

your global specialist

The right lubricant for each component.

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





The right lubricant for each component

| | |
|----------------------------------------|----|
| The right lubricant for each component | 3 |
| Rolling bearings | 4 |
| Plain bearings | 8 |
| Linear guides | 12 |
| Gears | 16 |
| Chains | 18 |
| Screws | 20 |
| Air compressors | 22 |
| Pneumatic systems | 26 |
| KlüberEfficiencySupport | 28 |

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 Lubrication or download them from our website www.klueber.com.

Rolling bearings
Special greases



| Selection criteria | Upper service temperature approx. | Lower service temperature approx. | Speed factor n·dm [min ⁻¹ ·mm], approx. | Base oil viscosity DIN 51562 [mm²/s] at approx. 40 °C/104 °F | Base oil viscosity DIN 51562 [mm²/s] at approx. 100 °C/212 °F | Base oil | Thickener | Speciality lubricants from Klüber Lubrication | Description/application examples |
|-------------------------------|-----------------------------------|-----------------------------------|----------------------------------------------------|--------------------------------------------------------------|---------------------------------------------------------------|-----------------------|----------------|-----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| High-temperature applications | 260 °C 500 °F | −40 °C −40 °F | 300,000 | 420 | 40 | 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 H1 ¹⁾ |
| | 200 °C 392 °F | −40 °C −40 °F | 1,000,000 | 130 | 20 | 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 |
| | 180 °C 356 °F | −40 °C −40 °F | 1,000,000 | 80 | 11 | 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 |
| | 180 °C 356 °F | −30 °C −22 °F | 300,000 | 180 | 19.5 | Synthetic hydrocarbon | PTFE | Klübertherm HB 88-182 | <ul style="list-style-type: none">– Specially engineered high-temperature grease for applications up to 180 °C; does not form residues in bearings or lines– Closes the gap between high-temperature greases based on PFPE oils and conventional ester greases– High yield due to low density, thus reducing consumption costs compared to fully fluorinated lubricants– For applications subject to various operating conditions and different rolling bearing types, like corrugator roll bearings, cylindrical roller bearings and sealing systems in the automotive industry |
| Low-temperature applications | 110 °C 230 °F | −70 °C −94 °F | 1,000,000 | 9 | 2.6 | Ester | Lithium soap | ISOFLEX PDL 300 A | <ul style="list-style-type: none">– Heavy-duty grease for low friction moments |
| Low-noise applications | 180 °C 356 °F | −45 °C −49 °F | 1,000,000 | 72 | 9.5 | 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 |
| | 180 °C 356 °F | −40 °C −40 °F | 1,000,000 | 100 | 12.5 | Ether oil | Polyurea | Klüberquiet BQR 78-102 | <ul style="list-style-type: none">– For lifetime lubrication of sealed ball bearings in electric motors, fans or similar applications in the automotive industry, where they have to offer a long service life at above-average permanent temperatures while preventing noise generation.– Good compatibility with ACM and FKM even under high temperature |
| | 140 °C 284 °F | −50 °C −58 °F | 1,000,000 | 25 | 5 | Ester | Lithium soap | ASONIC GLY 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 |

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

1) This lubricant is NSF H1 registered and therefore complies with FDA 21 CFR § 178.3570. The lubricant was developed for incidental contact with products and packaging materials in the food-processing, cosmetics, pharmaceutical or animal feed industries. The use of this lubricant can contribute to increase reliability of your production processes. We nevertheless recommend conducting an additional risk analysis, e.g. HACCP.

Rolling bearings
Special greases



| Selection criteria | Upper service temperature approx. | Lower service temperature approx. | Speed factor n·dm [min ⁻¹ ·mm], approx. | Base oil viscosity DIN 51562 [mm²/s] at approx. 40 °C/104 °F | Base oil viscosity DIN 51562 [mm²/s] at approx. 100 °C/212 °F | Base oil | Thickener | Speciality lubricants from Klüber Lubrication | Description/application examples |
|----------------------------------------------|-----------------------------------|-----------------------------------|----------------------------------------------------|--------------------------------------------------------------|---------------------------------------------------------------|------------------------------------|-------------------------------|-----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| High-speed and spindle bearing applications | 120 °C 248 °F | −50 °C −58 °F | 2,100,000 | 22 | 5 | Synthetic hydrocarbon/ ester | Polyurea | Klüberspeed BF 72-23 | – Especially for spindle bearings with inclined or vertical mounting position, but also for horizontal shafts in machine tools |
| High-load and heavy-duty applications | 150 °C 302 °F | −40 °C −40 °F | 1,000,000 | 130 | 14 | Synthetic hydrocarbon/ mineral oil | Special lithium soap | Klüberplex BEM 41-141 | – For rolling and plain bearings subject to high loads – For vibrations and oscillations – For applications such as main bearings in wind turbines |
| | 140 °C 284 °F | −20 °C −4 °F | 500,000 | 540 | 28 | Mineral oil | Lithium soap | Klüberlub BE 41-542 | – For low to medium speeds |
| | 140 °C 284 °F | −15 °C 5 °F | 500,000 | 220 | 19 | Mineral oil | Special calcium soap | Klüberplex BE 31-222 | – For ball bearings subject to high loads in wet processing zones – For medium rotating speeds |
| Applications in the food & pharma industry | 120 °C 248 °F | −45 °C −49 °F | 300,000 | 150 | 22 | Synthetic hydrocarbon | Aluminium complex soap | Klübersynth UH1 14-151 | – NSF H1-registered ¹⁾ 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 |
| Applications requiring electric conductivity | 150 °C 302 °F | −40 °C −40 °F | 1,000,000 | 150 | 19 | Synthetic hydrocarbon | Lithium soap, solid lubricant | Klüberlectric BE 44-152 | – 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 ([Ω × cm]), (electrode spacing 1 cm, electrode surface 1 cm²) ≤ 10,000 |

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

1) This lubricant is NSF H1 registered and therefore complies with FDA 21 CFR § 178.3570. The lubricant was developed for incidental contact with products and packaging materials in the food-processing, cosmetics, pharmaceutical or animal feed industries. The use of this lubricant can contribute to increase reliability of your production processes. We nevertheless recommend conducting an additional risk analysis, e.g. HACCP.

