

your global specialist

Detailed information

Manufacturing in accordance with GMP standards.

Speciality lubricants for the pharmaceutical industry



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Speciality lubricants from Klüber Lubrication always a good choice

Stringent requirements

It is normally possible to change over from mineral-oil-based industrial lubricants to high-performance H1-registered lubricants To support you in compliance with the stringent Good fairly easily provided some basic conditions are met (compatibility of materials, replacement of filter elements, etc.). What has to be Manufacturing Practice guidelines applying in the pharmaceutical observed may differ with each component, so please consult us industry, Klüber Lubrication has developed special lubricants and has them registered as NSF H1. for advice.

The control of contamination risks is a major issue in the GMP guidelines. Contamination means the intrusion of any undesirable materials into a product. Risk control therefore includes all auxiliary substances - including lubricants - which may come into contact with the product in applications where this is technically not always avoidable.

To make manufacturing processes more reliable, H1 lubricants should be used exclusively. This prevents the risk of lubricants being mixed up, and contamination of the pharmaceutical products with non-H1 lubricants becomes impossible.

Clean solutions

All lubricants from Klüber Lubrication listed in this brochure cleaning and additional anticorrosive effect conform with the requirements set forth in FDA 21 CFR - good load-carrying capacity 178.3570 and are registered as NSF H1. Furthermore, all The result is a significant extension of the component life our production sites manufacturing H1 lubricants and the H1 lubricants manufactured there are certified by NSF according and much longer maintenance intervals, and depending on the to the new international standard ISO 21469. This standard lays application reduced energy consumption. Our experts will be down hygiene requirements for the formulation, manufacture pleased to advise you in detail about which lubricant from our and use of lubricants that could have unintentional contact range offers the optimum properties to fulfil the requirements of with the pharmaceutical product. It also requires the lubricant the application. We also provide product information leaflets on manufacturers to develop a hygiene strategy with a view to request. chemical, physical and biological risks in the intended lubricant applications.

In close cooperation with the machine makers, we develop lubricants that are closely tuned to the specified friction- and lubrication points. Due to their excellent performance, the quantity of our lubricants that has to be applied can often be reduced. Exact dosage also supports compliance with the guidelines.

High-performance H1 lubricants from Klüber Lubrication

Speciality lubricants made by Klüber Lubrication help to increase productivity, reliability and economical operation of your machinery. Each of our H1 lubricants was developed with the goal to make it optimally suited for specific application requirements. Depending on the application, the following characteristics were emphasised:

- high resistance to ageing and oxidation
- optimised wear protection
- good corrosion protection
- good water resistance for protection against wash-out during

Thorough consulting

For this brochure, we have selected a range of products that have proven successful in applications in the pharmaceutical industry. As a rule, we would always recommend consulting by our experts prior to choosing a lubricant. To optimise your lubricant management, Klüber Lubrication has developed a special service programme called KlüberEfficiencySupport.

Just contact us!



