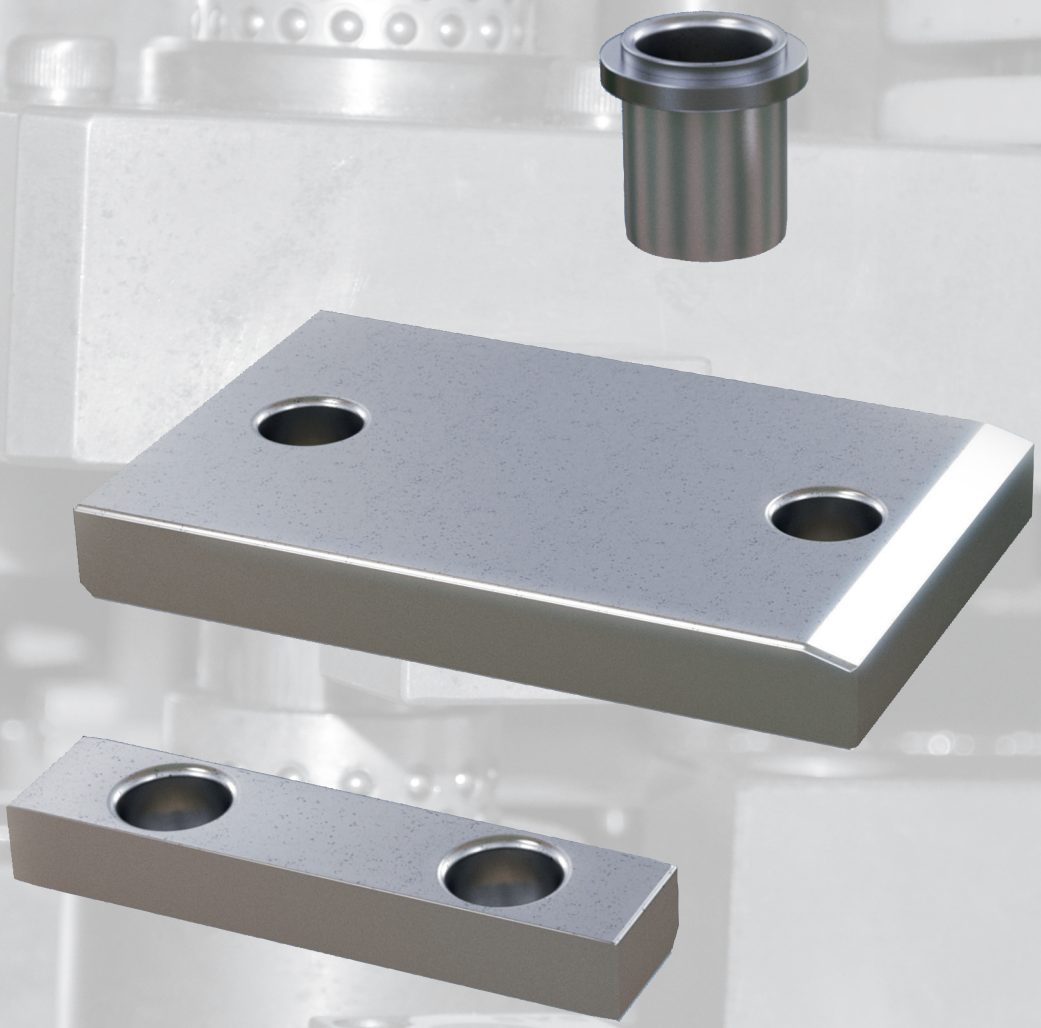
SNS GUIDE ELEMENTS
OPERATING- AND MACHINING INSTRUCTIONS



STRACK®
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SNS guide elements – Operating- and machining instructions

Contents

10.2018

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SNS guide elements – Operating- and machining instructions

1. Preamble

Thank you for your trust in the product of STRACK NORMA GmbH & Co. KG.

We are pleased that you have decided to purchase a product of STRACK.
To facilitate the handling of the product for you, we have prepared this operation instruction.

The operating instruction is an important document for the SNS guide elements and ensures the safe and efficient operation. It is intended for all persons, which are operating these SNS guide elements or are responsible for the safe operation.

Please read the operating instructions carefully and completely before the mounting and the initial start-up.

A regular maintenance is necessary to ensure a safe and efficient use.

If the prescriptions and hints of this operation instruction are not considered any liability from our side for resulting damages and loss of performance is excluded.

