Klüberpaste® HEL 46-450

High-temperature screw paste

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 and 1000 °C. In the normal temperature range (i.e. below 200 °C) it shows a 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), turbochargers and compressors.

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.

Minimum shelf life

The minimum shelf life is approx. 24 months if the product is stored in its unopened original container in a dry, frost-free place.

Pack size

1	x	750 g	can
12	x	750 g	can
24	x	750 g	can
1	x	30 kg	bucket
2	x	30 kg	bucket
12	x	30 kg	bucket
6	x	30 kg	bucket
25	x	70 g	tube
12	x	600 g	cartridge

*High-temperature screw test**
The test is based on VW-TL 52112.

Pin	DIN 931-2
Material	1.4986
Nut, material	1.4923

Klüberpaste HEL 46-450

- Reliable screw connection in combination with constant and sufficient preload force
- Approved in acc. with VW-TL 52112 and Ford tox. No. 138624
- Easy release also after long time at high temperature
- Assembly without damage
- Screw paste for conventional and high alloy steels

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.

*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.

Current material safety data sheets can be downloaded from our website www.klueber.com or requested from Klüber Lubrication.

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Product characteristics

Service temperature range*, [°C]	-40 to 1000
Colour	black
Density, 20 °C, [g/cm³], approx.	1.43
Worked penetration at 25 °C, DIN ISO 2137 [0.1 mm]	325 - 340
Corrosion protection, DIN 51 802, SKF-Emcor test, 1 week, distilled water, corrosion degree	≤ 1
Flow pressure, DIN 51 805, at -35 °C, [mbar]	≤ 600
Drop point, DIN ISO 2176, [°C]	≥ 250
Four-ball tester, welding force, DIN 51 350, pt 4, [N]	≥ 5000
Water resistance, DIN 51 807, pt 1, 3h / 90 °C, rating	≤ 1 - 90

* Service temperatures are guide values which depend on the lubricant's composition, the intended use and the application method. Lubricants change their consistency, apparent dynamic viscosity or viscosity depending on the mechano-dynamical loads, time, pressure and temperature. These changes in product characteristics may affect the function of a component.

*Friction values***

Measured on screws M 10x30-8.8, DIN EN ISO 4017, black, and nut M 10-8, DIN EN ISO 4032, bright; number of screws: 20 each

$\mu_{K,m}$ = 0.09 S = 0.009
$\mu_{G,m}$ = 0.11 S = 0.02

** 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.

Explanation

$\mu_{K,m}$ = averaged head friction coefficient (first-time tightening)

$\mu_{G,m}$ = averaged thread friction coefficient (first-time tightening)

S = standard deviation

Klüber Lubrication, a member of the Freudenberg group

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