Pharmaceutical machine	Machine component	Lubricants from Klüber Lubrication, in compliance with FDA 21 CFR 178.3570, NSF H1 registered	Technical data	Information on composition	Offers the following benefits for
Tablet press	Tablet punches and bronze guides	Klüberpharma UH1 4-220, 4-460	ISO VG 220, 460 acc. to DIN 51519 Service temperature range: –15 °C to 110 °C	Special synthetic oil	 Especially designed for the lubrication Good wear protection Compatible with bronze. No black leading to a reduction in rejected
	Tablet punches and guides made of other materials than bronze	Klüberoil 4 UH1-100 N	ISO VG 100 acc. to DIN 51519 Service temperature range: –35 °C to 120 °C	Synthetic hydrocarbon oils, ester oil	- For the lubrication of punches ma
	Main shaft bearing/ rotor bearing	Klübersynth UH1 14-151 ²⁾	Consistency grade NLGI 1 acc. to DIN 51818 Base oil viscosity acc. to DIN 51562 pt. 1 at 40 °C approx. 150 mm²/s Service temperature range: -45 °C to 120 °C	Synthetic hydrocarbon oils/ aluminium complex soap	 Neutral towards many NBR elastor For universal lubrication of rolling cam discs. The wide range of app transparency and enabling simplified
		Klübersynth UH1 14-222 ²⁾	Consistency grade NLGI 2 acc. to DIN 51818 Base oil viscosity acc. to DIN 51562-1 at 40 °C approx. 260 mm²/s Service temperature range: -25 °C to 120 °C	Synthetic hydrocarbon oils/ aluminium complex soap	 Neutral towards many NBR elastor For universal lubrication of rolling cam discs. The wide range of app transparency and enabling simplified
	Hydraulic unit	Klüberfood 4 NH1 series	Available in ISO VG 32, 46, 68, 100 acc. to DIN 51519 Service temperature range (ISO VG 32, 46, 68): -40 to 135 °C and (ISO VG 100): -35 °C to 135 °C	Hydraulic oils based on synthetic hydrocarbon oils	 Contains additives improving the compatible with many NBR and F
	Gears ¹⁾	Klübersynth UH1 6 series	Available in ISO VG 100, 150, 220, 320, 460, 680 acc. to DIN 51519 Service temperature range: -25 °C to 160 °C	Synthetic polyglycol long-term gear and high-temperature oils	 Especially for the lubrication of sterelevated temperatures The excellent friction behaviour of loss and improving efficiency = rereduction in energy consumption Complies with CLP requirements
	Tool assembly and tablet punch preservation	Klüberoil 4 UH1-1500 N Spray	ISO VG 1500 acc. to DIN 51519 Service temperature range: -25 °C to 120 °C	Synthetic oil	 Facilitates punch assembly Good corrosion protection for pur Easy spray application

 In addition to Klübersynth UH1 6 polyglycol gear oils in the pharmaceutical industry, we offer FDA-compliant Klüberoil 4 UH1 N gear oils based on PAO for normal temperatures as well as the FDA-compliant NLGI 00 grade fluid gear grease Klübersynth UH1 14-1600. Please do not hesitate to contact us for technical support.
 Both types of lubricant have proven highly successful in this application. Due to its adhesive qualities and specific consistency, Klübersynth UH1 14-222 improves surface protection. Klübersynth UH1 14-151 is characterised by very good pumpability in centralised lubricating systems. Our experts will be pleased to advise

you with a view to the specific parameters of your application.

or this application

rication of tablet presses, in particular for high-volume production

ackening and, therefore, no contamination of tablets with dark particles, ad product

made of e.g. POM or special steel

stomer types

ng and plain bearings, lifting cylinders, joints, guide bars, guide rails, applications reduces the number of lubricants used, leading to more plified stockkeeping

stomer types

ng and plain bearings, lifting cylinders, joints, guide bars, guide rails, applications reduces the number of lubricants used, leading to more plified stockkeeping

ne ageing resistance; has a demulsifying effect; very low foaming tendency; d FPM elastomer types²⁾

steel-bronze worm gears, but also for all types of spur and bevel gears at

of the polyglycol base oil provides energy savings by reducing the power reduction of costs and $\rm CO_2$ emissions. In large gears, a measurable on can even be achieved

