

your global specialist

## More than food safety.

Speciality lubricants for the beverage industry





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# Combine food safety and production reliability

There are three aspects which are particularly important for you as a beverage production specialist: consumer protection through food safety, reliable manufacturing processes and reduced operational and maintenance cost.

During the peak season of production, lubrication failures can prove very expensive for you. Just imagine the loss of production due to a lubrication failure in glue roller bearings in the labeling machine or problems with EPDM seals in the mixing area of the filling machine. A wrong lubricant used in the centralised lubrication system in the blow moulding machine could bring production to a complete halt.

Avoiding contamination is one of the biggest challenges in the beverage industry. In that regard, lubricants, which are considered as chemical contaminants, need some special attention. The use of industrial lubricants in critical control points could lead to food safety issues and product recalls.

## H1 lubricants across the line

Synthetic high-performance lubricants by Klüber Lubrication with H1 registration help you obtain these objectives, as they are capable of a lot more than friction reduction, lowering operating temperatures and increasing components' service life. Depending on your application conditions, you can select lubricants meeting a wide range of requirements from hygienic filling in aseptic areas to high resistance to water washdown from this brochure.

We offer you a comprehensive range of valuable H1-registered speciality lubricants for all lubrication points in your plant, across the entire production line. These H1 lubricants are designed for incidental, technically unavoidable contact with the food product.

Additionally, H1 lubricants by Klüber Lubrication are produced according to the highest standards of ISO 21469 to ensure hygienic products. ISO 21469 standard defines hygiene requirements for the formulation, manufacture and use of lubricants that could have unintentional product contact. To obtain the certification, lubricant manufacturers must develop a hygiene strategy taking all chemical, physical and biological hazards of lubricant application into account.

We also offer more than 100 different lubricants with halal and kosher certification that are H1-registered, enabling Klüber Lubrication to support compliance with these requirements across the complete production line.

## Tested quality for the beverage industry

The lubricants we developed especially for the production of beverages are the result of our long-standing and close cooperation with both machine manufacturers and end-users in the beverage industry. Designers of machines and installations can build on this experience right from the very start of machine development. Klüber Lubrication is already a member of EHEDG, an organisation which works with machine manufacturers to ensure food safety right from the design stage. Beverage manufacturers can trust in our experience on every step of the beverage production process. Hence, our lubricants are a valuable contribution towards food safety.

The combination of personal consultation and a comprehensive lubricant range is our particular strength.

## KlüberEfficiencySupport – beyond food safety...

Klüber Lubrication is more than just a manufacturer of speciality lubricants. As a partner for our customers we offer you the best package of finely matched lubricants and competent services fitting to your individual requirements going beyond just lubrication needs.

In case environmental goals play an important role in your company, our KlüberEfficiencySupport solutions aimed at saving energy, water and resources help you to identify and realise unused potentials by providing a remarkable level of plant transparency.

If your company uses maintenance programs like TPM, our solutions to increase the efficiency in your maintenance and improving your equipment efficiency support most of them in a unique way. These are just two examples of topics covered by KlüberEfficiencySupport

In short: we work in close cooperation with you to improve lubrication processes in your plant systematically, allowing you to benefit from your machines and your staff's know-how to the maximum. Production volumes can be increased while simultaneously reducing operating cost and avoiding wastage of natural resources. Please contact our KlüberEfficiencySupport specialists, who will introduce you to interesting and often surprising solutions to save costs.

## Filling, capping, seaming and labelling machines

Application	Application points/ machine components	Klüber speciality lubricant	NLGI grade	Base oil	Thickener
Filling, capping, seaming and labelling machines	Lifting rods and guides in filling machines	PARALIQ P40 Spray	Not applicable	Paraffinic mineral oil <sup>1)</sup>	None
		Klüberfood 4 NH1 100	Not applicable	Synthetic hydrocarbon oil	None
		Klüberfood NH1 94-6000	000	Synthetic hydrocarbon oil	Calcium complex soap
		Klüberfood NH1 94-120	0	Synthetic hydrocarbon oil	Calcium complex soap
Open drive gears in filling machines		Klüberfood NH1 14-222 Spray	2	Synthetic hydrocarbon oil <sup>1)</sup>	Aluminium complex soap <sup>1)</sup>
		Klüberplex AG 11-462	2	Mineral base oil	Aluminium complex soap <sup>1)</sup>
Can seamers: Roller bearings		Klüberfood NH1 94 series	0, 1, 2	Synthetic hydrocarbon oil	Calcium complex soap
Centralised grease systems in filling machines		Klüberfood NH1 94 series	0, 1, 2	Synthetic hydrocarbon oil	Calcium complex soap
Capper bearings and sliding shafts		Klüberfood NH1 94-402	2	Synthetic hydrocarbon oil	Calcium complex soap
		Klüberfood NH1 94-301	1	Synthetic hydrocarbon oil	Calcium complex soap
Capping head sliding surfaces		PARALIQ 91 Spray	Not applicable	Ester oil	None
High-temperature bearings in labelling machines		BARRIERTA L55/2	2	PFPE	PTFE

