

your global specialist

Detailed information

The right lubricant for each component

A selection of speciality lubricants for bearings, linear guides, gears, chains, screws and compressors





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The right lubricant for each component

You need a lubricant – we've got it: for each industry, component size or any conceivable load on the lubrication point. We've created this brochure on the most frequently used components to show you the quick way to find the right lubricant for your requirements.

The intention of this lubricant selection brochure

This brochure is an overview providing you with comprehensive know-how gained from our more than 80 years of experience in the lubricants sector. The products presented in this brochure represent merely a fraction of our extensive lubricant range and meet most requirements. They were selected by specialists for the individual technical fields.

We also have special lubricants for requirements and components not shown in this brochure. Do not hesitate to contact us if you feel that your requirements are not met by the products presented here. Our lubrication experts are glad to be of advice and can help you find the right lubricant for your application.

The intention of this product selection brochure is to provide a logical guide through the Klüber Lubrication specialised product range. The structure of the brochure first considers the various application requirements and then leads you toward selection of the appropriate lubricant solution.

Whenever products appear to have similar properties, we highlight the differences in grey in the respective fields to assist with the final product selection. Which criteria are the most important depends on the application.

-  Most important selection criterion
-  Selection criterion of secondary importance
-  Selection criterion of tertiary importance

We generally recommend consulting our lubrication experts prior to selecting a lubricant.

Please refer to our product information leaflets for detailed product specifications. You can obtain them through your contact person at Klüber or download them from our website www.klueber.com.

Rolling bearings

Special greases

Selection criteria	Upper service temperature ¹⁾ approx.	Lower service temperature ¹⁾ approx.	Speed factor ²⁾ n·dm [min ⁻¹ ·mm], approx.	Base oil viscosity DIN 51562 [mm ² /s] at approx. 40 °C/ 104 °F	Base oil viscosity DIN 51562 [mm ² /s] at approx. 100 °C/ 212 °F
High-temperature applications	260 °C 500 °F	-40 °C -40 °F	300 000	420	40
	200 °C 392 °F	-40 °C -40 °F	1 000 000	130	20
	180 °C 356 °F	-40 °C -40 °F	1 000 000	80	11
Low-temperature applications	110 °C 230 °F	-70 °C -94 °F	1 000 000	9	2,6
Low-noise applications	180 °C 356 °F	-45 °C -49 °F	1 000 000	72	9,5
	150 °C 302 °F	-50 °C -58 °F	1 000 000	25	5

Most important selection criterion
 Selection criterion of secondary importance
 Selection criterion of tertiary importance

- 1) Service temperatures are guide values which depend on the lubricant's composition, the intended use and the application method. Lubricants change their consistency, shear viscosity or viscosity depending on the mechanical-dynamical loads, time, pressure and temperature. These changes in product characteristics may affect the function of a component. The service temperatures stated herein do not necessarily refer to DIN 51825.
- 2) Speed factors are guide values which depend on the type and size of the rolling bearing type and the local operating conditions, which is why they have to be confirmed in tests carried out by the user in each individual case.



	Base oil	Thickener	Klüber speciality lubricant	Description/application examples
	PFPE	PTFE	BARRIERTA L 55/2	<ul style="list-style-type: none"> • Tried-and-tested long-term grease for rolling bearings subject to high temperatures • Very good long-term stability • Very good corrosion protection • Approved and recommended by many manufacturers • Tested and listed for use in the food-processing industry according to NSF H1³⁾
	PFPE, ester	PTFE, polyurea	Klübersynth BHP 72-102	<ul style="list-style-type: none"> • Patented hybrid grease concept for long-term lubrication • Also for wet and corrosive environments and vibrations
	ester	polyurea	Klübersynth BEP 72-82	<ul style="list-style-type: none"> • Excellent corrosion protection • Long bearing life due to special wear protection additives preventing premature material fatigue caused by vibration or high speeds • For motor vehicle applications, e.g. pulleys, generators, clutch release bearings, fan bearings, wiper motors
	ester	lithium soap	ISOFLEX PDL 300 A	<ul style="list-style-type: none"> • Heavy-duty grease for low friction moments
	ester	polyurea	Klüberquiet BQ 72-72	<ul style="list-style-type: none"> • For lifetime and long-term lubrication at high and low temperatures • For double-sealed and shielded rolling bearings • For applications in e.g. in electric motors, fans, air conditioning systems and hard disc drives
	ester	lithium soap	Klüberquiet BQ 42-32	<ul style="list-style-type: none"> • For low temperatures and low friction moments • For the lifetime lubrication of double-sealed ball bearings such as miniature and instrument bearings

3) This lubricant is registered as H1, which means that it has been designed for incidental, technically unavoidable food contact. Experience shows that it can be used for equivalent applications in the cosmetics and pharmaceutical industry under the conditions described in the product information leaflet. Specific test results as e.g. biocompatibility, which could be an additional requirement for applications in the pharmaceutical industry, are not available for this product. Therefore, before using the lubricant adequate risk analyses should be performed and, if necessary, suitable measures be taken by the manufacturer and user of installations in order to exclude the risk of health hazards and personal injuries. NSF ISO 21469 supports compliance with the hygienic requirements of your production. You will find further information on our website www.klueber.com.

