

Klüberoil GEM 1 S

High-performance gear and multipurpose oil based on mineral oil



Your benefits at a glance

- High scuffing protection
- Excellent wear protection for gears and rolling bearings
- Good shear stability for reliable lubricant film formation
- Excellent ageing and oxidation resistance
- Low foaming tendency
- Good elastomer compatibility

Your requirements - our solution

Klüberoil GEM 1 S is a high-performance gear and multipurpose oil based on selected mineral oils satisfying the growing requirements and increasing power density of modern gears.

Klüberoil GEM 1 S meets CLP requirements according to DIN 51517-3. Corresponding gears can be switched to Klüberoil GEM 1 S without prior consultation with the gear manufacturer provided the general application notes are observed.

Klüberoil GEM 1 S offers high scuffing load capacity. Gears are sufficiently protected against scuffing even at extremely high peak loads, vibrations or oscillations, or if no running-in was performed. The excellent wear protection of both gears and rolling bearings ensures that the service life calculated for the lubricated components is achieved, leading to lower maintenance and repair costs.

Klüberoil GEM 1 S offers a much longer service life than mineral oil-based standard gear oils due to the excellent ageing and oxidation resistance of the selected raw materials; thus service intervals can be extended and maintenance costs reduced. The product's low foaming tendency and anti-corrosive properties enable problem-free gear operation. Klüberoil GEM 1 S is compatible with seals made of NBR and FKM. Leakages and oil contamination are prevented.

By using Klüberoil GEM 1 S you can benefit from a number of advantages that will help you save costs easily and efficiently. We look forward to hearing from you.

Application

Klüberoil GEM 1 S was specially developed for the lubrication of spur, bevel, hypoid and planetary gears that are subject to high loads. Such gears are frequently used in the steel, mining and sugar industries.

Klüberoil GEM 1 S can also be used for the lubrication of plain and rolling bearings, all kinds of toothed couplings, chains, guideways, joints, spindles and pumps.

Application notes

Klüberoil GEM 1 S can be applied by means of immersion, immersion circulation or injection.

The use of drip-feed oilers, brushes, oil cans or suitable automatic lubricating systems is also possible. When using automatic lubricating systems, please note the manufacturer's instructions regarding the maximum permissible viscosity. The low-viscosity varieties are also used for oil mist lubrication.

It should be noted that elastomers from one or several manufacturers can behave differently; therefore tests should be performed.

For checking the contact pattern during running-in, the inspection paint Klübertop P 39-462 Spray (Art. No. 081295) can be used.

Viscosity selection

When determining the oil viscosity for gear lubrication, the gear manufacturer's instructions take priority. Only for applications where manufacturer's instructions are not available, the suitable viscosity can be determined as laid down in DIN 51509. To determine the correct oil viscosity for bearings, please observe the bearing manufacturer's instructions.

Material safety data sheets

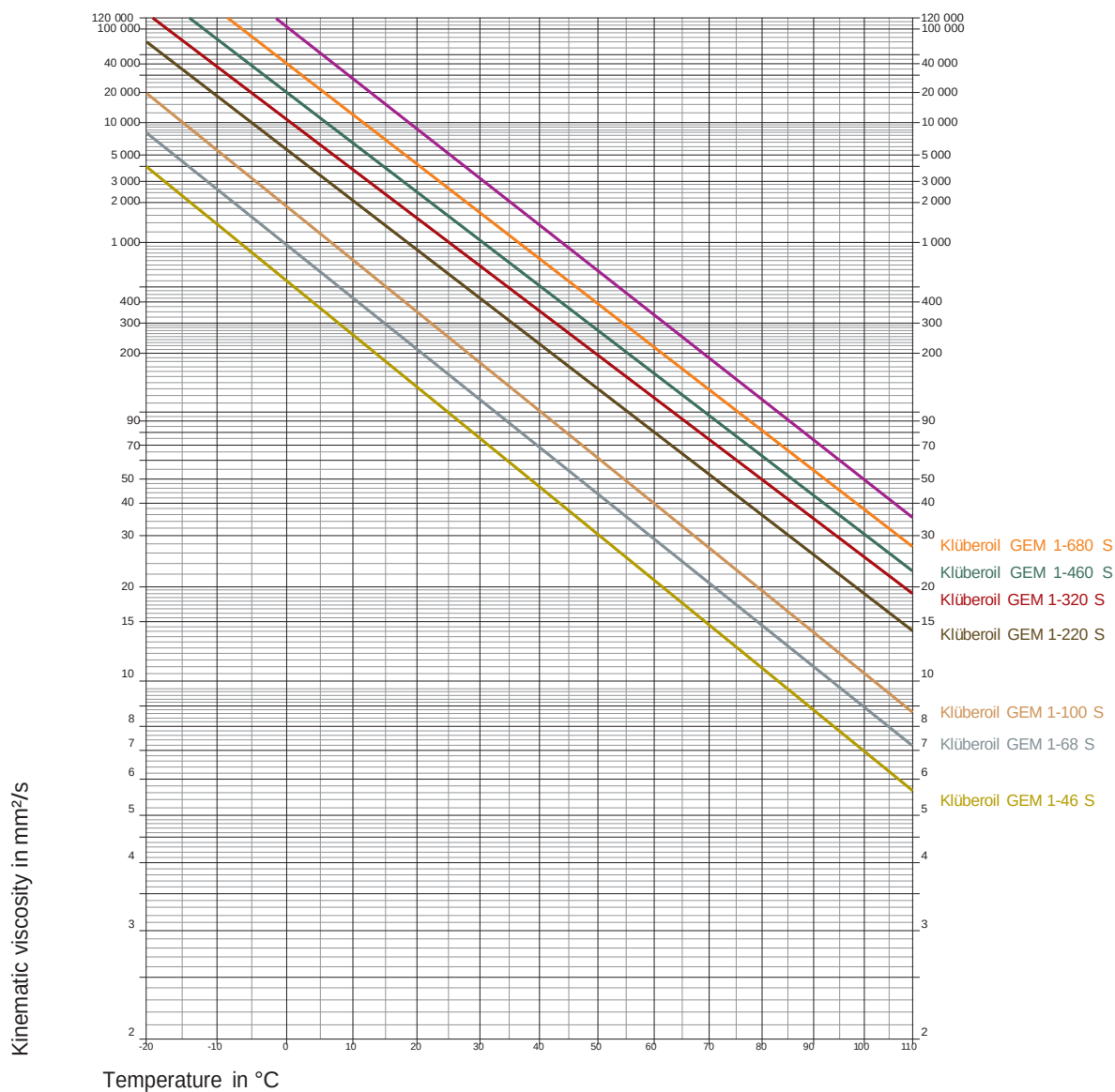
Material safety data sheets can be requested via our website www.klueber.com. You may also obtain them through your contact person at Klüber Lubrication.