<sup>1)</sup> of the active component



	<b>Upper service temperature approx.</b>	<b>Lower service temperature approx.</b>	<b>Application notes and benefits</b>
	60 <sup>1)</sup> [°C] 140 [°F]	-10 [°C] 14 [°F]	- Light oil to reduce friction and optimise sliding actions, e.g. in capping heads
	135 [°C] 275 [°F]	-35 [°C] -31 [°F]	- Synthetic base oil with low volatility ensuring minimum carry-over, minimising contamination risks
	120 [°C] 248 [°F]	-45 [°C] -49 [°F]	- Good corrosion protection and good pumpability in central lubrication systems - Reduced wear and extended maintenance intervals due to good load-carrying capacity - Good low-temperature characteristics enable use in refrigerated environments
	140 [°C] 284 [°F]	-45 [°C] -49 [°F]	- Good wear and corrosion protection - Excellent pumpability, low oil separation and high stability in centralised lubrication systems
	120 <sup>1)</sup> [°C] 248 [°F]	-25 [°C] -13 [°F]	- Sprayable grease for ease of application on open gears & slideways - Good wear and corrosion protection. - Good hot and cold water resistance
	150 <sup>1)</sup> [°C] 302 [°F]	-10 [°C] -14 [°F]	- Very good adhesion even at low temperatures - Improved component performance - Less wear due to selected solid lubricants and additives - Very good corrosion protection also when exposed to saltwater
	120 [°C] 248 [°F]	-30 [°C] -22 [°F]	- Increased component availability and extended maintenance intervals owing to good load-carrying capacity and good corrosion protection
	120 [°C] 248 [°F]	-30 [°C] -22 [°F]	- Increased component availability and extended maintenance intervals owing to good load-carrying capacity and good corrosion protection
	160 [°C] 320 [°F]	-30 [°C] -22 [°F]	- Increased component availability and extended maintenance intervals owing to good load-carrying capacity and good corrosion protection
	120 [°C] 248 [°F]	-35 [°C] -31 [°F]	- Increased component availability and extended maintenance intervals owing to good load-carrying capacity and good corrosion protection
	Not applicable	Not applicable	- Neutral in taste and odour - NSF H1 and 3 H registered supporting process reliability
	260 [°C] 500 [°F]	-40 [°C] -40 [°F]	- Good wear protection and thermal stability for extended relubrication intervals - Please note that friction points should be cleaned before initial lubrication



# Conveyor systems

Application	Application points/ machine components	Klüber Lubrication speciality lubricant	NLGI grade	Base oil	Thickener
Conveyor systems	Palletisers, drives and conveyor chains	Klüberoil 4 UH1-1500 N Spray	Not applicable	Synthetic hydrocarbon oil/ester <sup>1)</sup>	None
	Conveyor bearings	Klüberfood NH1 94-402	2	Synthetic hydrocarbon oil	Calcium complex soap
		Klüberfood NH1 94-301	1	Synthetic hydrocarbon oil	Calcium complex soap

1) of the active component

2) Due to the many different elastomer and plastics compositions we recommend checking compatibility prior to series application.

Application	Application points/ machine components	Klüber Lubrication speciality lubricant	Base oil	Viscosity approx.
Conveyor systems	Conveyor chains in carton lines	Klüberfood NH1 C 4-58	Synthetic hydrocarbon oil	46 mm <sup>2</sup> /s
		Klüberplus C2 K2 Ultra Dry	Ester oil	2.8 mm <sup>2</sup> /s
	Conveyor chains in PET lines with Löhrke spraying equipment	Klüberplus C2 PM2 Ultra Dry	Ester oil	4 mm <sup>2</sup> /s
	Conveyor chains in PET lines with existing spraying equipment	Klüberplus C2 PM2 Super Dry	Ester oil	1.3 mm <sup>2</sup> /s