Rolling bearings

Special greases

Selection criteria	Upper service temperature ¹⁾ approx.	Lower service temperature ¹⁾ approx.	Speed factor ²⁾ n·dm [min ⁻¹ ·mm], approx.	Base oil viscosity DIN 51562 [mm ² /s] at approx. 40 °C/ 104 °F	Base oil viscosity DIN 51562 [mm ² /s] at approx. 100 °C/ 212 °F
High-speed and spindle bearing applications	120 °C 248 °F	-50 °C -58 °F	2 100 000	22	5
High-load and heavy-duty applications	150 °C 302 °F	-40 °C -40 °F	1 000 000	130	14
	140 °C 284 °F	-20 °C -4 °F	500 000	540	28
	140 °C 284 °F	-15 °C 5 °F	500 000	220	19
Applications in the food & pharma industry	120 °C 248 °F	-45 °C -49 °F	300 000	150	22
Applications requiring electric conductivity	150 °C 302 °F	-40 °C -40 °F	1 000 000	150	19

Most important selection criterion
 Selection criterion of secondary importance
 Selection criterion of tertiary importance

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2) Speed factors are guide values which depend on the type and size of the rolling bearing type and the local operating conditions, which is why they have to be confirmed in tests carried out by the user in each individual case.



	Base oil	Thickener	Klüber speciality lubricant	Description/ application examples
	synthetic hydrocarbon/ ester	polyurea	Klüberspeed BF 72-23	<ul style="list-style-type: none"> • Especially for spindle bearings with inclined or vertical mounting position, but also for horizontal shafts in machine tools
	synthetic hydrocarbon/ mineral oil	special lithium soap	Klüberplex BEM 41-141	<ul style="list-style-type: none"> • For rolling and plain bearings subject to high loads • For vibrations and oscillations • For applications such as main bearings in wind turbines
	mineral oil	lithium soap	Klüberlub BE 41-542	<ul style="list-style-type: none"> • For low to medium speeds
	mineral oil	special calcium soap	Klüberplex BE 31-222	<ul style="list-style-type: none"> • For ball bearings subject to high loads in wet processing zones • For medium rotating speeds
	synthetic hydrocarbon	aluminium complex soap	Klübersynth UH1 14-151	<ul style="list-style-type: none"> • NSF H1-registered³⁾ and ISO 21469-certified – supports compliance with the hygienic requirements of your production. Further information on our website www.klueber.com. • Excellent low-temperature behaviour • Good wear protection • Good water resistance, reducing the risk of corrosion and premature bearing failure • For medium rotation speeds
	synthetic hydrocarbon	lithium soap, solid lubricant	Klüberelectric BE 44-152	<ul style="list-style-type: none"> • For the long-term lubrication of rolling bearings subject to static electricity, e.g. in electric motors, paper making machines, copying machines, film stretchers, guides in belt conveyors and fans • Electric resistance based on DIN 53 482 ($[\Omega \times \text{cm}]$), (electrode spacing 1 cm, electrode surface 1 cm²) $\leq 10\,000$

3) This lubricant is registered as H1, which means that it has been designed for incidental, technically unavoidable food contact. Experience shows that it can be used for equivalent applications in the cosmetics and pharmaceutical industry under the conditions described in the product information leaflet. Specific test results as e.g. biocompatibility, which could be an additional requirement for applications in the pharmaceutical industry, are not available for this product. Therefore, before using the lubricant adequate risk analyses should be performed and, if necessary, suitable measures be taken by the manufacturer and user of installations in order to exclude the risk of health hazards and personal injuries. NSF ISO 21469 supports compliance with the hygienic requirements of your production. You will find further information on our website www.klueber.com.

Plain bearings

Special greases

Industry	Type of operation	Sliding speed [m/s]	Max. surface pressure [N/mm ²]	Upper service temperature ¹⁾ approx.	Lower service temperature ¹⁾ approx.	Klüber speciality lubricant
Plant and machine building, appliance industry	Oscillating/rotating	< 1	approx. 100	260 °C 500 °F	-40 °C -40 °F	Klüberalfa BHR 53-402
				180 °C 356 °F	-30 °C -22 °F	PETAMO GHY 441
				160 °C 320 °F	-20 °C -4 °F	Klüberlub BVH 71-461
				150 °C 302 °F	-40 °C -40 °F	POLYLUB GLY 501
				140 °C 284 °F	-20 °C -4 °F	Klüberlub BE 41-542
				140 °C 284 °F	-30 °C -22 °F	Klüberlub BEM 41-122
	Mainly rotating	≥ 1	approx. 10	150 °C 302 °F	-50 °C -58 °F	POLYLUB GLY 151
	≥ 2	approx. 1	130 °C 266 °F	-50 °C -58 °F	Klübersynth LR 44-21	
Food-processing and pharmaceutical industry	Oscillating/rotating	< 1	approx. 100	140 °C 284 °F	-5 °C 23 °F	Klübersynth UH1 64-1302
				120 °C 248 °F	-35 °C -31 °F	Klüberfood NH1 94-301
	Mainly rotating	≥ 1	approx. 10	120 °C 248 °F	-40 °C -40 °F	Klübersynth UH1 14-151
Plant and machine building, appliance and automotive industry if lubricant contact with the environment cannot be excluded	Mainly rotating	≥ 1	approx. 10	100 °C 212 °F	-40 °C -40 °F	Klüberbio M 72-82