Plain bearings
Special greases



| Industry | Type of operation | Sliding speed [m/s] | Max. surface pressure [N/mm²] | Upper service temperature approx. | Lower service temperature approx. | Speciality lubricants from Klüber Lubrication | Description | Benefits |
|----------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------------|-------------------------------|-----------------------------------|-----------------------------------|-----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Plant and machine building, appliance industry | Oscillating/ rotating | < 1 | Approx. 100 | 260 °C 500 °F | −40 °C −40 °F | Klüberalfa BHR 53-402 | High-temperature, long-term lubricating grease with largely neutral behaviour towards many materials (metals, plastics). | Lifetime lubrication enables a significant reduction in lubrication quantities. |
| | | | | 180 °C 356 °F | −30 °C −22 °F | PETAMO GHY 441 | Alternative to Klüberlub BVH 71-461, suitable for higher ambient temperatures. | Extended relubrication intervals, also at high temperatures owing to its long-term stability. |
| | | | | 160 °C 320 °F | −20 °C −4 °F | Klüberlub BVH 71-461 | The preferred lubricant option for plain bearings, offering long service life and relubrication intervals. | Suitable for universal standard applications. |
| | | | | 150 °C 302 °F | −40 °C −40 °F | POLYLUB GLY 501 | Especially for plastic plain bearings ²⁾ ; also available in other base oil viscosities. | Good compatibility with many plastics. |
| | | | | 140 °C 284 °F | −20 °C −4 °F | Klüberlub BE 41-542 | 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. |
| | | | | 140 °C 284 °F | −30 °C −22 °F | Klüberlub BEM 41-122 | For steel/steel spherical plain bearings. | Improved functionality and long-term lubrication due to the formation of a wear-resistant tribolayer. |
| | Mainly rotating | ≥ 1 | Approx. 10 | 150 °C 302 °F | −50 °C −58 °F | POLYLUB GLY 151 | Also for plastic plain bearings owing to its good compatibility. | Suitable for universal standard applications. |
| | | ≥ 2 | Approx. 1 | 130 °C 266 °F | −50 °C −58 °F | Klübersynth LR 44-21 | Also for plastic plain bearings owing to its good compatibility. | Suitable for universal standard applications. |
| Food-processing and pharmaceutical industry | Oscillating/ rotating | < 1 | Approx. 100 | 140 °C 284 °F | −5 °C 23 °F | Klübersynth UH1 64-1302 | NSF H1-registered and certified according to ISO 21469 for use in the food-processing and pharmaceutical industries. ¹⁾ | Long lifetime owing to good water resistance and wear protection. |
| | | | | 120 °C 248 °F | −35 °C −31 °F | Klüberfood NH1 94-301 | NSF H1-registered for use in the food-processing and pharmaceutical industries. ¹⁾ | Good corrosion- and wear protection, also when subject to micro movements; can be applied via centralised lubrication systems. |
| | Mainly rotating | ≥ 1 | Approx. 10 | 120 °C 248 °F | −40 °C −40 °F | Klübersynth UH1 14-151 | NSF H1-registered and certified according to ISO 21469 for use in the food-processing and pharmaceutical industries. ¹⁾ | Reduced risk of bearing failure due to good water resistance. |
| Plant and machine building, appliance and automotive industry if lubricant contact with the environment cannot be excluded | Mainly rotating | < 1 | Approx. 100 | 100 °C 212 °F | −30 °C −22 °F | Klüberbio LG 39-701 N | Eco-compatible operating lubricant based on renewable raw materials | Suitable for many applications due to good wear and water resistance. |
| | | ≥ 1 | Approx. 10 | 120 °C 248 °F | −40 °C −40 °F | Klüberbio BM 32-142 | Eco-compatible multi-purpose grease for rolling and plain bearings in the marine industry | Good corrosion and wear protection. Complies with the requirements for environmentally acceptable lubricants (EALs) and bears the EU Ecolabel |

Most important selection criterion

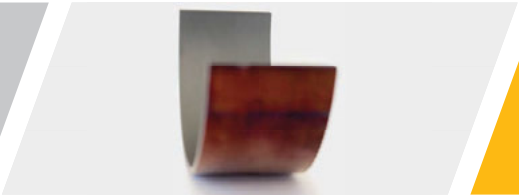
Selection criterion of secondary importance

Selection criterion of tertiary importance

1) This lubricant is NSF H1 registered and therefore complies with FDA 21 CFR § 178.3570. The lubricant was developed for incidental contact with products and packaging materials in the food-processing, cosmetics, pharmaceutical or animal feed industries. The use of this lubricant can contribute to increase reliability of your production processes. We nevertheless recommend conducting an additional risk analysis, e.g. HACCP.

Plain bearings

Special lubricating oils and bonded coatings



Lubricating oils for hydrodynamic plain bearings

| Application/requirement | Speciality lubricants from Klüber Lubrication | Description | Benefits |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------|---------------------------------------------|-------------------------------------------------------------------------------------------------------|
| Standard | Klüberoil GEM 1-100, 150, 220, 320, 460 N | Viscosity depends on temperature and speed. | Tried-and-tested gear oil series compatible with conventional plain bearing metals. |
| Particular long-term resistance | Klüber Summit SH 32, 46, 68, 100 | Viscosity depends on temperature and speed. | Long-term, reasonably priced compressor oil series compatible with conventional plain bearing metals. |
| | Alternative: Klübersynth GH 6 series, if the required viscosity is not available in the Klüber Summit SH series | | Tried-and-tested long-term gear oil series compatible with conventional plain bearing metals. |

