

# Klübersynth UH1 6

Synthetic high-performance gear oil for the food-processing and pharmaceutical industries with KlüberComp Lube Technology



## Your benefits at a glance

- Registered as NSF H1 and certified according to ISO 21469
- High scuffing protection
- Good wear protection for gears and rolling bearings
- High micropitting resistance
- Good shear stability for reliable lubricant film formation
- Optimised for the lubrication of worm gears
- Excellent ageing and oxidation resistance
- Wide service temperature range due to good viscosity-temperature behaviour
- Low foaming tendency
- Energy savings due to optimised friction behaviour
- Good elastomer compatibility
- Approvals by numerous gear OEMs

## Your requirements - our solution

Klübersynth UH1 6 is a synthetic high-performance gear oil based on polyglycol satisfying the growing requirements and increasing power density of modern gears. Klübersynth UH1 6 includes KlüberComp Lube Technology\*, i.e. it is based on especially high-grade raw materials and advanced additives, enabling maximum performance in the lubrication of all gear components.

Klübersynth UH1 6 oils are NSF H1 registered and therefore comply with FDA 21 CFR § 178.3570. The lubricants were developed for incidental contact with products and packaging materials in the food-processing, cosmetics, pharmaceutical or animal feed industries. The use of Klübersynth UH1 6 oils can contribute to increase reliability of your production processes. We nevertheless recommend conducting an additional risk analysis, e.g. HACCP.

Klübersynth UH1 6 is certified according to ISO 21469, thus supporting compliance with hygienic requirements of your production. You will find further information about ISO Standard 21469 on our website [www.klueber.com](http://www.klueber.com).

Klübersynth UH1 6 clearly exceeds CLP requirements according to DIN 51517-3. Corresponding gears can be switched to Klübersynth UH1 6 without prior consultation with the gear manufacturer provided the general application notes are observed.

Klübersynth UH1 6 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. 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.

Klübersynth UH1 6 offers a much longer service life than mineral oils due to the excellent ageing and oxidation resistance of the selected raw materials; thus service intervals can be extended and maintenance costs reduced. In certain applications, even lifetime lubrication is possible. The product's low foaming tendency and anti-corrosive properties enable problem-free gear operation. Freudenberg seals made of 72 NBR 902, 75 FKM 585, 75 FKM 260466 and 75 FKM 170055 are resistant to Klübersynth UH1 6. Leakage and oil contamination are prevented.

The excellent viscosity-temperature behaviour supports the formation of a sufficient lubricant film across a wide service temperature range, even at elevated and high temperatures. Therefore, a single viscosity grade can cover both low and high temperatures in many applications.

The optimised friction behaviour enabled by the carefully selected base oils based on polyglycol reduces power loss and improves gear efficiency, especially in worm gears. Due to the optimised additives, wear values are reduced and a very low wear intensity

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according to DIN 3996 (calculation of load capacity of worm gears) is achieved.

Klübersynth UH1 6 is approved by Siemens-Flender, Siemens Geared Motors, SEW Eurodrive, Getriebebau Nord, Stöber Antriebstechnik, Lenze, ZAE Antriebssysteme, Baldor, Boston Gear, Bonfiglioli, Watt Drive, etc.

By using Klübersynth UH1 6 you can benefit from a number of advantages that will help you save costs easily and efficiently. We look forward to hearing from you.

\* For further information, please see our flyer: KlüberComp Lube Technology – Gear oils meeting the highest requirements

## Application

Klübersynth UH1 6 oil is used for the lubrication of highly loaded spur, bevel and planetary gears, rolling and plain bearings as well as all types of toothed couplings, especially when exposed to high temperatures.

Klübersynth UH1 6 oil was especially developed for the lubrication of worm gears with steel/bronze pairings.

It can also be used for the lubrication of lifting, drive and transport chains.

## Application notes

Klübersynth UH1 6 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.

## 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 the worksheet "Hints for Practice - selection of oil viscosity for gears". To determine the correct oil viscosity for bearings, please observe the bearing manufacturer's instructions.

Due to the better viscosity-temperature behaviour of Klübersynth UH1 6 compared to mineral oils, the actual viscosity of Klübersynth UH1 6 during operation differs and can be determined by means of the enclosed diagram.

Klübersynth UH1 6 is not miscible with mineral oil or synthetic hydrocarbons. Prior to switchover, lubrication points should be cleaned, or gears or enclosed systems be flushed with the Klübersynth UH1 6 oil to be used.

Klübersynth UH1 6 is neutral towards ferrous and nearly all non-ferrous metals.