2. After receipt of delivery

Examine the delivery for external damages before opening.
Please immediately submit a complaint to the transport company which delivered the consignment in the event of damage.

Compare the content of your delivery with the bill of delivery.

Check if all pieces listed on the bill of delivery are included and unpacked.
Only then dispose the transport- and packing material.

In the case of damages to the content without externally visible damage of the packaging, please do not send it back for repair or replacement.
Please contact STRACK NORMA GmbH & Co. KG in Lüdenscheid to get further information.

Phone: +49 2351 / 8701 - 0

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SNS guide elements – Operating- and machining instructions

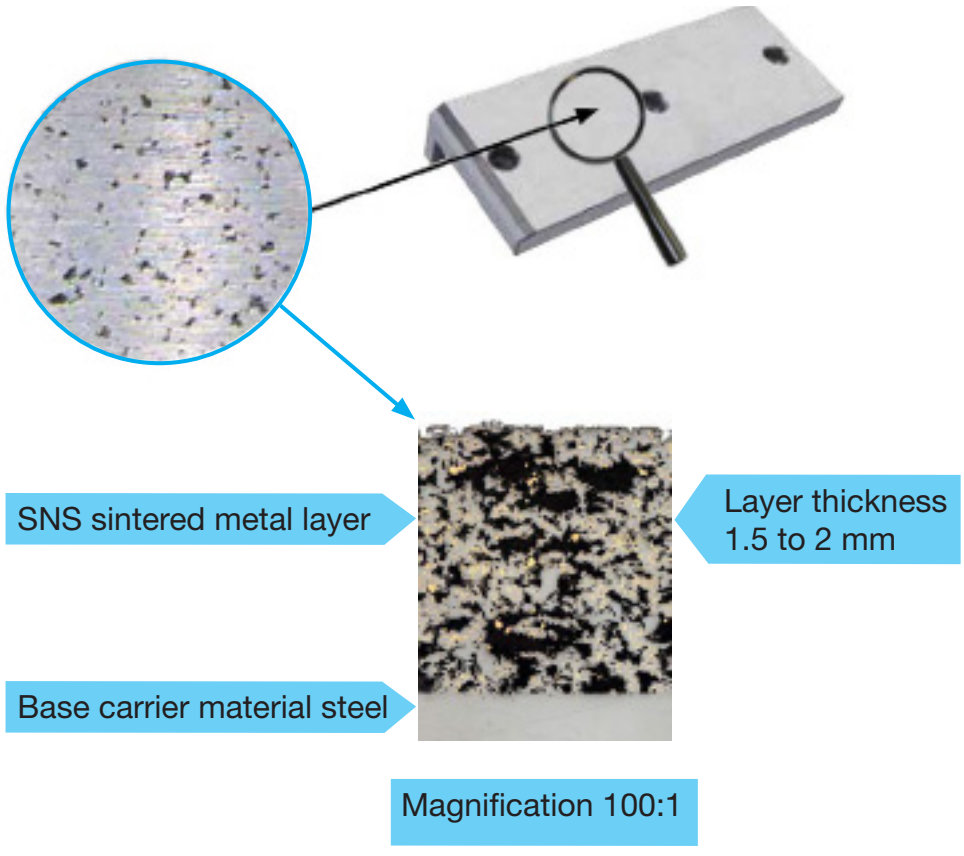
3. Description

Guide elements out of SNS-sintered metal characterize by the following features:

- Significant increase of the service life reduces your maintenance costs
- High wear resistance increases your productivity
- High temperature resistance up to 250 °C ensures your flexibility
- Favourable and constant purchase prices spare your wallet

The requirements of the modern toolmaking have changed.
A new sintered metal as slide bearing material has been developed to meet these requirements. This SNS-sintered metal absorbs the loads due to the machining of high strength sheets. At the same time the maintenance friendliness and service life are increasing.

The new generation of bearing elements is a porous sintered metal based on iron.
It characterizes by its high running performance at medium and high speeds.
The sintered metal is applied to a steel base body, which gives the guide element a higher strength.