Most important selection criterion
 Selection criterion of secondary importance
 Selection criterion of tertiary importance

- 1) Service temperatures are guide values which depend on the lubricant's composition, the intended use and the application method. Lubricants change their consistency, shear viscosity or viscosity depending on the mechanical-dynamical loads, time, pressure and temperature. These changes in product characteristics may affect the function of a component. Statements regarding the upper service temperature do not necessarily refer to DIN 51825.
- 2) Owing to the many different elastomer compositions, we recommend having their compatibility checked by the elastomer manufacturer prior to series application.
- 3) Biodegradable according to CEC-L-33-A-93. Biodegradable lubricants should be handled with the same care as all other lubricants. Any avoidance of contamination is to the benefit of our environment.
- 4) The product can normally be applied by means of centralised lubricating systems. Please note, however, that due to different system configurations and application conditions the pumpability of the product has to be confirmed with the system manufacturer for each individual application. We will be pleased to provide assistance in this matter.



Description	Benefits
High-temperature, long-term lubricating grease with largely neutral behaviour towards many materials (metals, plastics) ³⁾	Lifetime lubrication enables a significant reduction in lubrication quantities
Alternative to Klüberlub BVH 71-461, suitable for higher ambient temperatures	Extended relubrication intervals, also at high temperatures owing to its long-term stability
The preferred lubricant option for plain bearings, offering long service life and relubrication intervals	Suitable for universal standard applications
Especially for plastic plain bearings; ³⁾ also available in other base oil viscosities	Good compatibility with many plastics
More solid alternative to Klüberlub BVH 71-461 (NLGI 2)	KP2N-20 grease according to the standard for bearing lubricants DIN 51825, which is often required
For steel/steel spherical plain bearings	Improved functionality and long-term lubrication due to the formation of a wear-resistant tribolayer
Also for plastic plain bearings ³⁾ owing to its good compatibility	Suitable for universal standard applications
Also for plastic plain bearings ³⁾ owing to its good compatibility	Suitable for universal standard applications
NSF H1-registered and certified according to ISO 21469 for use in the food-processing and pharmaceutical industries ⁵⁾	Long lifetime owing to good water resistance and wear protection
NSF H1-registered for use in the food-processing and pharmaceutical industries ⁵⁾	Good corrosion- and wear protection, also when subject to micro movements; can be applied via centralised lubrication systems ⁴⁾
NSF H1-registered and certified according to ISO 21469 for use in the food-processing and pharmaceutical industries ⁵⁾	Reduced risk of bearing failure due to good water resistance
Readily biodegradable. ³⁾ The preferred option to avoid contamination of soil or water.	Suitable for many applications due to good wear and water resistance

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Plain bearings

Special oils and dry lubricants

Lubricating oils for hydrodynamic plain bearings:

Application/requirement	Klüber speciality lubricant
Standard	Klüberoil GEM 1-100, -150, -220, -320, -460 N
Particular long-term resistance	Klüber Summit SH 32, 46, 68, 100
	Alternative: Klübersynth GH 6-..., if the required viscosity is not available in the Klüber Summit SH series

Dry lubricants for tribologically optimised plain bearings:

Type of lubricant	Klüber speciality lubricant
2-component tribosystem material (lubricant compound)	Klüberdur KM 02-854
Bonded coating	KlüberTG 05-371

Most important selection criterion
 Selection criterion of secondary importance



	Description	Benefits
	Viscosity depends on temperature and speed	Tried-and-tested gear oil series compatible with conventional plain bearing metals
	Viscosity depends on temperature and speed	Long-term, reasonably priced compressor oil series compatible with conventional plain bearing metals
		Tried-and-tested long-term gear oil series compatible with conventional plain bearing metals

	Description	Benefits
	For bronze plain bearings with lubricating holes	Lifetime lubrication not requiring additional lubrication with lubricating oil or grease, saving maintenance costs and costs for relubrication systems
	Bonded coatings should be selected with regard to component geometry and material as well as the type of application, operating conditions and application methods. Further products available on request	Heat-hardening bonding agent for good adhesion and wear protection on sliding surfaces for safe component operation; also suitable for emergency- and running-in lubrication

Linear guides

Special oils and fluid greases

Oil lubrication for continuous lubrication:

Industry/requirements	Linear type
General/increased corrosion protection	All
General	Rolling motion guides
General	Slideways
Food-processing and pharmaceutical industry	All
Readily biodegradable	All

Fluid grease lubrication for the continuous lubrication of all linear types:

Industry/requirements	NLGI class/requirements
General/low speed (< 15 m/min) ⁴⁾	NLGI 00/000
General/medium speed (corresponds to 15 to 60 m/min) ⁴⁾	NLGI 000
General/medium speed (> 60 m/min) ⁴⁾	NLGI 0/00
General/higher temperatures	NLGI 0/00
General/high load, micromovements, vibration	NLGI 0, 00/000
Food-processing and pharmaceutical industry	NLGI 00

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 Selection criterion of secondary importance

