

Klüberpaste HEL 46-450

High-temperature screw paste



Benefits for your application

- **Reliable screw connection ensured by constant and sufficient preload force**
- **Easy release also after long time at high temperature**
- **Approved in acc. with VW-TL 52112 and Ford tox. No. 138624**

Description

Klüberpaste HEL 46-450 is a black hot screw paste for high-alloy steels. It contains fully synthetic polyalkylene glycol and ester base oils and a combination of inorganic solid lubricants.

Klüberpaste HEL 46-450 is suitable for a temperature range between -40 °C and 1000 °C. In the normal temperature range (i.e. below 200 °C) it shows good anticorrosion behaviour and good water resistance. Above 200 °C it acts as a dry lubricant.

Application

Screw paste for conventional and high-alloy steels (Cr-Ni steels) up to 1000 °C.

Lubricating and assembly paste for connections in hot air ducts (e.g. automotive exhaust systems). For connecting elements in turbochargers and compressors.

High-temperature screw test ¹

The test was performed acc. to VW-TL 52112

- Bolt: DIN 931-2
- Material: 1.4989
- Nut, material: 1.4923

The nuts were preloaded with 70 Nm and stored at 750 °C for 100 hours. After this period the release torque was measured as ≤ 120 Nm.

Application notes

It is important to clean and degrease the contact surfaces thoroughly before applying Klüberpaste HEL 46-450.

A thin layer of paste is then applied by brush, leather cloth or plastic sponge.

Klüberpaste HEL 46-450 spreads easily over the entire surface and thus prevents excess lubrication.

Close container immediately after use in order to prevent contamination.

Material safety data sheets

Material safety data sheets can be requested via our website www.klueber.com. You may also obtain them through your contact person at Klüber Lubrication.

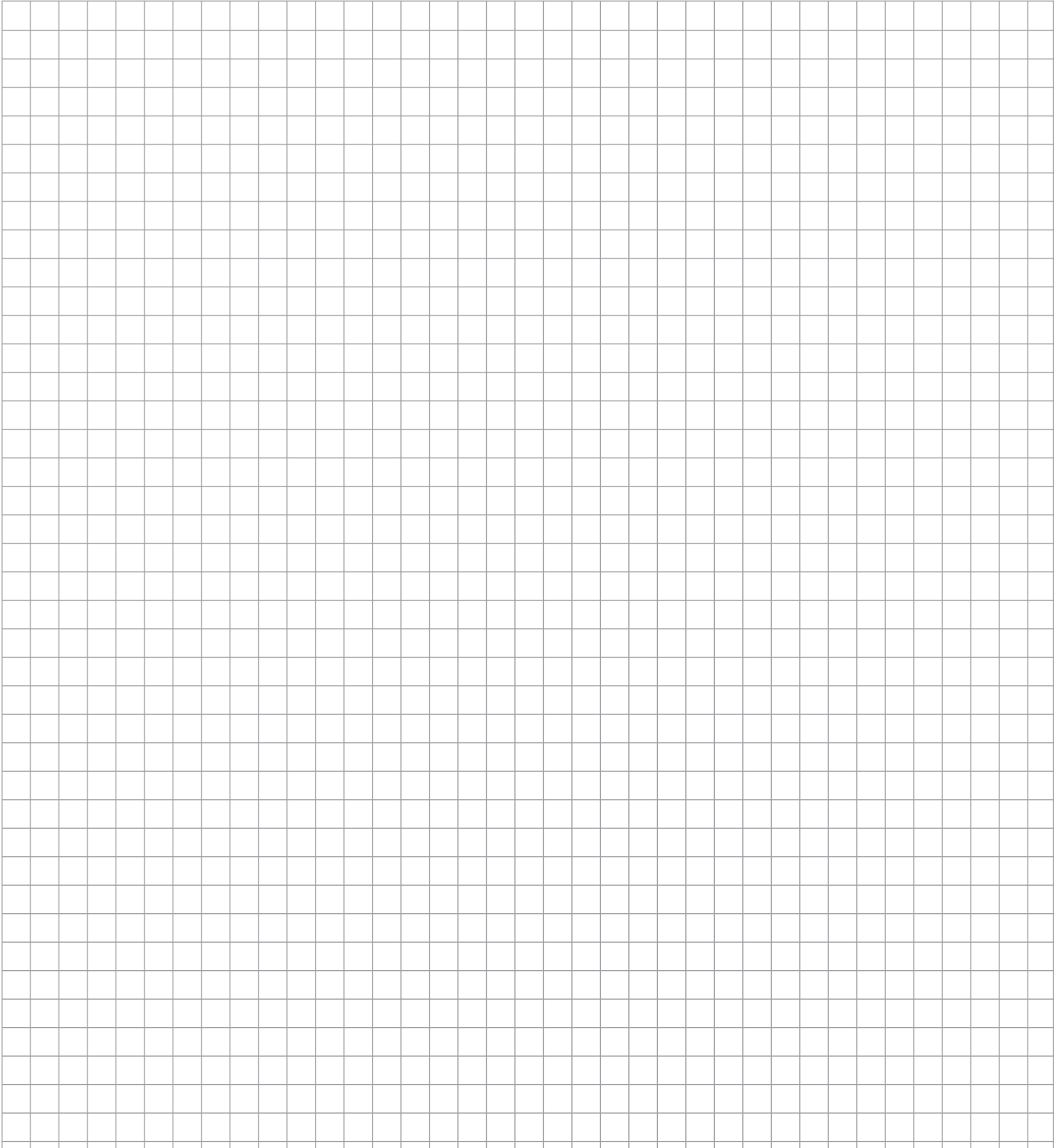
Pack sizes	Klüberpaste HEL 46-450
Tube 70 g	+
Cartridge 600 g	+
Can 750 g	+
Bucket 30 kg	+

