

Klüber TP 41 N A-B

Two-component bonded coating for metal components



Benefits for your application

- **Long component life expectancy**
 - for a wide service temperature range
 - especially in combination with oils or greases
 - due to a highly flexible bonded coating
 - coatings of up to 70 µm thickness can be applied
- **Better component performance**
 - due to less stick-slip
 - due to very high resistance to wear
 - as lifetime lubrication is possible

Description

Klüber TP 41 N A/B is a thermosetting, black-coloured high-performance bonded coating made up of two component parts. It has an organic binder containing PTFE-free solid lubricants.

Klüber TP 41 N A/B reduces friction and wear on metal/metal and metal/plastic material pairings. This bonded coating can be used for high mechano-dynamic loads as well as with high temperatures. Optimum performance of the bonded coating is obtained with low to medium surface pressures.

Klüber TP 41 N A/B is supplied in liquid form and with a viscosity ready to use. It contains an inflammable solvent mixture (former hazard class A II).

Once applied and hardened, the bonded coating forms a dry lubricating layer with a wide service temperature range, low friction coefficients and a high resistance to wear. Its resistance to chemicals and anticorrosive effect are good.

Klüber TP 41 N A/B excels due to its excellent high wear resistance plus good adhesion on steel and aluminium substrates.

Application

Klüber TP 41 N A/B is used with components that require a low friction coefficient but where contamination by oil or grease is highly undesirable. Typical applications are found, for example, in the automotive industry or in electrical and precision engineering.

Due to its good resistance to media and wear, Klüber TP 41 N A/B is also particularly suitable for dynamic loads when used in combination with oil lubrication.

Application notes

Klüber TP 41 N A/B consists of:

Component A (Art. No. 099202) and component B. Klüber TH 06 component B (Art. No. 099200) is used as component B.

Component B is mixed with component A at a 5 wt. % to 95 wt. % ratio.

Example: 50 g of component B with 950 g of component A.

Prior to mixing the components, stir component A to remove any bottom deposits. Use a slow-moving stirrer (500 to 800 rpm, stir for at least 15 min) or a high-speed jetstream stirrer, e.g. made by Ystral, drive x 40/36, shaft LDT-1, mix-ing generator Ø 65 mm (approx. 10 000 rpm, stir for 5 min).

Upon stirring, add component B. The mixture should be homogenised either by the above-mentioned slow-moving stirrer for 15 min, or by the high-speed jetstream stirrer for 5 min. If the high-speed stirrer is used, make sure the temperature of the mixture does not significantly exceed 30 °C in order to avoid drop in viscosity (reversible), which would increase the tendency of the bonded coating to drip off the component

After mixing, pass the mixture through a poly-ethylene filter with approx. 150 µm pore size.

The mixing container should always be covered with a lid.

The mixture of components A and B can be processed for approx. 24 h provided the ambient temperature is not much above 25 °C (pot life). As the bonded coating shows thixotrope properties, it should be stirred up after an extended period of non-use (> 12 hours) in order to re-establish its original viscosity (5 minutes at approx. 500 rpm is sufficient).

Any tubes in contact with the mixture must be made of polyethylene or PTFE.

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The mixture is applied to the component by means of spraying. The recommended layer thickness for tribological loads is 5 to 25 µm (dried coating). For special applications, layers up to 70 µm thickness may be applied.

For application by means of spray systems, we recommend a stirrer to be installed in the mixture container and circulating mixture feed. This helps to prevent the solid lubricants from settling.

Please ensure that the relative atmospheric humidity is fairly low (max. 60 %) during application processes (coating and deaeration).

If atmospheric humidity is too high, water will be absorbed into the wet applied film (product is hygroscopic).

This may impair the lubricating film's performance, especially if the coating is applied wet-on-wet.

To clean the spray equipment and dilute the bonded coating, the Klüber solvent and cleaning agent SOLUTIN C 10 (Art. No. 058036) may be used. Opened containers of both components should be closed again immediately after use.

Drying / hardening

The coating is hardened at 230 °C object temperature for at least 15 min.

The product will only offer its full performance if hardened completely as described.

When subjected to a heat treatment of 100 °C the coated parts are dry to the touch after approx. 6 – 10 minutes. To obtain a bubble-free coating, especially when its thickness is > 15 µm, the coated component should be allowed to deaerate for 10 to 15 min at a temperature between 80 °C and 120 °C prior to hardening at 230 °C.

Pretreatment

To attain optimum adhesion of the bonded coating, the component surface must be cleaned and degreased. It should also be roughened prior to coating, either by means of sandblasting or application of a phosphate layer. When applied under bonded coatings, phosphate layers help to increase corrosion resistance.

The maximum storage temperature of 25 °C should not be exceeded but for a short time.

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	Klüber TP 41 N A/ BKomp. A
Can 950 ml	+
Bucket 17.1 l	+
Bottle 50 ml	-
Can 900 ml	-

Product data	Klüber TP 41 N A/ BKomp. A
Article number	099202
Service temperature, lower limiting value (standard mixture)	-40 °C
Operating temperature, upper limit value (standard mixture)	230 °C
Colour space	black
Colour space, (standard mixture)	black
Density, DIN EN ISO 2811, at 20 °C	approx. 1.03 g/cm ³
Density DIN EN ISO 2811, 20°C (standard mixture)	approx. 1.03 g/cm ³
Runout time, DIN EN ISO 2431, with flow cups, 3 mm nozzle	



Product data	Klüber TP 41 N A/ BKomp. A
Runout time, DIN EN ISO 2431, with flow cups, nozzle 6 mm	approx. 55 s
Runout time, DIN EN ISO 2431, with flow cups, 6 mm nozzle (standard mixture)	approx. 50 s
Flash point, DIN EN ISO 1516, -30 °C to 110 °C	approx. 29 °C
Cross-cut adhesion (test plate), PA-063 based on DIN EN ISO 2409, value	0-1 Gt
Mandrel bending test, DIN EN ISO 1519, substrate tinplate, layer thickness approx. 25 µm, temperature -40 °C, mandrel diameter 3 mm	passed
Yield with a tribo-film thickness of 15 micrometer (standard mixture)	approx. 14 m ² /l
Media resistance of coatings, based on DIN EN ISO 2812-1, tested at room temperature, layer thickness approx. 15 µm, substrate steel, medium soda lye, result: film resistant, tested up to	1 000 h
Media resistance of coatings, based on DIN EN ISO 2812-1, tested at room temperature, layer thickness approx. 15 µm, substrate steel, medium 0.1n hydrochloric acid, result: film resistant, tested up to	1 000 h
Friction coefficient, Tannert sliding indicator, room temperature, v _{max} = 0.243 mm/s, F = 50 - 300 N	approx. 0.05
Salt spray test, DIN EN ISO 9227, 5% NaCL, temperature 35°C, material steel ST 1405, layer thickness 15 µm, corrosion after	>= 180 h
Salt spray test, DIN EN ISO 9227, linked with DIN EN ISO 7253, 5% NaCl, temperature 35°C, material steel zinc-phosphatized, layer thickness 15 µm, corrosion after	>= 500 h
Minimum shelf life from the date of manufacture - in a dry, frost-free place and in the unopened original container, approx.	12 months



Klüber[®]top TP 41 N A-B

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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.**

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