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Klüber speciality lubricant	Description
Klübersynth MZ 4-17	Good compatibility with other lubricants; can also be used for initial lubrication
Klüberoil GEM 1-46, 68, 220 N	CLP gear oil offering good corrosion- and wear protection. Viscosity to be selected according to speed. Klüberoil GEM 1-46 N is suitable for particularly low ambient temperatures
LAMORA D 68, 220	CGLP slideway oil with good demulsifying behaviour towards cooling lubricants, tried-and-tested also for plastic guideways. ²⁾ Viscosity to be selected according to speed
Klüberoil 4 UH1-68 N	NSF H1-registered and ISO 21469-certified. ¹⁾ Good ageing resistance and wear protection. Also available in other viscosities (ISO VG 32 ... 1500)
Klüberbio C 2-46	Low water hazard ensures unharmed environment. ³⁾ High-performance lubricant. Also available in ISO VG 100 as Klüberbio CA 2-100

Klüber speciality lubricant	Description
MICROLUBE GB 00	With high-pressure and antiwear additives, without solid lubricants
CENTOPLEX GLP 500	Good pressure absorption capacity
ISOFLEX TOPAS NCA 5051	Low base oil viscosity for low friction and smooth running
ISOFLEX TOPAS NCA 5051	Synthetic base oil with good ageing resistance
MICROLUBE GB 0, 00	With high-pressure and antiwear additives, without solid lubricants. Select NLGI class according to lubrication specification
Klübersynth UH1 14-1600	NSF H1-registered and ISO 21469-certified. ¹⁾ Good corrosion protection

2) Owing to the many different elastomer compositions, we recommend having their compatibility checked by the elastomer manufacturer prior to series application.

3) Biodegradable according to CEC-L-33-A-93. Biodegradable lubricants should be handled with the same care as all other lubricants. Any avoidance of contamination is to the benefit of our environment.

4) The guide values for lubricant selection are based on our many years of experience.

Linear guides

Special greases

Grease lubrication for extended relubrication intervals:

Linear type	Industry/requirements	Selection criterion
Rolling motion guides, primarily with balls	Universal	Low speed (< 15 m/min) ⁴⁾
		Medium speed (corresponds to 15 to 60 m/min) ⁴⁾
		High speed (> 60 m/min) ⁴⁾
Miniature guideway	Universal	
Roller screw drives	Universal	
Trapezoidal thread drives	Plastic nut	Low speed (< 15 m/min) ⁴⁾
	Metal nut	Medium speed (corresponds to 15 to 60 m/min) ⁴⁾
Sliding motion guides	Universal	Medium speed (corresponds to 15 to 60 m/min) ⁴⁾
All	Smooth running	High accelerations and speed
	Micromovement/vibration	Normal load
	High load	
	High temperature	Not in high vacuum, UV light, aggressive media
	Clean room production/semi-conductor, LCD, HDD production	Friction point temperature up to 60 °C (140 °F) not in high vacuum or aggressive radiation
	Clean room production/semi-conductor, LCD, HDD production	High temperature range, under high vacuum, UV radiation
	Food-processing and pharmaceutical industry	
	Ecologically sensitive areas	Readily biodegradable for a clean environment ³⁾

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 Selection criterion of secondary importance
 Selection criterion of tertiary importance

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Klüber speciality lubricant	Description
Klüberplex BE 31-222	Lubricating grease, good adhesion and sealing effect
Klüberplex BE 31-102	Lubricating grease, good adhesion and sealing effect
ISOFLEX NCA 15	Lubricating grease, good adhesion and sealing effect
ISOFLEX TOPAS AK 50	Fluid grease. NLGI 0 for easy application
Klüberplex BEM 41-132	Good lubricating capacities in linear contact
POLYLUB GLY 801	Good compatibility with plastics. ²⁾ Lubricants for higher speeds on request
Klüberplex BEM 41-132	Good wear protection for long relubrication intervals. Lubricants for high/low speeds on request
Klüberplex BEM 41-132	Good wear protection for long relubrication intervals. Lubricants for high/low speeds on request
ISOFLEX TOPAS NCA 52	Ageing-resistant lubricating grease for long-term lubrication
Klüberplex BEM 34-132	Tried-and-tested grease against tribocorrosion
Klüberlub BE 71-501	Good wear protection, applicable through central lubricating systems ⁵⁾
Klübersynth BM 44-42	Very wide temperature range. Compatible with plastics. ²⁾ Low-cost alternative to PFPE oils. Tried-and-tested for automotive applications (steering system)
Klübersynth BEM 34-32	Primarily supplied in small 50 g packs for relubrication in clean room environments
BARRIERTA KM 192	Low evaporation rate
Klüberfood NH1 94-301	NSF H1-registered ¹⁾
Klüberbio M 72-82	Low water hazard ensures unharmed environment. Good water resistance. High pressure absorption capacity

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3) Biodegradable according to CEC-L-33-A-93. Biodegradable lubricants should be handled with the same care as all other lubricants. Any avoidance of contamination is to the benefit of our environment.

4) The guide values for lubricant selection are based on our many years of experience.