Bonded coatings for tribologically optimised plain bearings

| Type of lubricant | Speciality lubricants from Klüber Lubrication | Description | Benefits |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| Thermosetting, black-coloured high-performance bonded coating made up of two components with nanoparticles | Klüberbtop TN 01-311 A/B | Primarily for the coating of metal plain bearings used as dry lubrication, running-in lubrication or emergency lubrication in combination with oil. | Excellent wear protection for a very long component life. |
| Thermosetting, single-component, black-coloured high-performance bonded coating containing graphite | Klüberbtop TG 05 N | Primarily for the coating of metal plain bearings used as dry lubrication, running-in lubrication or emergency lubrication in combination with oil. | Good corrosion protection and low friction coefficient for a reliable function of components, even under the influence of media. |
| Water-miscible, thermosetting PTFE bonded coating | Klüberbtop TP 46-111 | Primarily for the coating of plastic plain bearings and medium loads, used as dry lubricant. | Increased component performance due to sliding without stick-slip; cost-effective coating process. |
| 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. | | | |

Linear guides

Special oils and fluid greases



Oil lubrication for continuous lubrication

| Industry/requirements | Linear type | Speciality Lubricants from Klüber Lubrication | Description |
|---------------------------------------------|-----------------------|-----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| General/increased corrosion protection | All | Klübersynth MZ 4-17 | Good compatibility with other lubricants; can also be used for initial lubrication. |
| General | Rolling motion guides | 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. |
| General | Slideways | LAMORA D 68, 220 | CGLP slideway oil with good demulsifying behaviour towards cooling lubricants, tried-and-tested also for plastic guideways. Viscosity to be selected according to speed. |
| Food-processing and pharmaceutical industry | All | 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). |
| Readily biodegradable | All | Klüberbio C 2-46 | Low water hazard ensures unharmed environment. High-performance lubricant. Also available in ISO VG 100 as Klüberbio CA 2-100. |

Fluid grease lubrication for the continuous lubrication of all linear types

| Industry/requirements | NLGI grade | Speciality Lubricants from Klüber Lubrication | Description |
|------------------------------------------------------|------------------|-----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| General/low speed (< 15 m/min) | NLGI 00 - 000 | MICROLUBE GB 00 | With high-pressure and antiwear additives, without solid lubricants. |
| General | NLGI 00 | Klübersynth BEM 44-4600 | No gearbox leakage. Reduced power consumption due to low starting torque |
| General/medium speed (corresponds to 15 to 60 m/min) | NLGI 000 | CENTOPLEX GLP 500 | Good pressure absorbtion capacity. |
| General/medium speed (> 60 m/min) | NLGI 0 - 00 | ISOFLEX TOPAS NCA 5051 | Low base oil viscosity for low friction and smooth running. |
| General/higher temperatures | NLGI 0/00 | ISOFLEX TOPAS NCA 5051 | Synthetic base oil with good ageing resistance. |
| General/high load, micromovements, vibration | NLGI 0, 00 - 000 | MICROLUBE GB 0, 00 | With high-pressure and antiwear additives, without solid lubricants. Select NLGI grade according to lubrication specification. |
| Food-processing and pharmaceutical industry | NLGI 000 | Klüberfood NH 1 94-6000 | NSF H1-registered ¹⁾ . Good corrosion protection and good pressure-absorption capacity. |

Most important selection criterion Selection criterion of secondary importance

1) This lubricant is NSF H1 registered and therefore complies with FDA 21 CFR § 178.3570. The lubricant was developed for incidental contact with products and packaging materials in the food-processing, cosmetics, pharmaceutical or animal feed industries. The use of this lubricant can contribute to increase reliability of your production processes. We nevertheless recommend conducting an additional risk analysis, e.g. HACCP.

Linear guides
Special greases



Grease lubrication for extended relubrication intervals

| Linear type | Industry/requirements | Selection criterion | Speciality lubricants from Klüber Lubrication | Description |
|---------------------------------------------|-----------------------------------------------------------|--------------------------------------------------------------------------------------------|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Rolling motion guides, primarily with balls | Universal | Low speed (< 15 m/min) | Klüberplex BE 31-222 | Lubricating grease, good adhesion and sealing effect. |
| | | Medium speed (corresponds to 15 to 60 m/min) | Klüberplex BE 31-102 | Lubricating grease, good adhesion and sealing effect. |
| | | High speed (> 60 m/min) | ISOFLEX NCA 15 | Lubricating grease, good adhesion and sealing effect. |
| Miniature guideway | Universal | | ISOFLEX TOPAS AK 50 | Fluid grease. NLGI 0 for easy application. |
| Roller screw drives | Universal | | Klüberplex BEM 41-132 | Good lubricating capacities in linear contact. |
| Trapezoidal thread drives | Plastic nut | Low speed (< 15 m/min) | POLYLUB GLY 801 | Good compatibility with plastics. Lubricants for higher speeds on request. |
| | Metal nut | Medium speed (corresponds to 15 to 60 m/min) | Klüberplex BEM 41-132 | Good wear protection for long relubrication intervals. Lubricants for high/low speeds on request. |
| Sliding motion guides | Universal | Medium speed (corresponds to 15 to 60 m/min) | Klüberplex BEM 41-132 | Good wear protection for long relubrication intervals. Lubricants for high/low speeds on request. |
| All | Smooth running | High accelerations and speed | ISOFLEX TOPAS NCA 52 | Ageing-resistant lubricating grease for long-term lubrication. |
| | Micromovement/vibration | Normal load | Klüberplex BEM 34-132 | Tried-and-tested grease against tribocorrosion. |
| | High load | | Klüberlub BE 71-501 | Good wear protection, applicable through central lubricating systems. |
| | High temperature | Not in high vacuum, UV light, aggressive media | Klübersynth BM 44-42 | Very wide temperature range. Compatible with plastics. Low-cost alternative to PFPE oils. Tried-and-tested for automotive applications (steering system). |
| | Clean room production/semi-conductor, LCD, HDD production | Friction point temperature up to 60 °C (140 °F) not in high vacuum or aggressive radiation | Klübersynth BEM 34-32 | Primarily supplied in small 50 g packs for relubrication in clean room environments. |
| | Clean room production/semi-conductor, LCD, HDD production | High temperature range, under high vacuum, UV radiation | BARRIERTA KM 192 | Low evaporation rate. |
| | Food-processing and pharmaceutical industry | | Klüberfood NH1 94-301 | NSF H1-registered ¹⁾ . |
| | Ecologically sensitive areas | Readily biodegradable for a clean environment | Klüberbio LG 39-701 N | Low water hazard ensures unharmed environment. Good water resistance. High pressure absorption capacity. |

