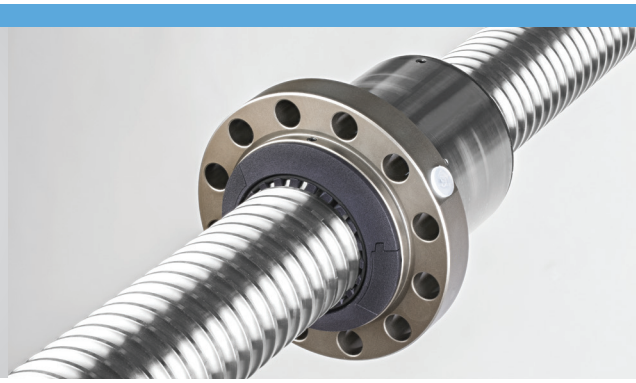
Technical Information March 2018
Lubrication and wipers for ball screws



Product development: New wipers with improved efficiency

Advantages offered by the new wipers

- A significant improvement in wiping with simultaneous reduction of friction.
- The natural felt wiper is replaced by a strip of synthetic felt based on PUR ester. This new material not only reduces friction between the wiper and the shaft, but it also has 5% better oil absorption capacity. The result is an improved lubricant supply to the ball screw.
- The previous method of attaching the wipers has been improved.
- The new design prevents the formation of deposits.

For ball screws, it is very important that the lubricant supply and the wiper or seals of the nut are matched to each other. In addition to the ambient conditions, the operating speeds and loads also influence the selection.

Segmented wipers are the standard in mechanical engineering applications. They reliably prevent the penetration of chips and coarse dirt particles, but allow a defined leakage of the lubricant. Together with an automatic oil or grease supply, this results in a certain flushing effect of ballnut, which achieves a high degree of operational reliability. The Steinmeyer portfolio includes both injection-moulded and laser-sintered versions. The unit is attached either using a screw connection or form fit.

Synthetic felt wipers are suitable for all Applications in which abrasive or otherwise problematic (such as oil-absorbent) dirt particles occur. Typical applications are grinding and wood-working machines.

Synthetic felt wipers seal the nut very efficiently against this type of troublesome dirt and at the same time serve as a lubricant reservoir. Steinmeyer offers four different versions depending on the type of nut and nominal diameter, which can be essentially differentiated by the attachment method.

Combination wiper - a combination of segment and felt wiper is used where problematic soiling occurs but exposure of the nut to water or water-based lubricants cannot be ruled out.

Steinmeyer offers two different versions of combination wipers:

1. Nuts with single thread ball recirculation, liner and Z-recirculation with nominal diameters from 20 to 160 mm use laser-sintered sleeves for the new synthetic felt and integrated segmented wiper. The wipers are fixed on both sides of the nut using special screws - the increase of nut length is minimal.

2. Laser-sintered sleeves for synthetic felt are suitable for nuts with external recirculation and nominal diameters from 32 to 100 mm. These are attached with a clamping element, which engages in the recess of the deflector; also here the increase in nut length is minimal.

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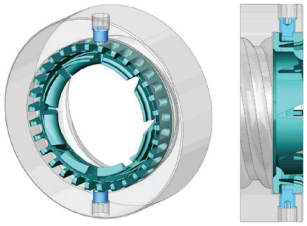
Wiper and wiper attachment: Segmented wiper

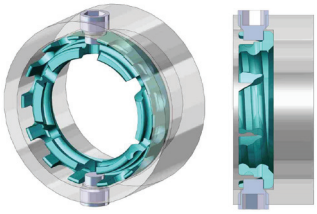
Group 1:

For nuts with: Single thread ball recirculation (1…) | deflection liner (8…) | Z-recirculation (9…)



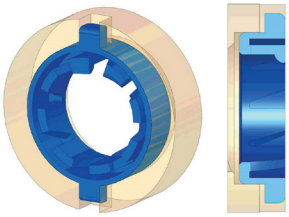
a) From nominal Ø20 up to nominal Ø160 (incl. nominal Ø16 from pitch 4)

Standard:
Injection moulded version with segments. Alternative: Laser-sintered version with segments.
Attachment using special screws with a mini head: Up to nominal Ø32: M4 /
from nominal Ø40: M5.



b) From nominal Ø8 to nominal Ø12 (incl. nominal Ø16 from pitch 3)

Standard:
Injection moulded version with segments.
Attachment with M3 grub screws.