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Gears

Special oils

Industry	Gear type		Klüber speciality lubricant	Service temperature range ¹⁾	
	Spur, bevel, planetary and hypoid gears	Worm gear		Upper service temperature, approx.	Lower service temperature, approx.
General	+++	+	Klüberoil GEM 1-... N	100 °C 212 °F	-15 °C 5 °F
General	+++	++	Klübersynth GEM 4-... N	140 °C 284 °F	-45 °C -49 °F
General	++	+++	Klübersynth GH 6-...	160 °C 320 °F	-25 °C -13 °F
Food & pharma	+++	+++	Klübersynth UH1 6-... ²⁾	160 °C 320 °F	-35 °C -31 °F
Food & pharma	++	++	Klüberoil 4 UH1-... N ²⁾	120 °C 248 °F	-35 °C -31 °F
Ecologically sensitive areas	+++	++	Klübersynth GEM 2-...	130 °C 266 °F	-30 °C -22 °F

+++ Optimum performance/enhanced benefit ++ Improved performance/benefit + Standard performance

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Performance parameters							DIN 51 502, AGMA 9005 designation	Registrations and tests
Energy saving	Oil life	Scuffing load capacity	Micro-pitting resistance	Wear protection of rolling bearings	Elastomer compatibility Radial shaft seals			
+	+	+++	+++	+++	+++	CLP, EP oil	NSF H2	
++	++	+++	+++	+++	+++	CLP HC, EP oil		
+++	+++	+++	+++	+++	+++	CLP PG, EP oil		
+++	+++	+++	+++	+++	+++	CLP PG, EP oil	NSF H1, NSF ISO 21469	
++	++	++	+	+++	+++	CLP HC, EP oil	NSF H1, NSF ISO 21469	
++	++	+++	+++	+++	++	CLP E ⁴⁾ , EP oil	CEC-L-33-A-93 ³⁾	

3) Biodegradable lubricants should be handled with the same care as all other lubricants. Any avoidance of contamination is to the benefit of our environment.

4) Complies with CLP requirements, except for demulsibility and resistance to SRE NBR 28 elastomer

Chains

Speciality lubricants

Industry	Upper service temperature ¹⁾ approx.
Food-processing and pharmaceutical industries	250 °C 482 °F
	160 °C 320 °F
	120 °C 248 °F
Other industries	1 000 °C 1 832 °F Note: above approx. 200 °C/392 °F dry lubrication
	500 °C 932 °F Note: above approx. 200 °C/392 °F dry lubrication
	250 °C/482 °F
	120 °C/248 °F
	110°C/230 °F
	80 °C/176 °F

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 Selection criterion of tertiary importance

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Selection criteria ⁴⁾	Klüber speciality lubricant
High-temperature chain oil, NSF H1-registered, ISO 21469-certified	Klüberfood NH1 CH 2-220 ²⁾
Special high-temperature chain oil based on polyglycol for chains in can lacquering lines; NSF H1-registered and ISO 21469-certified	Klüberfood NH1 C 6-150 ²⁾
NSF H1-registered and ISO 21469-certified. For normal temperatures	Klüberoil 4 UH1-32 N bis 460 N ²⁾
Solid lubricant suspension, e.g. for chains in burning, melting or annealing furnaces. Note: for applications at service temperatures above 250 °C/482 °F	WOLFRAKOTE TOP FLUID
High-temperature chain oil containing solid lubricants; also for plate carrier chains in baking ovens. Note: for applications at service temperatures above 250 °C/482 °F	Klüberoil YF 100
Glass and rockwool polymerization furnaces (heat relief materials); conveyors (e.g. in the automotive industry), drying installations (e.g. for gypsum board)	Klübersynth CH 2-100 N or other viscosity grades of the Klübersynth CH 2 series
For continuous board or laminate presses. Approved for Dieffenbacher chains. Especially for belt lubrication.	HOTEMP SUPER N PLUS
Lubrication of chains and pins (ContiRoll presses of Messrs. Siempelkamp)	HOTEMP SUPER M 121 S
Lubrication of bending rods (wood presses of Messrs. Dieffenbacher)	HOTEMP SUPER CH 2-100
Especially for fabric conveyor chains in textile finishing machines	Klübersynth CTH 2-260
For conveyor chains in biaxial film stretchers; especially for high chain speeds and stretching temperatures. Approved by Messrs. Brückner	Klübersynth CH 2-280
Chain lubricant based on mineral oil, also for conveyor chains in wet processing zones	STRUCTOVIS HD series; especially STRUCTOVIS FHD and STRUCTOVIS EHD
For moist conditions, especially when exposed to water and steam. Hydrocapillary effect (lubricant penetrates through humidity and water)	Klüberoil CA 1-460
Lubricating wax for chains, up to 70 - 80°C/158 - 176°F “quasi-dry” lubricating film; especially for the initial lubrication by the chain manufacturer	Klüberplus SK 11-299
Biodegradable chain oils tested acc. to CEC L-33-A-93, 21 days, ≥ 70 % ³⁾	Klüberbio CA 2 oils (multi-purpose oils)
	Klüberbio C 2-46 (especially for escalator step chain and passenger conveyors)

3) Biodegradable lubricants should be handled with the same care as all other lubricants. Any avoidance of contamination is to the benefit of our environment.

4) For detailed product data, please refer to the product information sheet. We would be pleased to be of assistance!