There may be increased wear when the contact surfaces of design elements made of aluminium or aluminium alloys are exposed to dynamic loads. If necessary, preliminary wear tests should be carried out.

For use at permanent temperatures of 80 °C max., seals made of NBR may be used. For higher temperatures, seals made of FKM should be chosen. It should be noted that elastomers from one or several manufacturers can behave differently; therefore tests should be performed.

When applying Klübersynth UH1 6 oil we recommend the use of two-component paints (reaction paints) for interior coating. Oil gauge glasses should preferably be made of natural glass or polyamide materials. Other transparent plastics, e.g. Plexiglas, have a tendency to crack under stress. The suitability of materials used in contact with Klübersynth UH1 6 oil should be tested, especially prior to series application.

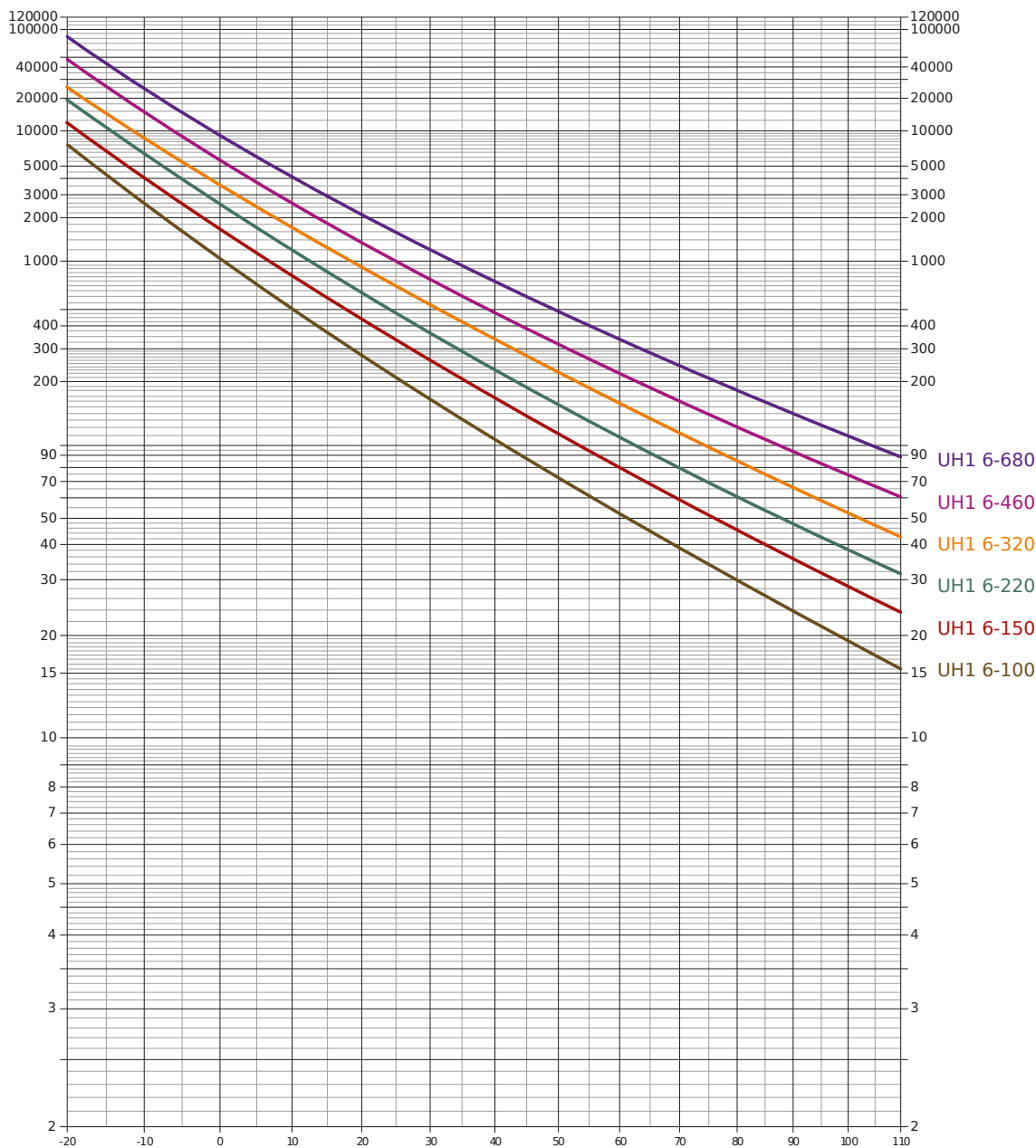
For checking the contact pattern during running-in, the inspection paint Klübertop P 39-362 Spray (Art. No. 081295) can be used.