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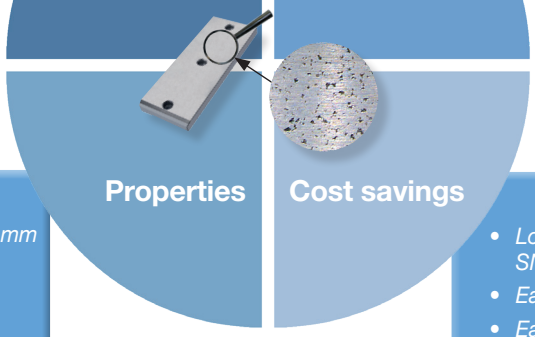
3.1 Advantages

Performance features

- *high wear resistance*
- *very high service life*
- *PV-value which is three times higher compared to bronze with graphite*
- *Three times higher unlubricated running performance compared to bronze*

Maintenance

- *Low maintenance, because the solid lubricant is imbedded in the SNS layer*
- *Reoiling possible without problems if desired*



Properties

- *Thickness of sintered metal layer 1.5 - 2 mm*
- *Easy machining because base carrier material out of steel*
- *Even base layer because there are no graphite plugs*
- *High temperature resistance up to 250 °C*

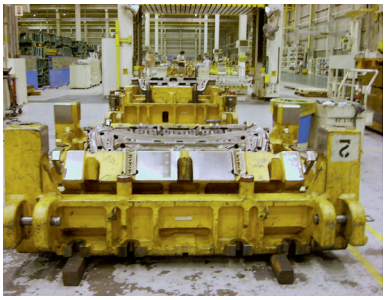
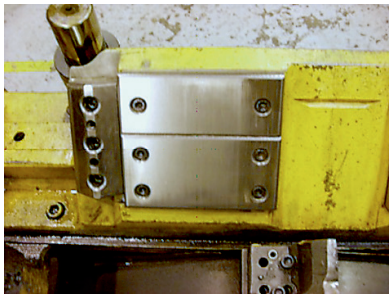
Cost savings

- *Low maintenance due to utilization of SNS-sintered matal guiding*
- *Easy exchange in case of wear*
- *Easy machining (as steel)*
- *Cost-efficient, because independent from bronze price development*

3.2 Description of the SNS-slide elements in use

At SNS-sintered metal sliding surfaces, the lubricant is imbedded in the porous sintered layer and thus has a homogeneous sliding surface.
Therefore, there is no prescribed sliding direction which increases the flexibility.
The even surface structure passes the force uniformly on the counter bearing material.
No impressions occur due to differences in the sliding layer surface, as it is the case with other low-maintenance slide elements.

Application test in the cam of a cutting tool

Test tool	SNS sintered metal
	

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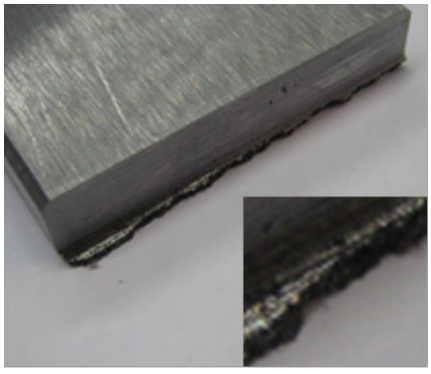
4. Preparation of the SNS slide elements and adaptation to the operational environment

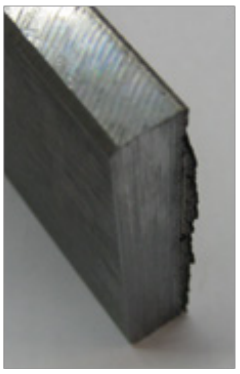
SNS guide elements are already available in many executions and dimensions.
These also include slide plates out of SNS in bar form. They are suited to adapt special dimensions to the own installation conditions.
For example, the bars Z3866 and Z3870 belong to them. But also, the adaptation of standard pieces to the tool environment is possible without problems. Here the following things must be considered:

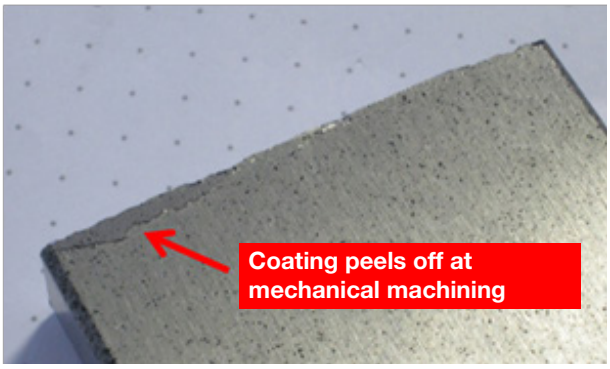
4.1 Notes concerning sawing

If, at first the harder layer of the bearing steel is cut through at the sawing, the resistance at the cutting of the sintered metal layer will reduce and thus the feed will increase. This causes that the layer rips and peels off. The following pictures are showing the damage due to improper machining. This error can be avoided by the correct clamping of the work piece which should be cut.

