

# Klüberplus SK 02-295

Lubricating wax



## Benefits for your application

- Non-polluting
- Wax-like texture
- Protects against wear and reduces friction in the boundary and mixed friction regimes
- No stick-slip
- Very low friction coefficient
- Water hazard category 1
- NSF H1-registered

## Description

Klüberplus SK 02-295 is a lubricating wax based on a combination of high-molecular synthetic hydrocarbons. It offers good protection against friction, wear, tribo-corrosion and rust. It prevents stick slip and ensures good lubricity particularly in the boundary and mixed friction regimes, i.e. in cases of minor sliding movements or speeds and specifically high loads. The lubricating effect is also excellent between friction components made of different materials, especially aluminium alloys.

Tests carried out with the Tannert sliding indicator have confirmed the good lubricating properties of Klüberplus SK 02-295. Almost all friction coefficients were clearly below 0.1 and no stick slip movement occurred.

An essential property is that the consistent wax becomes liquid with increasing temperatures – between 45 °C and 75°C – and still offers good adhesion properties. In tests with a horizontal plate (steel ST 14) Klüberplus SK 02-295 did not run off when the plate was heated to 100 °C. Prior to testing, when the plate was still cold, approx. 6 g/m<sup>2</sup> of Klüberplus SK 02-295 were applied.

The texture is reversible. When cooling down, Klüberplus SK 02-295 becomes consistent again as soon as the temperature is below the softening range (45–75 °C). In its consistent texture the lubricating wax is extremely resistant to low temperatures and stable.

Klüberplus SK 02-295 is very resistant to oxidation. It can be applied where incidental, technically unavoidable contact with food products may occur. Klüberplus SK 02-295 is generally recognized as safe, non-toxic and non-hazardous to the environment. It is classified in water hazard category 1 (not hazardous).

In addition, Klüberplus SK 02-295 offers very good protection against corrosion. During tests in a condensation water-alternating climate (DIN 50 017 KFW) a corrosion rating of 0 was achieved after 30 cycles (720 h). This is equivalent to the

performance of high-quality corrosion inhibitors. Consequently, Klüberplus SK 02-295 is substantially more efficient than e.g. hydraulic oils.

Klüberplus SK 02-295 is NSF H1 registered and therefore complies with FDA 21 CFR § 178.3570. The lubricant was developed for incidental contact with products and packaging materials in the food-processing, cosmetics, pharmaceutical or animal feed industries. The use of Klüberplus SK 02-295 can contribute to increase reliability of your production processes. We nevertheless recommend conducting an additional risk analysis, e.g. HACCP.

## Application

Klüberplus SK 02-295 was developed for industrial applications, e.g.

- all types of press fits for easier fitting of pins, bolts and bushings
- sliding guides for stick-free smooth sliding
- sliding points for long-term and lifetime lubrication in case of mixed friction
- hinges for non-tacky, clean lubrication to prevent squeaking
- screws for low friction, steady tightening
- ropes for smooth handling and reliable protection against corrosion
- shaft/hub connection for protection against tribo-corrosion and fretting corrosion

Klüberplus SK 02-295 is very useful for metal-forming processes, e.g. deep-drawing of CrNi steel, aluminium sheet and threading or drilling of plates. The efficiency was verified in many mechano-dynamical tests and has been proven in practice.

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### Application notes

#### Cold application

Klüberplus SK 02-295 is applied manually on polished surfaces three or four times and on normal surfaces twice without any auxiliary means, thus obtaining a layer of approx. 6 µm. Film thickness also depends on the force and speed applied during application.

#### Hot application

If possible, Klüberplus SK 02-295 should be applied to preheated surfaces. This allows a faster and more

homogeneous application of the lubricating wax and results in lower friction coefficients. Heating the component surfaces to 50–70 °C has proven most efficient.

### Material safety data sheets

Material safety data sheets can be requested via our website [www.klueber.com](http://www.klueber.com). You may also obtain them through your contact person at Klüber Lubrication.

Pack sizes	Klüberplus SK 02-295
Bucket 20 kg	+

Product data	Klüberplus SK 02-295
Article number	012166
NSF-H1 registration	136 216
Chemical composition, thickener	wax
Lower service temperature	-40 °C / -40 °F
Upper service temperature	120 °C / 248 °F
Colour space	yellow
Needle penetration of paraffins, DIN ISO 51579, 25 °C	approx. 25 x 0.1 mm
Corrosion protection behaviour, DIN EN ISO 6270-2, condensation water in alternating atmosphere, 40 °C, material steel ST 37, corrosion after	>= 30 cycles
Drop point, DIN ISO 2176	75-82 °C
Water resistance, based on DIN 51807 pt. 01, 24h/50 °C	0 - 50
Minimum shelf life from the date of manufacture - in a dry, frost-free place and in the unopened original container, approx.	60 months

Supplementary data	Klüberplus SK 02-295		Mineral hydrocarbon oil CL (ISO-VG 46)		Lithium soap based grease	
load	50 N corresponds to 0.46 N/mm <sup>2</sup>	300 N corresponds to 2.75 N/mm <sup>2</sup>	50 N corresponds to 0.46 N/mm <sup>2</sup>	300 N corresponds to 2.75 N/mm <sup>2</sup>	50 N corresponds to 0.46 N/mm <sup>2</sup>	300 N corresponds to 2.75 N/mm <sup>2</sup>
steel / aluminium	0.065	0.050	0.244	stick-slip at 100 N	0.18	0.137
steel / copper	0.066	0.054	stick-slip	-	0.216	stick-slip at 100 N
steel / steel	0.084	0.072	stick-slip	-	stick-slip	-
aluminium / aluminium	0.184	0.122	0.22	0.185	0.19	stick-slip at 250 N



Friction coefficients determined with the Tannert sliding indicator; for Klüberplus SK 02-295 determined during hot application.



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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.

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