23 Adapter sleeves

More information

SKF maintenance products → skf.com/mapro

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Adapter sleeves are the most commonly used components for locating bearings with a tapered bore onto a cylindrical seat as they can be used on (**fig. 1**):

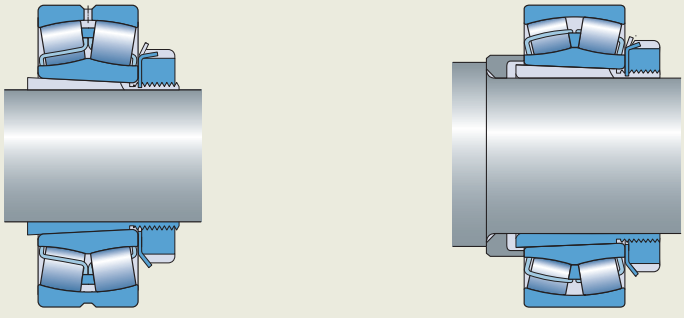
- plain shafts
- stepped shafts

They are easy to install and require no additional location on the shaft:

- When used on plain shafts, the bearing can be located at any position on the shaft.
- When used on stepped shafts together with an L-shaped spacer ring, the bearing can be accurately positioned axially, thereby facilitating bearing mounting and dismounting.

Fig. 1

Adapter sleeve assemblies



On a plain shaft

On a stepped shaft

Designs and variants

SKF supplies:

- metric adapter sleeves
  - with a metric bore
  - with an inch bore

    These sleeves are not listed in this catalogue, but can be found online at skf.com/go/17000-23-3.
- inch adapter sleeves

The sleeves are slit and are supplied complete with a lock nut and locking device (**fig. 2**):

- Smaller sizes have a nut and a lock washer.
- Larger sizes have a nut and a locking clip or locking plate.

Metric sleeves:

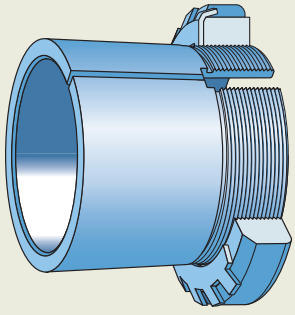
- with a bore diameter ≤ 180 mm (size ≤ 40) are phosphated
- with a bore diameter > 180 mm are coated with a solventless rust inhibitor

Inch sleeves are coated with a solventless rust inhibitor.

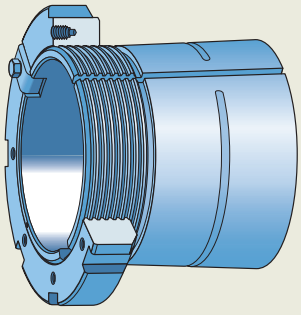
Adapter sleeves listed in the **product tables, page 1072**, constitute the standard SKF assortment and are only part of the complete assortment. For larger sizes (bore diameter ≥ 1 060 mm) and variants not listed, contact SKF.

Fig. 2

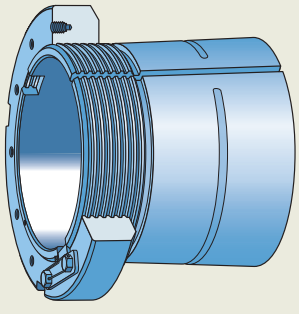
Basic designs



Sleeve with a nut and washer



Sleeve with a nut and clip



Sleeve with a nut and plate

Sleeves for oil injection

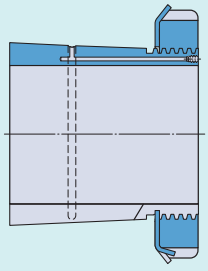
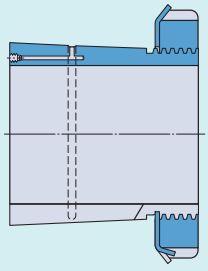
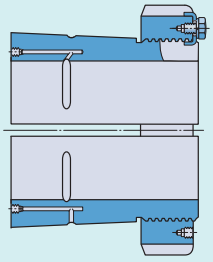
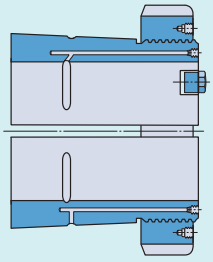
- enable use of the oil injection method to mount and dismount bearings
- are equipped with the necessary oil supply ducts and distribution grooves
  - as standard for metric sleeves with a bore diameter ≥ 200 mm (size ≥ 44)
  - on request for metric sleeves with a bore diameter ≥ 140 mm to < 200 mm
  - on request for inch sleeves with a bore diameter ≥ 4 5/16 inches (size ≥ 26)
- include OH (metric) series, and OSNW and OSNP (inch) series