ounches during storage



Pharmaceutical machine	Machine component	Lubricants from Klüber Lubrication, in compliance with FDA 21 CFR 178.3570, NSF H1 registered	Technical data	Information on composition	Offers the following benefits fo
Blister packaging machine	Deep-drawing unit, film-sealing unit and elevation guides near the heated plates unit	BARRIERTA L 55/2	Available in the NLGI grades 0, 1, 2 and 3 acc. to DIN 51818 Base oil viscosity at 40 °C approx. 420 mm ² /s acc. to DIN 51562 pt. 1 Service temperature range NLGI 0, 1, 2: -40 °C to 260 °C, NLGI 3: -30 °C to 260 °C	High-temperature grease based on PFPE/PTFE	 Resists to very high operating te BARRIERTA base oils are manuf stability and high purity level ¹⁾
	Guide rails, racks, drives and cardan shafts	Klübersynth UH1 14-151	Consistency NLGI 1 acc. to DIN 51818 Base oil viscosity acc. to DIN 51562 pt. 1 at 40 °C approx. 150 mm ² /s Service temperature range: -45 °C to 120 °C	Synthetic hydrocarbon oils/ aluminium complex soap	 Special high-performance lubric Can be applied by means of cer of installations and application c manufacturer of the installation i
	Chains ²⁾	Klüberoil 4 UH1-1500 N Spray	ISO VG 1500 acc. to DIN 51519 Service temperature range of the active agent: -25 °C to 120 °C	Synthetic hydrocarbon oils, ester oil	 Easy spray application. The active Please refer to the safety data st
	Moulds for the deep- drawing film	PARALIQ 91	Kinematic viscosity at 40 °C 13.0 – 15.6 mm²/s acc. to DIN 51562 pt. 1 Service temperature range: 0 to 120 °C	Ester oil	 Tried-and-tested as release ager (bottom film) Also available as spray for easy a
Cartoning machine	Guide rails, racks, drives, spindles, cardan shafts	Klübersynth UH1 14-151	Consistency grade NLGI 1 acc. to DIN 51818 Base oil viscosity acc. to DIN 51562 pt. 1 at 40 °C approx. 150 mm ² /s Service temperature range: -45 °C to 120 °C	Synthetic hydrocarbon oils/ aluminium complex soap	 Special high-performance lubric Neutral towards many NBR elas Can be applied by means of cer of installations and application c manufacturer of the installation i
	Chains ²⁾	Klüberoil 4 UH1-1500 N Spray	ISO VG 1500 acc. to DIN 51519 Service temperature range of the active agent: -30 °C to 120 °C	Synthetic hydrocarbon oils, ester oil	 Easy spray application. The active Please refer to the safety data st Also for spindles

2) We offer a multitude of other FDA-conforming chain oils, e.g. Klüberfood NH1 4-220 N Spray (optimum oil penetration due to medium base oil viscosity), as well as chain oils for high temperatures. Please do not hesitate to contact us for technical support.

or this application

emperatures up to 260 °C factured exclusively for Klüber Lubrication and show excellent long-term

cating grease for a wide range of applications entralised lubrication systems. However, due to the many different types conditions, pumpability in these systems has to be checked with the in each individual case. We would be pleased to provide support

tive agent easily penetrates into the chain links due to the aerosol formation. sheets for safe handling methods

ent for moulds in blister machines used for the deep-drawing of film

application

cating grease for a wide range of applications

stomer types

entralised lubrication systems. However, due to the many different types conditions, pumpability in these systems has to be checked with the in each individual case. We would be pleased to provide support

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Pharmaceutical machine	Machine component	Lubricants from Klüber Lubrication, in compliance with FDA 21 CFR 178.3570, NSF H1 registered	Technical data	Information on composition	Offers the following benefits for
Coater, fluidised bed system	Seals (e.g. O-rings) of the spray nozzle	PARALIQ GTE 703	Consistency NLGI 3 acc. to DIN 51818 Base oil viscosity at 25 °C: approx. 1350 mm ² /s acc. to DIN 51562 pt. 1 Service temperature range: -50 °C to 150 °C	Sealing grease based on silicone oil/PTFE	 Good resistance to media (cold agents, solvents) Good compatibility with many E
Capsule filling machine	Cam mechanism	Klüberfood NH1 94-301	Worked penetration 310–340 0.1 mm acc. to ISO 2137 Service temperature range: –35 °C to 120 °C	Grease based on synthetic hydrocarbon oils, white oil (acc. to EC pharmacopoeia), calcium complex thickener	 Increased component availability
Granulating machine	TMG agitator	Klüberoil 4 UH1-150 N	ISO VG 150 acc. to DIN 51519 Service temperature range: -30 °C to 120 °C	Synthetic hydrocarbon oils, ester oil	- Good wear protection thus extern

Machine components	Lubricants from Klüber Lubrication, in compliance with FDA 21 CFR 178.3570, NSF H1 registered	Technical data	Information on composition	Offers the following benefits for
Compressors	Klüber Summit FG 100500	Available in ISO VG 32, 46, 68, 100 acc. to DIN 51519 Service temperature range (ISO VG 32, 46, 68): -40 °C to 135 °C and (ISO VG 100): -35 °C to 135 °C	Fully synthetic air compressor oils based on synthetic hydrocarbon oils	 Low maintenance and operating oil-injected screw-type compress Low evaporation and carry-over Energy savings (reduction of cost efficiency by 5 % on average
Pneumatic drives	Pneumatic drives have to meet a variety of requirements depending on speed, design, operating temperature and materials (particularly elastomers). We would be pleased to assist you in selecting the lubricant tailored to your pneumatic machine.			

