Klüberlub® BE 41-542

Lead-free heavy-duty grease for rolling bearings subject to high loads

Description

Klüberlub BE 41-542 is a heavy-duty ("EP") grease with a high-viscosity mineral base oil, special lithium soap, EP/AW additives, antioxidants and anticorrosion additives.

Performance characteristics:
- lubricant film with high load-carrying capacity
- excellent wear protection
- good water resistance
- service temperature up to 140 °C
- excellent adhesion

Klüberlub BE 41-542 is free from polluting substances such as chlorine or heavy metals.

Application

Typical applications of Klüberlub BE 41-542 are in rolling bearings operating under high loads and low to medium speeds, e.g. in
- load rollers in rotary kilns (cement industry)
- crane wheels
- bucket wheel excavators
- hammer crushers, hammer mills
- working rolls in hot strip mills
- cold pilger rolling machines
- rolling bearings subject to shock loads or dynamic loads

Application notes

The ambient temperature should be at least 15 °C when applying the product with an automatic grease pump.

Minimum shelf life

Approx. 24 months when stored in a dry room in the closed original container.

Anti-wear behaviour

500 h test on the FAG-FE8 rolling bearing test rig.

Tapered roller bearing

31312 A, F_a = 50 kN, P/C = 0,24, n = 75 min^{-1}	
Steady-state temperature, °C	39.5*
Friction moment, Nm	10.5*
Rolling element wear (V_{50}), mg	22**
Cage wear (V_{50}), mg	42**

* Average values
** **Requirement of FAG/Schweinfurt for a "heavy-duty grease":**
Rolling element wear: ≤ 35 mg
Cage wear: ≤ 100 mg

Pack sizes

25 kg bucket
180 kg drum

Klüberlub BE 41-542

- Heavy-duty grease
- For rolling bearings subject to high loads
- Free from lead, chlorine, heavy metals

Product characteristics

Base oil/thickener	mineral oil / special lithium soap
Service temperature range*, °C, approx. (DIN 51 825)	– 20 to 140
FAG-FE9-test run, DIN 51 821 pt. 2 n = 6000 min^{-1}, F_a = 1500 N, F_{50}-running time, h/°C	121 / 140
Flow pressure, DIN 51 805 at – 20 °C, mbar	< 1400
Colour	brown
Texture	homogenous
Drop point, DIN ISO 2176, °C	> 230
Worked penetration, DIN ISO 2137 (ASTM-D 217), at 25 °C; 0,1 mm	265 – 295
Speed factor for deep groove ball bearings (n x dm), mm x min^{-1}, approx.	300 000
Consistency class, DIN 51 818, NLGI	2
Corrosion behaviour (Emcor test) DIN 51 802, 1 week, distilled water, rating	0/1
Water resistance, DIN 51 807, pt. 1, 3 h/90 °C, rating	0/1
Four ball tester, welding force, DIN 51 350, pt. 4, N	> 3000
Base oil viscosity, DIN 51 561 at 40 °C, mm^2/s, approx. at 100 °C, mm^2/s, approx.	540 32
Density, DIN 51 757, at 20 °C, g/cm^3, approx.	0.93

* = The given service temperatures are guide values depending on the intended use and the application method.

The **upper** service temperature was determined acc. to DIN 51 825 und DIN 51 821 pt. 2, the **lower** service temperature acc. to DIN 51 825 and 51 805.

Behaviour towards elastomers and plastics

The following elastomer types were tested for 168 h at 100 oder 140 °C to check their resistance to Klüberlub BE 41-542 .

Material Test period/temperature	79 NBR 902 168 h / 100 °C	70 ACM 370 168 h / 140 °C	75 FPM 585 168 h / 140 °C
Change in volume (%)	8	10	2
Change in hardness (SHA)	– 4	– 6	4
Tensile strength (%)	– 11	– 26	– 40
Elongation at tear (%)	– 1	– 4	– 54

We recommend checking the resistance of all materials in contact with the lubricant, especially prior to series applications (our test results were obtained with random samples. They are no substitute for your own compatibility tests).

Klüberlub BE 41-542
Safety Data Sheet

1.1 Product name: Klüberlub BE 41-542
Code-No.: 020 269 **24.6.1998**

1.2 Klüber Lubrication München KG
Geisenhausenerstr. 7
D-81379 München,
Tel. ++49 - 89 - 7876 - 0 telephone exchange
Fax ++49 - 89 - 7876 - 333

Emergency telephone no.:
++49 - 89 - 7876 - 0

2. Composition / information on ingredients

Chemical characterization (preparation): Mineral oil, special lithium soap

Additional information: No hazardous ingredients

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

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

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

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

9. Physical and chemical properties

Form	paste
Colour	brown
Odour	characteristic
Drop point	> 230 °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. 0,93 g/cm^3, 20 °C
Water solubility	insoluble, g/l
pH value	not applicable
Kinematic viscosity	not applicable
Further information	None

10. Stability and reactivity

Conditions to avoid: None

Materials to avoid: Strong oxidizing agents

Hazardous decomposition products: None under normal use

Additional information: None

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

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: Aquatic toxicity is unlikely due to low solubility

Additional information: Should not be released into the environment

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

14. Transport information

GGVS / GGVE: not applicable ADN / ADNR: 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

Freudenberg Klüber Lubrication, a member of the Freudenberg Group

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