Most important selection criterion

Selection criterion of secondary importance

Selection criterion of tertiary importance

1) This lubricant is NSF H1 registered and therefore complies with FDA 21 CFR § 178.3570. The lubricant was developed for incidental contact with products and packaging materials in the food-processing, cosmetics, pharmaceutical or animal feed industries. The use of this lubricant can contribute to increase reliability of your production processes. We nevertheless recommend conducting an additional risk analysis, e.g. HACCP.

Gears

Special lubricating oils and greases



Special lubricating oils

| Industry | Gear type | | Speciality lubricants from Klüber Lubrication | ISO viscosity grade, ISO VG | Service temperature range | | Performance parameters | | | | | | DIN 51 502, DIN 51517-3, AGMA 9005 designation | Registrations and tests |
|------------------------------|-----------------------------------------|-----------|-----------------------------------------------|----------------------------------------------------------|------------------------------------|------------------------------------|-------------------------|----------|-----------------------------------|-------------------------------------|-------------------------------------|--------------------------------------------|------------------------------------------------|-----------------------------------------|
| | Spur, bevel, planetary and hypoid gears | Worm gear | | | Upper service temperature, approx. | Lower service temperature, approx. | Energy saving potential | Oil life | Scuffing load capacity of gearing | Micro-pitting resistance of gearing | Wear protection of rolling bearings | Elastomer compatibility radial shaft seals | | |
| General | +++ | + | Klüberoil GEM 1 N | 46, 68, 100, 150, 220, 320, 460, 680, 1000 | 100 °C 212 °F | −15 °C 5 °F | + | + | +++ | +++ | +++ | +++ | CLP, EP oil | |
| General | +++ | ++ | Klübersynth GEM 4 N | 32, 46, 68, 100, 150, 220, 320, 460, 680, 1000 | 140 °C 284 °F | −50 °C −58 °F | ++ | ++ | +++ | +++ | +++ | +++ | CLP HC, EP oil | |
| General | +++ | +++ | Klübersynth GH 6 | 22, 32, 46, 68, 100, 150, 220, 320, 460, 680, 1000, 1500 | 160 °C 320 °F | −55 °C −67 °F | +++ | +++ | +++ | +++ | +++ | +++ | CLP PG, EP oil | |
| Food & pharma | +++ | +++ | Klübersynth UH1 6 | 100, 150, 220, 320, 460, 680, 1000 | 160 °C 320 °F | −35 °C −31 °F | +++ | +++ | +++ | +++ | +++ | +++ | CLP PG, EP oil | NSF H1 ¹⁾ , NSF ISO 21469 |
| Food & pharma | ++ | + | Klüberoil 4 UH1 N | 22, 32, 46, 68, 100, 150, 220, 320, 460, 680, 1500 | 120 °C 248 °F | −35 °C −31 °F | ++ | ++ | ++ | ++ | +++ | ++ | CLP HC, EP oil | NSF H1 ¹⁾ , NSF ISO 21469 |
| Ecologically sensitive areas | ++ | + | Klübersynth GEM 2 | 220, 320 | 130 °C 266 °F | −30 °C −22 °F | ++ | ++ | +++ | +++ | +++ | + | CLP E ²⁾ , EP oil | CEC-L-33-A-93 |
| Marine industry | ++ | + | Klüberbio EG 2 | 68, 100, 150 | 100 °C 212 °F | −25 °C −13 °F | ++ | ++ | ++ | ++ | +++ | +(+) | CLP, EP oil | EU Ecolabel |

+++

 Optimum performance/enhanced benefit

++

 Improved performance/benefit

+

 Standard performance

1) This lubricant is NSF H1 registered and therefore complies with FDA 21 CFR § 178.3570. The lubricant was developed for incidental contact with products and packaging materials in the food-processing, cosmetics, pharmaceutical or animal feed industries. The use of this lubricant can contribute to increase reliability of your production processes. We nevertheless recommend conducting an additional risk analysis, e.g. HACCP.

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

Special lubricating greases for small gears

| Industry | Gear type | | Speciality lubricants from Klüber Lubrication | Viscosity at 40 °C/104 °F | NLGI | Service temperature range | | Performance parameters | | Base oil | Thickener |
|-------------|----------------------|-----------|-----------------------------------------------|---------------------------|------|------------------------------------|------------------------------------|--------------------------------------------------------------|--------------------------------------------------------------|----------|-------------------|
| | Spur and bevel gears | Worm gear | | | | Upper service temperature, approx. | Lower service temperature, approx. | Wear protection for gears with steel/steel material pairings | Wear protection for gears with steel/steel material pairings | | |
| Power tools | +++ | ++ | Klübersynth GE 14-110, GE 14-111 | 110 | 0, 1 | 120 °C 248 °F | −55 °C −67 °F | +++ | +++ | PAO | Aluminium complex |
| General | ++ | +++ | Klübersynth PEG 46-121 | 120 | 1 | 120 °C 248 °F | −50 °C −58 °F | +++ | +++ | PG | Lithium |
| General | ++ | +++ | Klübersynth GE 46-1200 | 120 | 00 | 120 °C 248 °F | −50 °C −58 °F | +++ | +++ | PG | Lithium |
| Power tools | +++ | + | Klübersynth GE 14-151 | 170 | 1 | 140 °C 284 °F | −35 °C −31 °F | +++ | ++ | PAO | Aluminium complex |
| General | +++ | + | Klübersynth G 34-130 | 130 | 0 | 130 °C 266 °F | −30 °C −22 °F | ++ | ++ | PAO | Calcium complex |

