

Klüberpaste® HEL 46-450

Black hot screw compound



Description

Klüberpaste HEL 46-450 is a black, metal-free hot screw paste for high-alloy steels. It contains a fully synthetic base oil consisting of poly-alkylene glycol and ester, as well as a combination of inorganic solid lubricants (e.g. graphite and phosphates).

The raw materials do not contain heavy metals or halogens.

Klüberpaste HEL 46-450 is suitable for a temperature range between -40 and 1000 °C. In the normal temperature range (i.e. under 200 °C) it shows an excellent anti-corrosion behaviour and good water resistance. Above 200 °C it performs the function of 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), turbo-chargers 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 over-lubrication.

Storage

The minimum shelf life is approx. 24 months if the product is stored in the original closed container in a dry place.

Pack sizes

70 g tube
600 g cartridge
0.75 kg can
30 kg drum

High-temperature screw test

The test was based on VW TL-52112.

Pin	DIN 931
Material	1.4986
Nut	DIN 934
Material	1.4823

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

Klüberpaste HEL 46-450

- halogen-free screw paste for conventional and high-alloy steels and high temperatures
- approved in acc. with VW TL-52112
- ensures easy release of fastening elements after having been subject to high temperatures for an extended time
- good pressure absorption capacity
- prevents fretting corrosion
- good water resistance
- good protection against corrosion
- excellent low-temperature behaviour

Product data


Colour	black
Service temperature range, °C	-40 to 1000, dry lubrication above 200
Density, DIN 51 757, 20 °C, g/cm ³	approx. 1.43
Base oil viscosity, DIN 51 561, at 40 °C, mm ² /s	42
Drop point, DIN ISO 2176, °C	> 250
Worked penetration at 25 °C, DIN ISO 2137 (ASTM-D 271); 0.1 mm	310 – 340
Four-ball tester, welding force, DIN 51 350 Pt 4, N	> 5000
Corrosion protection, SKF Emcors test, DIN 51 802, 1 week, distilled water, rating	0 / 1
Flow pressure, DIN 51 805, at -35 °C, mbar	≤ 500
Water resistance, DIN 51 807, 3 h / 90 °C, rating	0/1 – 90
Copper corrosion, DIN 51 811, 24 h / 150 °C, rating	1 – 150

Klüberpaste® HEL 46-450

Safety Data Sheet

1.1 Product name: Klüberpaste HEL 46-450 Code-No.: 089 032 29.4.98	9. Physical and chemical properties Form: paste Colour: black Odour: characteristic Drop point: > 250 °C, DIN ISO 2176 Flash point: > 200 °C (base oil) Flammability: not applicable °C Ignition temperature: not applicable °C Autoflammability: not applicable Lower explosion limit: not applicable Upper explosion limit: not applicable Vapour pressure – first: not applicable Density: approx. 1,43 g/cm ³ , 20 °C Water solubility: insoluble, g/l pH value: not applicable Kinematic viscosity: not applicable Further information: None
1.2 Klüber Lubrication München KG Emergency telephone no.: Geisenhausenerstr. 7 ++49 - 89 - 7876 - 0 D-81379 München, Tel. ++49 - 89 - 7876 - 0 telephone exchange Fax ++49 - 89 - 7876 - 333	
2. Composition / information on ingredients Chemical characterization (preparation): Polyalkylene glycol oil, ester oil, inorganic solid lubricants (e.g. graphite, phosphates) Additional information: No hazardous ingredients	10. Stability and reactivity Conditions to avoid: None Materials to avoid: Strong oxidizing agents Hazardous decomposition products: None under normal use Additional information: None
3. Hazards identification No particular hazards known	
4. First aid measures After inhalation: Not applicable After contact with skin: Wash off with soap and plenty of water After contact with eyes: Rinse with plenty of water After ingestion: Do not induce vomiting. Obtain medical attention Advice to doctor: Treat symptomatically	11. Toxicological information The toxicological data has been taken from products of similar composition Acute toxicity: LD ₅₀ /oral/rat = > 2g/kg (literature data) Chronic toxicity: None Human experience: Prolonged skin contact may cause skin irritation and/or dermatitis
5. Fire-fighting measures Suitable extinguishing media: Water spray, foam, dry powder, carbon dioxide (CO ₂) Unsuitable extinguishing media: High volume water jet Special hazards: In case of fire the following can be released: Carbon monoxide, hydrocarbons Special protective equipment for firefighters: Standard procedure for chemical fires Additional information: Water mist may be used to cool closed containers. In the event of fire and/or explosion do not breathe fumes	
6. Accidental release measures Personal precautions: Not required Environmental precautions: Do not flush into surface water or sanitary sewer system Methods for cleaning up / taking up: Use mechanical handling equipment. Dispose of absorbed material in accordance with the regulations Additional information: None	12. Ecological information Information on elimination (persistence and degradability): Product is insoluble in water. May be separated out mechanically in purification plants Behaviour in environmental compartments: Ecological injuries are not known or expected under normal use Ecotoxic effects: Aquatic toxicity is unlikely due to low solubility Additional information: Should not be released into the environment
7. Handling and storage Advice on safe handling: No special handling advice required Advice on protection against fire and explosion: No special precautions required Requirements on storage rooms and vessels: No special conditions required Incompatible materials: Incompatible with oxidizing agents. Do not store together with food Further information on storage condition: Store at room temperature in the original container	13. Advice on disposal Disposal: Can be incinerated when in compliance with local, state and federal regulations Dispose of contaminated packaging and recommended cleaning: Offer rinsed packaging material to local recycling facilities
8. Exposure controls / personal protection Additional advice on system design: Not applicable Ingredients and specific control parameters: None Respiratory protection: No special protective equipment required Hand protection: No special protective equipment required Eye protection: No special protective equipment required Body protection: No special protective equipment required Other protection measures: No special protective equipment required General protection and hygiene measures: Avoid prolonged and/or repeated contact with skin. Remove soiled or soaked clothing immediately. Clean skin thoroughly after work; apply skin cream	14. Transport information GGVS / GGVE: not applicable ADN / ADN: not applicable IMDG-Code: not applicable ICAO / IATA-DGR: not applicable Further information: Not classified as dangerous in the meaning of transport regulations
	15. Regulatory information Labelling according to EU-guidelines: The product does not require a hazard warning label in accordance with EC-directives/German regulations on dangerous substances National regulations
	16. Other information Issue-department of Safety Data Sheet: Chemical Documentation, Tel.: ++49 - 89 - 7876 - 564

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 Klüber Lubrication, a member of the Freudenberg Group