## 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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Pack sizes	Klübersynth UH1 6-100	Klübersynth UH1 6-150	Klübersynth UH1 6-220	Klübersynth UH1 6-320
Canister 1 l	+	+	+	+
Canister 5 l	+	+		

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Pack sizes	Klübersynth UH1 6-100	Klübersynth UH1 6-150	Klübersynth UH1 6-220	Klübersynth UH1 6-320
Canister 20 l	+	+	+	+
Drum 200 l	+	+	+	+
Container 1000 kg			+	

Pack sizes	Klübersynth UH1 6-460	Klübersynth UH1 6-680	Klübersynth UH1 6-1000
Canister 1 l	+		+
Canister 5 l	+		
Canister 20 l	+	+	+
Drum 200 l	+	+	+
Container 1000 kg			

Characteristics	Klübersynth UH1 6-100	Klübersynth UH1 6-150	Klübersynth UH1 6-220	Klübersynth UH1 6-320
Article number	096094	096058	096059	096063
Colour space				
Service temperature, lower limit	-35 °C	-35 °C	-30 °C	-30 °C
Service temperature, upper limit	160 °C	160 °C	160 °C	160 °C
Designation, DIN 51502	CLP PG 100	CLP PG 150	CLP PG 220	CLP PG 320
Designation, ISO 12925-1	CKC 100	CKC 150	CKC 220	CKC 320
NSF H1 registration number	137872	124437	124438	124439
Density, DIN 51757, 15°C	1040 kg/m <sup>3</sup>	1050 kg/m <sup>3</sup>	1060 kg/m <sup>3</sup>	approx. 1065 kg/m <sup>3</sup>
Flash point, DIN EN ISO 2592, Cleveland open cup	≥ 220 °C	≥ 220 °C	≥ 220 °C	≥ 220 °C
Foam test, ISO 6247 / ASTM D892, 24°C, sequence I	≤ 100/10 ml	≤ 100/10 ml	≤ 100/10 ml	≤ 100/10 ml
Foam test, ISO 6247 / ASTM D892, 24°C, sequence III	≤ 100/10 ml	≤ 100/10 ml	≤ 100/10 ml	≤ 100/10 ml
Foam test, ISO 6247 / ASTM D892, 93.5°C, sequence II	≤ 100/10 ml	≤ 100/10 ml	≤ 100/10 ml	≤ 100/10 ml
ISO viscosity grade, DIN ISO 3448, ISO VG	100	150	220	320
Kinematic viscosity, DIN EN ISO 3104 / DIN 51562-1 / ASTM D445 / ASTM D7042, 100°C	approx. 19.5 mm <sup>2</sup> /s	approx. 28.5 mm <sup>2</sup> /s	approx. 41 mm <sup>2</sup> /s	approx. 56 mm <sup>2</sup> /s
Kinematic viscosity, DIN EN ISO 3104 / DIN 51562-1 / ASTM D445 / ASTM D7042, 20°C	approx. 250 mm <sup>2</sup> /s	approx. 390 mm <sup>2</sup> /s	approx. 610 mm <sup>2</sup> /s	approx. 840 mm <sup>2</sup> /s
Kinematic viscosity, DIN EN ISO 3104 / DIN 51562-1 / ASTM D445 / ASTM D7042, 40°C	approx. 100 mm <sup>2</sup> /s	approx. 150 mm <sup>2</sup> /s	approx. 220 mm <sup>2</sup> /s	approx. 320 mm <sup>2</sup> /s

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Characteristics	Klübersynth UH1 6-100	Klübersynth UH1 6-150	Klübersynth UH1 6-220	Klübersynth UH1 6-320
Viscosity index, DIN ISO 2909	≥ 190	≥ 210	≥ 220	≥ 220
Copper corrosion, DIN EN ISO 2160, 24 h, 100°C	1 - 100 - 24 corrosion degree	1 - 100 - 24 corrosion degree	1 - 100 - 24 corrosion degree	1 - 100 - 24 corrosion degree
Steel corrosion, DIN ISO 7120 / ASTM D665, method A, 24 h, 60°C	rust-free	rust-free	rust-free	rust-free
Pour point, DIN ISO 3016	≤ -40 °C	≤ -35 °C	≤ -35 °C	≤ -30 °C
Ageing behaviour, DIN EN ISO 4263-4 / ASTM D2893, 312 h, 95°C, increase in viscosity at 100°C	≤ 6 %	≤ 6 %	≤ 6 %	≤ 6 %
FAG FE8 rolling bearing test, DIN 51819-3, D-7.5 / 80-80, wear of cage	≤ 200 mg	≤ 200 mg	≤ 200 mg	≤ 200 mg
FAG FE8 rolling bearing test, DIN 51819-3, D-7.5 / 80-80, wear of rolling elements	≤ 30 mg	≤ 30 mg	≤ 30 mg	≤ 30 mg
FZG scuffing test, DIN ISO 14635-1, based on standard, A / 16.6 / 90, failure load stage		≥ 12	≥ 12	≥ 12
FZG scuffing test, DIN ISO 14635-1, A / 8.3 / 90, failure load stage	≥ 12	≥ 12	≥ 12	≥ 12
Minimum shelf life from the date of manufacture - in a dry, frost-free place and in the unopened original container, approx.	36 months	36 months	36 months	36 months