Screws

Special pastes and dry lubricants

	Service temperature range ¹⁾		Screw material					
	upper service temperature range approx.	lower service temperature range approx.	standard	friction values for initial tightening ²⁾ standard screw material	standard deviation (S)	special steel A 2-70	friction values for initial tightening ³⁾ special steel A 2-70	standard deviation (S)
Pastes	1 200 °C 2 192 °F	-30 °C -22 °F	•	$\mu_K = 0.15$ $\mu_G = 0.17$	$S_K = 0.008$ $S_G = 0.026$	•	$\mu_K = 0.11$ $\mu_G = 0.13$	$S_K = 0.007$ $S_G = 0.007$
	1 000 °C 1 832 °F	-40 °C -40 °F	•	$\mu_K = 0.09$ $\mu_G = 0.11$	$S_K = 0.009$ $S_G = 0.02$	•	$\mu_K = 0.11$ $\mu_G = 0.13$	$S_K = 0.011$ $S_G = 0.032$
	140 °C 284 °F	-40 °C -40 °F	•	$\mu_K = 0.11$ $\mu_G = 0.10$	$S_K = 0.008$ $S_G = 0.012$	•	$\mu_K = 0.10$ $\mu_G = 0.09$	$S_K = 0.013$ $S_G = 0.01$
	120 °C 248 °F	-45 °C -49 °F	•	$\mu_K = 0.10$ $\mu_G = 0.13$	$S_K = 0.004$ $S_G = 0.017$	•	$\mu_K = 0.09$ $\mu_G = 0.19$	$S_K = 0.009$ $S_G = 0.022$
	120 °C 248 °F	-30 °C -22 °F	•	$\mu_K = 0.13$ $\mu_G = 0.11$	$S_K = 0.012$ $S_G = 0.011$	-	not measured	not measured
Dry lubrication	1 000 °C 1 832 °F	-40 °C -40 °F	•	$\mu_K = 0.14$ ⁴⁾ $\mu_G = 0.14$ ⁴⁾	$S_K = 0.006$ ⁴⁾ $S_G = 0.028$ ⁴⁾	-	-	-
	350 °C 662 °F	-180 °C -292 °F	•	$\mu_K = 0.06$ ⁴⁾ $\mu_G = 0.07$ ⁴⁾	$S_K = 0.003$ ⁴⁾ $S_G = 0.007$ ⁴⁾	•	$\mu_K = 0.05$ $\mu_G = 0.08$	$S_K = 0.007$ $S_G = 0.007$
	300 °C 572 °F	-40 °C -40 °F	•	$\mu_K = 0.06$ ⁴⁾ $\mu_G = 0.08$ ⁴⁾	$S_K = 0.007$ ⁴⁾ $S_G = 0.019$ ⁴⁾	•	$\mu_K = 0.06$ $\mu_G = 0.11$	$S_K = 0.005$ $S_G = 0.051$
	180 °C 356 °F	-40 °C -40 °F	•	$\mu_K = 0.12$ ⁴⁾ $\mu_G = 0.14$ ⁴⁾	$S_K = 0.005$ ⁴⁾ $S_G = 0.006$ ⁴⁾	-	-	-
	90 °C 194 °F	-40 °C -40 °F	•	$\mu_K = 0.11$ ⁵⁾ $\mu_G = 0.13$ ⁵⁾	$S_K = 0.011$ ⁵⁾ $S_G = 0.021$ ⁵⁾	•	$\mu_K = 0.14$ $\mu_G = 0.12$	$S_K = 0.018$ $S_G = 0.017$

■ Most important selection criterion

- 1) Service temperatures are guide values which depend on the lubricant's composition, the intended use and the application method. Lubricants change their consistency, shear viscosity or viscosity depending on the mechanical-dynamical loads, time, pressure and temperature. These changes in product characteristics may affect the function of a component.
- 2) Measured with screws M 10x30-8.8, DIN EN ISO 4017, black and nuts M 10-8, DIN ISO 4032, bright; number of screws 20 each. μ_K = bearing surface friction coefficient, μ_G = thread friction coefficient
- 3) Measured with screws M 10x50, DIN EN ISO 4017, bright, A2-70, DIN EN ISO 3506-1, and nuts M 10, DIN EN ISO 4032-1, bright, A2-80, DIN EN ISO 3506-1; number of screws 20 each. μ_K = bearing surface friction coefficient, μ_G = thread friction coefficient
- 4) Screws pretreated with zinc-phosphatized surface
- 5) Friction values and standard deviation with a mixing ratio of 1:3.



	Colour	Application notes	Klüber speciality lubricant
	light-grey	NSF H1-registered and ISO 21469-certified. ⁶⁾ Above 200 °C dry lubrication	Klüberpaste UH1 96-402
	black	Approved acc. to VW-TL 52112 and Ford Tox No. 138624. Above 200 °C dry lubrication	Klüberpaste HEL 46-450
	beige	For screws and bolts subject to normal temperatures	DUOTEMPI PMY 45
	white	NSF H1-registered and ISO 21469-certified ⁶⁾	Klüberpaste UH1 84-201
	whitish	For use in agricultural, forestry and water resources industries	Klüberbio EM 72-81
	grey	Dispersion. A dry alternative to high-temperature screw pastes for cleaner handling	Klüberplus S 04-807
	grey	Bonded coating for high pressure. Low friction values	UNIMOLY C 220
	grey-black	Bonded coating providing good lubricating properties even in humid environment	Klüberstop TG 05-371
	black	Bonded coating offering good resistance to chemicals and oils. Good corrosion protection. Not suitable for special steels.	Klüberstop TP 03-111
	transparent (colour of the water-free lubricating film)	Lubricating wax emulsion. Ready-to-handle. Can be diluted with tap water	Klüberplus SK 12-205