Thread details for the oil supply ducts and the appropriate hydraulic nut designations are listed in the **product tables**, **page 1072**. For information about oil injection equipment, refer to the catalogue *SKF Maintenance and Lubrication Products* or online at skf.com/mapro.

SKF manufactures sleeves for oil injection in four variants (**table 1**). Those with a designation suffix H are the SKF standard.

Table 1

Adapter sleeves for oil injection

	 OH .. H OSNW .. H OSNP .. H	 OH .. OSNW .. OSNP ..	 OH .. B OSNW .. B OSNP .. B	 OH .. HB OSNW .. HB OSNP .. HB
Designation suffix	H	None	B	HB
No. of oil supply ducts[1] **for:**				
• all sleeves with a bore diameter < 200 mm	1	1	1	1
• metric sleeves with a bore diameter ≥ 200 mm	1	1	2	2
• inch sleeves with a bore diameter ≥ 4 5/16 inches (made to order)	1	1	2	2
Position of oil supply duct(s)	At the threaded end of the sleeve	At the end opposite the threaded section	At the end opposite the threaded section	At the threaded end of the sleeve
Position of distribution groove(s)	In the outside surface	In the outside surface	In the bore and in the outside surface	In the bore and in the outside surface

[1] When sleeves have two supply ducts, each duct feeds one of the distribution grooves. An arrow on the sleeve side face, next to the duct inlet, indicates which groove the duct feeds.

Sleeves for CARB toroidal roller bearings

- are specially designed to prevent the locking device from interfering with the cage

SKF manufactures sleeves for CARB toroidal roller bearings in three variants (fig. 3):

- **Sleeves with the designation suffix E**
  - are supplied with a KMFE lock nut in place of the standard KM lock nut and MB lock washer
  - are supplied with an HME lock nut in place of the standard HM 30 or HM 31 lock nut
- **Sleeves with the designation suffix L**
  - are supplied with a KML lock nut and MBL lock washer, both with low cross-sectional height, in place of the standard KM lock nut and MB lock washer
- **Sleeves with the designation suffix TL**
  - are supplied with an HM 30 lock nut and MS 30 locking clip, both with low cross-sectional height, in place of the standard HM .. T lock nut and MB lock washer

When using CARB bearings, check that there is sufficient space on both sides of the bearing to accommodate axial displacement.

Sleeves for sealed bearings

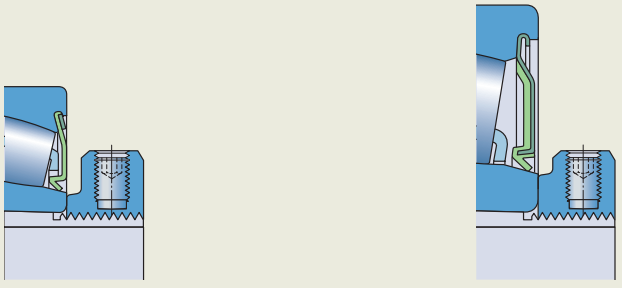
- are specially designed to prevent the locking device from interfering with the seals of sealed spherical roller bearings and sealed self-aligning ball bearings
- have the designation suffixes E, EL, EH, L, and TL (fig. 3 and fig. 4)

Adapter sleeve assemblies with the designation suffix EL or EH are supplied with one of the following, respectively:

- a KMFE .. L lock nut, which has a lower abutment diameter than the standard KMFE lock nut
- a KMFE .. H lock nut, which has a higher abutment diameter than the standard KMFE lock nut