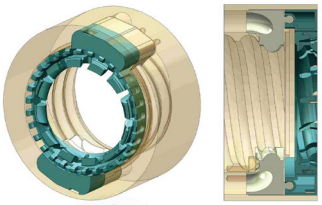


c) From nominal Ø3 to nominal Ø6

Standard:
Laser-sintered version.
Attachment using slots in the nut.

Group 2:

For nuts with: Axial recirculation



a) From nominal Ø32 up to nominal Ø100

Standard:
Injection moulded version with segments.
Attachment with clamping element.

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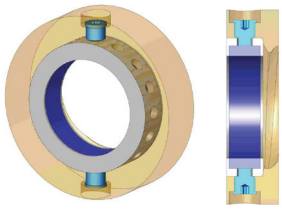
Wiper and wiper attachment: Synthetic felt wiper

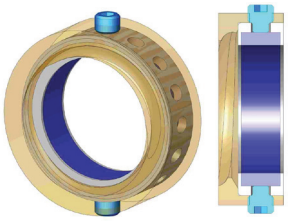
Group 1:

For nuts with: Single thread ball recirculation (1…) | deflection liner (8…) | Z-recirculation (9…)



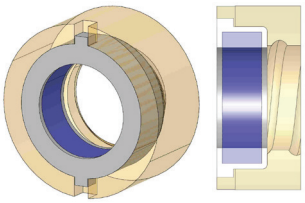
a) From nominal Ø20 up to nominal Ø160 (incl. nominal Ø16 from pitch 4)

Standard:
Laser sintered sleeve for synthetic felt.
Attachment with special screws with mini head: Up to nominal Ø32: M4 / from nominal Ø40: M5.



b) From nominal Ø8 to nominal Ø12 (incl. nominal Ø16 up to pitch 3)

Standard:
Laser-sintered sleeve for synthetic felt.
Attachment with M3 grub screws.

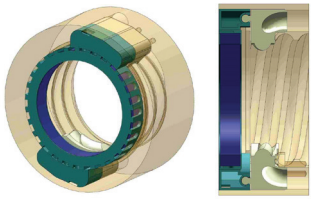


c) From nominal Ø3 to nominal Ø6

Standard:
Laser-sintered sleeve for synthetic felt.
Attachment via slots in the nut.

Group 2:

For nuts with: Axial recirculation



a) From nominal Ø32 up to nominal Ø 100

Standard:
Laser-sintered sleeve for synthetic felt.
Attachment with clamping element.

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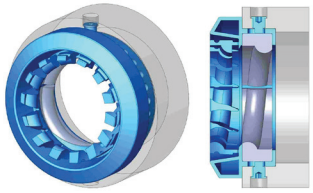
Wiper and wiper attachment: Combination wiper

Group 1:

For nuts with: Single thread ball recirculation (1…) | deflection liner (8…) | Z-recirculation (9…)

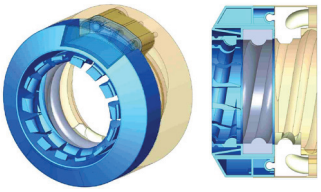


a) From nominal Ø20 up to nominal Ø160 (incl. nominal Ø16 from pitch 4)

Standard:
Laser-sintered sleeve for synthetic felt and integrated segment wiper.
Attachment using special screws with a mini head: Up to nominal Ø32: M4 /
from nominal Ø40: M5.

Group 2:

For nuts with: Axial recirculation



a) From nominal Ø32 up to nominal Ø100

Standard:
Laser-sintered sleeve for synthetic felt.
Attachment with clamping element.

Modification of the previous felt wipers to our combination wipers

Until now, the felt material used had a quality of T4 / 040 (density 0.4 g/ccm). These felt strips were provided with a negative profile of the specific spindle thread. In the production of these felt strips, however, a particular thread start cannot be maintaned due to the process. During assembly, this led to different degrees of friction between the felt strip and the spindle shaft.

This disadvantage can be eliminated by replacing these felt strips with a strip of synthetic felt (foam) – a type of “compressive foam” - on PUR ester base.

All necessary tests have been made to ensure resistance to ageing, media and temperature. The mechanical properties have also been adapted to our requirements.

Furthermore, it could be determined that the oil absorption capacity of this new material with a density of 0.2 g/ccm was approx. 5% higher than that of the previously used felt strip.

In our opinion there is nothing to be said against the use of this new material as a replacement for the existing felt strip. This change is not visible from the outside. We are gradually implementing this improved version.

The customer does not have to make any changes to his drawing, as the remark "internal felt wiper..." remains valid.

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