

# Klüberoil GEM 1 N

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
- High micropitting resistance
- Excellent ageing and oxidation resistance
- Low foaming tendency

## Your requirements - our solution

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

Klüberoil GEM 1 N offers high scuffing load capacity. Gears are sufficiently protected against scuffing even at extremely high peak loads, vibrations or oscillations. 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. The oil's high micropitting resistance of GFT  $\geq 10$  according to FVA 54/7 offers sufficient protection to gears that are subject to high loads and would normally be susceptible to this type of damage.

Klüberoil GEM 1 N 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.

By using Klüberoil GEM 1 N 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 N was specially developed for the lubrication of spur, bevel and planetary gears that are subject to high loads. Such gears are frequently used in the steel, mining and sugar industries. It is also used for the lubrication of standard worm gears as defined in DIN 3996.

Klüberoil GEM 1 N 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 N 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.

When changing over to Klüberoil GEM 1 N, residues of a previously used gear oil can be more easily removed if Klüber Summit Varnasolv HV (Article No. 050135) is added.

## 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.

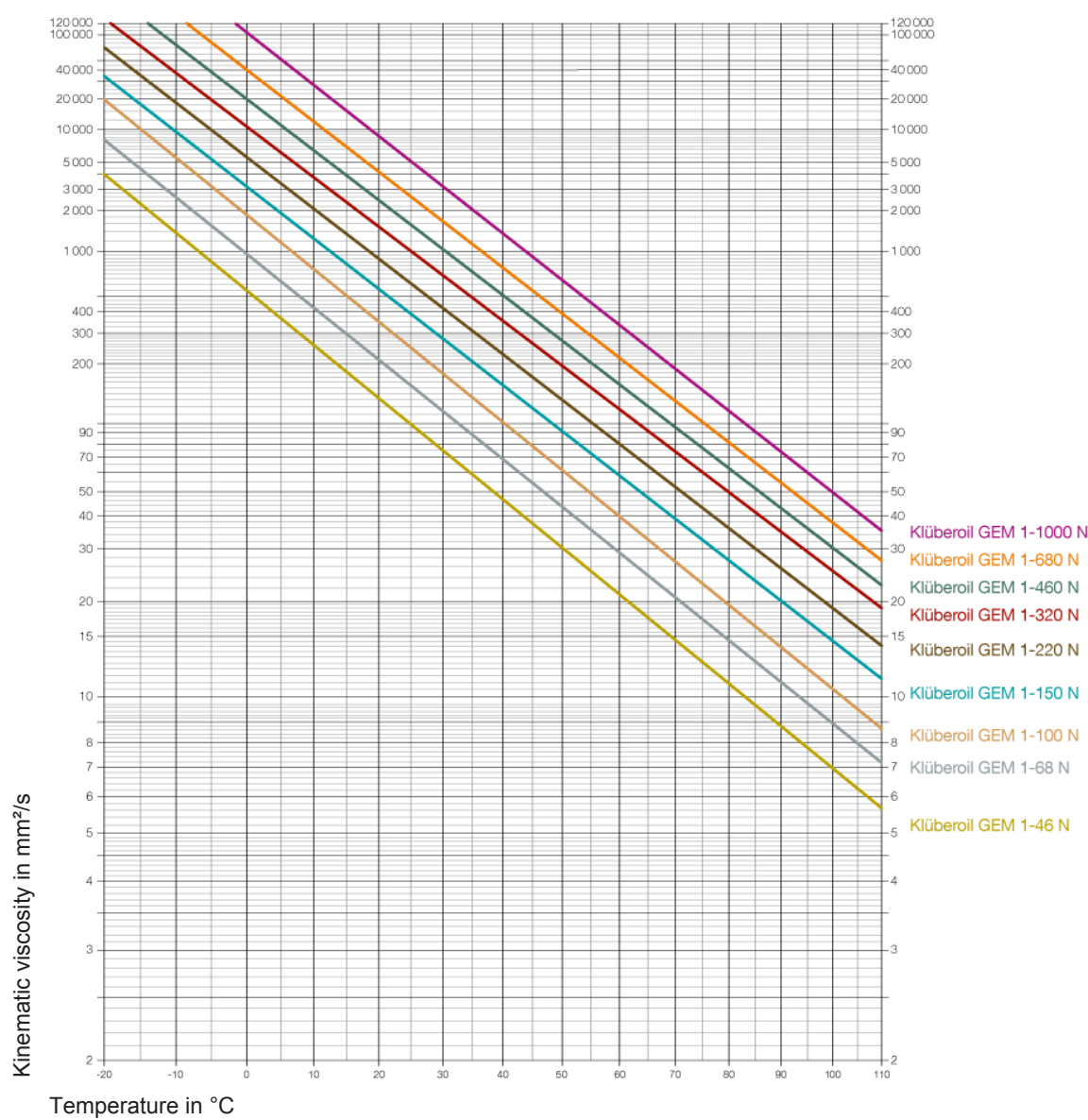
## Material safety data sheets

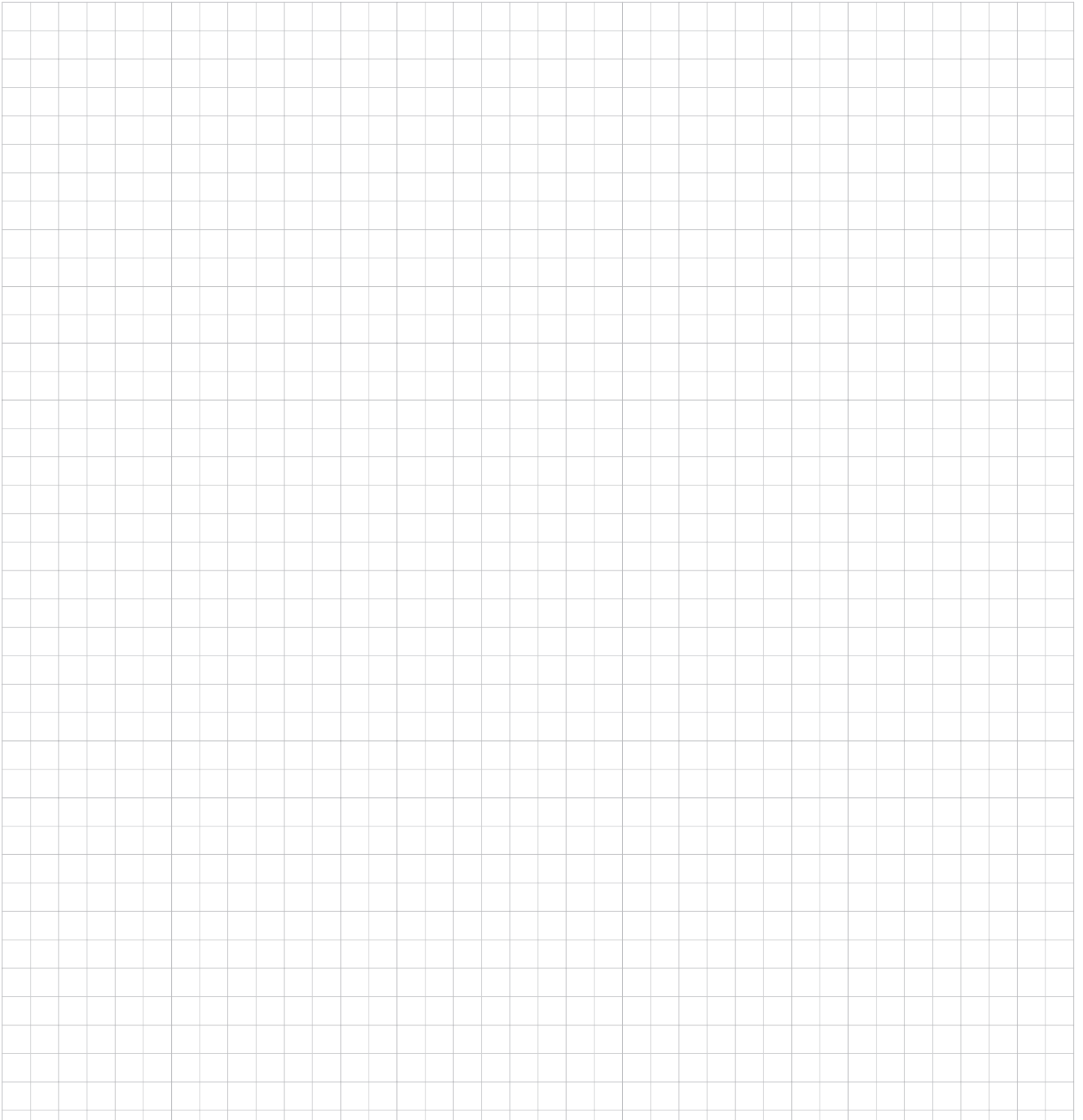
Material safety data sheets can be requested via our website [www.klueber.com](http://www.klueber.com). You may also obtain them through your contact person at Klüber Lubrication.