Characteristics	Klübersynth UH1 6-460	Klübersynth UH1 6-680	Klübersynth UH1 6-1000
Article number	096060	096064	096124
Colour space			yellow
Service temperature, lower limit	-30 °C	-25 °C	-25 °C
Service temperature, upper limit	160 °C	160 °C	160 °C
Designation, DIN 51502	CLP PG 460	CLP PG 680	CLP PG 1000
Designation, ISO 12925-1	CKC 460	CKC 680	CKC 1000
NSF H1 registration number	124440	124441	147019
Density, DIN 51757, 15°C	approx. 1075 kg/m <sup>3</sup>	approx. 1075 kg/m <sup>3</sup>	approx. 1075 kg/m <sup>3</sup>
Flash point, DIN EN ISO 2592, Cleveland open cup	≥ 220 °C	≥ 220 °C	≥ 220 °C
Foam test, ISO 6247 / ASTM D892, 24°C, sequence I	≤ 100/10 ml	≤ 100/10 ml	≤ 100/10 ml
Foam test, ISO 6247 / ASTM D892, 24°C, sequence III	≤ 100/10 ml	≤ 100/10 ml	≤ 100/10 ml
Foam test, ISO 6247 / ASTM D892, 93.5°C, sequence II	≤ 100/10 ml	≤ 100/10 ml	≤ 100/10 ml
ISO viscosity grade, DIN ISO 3448, ISO VG	460	680	1000

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Characteristics	Klübersynth UH1 6-460	Klübersynth UH1 6-680	Klübersynth UH1 6-1000
Kinematic viscosity, DIN EN ISO 3104 / DIN 51562-1 / ASTM D445 / ASTM D7042, 100°C	approx. 78 mm <sup>2</sup> /s	approx. 115 mm <sup>2</sup> /s	approx. 178 mm <sup>2</sup> /s
Kinematic viscosity, DIN EN ISO 3104 / DIN 51562-1 / ASTM D445 / ASTM D7042, 20°C	approx. 1270 mm <sup>2</sup> /s	approx. 1900 mm <sup>2</sup> /s	approx. 2940 mm <sup>2</sup> /s
Kinematic viscosity, DIN EN ISO 3104 / DIN 51562-1 / ASTM D445 / ASTM D7042, 40°C	approx. 460 mm <sup>2</sup> /s	approx. 680 mm <sup>2</sup> /s	approx. 1000 mm <sup>2</sup> /s
Viscosity index, DIN ISO 2909	≥ 240	≥ 250	≥ 250
Copper corrosion, DIN EN ISO 2160, 24 h, 100°C	1 - 100 - 24 corrosion degree	1 - 100 - 24 corrosion degree	1 - 100 - 24 corrosion degree
Steel corrosion, DIN ISO 7120 / ASTM D665, method A, 24 h, 60°C	rust-free	rust-free	rust-free
Pour point, DIN ISO 3016	≤ -30 °C	≤ -25 °C	≤ -25 °C
Ageing behaviour, DIN EN ISO 4263-4 / ASTM D2893, 312 h, 95°C, increase in viscosity at 100°C	≤ 6 %	≤ 6 %	≤ 6 %
FAG FE8 rolling bearing test, DIN 51819-3, D-7.5 / 80-80, wear of cage	≤ 200 mg	≤ 200 mg	≤ 200 mg
FAG FE8 rolling bearing test, DIN 51819-3, D-7.5 / 80-80, wear of rolling elements	≤ 30 mg	≤ 30 mg	≤ 30 mg
FZG scuffing test, DIN ISO 14635-1, based on standard, A / 16.6 / 90, failure load stage	≥ 12	≥ 12	≥ 12
FZG scuffing test, DIN ISO 14635-1, A / 8.3 / 90, failure load stage	≥ 12	≥ 12	≥ 12
Minimum shelf life from the date of manufacture - in a dry, frost-free place and in the unopened original container, approx.	36 months	36 months	36 months

## 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 90 years.

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