+++

 Optimum performance/enhanced benefit

++

 Improved performance/benefit

+

 Standard performance

Chains
Speciality lubricants



| Industry | Upper service temperature approx. | Selection criteria | Speciality lubricants from Klüber Lubrication |
|-----------------------------------------------|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| Food-processing and pharmaceutical industries | 650 °C 1,202 °F | High-temperature chain oil with white solid lubricants, NSF H1-registered and ISO 21460-certified. ¹⁾ For applications at temperatures from 250 °C (e.g. plate carrier chains in baking ovens). | Klüberfood NH1 CH 6-120 SUPREME |
| | 250 °C 482 °F | High-temperature chain oil, NSF H1-registered and ISO 21469-certified. ¹⁾ | Klüberfood NH1 CH 2-220 Plus |
| | | Special high-temperature chain oil for conveyor chains in the baking industry. NSF H1 registration and ISO 21469 certification. ¹⁾ | Klüberfood NH1 CH2-460 |
| | 120 °C 248 °F | Semi-synthetic chain oil for very wet areas in the food-processing industry, NSF H1 registration and ISO 21460 certification. ¹⁾ | Klüberfood NH1 C8-80 |
| Other industries | | NSF H1-registered ¹⁾ and ISO 21469-certified. For normal temperatures. | Klüberoil 4 UH1-32, 46, 68, 100, 150, 220, 320, 460 N |
| | 1,000 °C 1,832 °F | Solid lubricant suspension, e.g. for chains in burning, melting or annealing furnaces. For applications from a service temperature of 250 °C/482 °F. Note: above approx. 200 °C/392 °F dry lubrication | WOLFRAKOTE TOP FLUID |
| | 500 °C 932 °F | High-temperature chain oil containing solid lubricants; also for plate carrier chains in baking ovens. Also for plate carrier chains in baking ovens. For applications from a service temperature of 250 °C/482 °F. Note: above approx. 200 °C/392 °F dry lubrication | Klüberoil YF 100 |
| | | Aqueous graphite suspension for chains subject to high thermal stress, free from solvents, low level of undesirable smoke or odour. | Klüberplus S01-004 |
| | 250 °C 482 °F | Conveyor systems with drying oven (e.g. powder coating). Conveyor chains in hardening furnaces (e.g. mineral wool and gypsum plate production). | Klübersynth CHM 2 series, Klübersynth CH 2-100 N or other viscosity grades of the Klübersynth CH 2 series |
| | | High-temperature oil used in car body painting. | Klübersynth CHX 2-220 |
| | | For continuous fibreboard presses. Especially for belt lubrication. | HOTEMP SUPER N PLUS |
| | | Lubrication of chains and pins (ContiRoll presses). | HOTEMP SUPER CH 2-100 |
| | | Cleaning oil for chains / pins of continuous fibreboard presses | Klübertherm CH 2-140 |
| | | Especially for fabric conveyor chains in textile finishing machines. | Klübersynth CTH 2-260 |
| | | For conveyor chains in biaxial film stretchers; especially for high and highest chain speeds and stretching temperatures. Approved by Brückner Maschinenbau, Lindauer-Dornier, Andritz-Biax and ESOPP. | Klübersynth CH 2-280, Klübersynth CFH 2-400, Klübersynth CHZ 2-225, PRIMIUM SUPER M93 |
| | | Special oil for chain pin lubrication and cleaning of the chain system in film stretchers. | Klübersynth CZ 2-85 |
| | 120 °C 248 °F | Chain lubricant based on mineral oil, also for conveyor chains in wet processing zones. | STRUCTOVIS HD series; especially STRUCTOVIS FHD and STRUCTOVIS EHD |
| | | 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 |
| | 110 °C 230 °F | Biodegradable chain oils. | Klüberbio EG 2 series |
| | 80 °C 176 °F | Biodegradable chain oil especially for outdoor escalators | Klüberbio C 2-46 |

Most important selection criterion Selection criterion of secondary importance

¹⁾ This lubricant is NSF H1 registered and therefore complies with FDA 21 CFR § 178.3570. The lubricant was developed for incidental contact with products and packaging materials in the food-processing, cosmetics, pharmaceutical or animal feed industries. The use of this lubricant can contribute to increase reliability of your production processes. We nevertheless recommend conducting an additional risk analysis, e.g. HACCP.

Screws

Special pastes and dry lubricants



| | Service temperature range ¹⁾ | | Screw material | | Speciality lubricants from Klüber Lubrication | Colour space | Application notes |
|-----------------|-----------------------------------------|-----------------------------------------|----------------|------------------------------------|-----------------------------------------------|---------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| | Upper service temperature range approx. | Lower service temperature range approx. | Standard | Special steel A 2-70 ³⁾ | | | |
| Pastes | 1,400 °C 2,552 °F | −40 °C −40 °F | • | • | Klüberpaste HS 91-21 | Black | High degree of purity as paste is virtually free of chlorine, fluorine and sulphur; for applications in oil refineries. |
| | 1,200 °C 2,192 °F | −30 °C −22 °F | • | • | Klüberpaste UH1 96-402 | Grey | NSF H1-registered and ISO 21469-certified. Above 200 °C dry lubrication. ²⁾ |
| | 1,000 °C 1,832 °F | −40 °C −40 °F | • | • | Klüberpaste HEL 46-450 | Black | Approved acc. to VW-TL 52112 and Ford Tox No. 138624. Above 200 °C dry lubrication. |
| | 150 °C 302 °F | −40 °C −40 °F | • | • | Klüberpaste 46 MR 401 | White | Light-coloured, extreme-pressure lubricating paste. |
| | 120 °C 248 °F | −40 °C −40 °F | – | • | DUOTEMPI PMY 45 | Beige | For screws and bolts subject to normal temperatures. |
| | 120 °C 248 °F | −45 °C −49 °F | • | – | Klüberpaste UH1 84-201 | White | NSF H1-registered and ISO 21469-certified. ²⁾ |
| | 100 °C 212 °F | −20 °C −4 °F | • | – | Klüberbio AG 39-602 | Yellow | For use in agricultural, forestry and water resources industries. |
| Dry lubrication | 90 °C 194 °F | −40 °C −40 °F | • | – | Klüberplus SK 12-205 | Transparent (colour of the water-free lubricating film) | Lubricating wax emulsion. Ready-to-handle. Can be diluted with tap water. |

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) This lubricant is NSF H1 registered and therefore complies with FDA 21 CFR § 178.3570. The lubricant was developed for incidental contact with products and packaging materials in the food-processing, cosmetics, pharmaceutical or animal feed industries. The use of this lubricant can contribute to increase reliability of your production processes. We nevertheless recommend conducting an additional risk analysis, e.g. HACCP.