Example machining error at the sawing:







To avoid a peeling (ripping) of the sintered layer, it should always be machined from the layer side, so that the sintered metal has enough counter support due to the carrier material.

4.2 Notes concerning milling

During the milling process, it should be paid attention that roughing operations should be avoided.

In synchronized mode mill against the layer on suitable machines.
At front milling, you must pay attention that the sintered layer is machined as shown in the picture.

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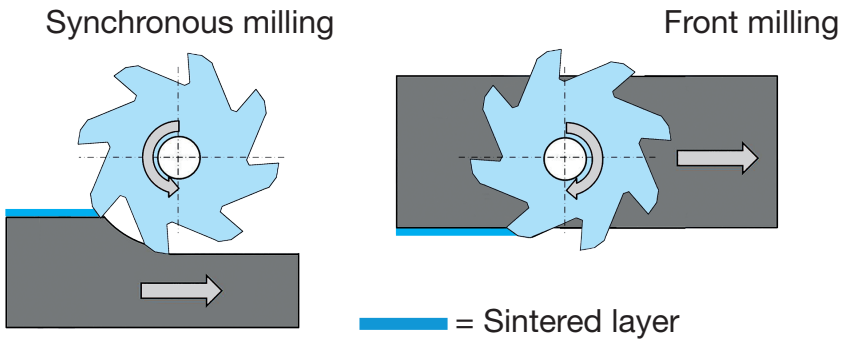
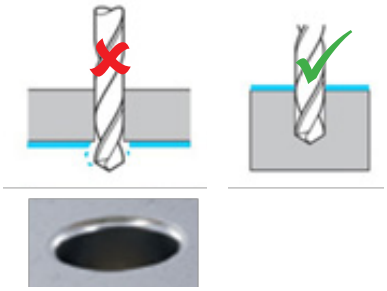
A simple rework of the machined edges with a file is possible (remove burrs), a peeling-off during the production is then no longer given.



4.3 Notes concerning boring

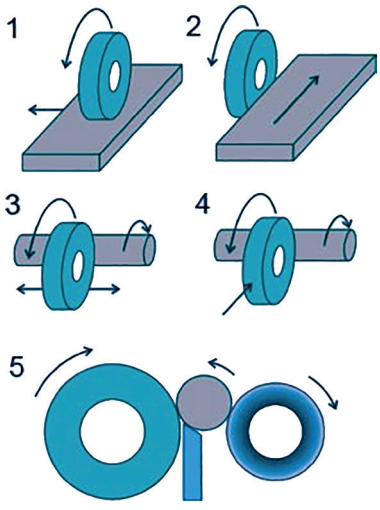
If it is bored from the rear side, during the drilling bursts can occur on the sintered surface.
Bore from the sintered side in the steel base body to avoid a bursting of the sintered layer.
Round boringson the sintered layer side.



4.4 Notes concerning grinding

In principle STRACK NORMA SNS-guide strips with sintered metal surface can be machined in the same way by surface grinding as it is common for steel strips.
There is no special requirement on the abrasive. Abrasives with a specification can be used, which are suited for the grinding of steel.

Surface-grinding (1):



For example:

- Abrasive: aluminium oxide (Al2O3) normal- or semifriable
- Grain size: 46
- Grinding body hardness: soft to medium
- Structure ratio (Concentration): 8
- Binding: ceramic

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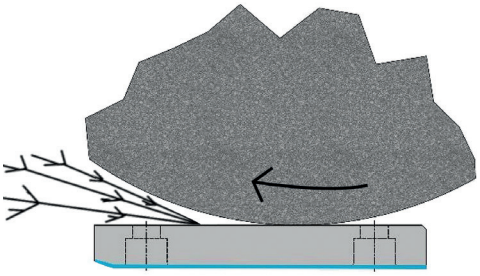
The machining variables at the grinding of sintered metal strips must not be changed compared to the grinding of steel strips.

