ISOFLEx® NBU 15

Special greases for rolling bearings operating at high speeds and loads

Description:
ISOFLEx NBU 15 is a high-speed grease with a good pressure absorption capacity. It consists of a combination of ester oil / synthetic hydrocarbon oil / mineral oil and barium complex soap. It provides good wear and corrosion protection, and is resistant to water, ambient media and oxidation.

Application:
These lubricants are especially suitable for high-speed plain and rolling bearings, such as spindle bearings in machine tools and textile machines, threaded spindles, ball screws subject to high loads, running gear bearings. They are also used as long-term greases for bearings in cableways and precision engineering applications, and they are suitable for the lubrication of tooth flanks in precision gears (e.g. bevel gears in milling machines, electromechanical valve actuators).

Application notes:
The lubricant is applied by brush, spatula, grease gun or grease cartridge. Owing to the different compositions of elastomers and plastic materials, it is indispensable to check compatibility prior to series application.

Minimum shelf life:
The minimum shelf life is approx. 36 months if the product is stored in the original closed container in a dry place.

Pack sizes:
- 50 g PE tube
- 400 g cartridge
- 1 kg can
- 25 kg bucket

Product data:

<table>
<thead>
<tr>
<th>Property</th>
<th>ISOFLEx NBU 15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colour</td>
<td>beige</td>
</tr>
<tr>
<td>Texture</td>
<td>homogeneous, short-fibred</td>
</tr>
<tr>
<td>Density at 20 °C, g/cm³</td>
<td>0.99</td>
</tr>
<tr>
<td>Service temperature range*, °C, approx.</td>
<td>– 40 to 130</td>
</tr>
<tr>
<td>Drop point, DIN ISO 2176, °C, approx.</td>
<td>&gt; 220</td>
</tr>
<tr>
<td>Worked penetration, DIN ISO 2137, (ASTM D 217); 0.1 mm</td>
<td>265 to 295</td>
</tr>
<tr>
<td>Corrosion protection (Emcor test), DIN 51 802, 1 week, distilled water, corrosion rating</td>
<td>0/1</td>
</tr>
<tr>
<td>Base oil viscosity, DIN 51 562/1, at 40 °C, mm²/s, approx.</td>
<td>21</td>
</tr>
<tr>
<td>at 100 °C, mm²/s, approx.</td>
<td>4.7</td>
</tr>
<tr>
<td>Speed factor** (n x dₘ), mm x min⁻¹, approx.</td>
<td>1,000,000</td>
</tr>
<tr>
<td>Apparent viscosity***, Klüber viscosity grade</td>
<td>M</td>
</tr>
</tbody>
</table>

* 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 mechno-dynamical loads, time, pressure and temperature. These changes in product characteristics may affect the function of a component.

** Speed factors are guide values which depend on the type and size of the rolling bearing type and the local operating conditions, which is why they have to be confirmed in tests carried out by the user in each individual case.

*** Klüber viscosity grades: EL = extra light lubricating grease; L = light lubricating grease; M = medium lubricating grease; S = heavy lubricating grease; ES = extra heavy lubricating grease
ISOFLEX® NBU 15 Safety Data Sheet

1.1 Product name: ISOFLEX NBU 15
   Code-No.: 004 026
   06.11.2001

1.2 Klüber Lubrication München KG
   Emergency telephone no.: +49 - 89 7876 - 0
   Geisenhausenstraße 7
   D-81379 München
   Tel. ++49 - 89 7876 - 0 telephone exchange
   Fax: ++49 - 89 7876 - 333

2. Composition / information on ingredients
   Chemical characterization (preparation): Mineral oil, synthetic
   hydrocarbon oil, ester oil, barium complex soap
   Hazardous ingredients
<table>
<thead>
<tr>
<th>Components</th>
<th>Value</th>
<th>Symbols</th>
<th>R-phrases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barium soap</td>
<td>&gt; 25 %</td>
<td></td>
<td>52/53</td>
</tr>
</tbody>
</table>

3. Hazards identification
   R phrases: 52/53. Harmful to aquatic organisms, may cause long-term
   adverse effects in the aquatic environment
   Prolonged skin contact may cause skin irritation and/or dermatitis

4. First aid measures
   After inhalation: Not applicable
   After contact with skin: Wash off with mild cleaners and plenty of water
   If symptoms persist, call a physician
   After contact with eyes: Rinse with plenty of water
   If symptoms persist, call a physician
   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 (CO2)
   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: Store at room temperature in the original container
   Incompatible materials: Incompatible with oxidizing agents. Do not store together with food

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.

9. Physical and chemical properties
   Form: paste
   Colour: beige
   Odour: characteristic
   Drop point: > 220 °C, DIN ISO 2176
   Flash point: > 200 °C (base oil)
   Ignition temperature: not applicable
   Lower explosion limit: not applicable
   Upper explosion limit: not applicable
   Vapour pressure-first: not applicable
   Density: approx. 0.99 g/cm³, 20 °C
   Water solubility: insoluble
   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
    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 effects: Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment
    Additional information: Should not be released into the environment

13. Advice on Disposal
    Code of waste: 120112
    Wastes from shaping and surface treatment of metals and plastics; wastes from shaping (including forging, welding, pressing, drawing, turning, cutting and filing); spent waxes and fats
    Disposal: The code of waste has to correspond to the Council Directive 75/442/EEC and be specific as far as the related sector and process are concerned
    Can be incinerated when in compliance with local, state and federal regulations

14. Transport information
    GGVIS / GOVE: 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 is classified labelled in accordance with EC-directive 99/45/CE
    S phrases: 61. Avoid release to the environment. Refer to special instructions/safety data sheets
    Labelling according to the Swiss regulations: No toxicological classification, BAGT-no. 611500

16. Other information
    Issue-department of Safety Data Sheet: Chemical Documentation
    Tel.: +49 - 89 7876 - 564

The data in this product information is based on our general experience and knowledge at the time of printing 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 tests with the selected product. We recommend contacting our Technical Consulting Staff to discuss your specific application. If required and possible we will be pleased to provide a sample for testing. Klüber products are continually improved. Therefore, Klüber Lubrication reserves the right to change all the technical data in this product information at any time without notice.

Klüber Lubrication München KG, a member of the Freudenberg group