Upper service temperature approx.	Lower service temperature approx.	Application notes and benefits
120 <sup>1)</sup> [°C] 248 [°F]	-20 [°C] -4 [°F]	<ul style="list-style-type: none"> <li>- Drive and conveyor chain lubrication where maximum adhesion is required in for example high speed applications</li> <li>- Good wear protection to optimise chain life</li> <li>- Low foaming of spray to ensure maximum penetration to main friction points of the chain</li> </ul>
160 [°C] 320 [°F]	-30 [°C] -22 [°F]	<ul style="list-style-type: none"> <li>- Increased component availability and extended maintenance intervals owing to good load-carrying capacity and good corrosion protection</li> </ul>
120 <sup>1)</sup> [°C] 248 [°F]	-35 [°C] -31 [°F]	<ul style="list-style-type: none"> <li>- Increased component availability and extended maintenance intervals owing to good load-carrying capacity and good corrosion protection</li> </ul>

Density approx.	Application notes and benefits
0.83 g/cm <sup>3</sup>	<ul style="list-style-type: none"> <li>- Oil based lubricant for carton lines</li> <li>- Optimum lubrication quantity ensures smooth running of carton lines</li> <li>- Reduced contamination build-up, safer work environment (dry floors), reduction of waste water</li> </ul>
1.03 g/cm <sup>3</sup>	<ul style="list-style-type: none"> <li>- <b>Water-based lubricant for carton lines</b></li> <li>- Better hygiene status and reduced cleaning effort due to prevention of residue formation on conveyor belts and in application systems</li> <li>- Reduced operating costs due to lower water and detergent consumption</li> <li>- Reliable line operation due to very good, constant lubricant wetting of the conveyor belt</li> </ul>
1.09 g/cm <sup>3</sup>	<ul style="list-style-type: none"> <li>- <b>Water-based lubricant for PET lines with Löhrike equipment</b></li> <li>- In combination with Löhrike spraying equipment &amp; nozzles, minimised lubrication is possible leading to optimised lubricant consumption</li> <li>- Quantity control on each chain track can be achieved with new Löhrike system. This leads to better friction coefficient management and less bottles toppling over</li> </ul>
1.02 g/cm <sup>3</sup>	<ul style="list-style-type: none"> <li>- <b>Water-based lubricant for PET lines with existing equipment</b></li> <li>- The product can be used with existing spraying equipment after thorough cleaning of chains</li> <li>- Provides good lubrication and cleaning effect, thereby increasing the cleaning interval</li> </ul>

# Seals and enclosed gears

Application	Type of lubricant	Klüber Lubrication speciality lubricant	NLGI grade	Base oil	Thickener
Seals	Seals and filling taps (EPDM)	PARALIQ GTE 703	3	Silicone oil	PTFE
	Seals and filling taps (EPDM) for aseptic cold filling	Klüberfood NH1 87-703 Hyg	3	Silicone oil	PTFE
	Seals and filling taps (non EPDM)	Klübersynth UH1 64-2403	3	Synthetic hydrocarbon oil	Silicate
Enclosed gears (spur-, bevel- and worm gears)	High performance gear oils	Klüberoil 4 UH1-32 N. Also available in viscosity grades 46, 68, 100, 150, 220, 320, 460, 680, 1500 <sup>1)</sup>	Not applicable	Synthetic hydrocarbon oil/ester	None
	High performance gear oils for extended life	Klübersynth UH1 6-100. Also available in viscosity grades 150, 220, 320, 460, 680, 1000 <sup>1)</sup>	Not applicable	Polyglycol	None
	High performance gear fluid greases		Klübersynth UH1 14-1600	00	Synthetic hydrocarbon oil
Klüberfood NH1 94-6000			000	Synthetic hydrocarbon oil	Aluminium complex soap
Klüberfood NH1 94-120			0	Synthetic hydrocarbon oil	Calcium complex soap

1) On oil viscosity selection please refer to the equipment manufacturer's manual or ask for advice.  
The selection of the viscosity grade depends on the gear type and the application.

2) Due to the many different elastomer and plastics compositions we recommend checking compatibility prior to series application.





