into the environment</p>
<p><b>4. First aid measures</b></p> <p>After inhalation: Not applicable</p> <p>After contact with skin: Wash off with soap and plenty of water</p> <p>After contact with eyes: Rinse with plenty of water</p> <p>After ingestion: Do not induce vomiting. Obtain medical attention</p> <p>Advice to doctor: Treat symptomatically. If swallowed or in the event of vomiting, risk of product entering the lungs</p>	<p><b>13. Advice on Disposal</b></p> <p>Disposal: Dispose of in accordance with your local, state and federal regulations as used oil for reconditioning</p> <p>Dispose of contaminated packaging and recommended cleaning: Offer rinsed packaging material to local recycling facilities</p>
<p><b>5. Fire-fighting measures</b></p> <p>Suitable extinguishing media: Water spray, foam, dry powder, carbon dioxide (CO<sub>2</sub>)</p> <p>Unsuitable extinguishing media: High volume water jet</p> <p>Special hazards: In case of fire the following can be released: Carbon monoxide, hydrocarbons</p> <p>Special protective equipment for firefighters: Standard procedure for chemical fires</p> <p>Additional information: Water mist may be used to cool closed containers. In the event of fire and/or explosion do not breathe fumes</p>	<p><b>14. Transport information</b></p> <p>GGVS / GGVE: not applicable</p> <p>ADN / ADNR: not applicable</p> <p>IMDG-Code: not applicable</p> <p>ICAO / IATA-DGR: not applicable</p> <p>Further information: Not classified as dangerous in the meaning of transport regulations</p>
<p><b>6. Accidental release measures</b></p> <p>Personal precautions: Risk of slipping due to leakage/spillage of product</p> <p>Environmental precautions: Do not flush into surface water or sanitary sewer system</p> <p>Methods for cleaning up / taking up: Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Dispose of absorbed material in accordance with the regulations</p> <p>Additional information: None</p>	<p><b>15. Regulatory information</b></p> <p>Labelling according to EU-guidelines: The product does not require a hazard warning label in accordance with EC-directives/German regulations on dangerous substances</p> <p>National regulations</p>
<p><b>7. Handling and storage</b></p> <p>Advice on safe handling: Avoid formation of aerosol</p> <p>Advice on protection against fire and explosion: No special precautions required</p> <p>Requirements on storage rooms and vessels: No special storage conditions required</p> <p>Incompatible materials: Incompatible with oxidizing agents. Do not store together with food</p> <p>Further information on storage conditions: Store at room temperature in the original container</p>	<p><b>16. Other information</b></p> <p>Issue-department of Safety Data Sheet: Chemical Documentation, Tel.: ++49 - 89 7876 - 564</p>
<p><b>8. Exposure controls / personal protection</b></p> <p>Additional advice on system design: Not applicable</p> <p>Ingredients and specific control parameters: None</p> <p>Respiratory protection: No special protective equipment required</p> <p>Hand protection: No special protective equipment required</p> <p>Eye protection: No special protective equipment required</p> <p>Body protection: No special protective equipment required</p> <p>Other protection measures: No special protective equipment required</p> <p>General protection and hygiene measures: Avoid prolonged and/or repeated contact with skin. Clean skin thoroughly after work; apply skin cream. Remove soiled or soaked clothing immediately. Do not inhale aerosol</p>	

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 München KG, a member of the Freudenberg group