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Viscosity-temperature diagram





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

Product data	Klüberoil GEM 1-46 N	Klüberoil GEM 1-68 N	Klüberoil GEM 1-100 N
Article number	030050	030051	030054
Marking acc. to DIN 51502	CLP 46	CLP 68	CLP 100
Classification acc. to ISO 12925-1	CKC 46	CKC 68	CKC 100
Lower service temperature	-15 °C / 5 °F	-15 °C / 5 °F	-5 °C / 23 °F
Upper service temperature	100 °C / 212 °F	100 °C / 212 °F	100 °C / 212 °F
Density, based on DIN 51757) at 15 °C	approx. 870 kg/m³	approx. 880 kg/m³	approx. 880 kg/m³
Kinematic viscosity, DIN 51562 pt. 01/ASTM D-445/ASTM D 7042, 40 °C	approx. 46 mm²/s	approx. 68 mm²/s	approx. 100 mm²/s
Kinematic viscosity, DIN 51562 pt. 01/ASTM D-445/ASTM D 7042, 100 °C	approx. 7 mm²/s	approx. 9 mm²/s	approx. 11 mm²/s
Viscosity index, DIN ISO 2909	>= 90	>= 90	>= 90
ISO viscosity grade, DIN ISO 3448	46	68	100
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	>= 12	>= 12	>= 12
FAG FE8 rolling bearing test, DIN 51819-3, D 7,5/80-80, wear of rolling element	<= 30 mg	<= 30 mg	<= 30 mg
FAG FE8 rolling bearing test, DIN 51819-3, D 7,5/80-80, wear of cage	<= 200 mg	<= 200 mg	<= 200 mg
Anticorrosive properties on steel, DIN ISO 7120, method A, steel, 24 h/60 °C	no rust corrosion degree	no rust corrosion degree	no rust corrosion degree
Copper corrosion, DIN EN ISO 2160, 3 h/100 °C	1 - 100 corrosion degree	1 - 100 corrosion degree	1 - 100 corrosion degree
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



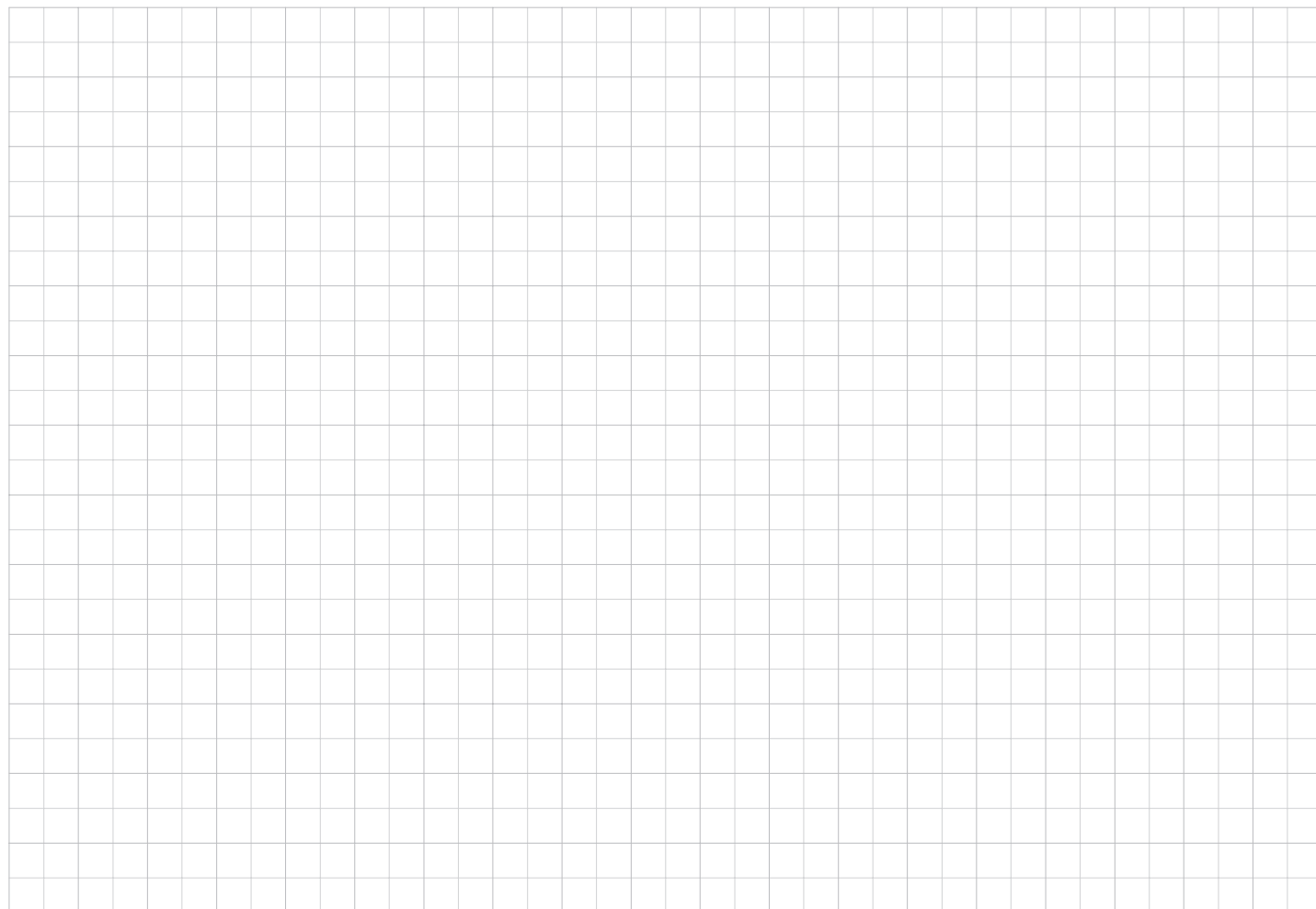
Klüberoil GEM 1-150 N	Klüberoil GEM 1-220 N	Klüberoil GEM 1-320 N	Klüberoil GEM 1-460 N	Klüberoil GEM 1-680 N	Klüberoil GEM 1-1000 N
+	+	+	+	+	+
+	+	+	+	+	+