During the grinding, we recommend the utilization of cutting- and grinding oil (without water addition) to reduce the friction heat and to cool the sintered metal strip.
In addition, the chipping spaces of the grinding disc are cleaned which results in an improved surface on the work piece. Don't use a cooling emulsion, because the mixed-in water can squeeze the oil out of the pores of the sintered metal layer.
Alternatively, it can be ground dryly.

For the grinding of the slide plates to fit size, grind the slide plate from the rear side.



Optionally there is the possibility to grind the SNS sliding layer if there are damages. Not grind more than 0.5 mm, because the thickness of the layer in the delivery state is only 1.5 – 2.0 mm.
Absolutely reoil the surfaces as described.

The guide strips should be oiled with the synthetic lubricant for SNS guide elements Z9084.
This closes the pores.

By heating the lubricant to about 50 – 60 °C the process can be accelerated and the lubricant penetrates deeper in the pores of the SNS layer.

Oil the surface again after the grinding process.

5. Operating- and machining instructions

SNS-guide elements offer due to their properties concerning service life, machinability and wear, significant advantages compared to low-maintenance guide elements out of bronze with solid lubricant.
The SNS elements are a layer which is applied on a base carrier material. These surfaces behave differently in the handling than bronze surfaces. Some points should be considered in the handling to be able to use the product optimally.

Sintered metal surfaces react to impact loads. Here particles are dissolved from the surface and fill the pores. Marks on the surface occur. However, no accumulations arise which must be reworked.

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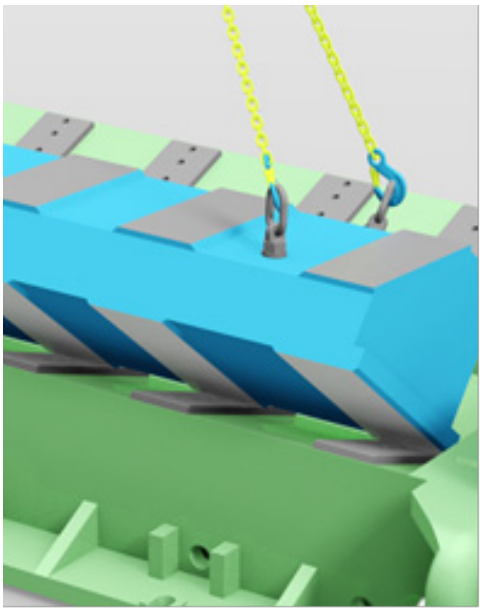
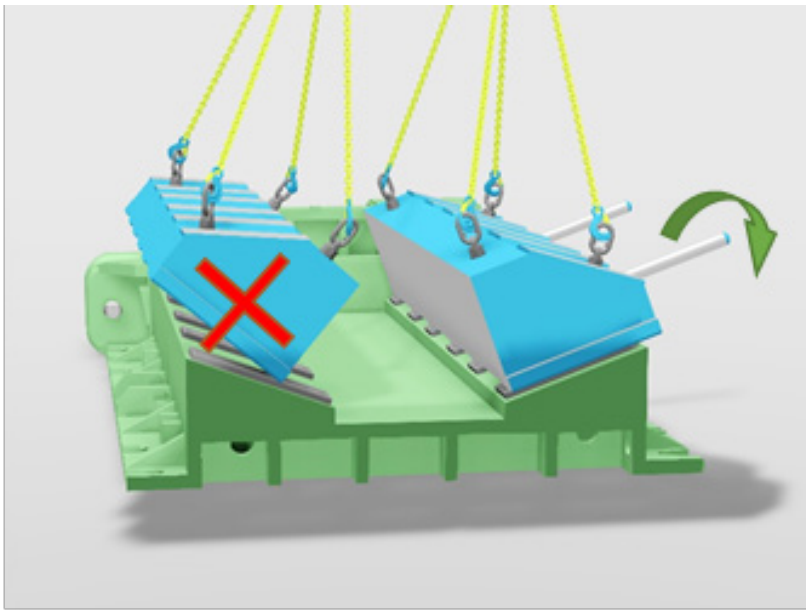
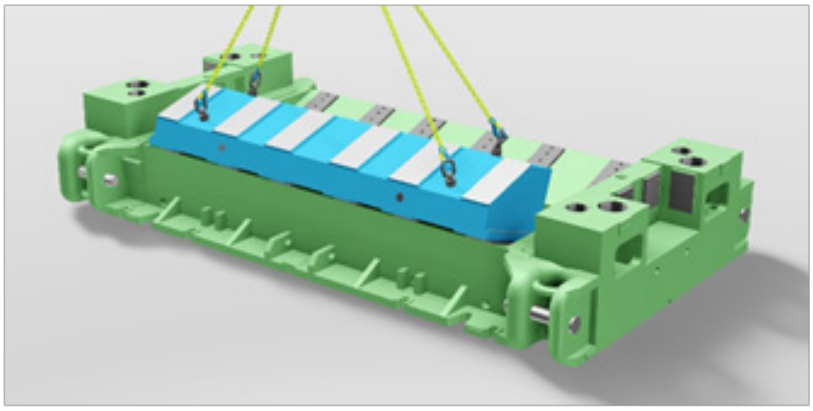
Tip:
Avoid damages of the slide plates due to edged placing of components, for example of a cam.