or this application

and hot steam, vapour, many types of disinfectants and cleaning

EPDM and NBR elastomer types

ty and extended maintenance intervals due to good wear protection

ending the service life of agitators

r this application

costs due to oil change intervals up to 5000 operating hours in

sors

giving long service life of activated carbon filter sts and CO_2 emissions) using synthetic hydrocarbons, due to increase in



Pharmaceutical machine	Machine component	Lubricants from Klüber Lubrication, in compliance with FDA 21 CFR 178.3570, NSF H1 registered	Technical data	Information on composition	Offers the following benefits for
Filling machine (for liquids)	Lever in filling station	Klübersynth UH1 64-1302	Consistency grade NLGI 2 acc. to DIN 51818 Base oil viscosity at 40 °C: approx. 1300 mm²/s acc. to DIN 51562 pt. 1 Service temperature range: –10 °C to 140 °C	Lubricating grease based on synthetic hydrocarbon oils and silicate	 Good resistance to media allow Smooth operation free from stic
	Guides and open sliding points, rolling and plain bearings ¹⁾ of feed screws (extruder)	Klübersynth UH1 14-151	Consistency grade NLGI 1 acc. to DIN 51818 Base oil viscosity at 40 °C: approx. 150 mm ² /s acc. to DIN 51562 pt. 1 Service temperature range: -45 °C to 120 °C	Grease based on synthetic hydrocarbon oils/aluminium complex soap	 High-perfomance special lubric Neutral towards many NBR elas Can be applied by means of cert of installations and application of manufacturer of the installation
	Mixer/piston metering system	Klübersynth UH1 14-222	Consistency grade NLGI 2 acc. to DIN 51818 Base oil viscosity at 40 °C: approx. 260 mm²/s acc. to DIN 51562 pt. 1 Service temperature range: –25 °C to 120 °C	Grease based on synthetic hydro- carbon oil/aluminium complex soap	 Also for rolling and plain bearing
	Seals, O-rings for filler heads	PARALIQ GTE 703	Consistency grade NLGI 3 acc. to DIN 51818 Base oil viscosity at 25 °C: approx. 1350 mm²/s acc. to DIN 51562 pt. 1 Service temperature range: -50 °C to 150 °C	Sealing grease based on silicone oil/PTFE	 Good resistance to media (cold and cleaning agents, solvents) Good compatibility with many E
	Chains ²⁾	Klüberoil 4 UH1-1500 N Spray	ISO VG 1500 acc. to DIN 51519 Service temperature range of the active agent: -25 °C to 120 °C	Synthetic hydrocarbon oils, ester oil	 Easy spray application. The active Please refer to the safety data for th

freezing tunnels or Klübersynth UH1 64-62 showing excellent low- and high-temperature stability as well as excellent water resistance. We would be pleased to

provide detailed information

2) We offer a multitude of other FDA-conforming chain oils, e.g. Klüberfood NH1 4-220 N Spray (optimum oil penetration due to medium base oil viscosity, as well as chain oils for high temperatures. Please do not hesitate to contact us for technical support.

or this application

vs extended maintenance intervals in contact with cleaning agents ck-slip

cating grease for a wide range of applications stomer types

entralised lubrication systems. However, due to the many different types conditions, pumpability in these systems has to be checked with the in each individual case. We would be pleased to provide support

gs, lifting cylinders, guide bars and cam discs

and hot steam, vapour, many types of disinfectants

EPDM and NBR elastomer types

tive agent easily penetrates into the chain links due to the aerosol formation. for safe handling methods