	<b>Upper service temperature approx.</b>	<b>Lower service temperature approx.</b>	<b>Application notes and benefits</b>
	150 [°C] 302 [°F]	-50 [°C] -58 [°F]	- For use in low-loaded bearings and EPDM <sup>2)</sup> seals in filling machines without aseptic cold filling
	150 [°C] 302 [°F]	-45 [°C] -49 [°F]	- For use in low-loaded bearings and EPDM <sup>2)</sup> seals in aseptic cold filling machines to improve hygiene levels - The lubricant contains an antimicrobial additive allowing extended maintenance intervals.
	140 [°C] 284 [°F]	-10 [°C] 14 [°F]	- Sealing grease suitable for beer taps, barrel fillers, filters, stuffing boxes, rubber diaphragms and seals <sup>2)</sup>
	120 [°C] 248 [°F] or lower (depending on viscosity)	-35 [°C] -31 [°F] or higher (depending on viscosity)	- Improved wear protection and load-carrying capacity to maximise component life - Oil series complies with CLP requirements DIN 51 517 part 3 - Scuffing load stage ≥ 12 in the FZG test, DIN ISO 14635-1 A/8.3/90 - Good ageing and oxidation stability for increased oil life in comparison with industrial mineral oils - Good corrosion protection - Neutral towards sealing materials and paints <sup>2)</sup>
	160 [°C] 320 [°F] or lower (depending on viscosity)	-35 [°C] -31 [°F] or higher (depending on viscosity)	- Improved wear protection and load-carrying capacity to maximise component life in comparison with industrial mineral oils and synthetic hydrocarbon oils - Oil series complies with CLP requirements DIN 51 517 part 3 - Scuffing load stage ≥ 12 in the FZG test, DIN ISO 14635-1 A/8.3/90 - Good ageing and oxidation stability for increased oil life - The low friction behaviour of the polyglycol base oil reduces power losses and improves efficiency - Good corrosion protection
	120 [°C] 248 [°F]	-45 [°C] -49 [°F]	- Component life enhanced resulting from a special thickener with good adhesion and good corrosion protection
	120 [°C] 248 [°F]	-45 [°C] -49 [°F]	- Good corrosion protection and good pumpability in central lubrication systems - Reduced wear and extended maintenance intervals due to good load-carrying capacity - Good low-temperature characteristics enable use in refrigerated environments
	140 [°C] 284 [°F]	-45 [°C] -49 [°F]	- Good wear and corrosion protection - Excellent pumpability, low oil separation and high stability in centralised lubrication systems

# Shrink wrap, vacuum pumps, screw threads and general maintenance

Application	Application points/machine components	Klüber Lubrication speciality lubricant	Base oil	Thickener	Upper service temperature approx.	Lower service temperature approx.
Shrink wrap tunnels	Transport and drive chains	Klüberfood NH1 CH 2 Plus series	Special ester	None	250 [°C] 482 [°F]	-15 [°C] -5 [°F]
Vacuum pumps in packaging machines	Vacuum pumps	Klüber Summit FG series	Synthetic hydrocarbon oil	None	Not applicable	Not applicable
Screw threads	Screw threads	Klüberoil 4 UH1-15 Spray	Synthetic hydrocarbon oil/ ester oil <sup>1)</sup>	None	110 <sup>1)</sup> [°C] 230 [°F]	-45 [°C] -49 [°F]
	Screw threads and slides	Klüberpaste UH1 84-201	Synthetic hydrocarbon oil	Solid lubricant/ PTFE	120 [°C] 248 [°F]	-45 [°C] -49 [°F]
General maintenance	Various applications	Klüberfood NH1 4-002 Spray	Synthetic hydrocarbon oil	None	Not applicable	Not applicable
	Various applications	Klüberfood NK1 8-001 Spray	Organic solvent	None	Not applicable	Not applicable

<sup>1)</sup> of the active component



#### Application notes and benefits

- Low oil evaporation rate resulting in low residue formation and reduced oil consumption
- Good oxidation stability
- Synthetic base oil with low volatility ensuring minimum carry-over, minimising contamination risks
- Light penetrating oil to aid disassembly and reduce downtime
- Universal white assembly and thread paste
- Excellent low-temperature behaviour; good load-carrying capacity, good corrosion protection
- Neutral towards alloyed steels
- Also suitable for low-speed plain bearings, for guide rails, hinges, rollers etc.
- Good penetrating and water displacement properties
- Rapid and thorough removal of oils, greases, waxes and resin residues
- NSF K1 and NSF K3-registered for applications in the food-processing industry