5.1 Slide couples

The slide plates are always in mesh with a slide partner out of hardened steel or a cast direct guidance.

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6. Maintenance and Care

SNS-sintered metal slide elements are low-maintenance. In normal operation, no additional maintenance measures are necessary.

Influences, however, such as cleaning of the tool or seals which are made for the transport can change the properties. Here an additional lubrication of the SNS slide elements increases the service life significantly.

An additional lubrication with an oil Z9084 reduces the frictional heat and the wear considerably. Also, the bearing service life increases by reduction of the number of abrasive particles and prevention of the influence of foreign particles (seal effect).
The lubrication reduces the noise generation and increases the corrosion protection.

In the state of delivery all SNS guide elements are soaked with oil Z9084.
This additionally reduces the drastic wear occurring during the initial operation.

According to the following operation conditions an additional lubrication is recommended.

For the optimal running performance, we recommend the following oil:

Lubricant	max.°C
STRACK Z9084	130

The relubrication intervals should be adapted to the operating conditions.
All SNS-bearing points should always be lubricated during the normal tool maintenance.

Alternative recommendations *(if not STRACK lubricants are available)*

Company	Oils	max.°C	Greases	max.°C
AGIP	Rotra ATF	100	Agip GR MU 2	120
BP	Autran DX III	100	Energrease	140
ESSO / Mobil	ATF 320	100	Nebula EP2	120
ESSO / Mobil	ATF 220	100	Beacon EP2	130
Castrol	ATF DEX II	100	Tribol GR 4020 PD	150
SHELL	Spirax S1 ATF TASA	80	Retinax LX	140

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7. Annex
7.1 Lubricant Z9084

Synthetic special lubricant for SNS Guide elements

Z9084	Basic: organic ester	**l**
Z9084-l		0.5
		1.0
		20.0

Synthetic special lubricant for SNS Guide elements

Technical data:	
Form	liquid
Density (15°C) DIN 51757	0.920 kg/l
Consistency agent	inorganic
ISO Viscosity class	68
SAE Viscosity class	30
Viskosity at 40°C	62.1 $mm^2 \cdot s^{-1}$
Viskosity at 100°C	11.4 $mm^2 \cdot s^{-1}$
Viskosity index	180
Optimal operating temperature range	-35°C - +130°C
Pour point	-54°C
Flash point COC	246°C
Evaporation loss 22h, 99°C	0.8 %

Operative ranges:

- Infiltration of sintered bearings
- Low friction bearings
- Manual or automatic lubricant supply
- Circulating lubrication
- Pressure lubrication

The product has no negative effects on seals, plastics or paints of Viton, Teflon, Perbunan with an acrylonitrile content > 30 %, epoxy resin lacquers, oil-resistant alkyd resins, polyamides, PET, PBT.

Not recommended are neoprene, SBR, perbunan with an acrylonitrile content < 30 %, acrylic lacquers, PVC, ABS.

Don't mix with other lubricants!

Characteristics:

- High viscosity index
- ISO VG 5 up to 100
- Wide operating temperature range
- High thermal, oxidative and chemical stability
- Excellent condensate separation
- Good detergent- and dispersion behaviour
- No tendencies to build oil dependent residues or deposits
- Good product compatibility with the materials in the modern toolmaking
- No foam formation
- Higher critical temperatures (about 40 - 60°C)
- Higher flash points and auto-ignition temperatures as mineral oils
- High polarity
- High shear stability
- Excellent wear protection
- High corrosion protection

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