1: The a.m. values are not subject to regular review and serve for orientation only. No fixed product data may be derived from these values.

Klüberpaste HEL 46-450

High-temperature screw paste

Product data	Klüberpaste HEL 46-450
Article number	089032
Upper service temperature	1000 °C / 1832 °F
Lower service temperature	-40 °C / -40 °F
Worked penetration, DIN ISO 2137, 25 °C, upper limit value	340 x 0.1 mm
Worked penetration, DIN ISO 2137, 25 °C, lower limit value	325 x 0.1 mm
Corrosion inhibiting properties of lubricating greases, DIN 51802, (SKF-EMCOR), test duration: 1 week, distilled water	<= 1 corrosion degree
Drop point, DIN ISO 2176	>= 250 °C
Colour space	black
Density at 20 °C	approx. 1.43 g/cm ³
Four-ball tester, welding load, DIN 51350 pt. 04	>= 5 000
Flow pressure of lubricating greases, DIN 51805, test temperature: -35 °C	<= 600 mbar
Friction coefficients screw test, screw M 10x30-8.8, DIN EN ISO 4017, black and nut M 10-8, DIN EN ISO 4032, polished, averaged thread friction coefficient (first-time tightening)	0.11
Friction coefficients screw test, screws M 10x30-8.8, DIN EN ISO 4017, black and nut M 10-8, DIN EN ISO 4032, bright, averaged head friction coefficient (first-time tightening)	0.09
Friction coefficients screw test, screw M 10x30-8.8, DIN EN ISO 4017, black and nut M 10-8, DIN EN ISO 4032, polished, standard deviation thread friction coefficient (first-time tightening)	0.02
Friction coefficients screw test, screw M 10x30-8.8, DIN EN ISO 4017, black and nut M 10-8, DIN EN ISO 4032, polished, standard deviation head friction coefficient (first-time tightening)	0.009
Water resistance, DIN 51807 pt. 01, 3 h/90 °C, rating	<= 1 - 90
Minimum shelf life from the date of manufacture - in a dry, frost-free place and in the unopened original container, approx.	24 months





Klüberpaste HEL 46-450

High-temperature screw paste



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.

**Klüber Lubrication München SE & Co. KG /
Geisenhausenerstraße 7 / 81379 München / Germany /
phone +49 89 7876-0 / fax +49 89 7876-333.**

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. Klüber products are continually improved. Therefore, Klüber Lubrication reserves the right to change all the technical data in this document at any time without notice.

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.



a company of the Freudenberg Group