6) This lubricant is registered as H1, which means that it has been designed for incidental, technically unavoidable food contact. Experience shows that it can be used for equivalent applications in the cosmetics and pharmaceutical industry under the conditions described in the product information leaflet. Specific test results as e.g. biocompatibility, which could be an additional requirement for applications in the pharmaceutical industry, are not available for this product. Therefore, before using the lubricant adequate risk analyses should be performed and, if necessary, suitable measures be taken by the manufacturer and user of installations in order to exclude the risk of health hazards and personal injuries. NSF ISO 21469 supports compliance with the hygienic requirements of your production. Further information on our website www.klueber.com.

Air Compressors

Special oils

Type of compressor	Food-processing and pharmaceutical industries	Oil change interval	Klüber speciality lubricant
Reciprocating piston compressors Rotary vane compressors with total loss or oil circulation lubrication	•	Depending on application	Klüber Summit HySyn FG 68 ... 100
		Depending on application	Klüber Summit PS 200 ... 400
		Depending on application	Klüber Summit DSL 68 ... 125
Screw compressors with oil injection	•	oil change intervals up to 4 000 hours ²⁾ under normal operating conditions ³⁾	Klüber Summit HySyn FG 32 ... 68
		oil change intervals up to 5 000 hours ²⁾ under normal operating conditions ³⁾	Klüber Summit PS 100 ... 200
		oil change intervals up to 8 000 hours ²⁾ under normal operating conditions ³⁾	Klüber Summit SB 46 ... 68
		oil change intervals up to 8 000 hours ²⁾ under normal operating conditions ³⁾	Klüber Summit Supra Coolant Klüber Summit Supra 32
		oil change intervals up to 10 000 hours ²⁾ under normal operating conditions ³⁾	Klüber Summit SH 32 ... 68
		oil change intervals up to 12 000 hours ²⁾ under normal operating conditions ³⁾ or for compressors running under severe operating conditions like seawater, extreme temperatures	Klüber Summit Ultima 46 ... 68

Most important selection criterion
 Selection criterion of secondary importance
 Selection criterion of tertiary importance

1) Please observe the viscosities specified by the manufacturers

2) The indicated oil change intervals are guide values which are based on practical experience. They depend on the intended use, the application method and the technical condition of the compressor. Lubricants change their condition depending on the mechano-dynamical loads, pressures and temperatures and the mixture with oil residues or build-ups of the previous oils fills. Such changes in product properties may have an effect on the oil change intervals and the function of components.

3) Normal operating conditions are considered a discharge temperature of max. 85 °C (176 °F), a discharge pressure of max. 8 bar, dry and clean intake air, oil cycle > 1.5



Product characteristics, advantages, benefits	Viscosity ¹⁾ Nominal value	Chemical composition
<ul style="list-style-type: none"> • NSF H1-registered and ISO 21469-certified for use in the food-processing and pharmaceutical industries⁴⁾ • up to 160 °C (320 °F) discharge temperature 	68, 100	Synthetic hydrocarbon
<ul style="list-style-type: none"> • Reduced residue formation on valves and in cylinders compared to mineral oil based compressor oils • Longer service life of valves and piston rings resulting in reduced maintenance and downtime costs in comparison to mineral oil • Up to approx. 160 °C (320 °F) discharge temperature 	68, 100, 150	Hydrotreated oil, diester oil
<ul style="list-style-type: none"> • Excellent residue removal on valves and in cylinders due to 100 % fully synthetic formulation • Even longer service life of valves and piston rings resulting in reduced maintenance and downtime costs compared to mineral and hydrocarbon-based oils • More energy efficiency resulting from lower friction coefficient, better thermal conductivity, etc. • Up to 220 °C (428 °F) discharge temperature 	68, 100, 125	Diester oil
<ul style="list-style-type: none"> • NSF H1-registered and ISO 21469-certified for use in the food-processing and pharmaceutical industries⁴⁾ 	32, 46, 68	Synthetic hydrocarbon
<ul style="list-style-type: none"> • Reduced maintenance and downtime costs • Reduced formation of residues 	32, 46, 68	Mineral oil, ester oil
<ul style="list-style-type: none"> • Reduced maintenance and downtime costs • Miscible with mineral and hydrocarbon oils 	46, 68	Synthetic hydrocarbon, ester oil
<ul style="list-style-type: none"> • Particularly for compressors filled with polyglycol-based compressor oils by the manufacturer • Good chemical stability with low degradation and deposit formation • Not miscible with mineral oil and hydrocarbon-based oils 	55	Polyglycol oil, ester oil
	38	
<ul style="list-style-type: none"> • Reduced maintenance and downtime costs • Good compatibility with elastomers • Non-hygroscopic 	32, 46, 68	Synthetic hydrocarbon
<ul style="list-style-type: none"> • Reduced maintenance and downtime costs 	46, 68	Ester oil, synthetic hydrocarbon

4) This lubricant is registered as H1, which means that it has been designed for incidental, technically unavoidable food contact. Experience shows that it can be used for equivalent applications in the cosmetics and pharmaceutical industry under the conditions described in the product information leaflet. Specific test results as e.g. biocompatibility, which could be an additional requirement for applications in the pharmaceutical industry, are not available for this product. Therefore, before using the lubricant adequate risk analyses should be performed and, if necessary, suitable measures be taken by the manufacturer and user of installations in order to exclude the risk of health hazards and personal injuries. NSF ISO 21469 supports compliance with the hygienic requirements of your production. You will find further information about ISO Standard 21469 on our website www.klueber.com.