3) Material acc. to property class 8.8

Air compressors
Special oils



| Type of compressor | Oil change interval | Speciality lubricants from Klüber Lubrication | Food-processing and pharmaceutical industries | ISO viscosity grade, ISO VG | Product characteristics, advantages, benefits | Base oil |
|------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-----------------------------------------------|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| Screw compressors with oil injection | Oil change intervals up to 12,000 hours under normal operating conditions or for compressors subject to extreme operating conditions, e.g. extreme temperatures, pressures. | Klüber Summit Ultima 46, 68 | | 46, 68 | <ul style="list-style-type: none">– Reduced maintenance costs– Reduction of downtime– Especially for oil-injected screw compressors which are operated at pressures > 10 bar and temperatures up to 125 °C / 257 °F | Ester oil, synthetic hydrocarbon |
| | Oil change intervals up to 10,000 hours under normal operating conditions ¹⁾ | Klüber Summit SH 46, 68 | | 46, 68 | <ul style="list-style-type: none">– Reduced maintenance costs– Reduction of downtime– Good compatibility with elastomers– Non-hygroscopic– Especially suitable for installations with heat recovery | Synthetic hydrocarbon, ester oil |
| | Oil change intervals up to 8,000 hours under normal operating conditions ¹⁾ | Klüber Summit SB 46, 68 | | 46, 68 | <ul style="list-style-type: none">– Reduced maintenance costs– Reduction of downtime– Miscible with mineral and hydrocarbon oils | Synthetic hydrocarbon, ester oil |
| | Oil change intervals up to 5,000 hours under normal operating conditions ¹⁾ | Klüber Summit PS 150, 200 | | 46, 68 | <ul style="list-style-type: none">– Reduced maintenance costs– Reduction of downtime– Reduced formation of residues | Mineral oil, ester oil |
| | Oil change intervals up to 5,000 hours under normal operating conditions ¹⁾ | Klüber Summit FG 200, 250 | • | 46, 68 | <ul style="list-style-type: none">– NSF H1-registered²⁾ and ISO 21469-certified for use in the food-processing and pharmaceutical industries | Synthetic hydrocarbon |
| | Oil change intervals up to 8,000 hours under normal operating conditions ¹⁾ | Klüber Summit FG Elite 46 | • | 46 | <ul style="list-style-type: none">– NSF H1-registered²⁾ and ISO 21469-certified for use in the food-processing and pharmaceutical industries | Synthetic hydrocarbon |
| | Oil change intervals up to 8,000 hours under normal operating conditions ¹⁾ | Klüber Summit Supra Coolant | | 55 | <ul style="list-style-type: none">– Particularly for compressors filled with polyglycol-based compressor oils by the manufacturer (Ingersoll-Rand and Sullair)– Good chemical stability with low degradation and deposit formation– Not miscible with mineral oil and hydrocarbon-based oils | Polyglycol oil, ester oil |
| | | Klüber Summit Supra 32 | | 32 | | |
| Screw-type compressors, reciprocating piston compressors, rotary vane compressors | Approx. once per year up to max. 24 months, depending on the application and the operating hours. | Klüber Summit DSL 46, 68, 100, 125 | | 46, 68, 100, 125 | <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– Klüber Summit DSL 46, 68 and 100 are biodegradable acc. to OECD 301 and can be used in all eco-sensitive areas, e.g. sewage plants, snow cannons or maritime applications, in accordance with regulatory requirements.– Klüber Summit DSL 46 is used in screw-type compressors and Klüber Summit 68, 100, 125 in reciprocating piston compressors. | Diester oil |
| Reciprocating piston compressors with total-loss or circulation lubrication, rotary vane compressors | 1 to 2 times per year, depending on the operating hours | Klüber Summit FG 250, 300, 500 | • | 68, 100, 150 | <ul style="list-style-type: none">– NSF H1-registered²⁾ and ISO 21469-certified for use in the food-processing and pharmaceutical industries– up to 160 °C (320 °F) discharge temperature | Synthetic hydrocarbon |
| | 1 to 2 times per year, depending on the operating hours | Klüber Summit PS 200, 300, 400 | | 68, 100, 150 | <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 | Hydrogenated oil, diester oil |

 Most important selection criterion

1) 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
2) This lubricant is NSF H1 registered and therefore complies with FDA 21 CFR § 178.3570. The lubricant was developed for incidental contact with products and packaging materials in the food-processing, cosmetics, pharmaceutical or animal feed industries. The use of this lubricant can contribute to increase reliability of your production processes. We nevertheless recommend conducting an additional risk analysis, e.g. HACCP.