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Viscosity-temperature diagram



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Pack sizes	Klüberoil GEM 1 S 46	Klüberoil GEM S 68	Klüberoil GEM 1 S 100
Canister 20 l	+	+	+
Drum 200 l	+	+	+

Product data	Klüberoil GEM 1 S 46	Klüberoil GEM S 68	Klüberoil GEM 1 S 100
Article number			
Marking acc. to DIN 51502	CLP 46	CLP 68	CLP 100
ISO viscosity grade, DIN ISO 3448	46	68	100
Lower service temperature	-15 °C	-15 °C	-5 °C
Upper service temperature	100 °C	100 °C	100 °C
Density, based on DIN 51757) at 15 °C , approx.	870 kg/m ³	880 kg/m ³	880 kg/m ³
Kinematic viscosity, DIN 51562 pt. 01, at 40 °C , approx.	46 mm ² /s	68 mm ² /s	100 mm ² /s
Kinematic viscosity, DIN 51562 pt. 01, at 100 °C , approx.	7 mm ² /s	9 mm ² /s	11 mm ² /s
Viscosity index, DIN ISO 2909	>= 90	>= 90	>= 90
Flash point, DIN EN ISO 2592, Cleveland, open-cup apparatus	>= 200 °C	>= 200 °C	>= 200 °C
Pour point, DIN ISO 3016	<= -20 °C	<= -15 °C	<= -15 °C
Foam test, ASTM-D 892, ISO 6247, sequence I/24 °C	<= 100/10 ml	<= 100/10 ml	<= 100/10 ml
Foam test, ASTM-D 892, ISO 6247, sequence II/ 93.5 °C	<= 100/10 ml	<= 100/10 ml	<= 100/10 ml
Foam test, ASTM D 892, ISO 6247, sequence III/24°C	<= 100/10 ml	<= 100/10 ml	<= 100/10 ml
Ageing properties, ASTM D 2893, increase in viscosity	<= 6 %	<= 6 %	<= 6 %
FZG scuffing test, DIN ISO 14635-1, A/8.3/90, scuffing load stage	>= 14	>= 14	>= 14
FAG FE8 rolling bearing test, DIN 51819-3, D 7	passed	passed	passed
Anticorrosive properties on steel, DIN ISO 7120, method A, steel, 24 h/60 °C	no rust	no rust	no rust
Copper corrosion, DIN EN ISO 2160, 3 h/100 °C, corrosion degree	1 - 100	1 - 100	1 - 100
Minimum shelf life from the date of manufacture - in a dry, frost-free place and in the unopened original container, approx.	60 months	60 months	60 months

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Klüberoil GEM 1 S 220	Klüberoil GEM 1 S 320	Klüberoil GEM 1 S 460	Klüberoil GEM 1 S 680
+	+	+	+
+	+	+	+

Klüberoil GEM 1 S 220	Klüberoil GEM 1 S 320	Klüberoil GEM 1 S 460	Klüberoil GEM 1 S 680
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CLP 220	CLP 320	CLP 460	CLP 680
220	320	460	680
-5 °C	-5 °C	-5 °C	0 °C
100 °C	100 °C	100 °C	100 °C
890 kg/m³	900 kg/m³	910 kg/m³	930 kg/m³
220 mm²/s	320 mm²/s	460 mm²/s	680 mm²/s
19 mm²/s	25 mm²/s	30 mm²/s	37 mm²/s
>= 90	>= 90	>= 90	>= 85
>= 200 °C	>= 200 °C	>= 200 °C	>= 200 °C
<= -10 °C	<= -10 °C	<= -10 °C	<= -5 °C
<= 100/10 ml	<= 100/10 ml	<= 100/10 ml	<= 100/10 ml
<= 100/10 ml	<= 100/10 ml	<= 100/10 ml	<= 100/10 ml
<= 100/10 ml	<= 100/10 ml	<= 100/10 ml	<= 100/10 ml
<= 6 %	<= 6 %	<= 6 %	<= 6 %
>= 14	>= 14	>= 14	>= 14
<= 30 mg	<= 30 mg	<= 30 mg	<= 30 mg
no rust	no rust	no rust	no rust
1 - 100	1 - 100	1 - 100	1 - 100
60 months	60 months	60 months	60 months

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Klüber Lubrication – your global specialist

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.

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