Klüberoil GEM 1-150 N	Klüberoil GEM 1-220 N	Klüberoil GEM 1-320 N	Klüberoil GEM 1-460 N	Klüberoil GEM 1-680 N	Klüberoil GEM 1-1000 N
030057	030058	030062	030063	030064	030049
CLP 150	CLP 220	CLP 320	CLP 460	CLP 680	CLP 1000
CKC 150	CKC 220	CKC 320	CKC 460	CKC 680	CKC 1000
-5 °C / 23 °F	-5 °C / 23 °F	-5 °C / 23 °F	-5 °C / 23 °F	0 °C / 32 °F	0 °C / 32 °F
100 °C / 212 °F	100 °C / 212 °F	100 °C / 212 °F	100 °C / 212 °F	100 °C / 212 °F	100 °C / 212 °F
approx. 880 kg/m³	approx. 890 kg/m³	approx. 900 kg/m³	approx. 910 kg/m³	approx. 930 kg/m³	approx. 920 kg/m³
approx. 150 mm²/s	approx. 220 mm²/s	approx. 320 mm²/s	approx. 460 mm²/s	approx. 680 mm²/s	approx. 1 000 mm²/s
approx. 15 mm²/s	approx. 19 mm²/s	approx. 25 mm²/s	approx. 30 mm²/s	approx. 37 mm²/s	approx. 48 mm²/s
>= 90	>= 90	>= 90	>= 90	>= 85	>= 85
150	220	320	460	680	1 000
>= 200 °C	>= 200 °C	>= 200 °C	>= 200 °C	>= 200 °C	>= 200 °C
<= -10 °C	<= -10 °C	<= -10 °C	<= -10 °C	<= -5 °C	<= -3 °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
<= 100/10 ml	<= 100/10 ml	<= 100/10 ml	<= 100/10 ml	<= 100/10 ml	<= 100/10 ml
<= 6 %	<= 6 %	<= 6 %	<= 6 %	<= 6 %	<= 6 %
>= 12	>= 12	>= 12	>= 12	>= 12	>= 12
<= 30 mg	<= 30 mg	<= 30 mg	<= 30 mg	<= 30 mg	<= 30 mg
<= 200 mg	<= 200 mg	<= 200 mg	<= 200 mg	<= 200 mg	<= 200 mg
no rust corrosion degree	no rust corrosion degree	no rust corrosion degree	no rust corrosion degree	no rust corrosion degree	no rust corrosion degree
1 - 100 corrosion degree	1 - 100 corrosion degree	1 - 100 corrosion degree	1 - 100 corrosion degree	1 - 100 corrosion degree	1 - 100 corrosion degree
60 months	60 months	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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