# Compressors

Application	Application points / machine components	Klüber Lubrication speciality lubricant	Base oil	Thickener	Flash point approx.	Pour point approx.
Compressors	Air screw compressors & pneumatics / hydraulics	Klüber Summit FG Elite 46	Synthetic hydrocarbon oil	None	≥ 250 [°C] ≥ 482 [°F]	≤ -40 [°C] ≤ -40 [°F]
		Klüber Summit FG 100/ Klüberfood 4 NH1 32 <sup>1)</sup>	Synthetic hydrocarbon oil	None	≥ 230 [°C] ≥ 446 [°F]	≤ -50 [°C] ≤ -58 [°F]
	Air screw compressors & pneumatics / hydraulics	Klüber Summit FG 200/ Klüberfood 4 NH1 46 <sup>1)</sup>	Synthetic hydrocarbon oil	None	≥ 240 [°C] ≥ 464 [°F]	≤ -50 / -45 [°C] ≤ -58 / -49 [°F]
	Air reciprocating compressors	Klüber Summit FG 250 or 300 <sup>1)</sup>	Synthetic hydrocarbon oil	None	≥ 250 [°C] ≥ 482 [°F]	≤ -48 or -45 [°C] ≤ -54 or -49 [°F]
	Air rotary vane compressors	Klüber Summit FG 300 <sup>1)</sup>	Synthetic hydrocarbon oil	None	≥ 250 [°C] ≥ 482 [°F]	≤ -45 [°C] ≤ -49 [°F]
	Refrigeration compressors	Klüber Summit R 200 <sup>1)</sup>	Synthetic hydrocarbon oil	None	≥ 240 [°C] ≥ 464 [°F]	≤ -51 [°C] ≤ -60 [°F]
			Klüber Summit RHT 68	Hydrotreated paraffin based mineral oil	None	≥ 240 [°C] ≥ 464 [°F]
Klüber Summit RPS 52		Polyglycol oil	None	≥ 210 [°C] ≥ 410 [°F]	≤ -34 [°C] ≤ -29 [°F]	

1) On oil viscosity selection please refer to the equipment manufacturer's manual or ask for advice.

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.



### Application notes and benefits

- Synthetic base oil with low volatility ensuring minimum carry-over, minimising contamination risks and consumption, providing typically increased oil life and operating cost reduction
  - KlüberMonitor analysis scheme recommended to determine the optimum duration of oil use
  - Up to 8,000 hours changing intervals<sup>2)</sup>
  - Please ask your Klüber Lubrication consultant for advice
- 
- Synthetic base oil with low volatility ensuring minimum carry-over, minimising contamination risks and consumption, providing typically increased oil life and operating cost reduction
  - KlüberMonitor analysis scheme recommended to determine the optimum duration of oil use
  - Up to 5,000 hours changing intervals<sup>2)</sup>
  - Please ask your Klüber Lubrication consultant for advice
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  - Up to 5,000 hours changing intervals<sup>2)</sup>
  - Please ask your Klüber Lubrication consultant for advice
- 
- Synthetic oil with low volatility ensuring minimum carry-over, minimising contamination risks
  - Low residue formation reducing contamination of valves to reduce the risk of sticking and loss of compression, resulting in increased efficiency and reduced energy consumption
  - Up to 5,000 hours changing intervals<sup>2)</sup>
- 
- Synthetic base oil with low volatility ensuring minimum carry-over, minimising contamination risks
  - Increased efficiency resulting from low residue formation to reduce contamination of vanes to prevent sticking and loss of compression
  - KlüberMonitor analysis scheme recommended to determine optimum duration of oil use
  - Up to 5,000 hours changing intervals<sup>2)</sup>
- 
- Synthetic compressor oil for refrigerating compressors operating with ammonia (R717), CO<sub>2</sub> (R744), propane (R290), propylene (R1270) or butane (R600) as refrigerant to minimise carry-over and sludge build-up, supporting a reduction in oil consumption and operating costs
- 
- Low maintenance costs due to extended oil change intervals and reduced oil consumption
  - Easy compressor oil conversion due to neutral behaviour towards seals
  - High efficiency of the refrigerating plant due to reduced oil deposits
  - Low operating costs due to long service life of filters and oil separators
  - Low oil carryover and consumption compared to naphthene-based mineral oils
- 
- Reliable operation of the compressor due to stable viscosity under the influence of refrigerants
  - High efficiency of the refrigerating plants due to reduced oil deposits
  - Low operating costs due to long service life of filters and oil separators
  - Simplified system configuration as the product can be used with dry evaporation

# The right lubricant at the right place at the right time



## Systems for automatic lubrication

We at 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.

### 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 can reduce costs by up to 25 %**

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

### 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.

### 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

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

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





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## Klüber Lubrication – your global specialist

Innovative tribological solutions are our passion. Through personal contact and consultation, we help our customers to be successful worldwide, in all industries and markets. With our ambitious technical concepts and experienced, competent staff we have been fulfilling increasingly demanding requirements by manufacturing efficient high-performance lubricants for more than 85 years.