Air compressors
Special oils

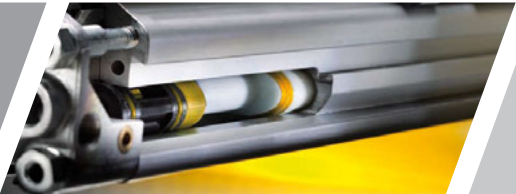


| | Speciality lubricants from Klüber Lubrication | Food-processing and pharmaceutical industries | ISO viscosity grades, ISO VG | Product characteristics, advantages, benefits | Base oils |
|-------------------------------------------------------------------------------------------------------|-----------------------------------------------|-----------------------------------------------|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Gear lubrication in oil-free compressors | Klüber Summit HySyn FG 68, 100 | • | 68, 100 | – NSF H1-registered ¹⁾ and ISO 21469-certified for use in the food-processing and pharmaceutical industries – Fully synthetic compressor oil | Synthetic hydrocarbon |
| | Klüber Summit SH 68 | | 68 | – Cost savings due to longer oil change intervals compared to mineral and partially synthetic oils – Fully synthetic compressor oil | Synthetic hydrocarbon, ester oil |
| | Klüber Summit Ultima 68 | | 68 | – Cost savings due to longer oil change intervals compared to mineral and partially synthetic oils – Fully synthetic compressor oil | Ester oil |
| Blower (gear lubrication) | Klüberoil 4 UH 1 N | • | 100, 150, 220 | – NSF H1-registered ¹⁾ and ISO 21469-certified for use in the food-processing and pharmaceutical industries | Synthetic hydrocarbon, ester oil |
| | Klüber Summit PS 300, 400 | | 100, 150 | – Cost savings due to longer oil change intervals compared to mineral oil | Mineral oil, ester oil |
| | Klübersynth G4 68, 130, 150, 220 | | 68, 130, 150, 220 | – Fully synthetic – Significantly longer service life compared to mineral oils – Wide service temperature range | PAO |
| Cleaning of screw compressors, turbo compressors and rotary vane air compressors with oil circulation | Klüber Summit Varnasolv | | 32 | – 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 | 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. |
| Aging test oil for checking the aging condition of compressor oils | Klüber Summit T.A.N.-Kit | | | – 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. |
| Rolling bearings of electric motors | Klüberquiet BQH 72-102 | | | – Long-term and lifetime lubrication – Especially for frequency-controlled engines | Ester oil, polyurea thickener |
| Oilers with two products | AIRPRESS 15, 32 | | 15, 32 | – For the lubrication and maintenance of pneumatic systems – Good corrosion protection – Dispersion of condensed water, protection against icing | Mineral oil, ester oil |
| | Klüber Summit HySyn FG 15, 32 | | 15, 32 | – Lubrication and maintenance of pneumatic systems – Fully synthetic – Low setting point | Synthetic hydrocarbon |

Most important selection criterion

1) This lubricant is NSF H1 registered and therefore complies with FDA 21 CFR § 178.3570. The lubricant was developed for incidental contact with products and packaging materials in the food-processing, cosmetics, pharmaceutical or animal feed industries. The use of this lubricant can contribute to increase reliability of your production processes. We nevertheless recommend conducting an additional risk analysis, e.g. HACCP.

Pneumatic systems



Cylinders in pneumatic systems:

| Application | Products | Seal types | Product characteristics | Application notes |
|-----------------------------------------------|-----------------------|-------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Standard applications/food-grade applications | Klübersynth AR 34-401 | Damping seal, piston seal, rod seal | Adhesive lubricating grease for wide piston speed ranges; reduced tendency to stick-slip at very low piston speeds; low breakaway torques after long periods of standstill; NSF H1 registered ¹⁾ for use in the food-processing and pharmaceutical industries; excellent compatibility with commercial sealing materials (except for EPDM). | For lubricant application the use round brushes or automatic greasing pistons has proven effective. It is important that after assembly the piston is moved several times over the full stroke length in order to ensure adequate wetting of the sealing elements on both sides if only one-sided lubrication was possible. |
| High-temperature applications | BARRIERTA KM 192 | Damping seal, piston seal, rod seal | Very wide temperature range; low breakaway torques; high chemical stability; excellent compatibility with commercial sealing materials. | |

Valves in pneumatics systems:

| Application | Products | Valve types | Product characteristics | Application notes |
|------------------------------------------------------------------------------------|-----------------|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Standard applications | PETAMO GHY 133N | Seat valve, directional control valve | Adhesive lubricating grease for a wide service temperature range; reduces static and dynamic friction; good water resistance; good corrosion protection. | A similar procedure as for cylinders applies. Excessive lubrication of the piston seal after several piston strokes – depending on the size and circumference – ensures a more uniform lubricant layer. |
| High-temperature applications in the food-processing and pharmaceutical industries | UNISILKON L 641 | Seat valve, directional control valve | Very adhesive, NSF H1 registered ¹⁾ lubricating grease especially for applications involving a high number of cycles, high air throughput and thermal fluctuations. | |