Air Compressors

Special oils

Application	Food-processing and pharmaceutical industries	Klüber speciality lubricant
Gear lubrication in oil-free compressors	•	Klüber Summit HySyn FG 68
		Klüber Summit SH 68
Blower (gear lubrication)	•	Klüberoil 4 UH 1-100 N... 220 N
		Klüber Summit PS 400
Cleaning of screw compressors, turbo compressors and rotary vane air compressors with oil circulation		Klüber Summit Varnasolv
Aeging test oil for checking the aging condition of compressor oils		Klüber Summit T.A.N-Kit
Rolling bearings of electric motors		Klüberquiet BQH 72-102

Most important selection criterion

1) Please observe the viscosities specified by the manufacturers

2) This lubricant is registered as H1, which means that it has been designed for incidental, technically unavoidable food contact. Experience shows that it can be used for equivalent applications in the cosmetics and pharmaceutical industry under the conditions described in the product information leaflet. Specific test results as e.g. biocompatibility, which could be an additional requirement for applications in the pharmaceutical industry, are not available for this product. Therefore, before using the lubricant adequate risk analyses should be performed and, if necessary, suitable measures be taken by the manufacturer and user of installations in order to exclude the risk of health hazards and personal injuries. NSF ISO 21469 supports compliance with the hygienic requirements of your production. You will find further information about ISO Standard 21469 on our website www.klueber.com.

Product characteristics, advantages, benefits	Viscosity ¹⁾ Nominal value	Chemical composition
<ul style="list-style-type: none"> NSF H1-registered and ISO 21469-certified for use in the food-processing and pharmaceutical industries²⁾ Fully synthetic compressor oil 	68	Synthetic hydrocarbon
<ul style="list-style-type: none"> Cost savings due to longer oil change intervals compared to mineral and partially synthetic oils Fully synthetic compressor oil 	68	Synthetic hydrocarbon, ester oil
<ul style="list-style-type: none"> NSF H1-registered and ISO 21469-certified for use in the food-processing and pharmaceutical industries²⁾ 	100, 150, 220	Synthetic hydrocarbon, ester oil
<ul style="list-style-type: none"> Cost savings due to longer oil change intervals compared to mineral oil 	150	Mineral oil, ester oil
<ul style="list-style-type: none"> Effectively dissolves residues and impurities caused by mineral oils (e.g. carbon buildup, oxidation residues) and removes them together with the oil during oil change No downtimes due to cleaning during operation Lower costs due to simple cleaning procedure Economical operation of the cleaned compressor 	78	Ester oil based conditioner for screw-type compressors, turbo compressors and rotary vane compressors with oil circulation lubrication. May not be used for polyglycol oils.
<ul style="list-style-type: none"> Rapid way of checking the condition (neutralisation number) of compressor oils on the spot Suitable for determining the compressor oil change intervals 		Can be used for all conventional mineral and synthetic compressor oils, except polyglycol oils.
<ul style="list-style-type: none"> Long-term and lifetime lubrication 		Ester oil, polyurea thickener

Appendix: Miscibility of base oils

	Mineral oil	SHC (PAO)	Ester oil	Polyglycol	Silicone oil	PFPE
Mineral oil	•	•	•	–	–	–
SHC (PAO)	•	•	•	–	–	–
Ester oil	•	•	•	•	–	–
Polyglycol	–	–	•	•	–	–
Silicone oil	–	–	–	–	•	–
PFPE	–	–	–	–	–	•

The KlüberServiceSystem: Because you matter to us!

What you rightly expect from lubricants made by Klüber naturally applies to our KlüberServiceSystem as well: quality of the highest level, and a diversity that is probably unparalleled. This diversity reflects the many lines of business we serve. It has also evolved from the many individualised solutions which Klüber has developed for its customers, and often in cooperation with them.

It is not only important that your machinery runs reliably; but that it runs efficiently, and for a long time. It is also important that you know that your lubrication needs are being taken care of by a competent partner so that your workforce can concentrate on their primary job responsibilities.

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We know from listening to our customers that they attach major importance to being serviced comprehensively and competently – and that what each one of them needs can be very different things.

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- KlüberConsult for all individual questions
- KlüberCollege for training your staff
- KlüberLubConcept for the creation of lubrication charts, the use of dedicated software and the labelling of lubrication points
- KlüberMonitor for monitoring the condition of the lubricants used and your machinery
- KlüberMaintain for the cleaning and relubrication of machines
- KlüberRepair for damaged large gear drives
- KlüberAssetSupport for the utilisation of potential for improvement

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