Pharmaceutical machine	Machine component	Lubricants from Klüber Lubrication, in compliance with FDA 21 CFR 178.3570, NSF H1 registered	Technical data	Information on composition	Offers the following benefits for
Peeler centrifuge	Peeling knife/broad- peeling machine (rolling and plain bearings)	Klübersynth UH1 64-1302	Consistency grade NLGI 2 acc. to DIN 51818 Base oil viscosity at 40 °C: approx. 1300 mm²/s acc. to DIN 51562 pt. 1 Service temperature range: -10 °C to 140 °C	Lubricating grease based on synthetic hydrocarbon oils and silicate	 Good resistance to media allow cleaning agents
	Deep groove ball bearings and shaft seal	Klübersynth UH1 14-151 ¹⁾ Please note: due to the complex requirements, consultation is always necessary prior to lubricant selection.	Consistency grade NLGI 1 acc. to DIN 51818 Base oil viscosity acc. to DIN 51562 pt. 1 at 40 °C approx. 150 mm ² /s Service temperature range: -45 °C to 120 °C	Synthetic hydrocarbon oils/ aluminium complex soap	 Neutral towards many NBR elast
Separator	Sealing rings (drum)	PARALIQ GTE 703	Consistency grade NLGI 3 acc. to DIN 51818 Base oil viscosity at 25 °C: approx.1350 mm ² /s acc. to DIN 51562 pt. 1 Service temperature range: -50 °C to 120 °C	Silicone oil/PTFE sealing grease	 Good compatibility with many E Good resistance to media (cold agents, solvents)
	Lock of drum cover connected to the lower drum part (trapezoid thread)	Klüberpaste UH1 96-402	Consistency grade NLGI 2 acc. to DIN 51818 Service temperature range: -30 °C to 1,200 °C	Fully synthetic base oils/ solid lubricants	 Good adhesion to the friction period Compatible with high-alloy stee
Autoclave	Door seal	BARRIERTA L 55/2	Consistency grade NLGI grades 0, 1, 2 and 3 acc. to DIN 51818 Base oil viscosity at 40 °C: approx. 420 mm ² /s acc. to DIN 51562 pt. 1, Service temperature range NLGI 0, 1, 2: -40 °C to 260 °C, NLGI 3: -30 °C to 260 °C	PFPE/PTFE high-temperature grease	 Resists very high operating tem Compatible with most elastome BARRIERTA base oils are manu stability and high purity levels²
1) Please note that the of successful in certain under the respective	centrifugal forces acting on types of centrifuges. When operating conditions (type of	this type of bearing place particularly high demands or selecting the bearing grease it should be checked whi of centrifuge, speed factor [n · d_] of the bearing, beari	n the bearing grease. Klübersynth UH1 14-151 has proven ich special grease from Klüber Lubrication performs best ng type). Please contact us!	2) BARRIERTA L 55 greases are resistant to	ultraviolet light and can be used for line

or this application

vs extended maintenance intervals even when in contact with

stomer types

EPDM and NBR elastomer types d and hot steam, vapour, many types of disinfectants and cleaning

ooint, also when subject to humidity als (e.g. A2-70)

nperatures up to 260 °C er types ufactured exclusively for Klüber Lubrication and show excellent long-term

ear guides exposed to UV light in the pharmaceutical industry

Speciality lubricants for machine-independent components and special applications

Component	Lubricants from Klüber Lubrication, in compliance with FDA 21 CFR 178.3570, NSF H1 registered	Technical data	Information on composition	Offers the following benefits fo
Mechanical seals, e.g. in agitators	Klüberfluid NH1 4-005	ISO VG 5 acc. to DIN 51519 Service temperature range: -40 °C to 150 °C	Synthetic hydrocarbon oils	 The suitable viscosity for mecha 1500 and 3000 rpm). Please cor
	Klüberoil 4 UH1-15 AF	Oil viscosity at 40 °C approx. 18 mm²/s acc. to DIN 51562 pt. 1 Service temperature range: -40 °C to 110 °C	Synthetic hydrocarbon oils	 – Neutral towards many NBR and
	PARALIQ P 12	Oil viscosity at 40 °C approx. 20 mm²/s acc. to DIN 51562 pt. 1 Service temperature range: –10 °C to 120 °C	Medical white oil acc. to the European Pharmacopoeia	-
Valves (double-chamber valves, stop valves etc.)	PARALIQ GB 363	Worked penetration 215-245 0.1 mm acc. to DIN ISO 2137 Base oil viscosity at 40 °C: approx. 2400 mm ² /s acc. to DIN 51562 pt. 1 Service temperature range: –30 °C to 140 °C	White oil (acc. to EU pharmacopoeia)/ synthetic hydrocarbon oil/silicate	 Neutral towards many NBR and
Seal lubrication under hygienic conditions	Klüberfood NH1 87-703 Hyg	Consistency NLGI 3 acc. to DIN 51818 Base oil viscosity at 25 °C: approx. 1350 mm²/s acc. to DIN 51562 pt. 1 Service temperature range: -45 °C to 150 °C	Sealing grease based on silicone oil/PTFE	 Contains an antimicrobial agent service intervals also in critical a Good resistance to media (cold a solvents) Good compatibility with many Effective