Most important selection criterion

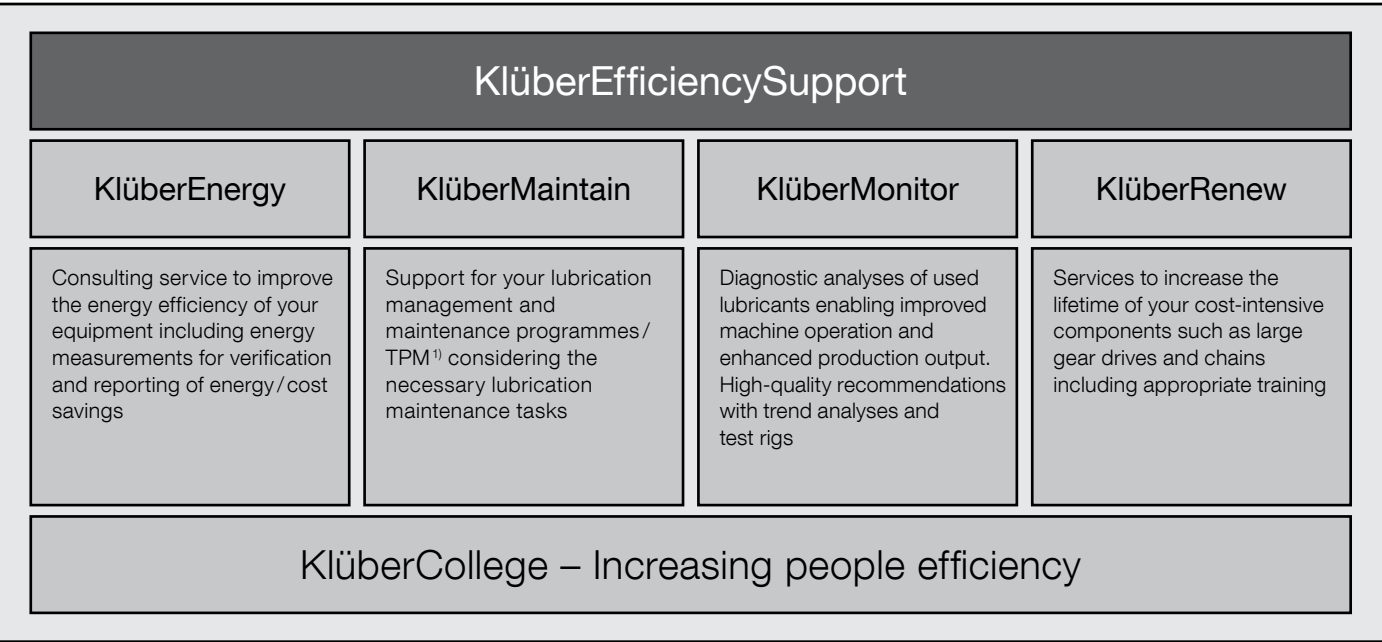
1) This lubricant is NSF H1 registered and therefore complies with FDA 21 CFR § 178.3570. It was developed for incidental contact with products and packaging materials in the food-processing, cosmetics, pharmaceutical or animal feed industries. The use of this product can contribute to increase reliability of your production processes. We nevertheless recommend conducting an additional risk analysis, e.g. HACCP.

KlüberEfficiencySupport

Services by Klüber Lubrication – your success from one tool box

Every manufacturer and operator in every industry wants his machinery to run reliably and efficiently to its design life and beyond. The right lubricants carry considerable potential to reduce the energy costs, spare parts and labour while increasing productivity. Companies from many industries

have been using Klüber Lubrication's professional services in addition to its high-quality lubricants to benefit from considerable added value and the optimum solution for their needs. Our consulting and other services are put together under the umbrella of KlüberEfficiencySupport.



The methodology was developed by Klüber Lubrication, is tried-and-tested and consists of a multi-stage, systematic approach. We identify your requirements together with you at an early stage to discover potential for optimisation. From that we develop solutions together with you to improve the energy efficiency of your machinery or the efficiency of your maintenance

and production processes, machines or components, going well beyond a simple lubricant recommendation. We also verify the effects our measures have in practice. This provides you with everything you need to multiply improvements and develop your success.

The right lubricant at the right place at the right time

Systems for automatic lubrication

We in Klüber Lubrication understand ourselves as a solution provider. We not only supply high-performance oils and greases, but also “intelligent packages” for automatic lubrication of your machines and components. Selected lubricants covering a wide range of typical applications are available in automatic lubricant dispensers for single-point lubrication. These tried-and-tested systems based on electromechanical or electrochemical

technology are available with standard, long-term or high-pressure greases, standard or high-temperature chain oils and special oils and greases for the food-processing industry. We are also able to supply other lubricants in automatic dispensers on request and for higher order volumes, provided they have been tested and approved for use – please contact your Klüber Lubrication consultant for details.

Your benefits at a glance

Profitability

Continuous production processes and predictable maintenance intervals reduce production losses to a minimum. Consistently high lubricant quality ensures continuous, maintenance-free long-term lubrication for high plant availability. Continuous supply of fresh lubricant to the lubrication points keeps friction low and reduces energy costs.

→ Lubrication with Klübermatic can reduce costs by up to 25 %.

Safety

Longer lubrication intervals reduce the frequency of maintenance work and the need for your staff to work in danger zones. Lubrication systems from Klüber Lubrication can therefore considerably reduce occupational safety risks in work areas that are difficult to access.

→ Lubrication with Klübermatic can decrease the risk of accidents by up to 90 %.

Reliability

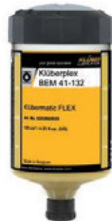



Automatic lubrication systems from Klüber Lubrication ensure reliable, clean and precise lubrication around the clock. Plant availability is ensured by continuous relubrication of the application.

→ Lubrication with Klübermatic may help to prevent up to 55 % of rolling bearing failures.

From low-cost to high-tech – automatic systems for all requirements

- Klüber Lubrication offers you the following technological solutions:

 - Freely adjustable lubrication increments between 1 and 12 months
 - Range of speciality lubricants
 - Self-contained or machine-controlled lubrication systems (time control with programmable controller)
 - Combination of tried-and-tested Klüber Lubrication lubricants with proven automatic lubricant dispensers

| Klübermatic FLEX | Klübermatic NOVA | Klübermatic STAR VARIO | Klübermatic STAR CONTROL |
|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |  |  |
| Flexible use – and for lubrication points with high requirements. | For applications subject to wide temperature fluctuations. | Precise and adjustable lubricant metering. | Externally controlled single-point relubrication. |

1) TPM: Total Productive Maintenance



Publisher and Copyright:
Klüber Lubrication München SE & Co. KG

Reprints, total or in part, are permitted only prior consultation with Klüber Lubrication München SE & Co. KG and if source is indicated and voucher copy is forwarded.

The data in this document is based on our general experience and knowledge at the time of publication 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 field tests with the product selected for a specific application. All data are guide values which depend on the lubricant's composition, the intended use and the application method. The technical values of lubricants change depending on the mechanical, dynamical, chemical and thermal loads, time and pressure. These changes may affect the function of a component. We recommend contacting us to discuss your specific application. If possible we will be pleased to provide a sample for testing on request. Products from Klüber Lubrication are continually improved. Therefore, Klüber Lubrication reserves the right to change all the technical data in this document at any time without notice.

Klüber Lubrication München SE & Co. KG
Geisenhausenerstraße 7
81379 München
Germany

Local first-instance court Munich, Germany
Certificate of registration 46624

www.klueber.com

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 85 years.