Application	Lubricants from Klüber Lubrication, in compliance with FDA 21 CFR 178.3570, NSF H1 registered	Technical data	Information on composition	Benefits
Universal lubricating oils, e.g. for open slide rails	Klüberoil 4 UH1-1500 N Spray	ISO VG 1500 N acc. to DIN 51519 Service temperature range of the active agent: -30 °C to 120 °C	Synthetic hydrocarbon oils, ester oil	 For metal surfaces Easy spray application. Please re
	UNISILKON M 2000 Spray	Service temperature range of the active agent: -10 °C to 150 °C	Silicone spray	 For non-metallic surfaces like pla Particularly for conveyor belts ma Efficient protection against stickit Easy spray application. Please rest
	Klübersynth NH1 4-68 Foam Spray	Service temperature range of active agent: -35 °C to 120 °C	Synthetic oil	 Excellent adhesion enables good The unique combination of foam Optimised consumption due to consumpt



r this application

nical seals depends on the speed (normal speeds range between ntact us! FKM elastomer types

FKM elastomer types 1)

which protects against microbial spoilage and contributes to extending applications like aseptic filling and hot steam, vapour, many types of disinfectants and cleaning agents,

PDM and NBR elastomer types

refer to the safety data sheets for notes on safe handling

lastic, rubber etc.

nade of plastic, because the product is compatible with most plastics king

refer to the safety data sheets for notes on safe handling

od lubricity and reduced wear

and oil enables drip-free overhead application

capillary effect leading to slow but thorough lubricant penetration

Maintenance and repair of high-quality manufacturing installations

Application	Problem	Lubricants from Klüber Lubrication, in compliance with FDA 21 CFR 178.3570, NSF H1 registered	Benefits
Corrosion protection	The corrosion resistance of DIN EN 10020 special steel is based on the formation of a very thin passive layer on the steel surface. This passive layer can be destroyed under adverse conditions (e.g. high pH values > 11, chloride ions, leading to intergranular corrosion (welding), crevice corrosion, stress corrosion cracking (e.g. in tube joints) or corrosion fatigue cracking.	Klüberfood NH1 K 32	 Good corrosion protection, even with frequent cleaning Repels moisture Also available as spray, therefore easy to apply
Assembly	Particularly in screw connections of the same material there is a risk of cold welding (seizure), which can be prevented by using a Klüberpaste product.	Klüberpaste UH1 96-402	 Facilitates disassembly after longer periods of use Prevents cold welding in special steel joints Compatible with high-alloy steels Excellent water resistance, therefore particularly suitable for friction points Prevents fretting corrosion Protects against corrosion For high temperatures (upper limit 800 °C, > 200 °C dry lubrication)
Cleaning and maintenance	Cleaning/degreasing spray for the pharmaceutical industry registered as NSF K1/K3	Klüberfood NK1 Z 8-001 Spray	 Rapid and thorough removal of oils, greases, waxes and resin residues NSF K1 and NSF K3-registered for applications in the pharmaceutical indu- Easy spray application
	Surface cleaning agent for universal use	Klüberfluid NH1 1-002	 Removes oils, greases and waxes from metal surfaces Evaporates without residues



subject to moisture (guide rails, hinges etc.)

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Notes





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Klüber Lubrication - your global specialist

Innovative tribological solutions are our passion. Through personal contact and consultation, we help our customers to be successful worldwide, in all industries and markets. With our ambitious technical concepts and experienced, competent staff we have been fulfilling increasingly demanding requirements by manufacturing efficient high-performance lubricants for more than 80 years.



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