Fig. 4

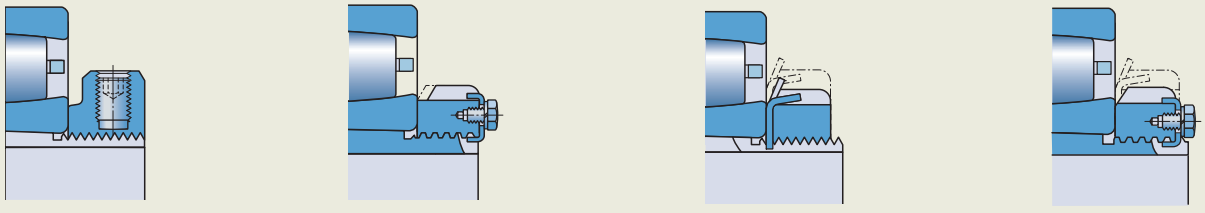
Adapter sleeve assemblies for sealed bearings (with a KMFE lock nut)



EL EH

Fig. 3

Adapter sleeve assemblies for CARB toroidal roller bearings



E (with a KMFE nut) E (with an HME nut) L TL

24 Withdrawal sleeves

Withdrawal sleeves are slit tapered sleeves (**fig. 1**), which can be used to mount bearings with a tapered bore onto a cylindrical seat of stepped shafts (**fig. 2**). The sleeves are pressed into the bore of the bearing inner ring, which abuts a shaft shoulder or similar fixed component. They are located on the shaft by a nut or an end plate.

The standard assortment of SKF withdrawal sleeves is available online at skf.com/go/17000-24-1 and comprises:

- basic design sleeves (**fig. 1**)
- sleeves for oil injection (**fig. 3**)
- sleeves for shaft diameters up to 1 000 mm

Withdrawal sleeves are not listed in this catalogue. Comprehensive information about SKF withdrawal sleeves is available online at skf.com/go/17000-24.

Fig. 1

Withdrawal sleeve, basic design

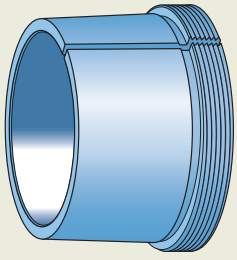


Fig. 2

Withdrawal sleeve on a stepped shaft

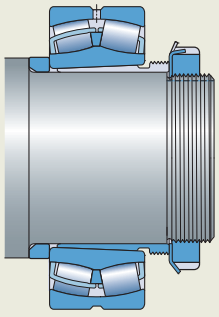
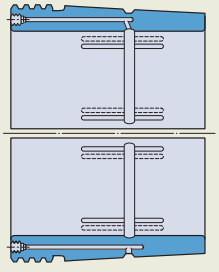


Fig. 3

Withdrawal sleeve for oil injection



25 Lock nuts

Lock nuts are used to locate bearings onto a shaft. Additionally, they can be used to mount bearings with a tapered bore onto tapered shaft seats and adapter sleeves, and to dismount bearings from withdrawal sleeves. Lock nuts are also frequently used to secure gears, belt pulleys and other machine components.

Lock nuts have to be secured to prevent unintentional loosening by:

- a locking device that engages a keyway in the shaft or key slot in the adapter sleeve, or
- a locking mechanism integrated in the nut

When choosing or replacing a lock nut, there are a number of factors that should be taken into consideration. They include, but are not limited to:

- Space – axial and radial
- Shaft rotation – one or both directions
- Axial loads
- Dynamic behaviour of the application
- Cost and downtime of machining keyways in shafts vs. other locking methods
- Ease and frequency of assembly and disassembly
- Precision

Designs and variants

SKF lock nuts provide a variety of ways to secure the nut onto a shaft. The lock nuts listed here constitute the basic SKF assortment. Lock nuts with other locking methods can be supplied on request. For additional information, contact SKF.

The following tables provide an overview over the basic SKF assortment:

- **table 1** for SKF industrial lock nuts
- **table 2**, **page 1092** for SKF precision lock nuts

Lock nuts with integral locking reduce the cost of the shaft as no keyway is required. Installation is quicker and easier because no separate locking device is necessary. However, the loosening torque of these lock nuts requires more attention. For information on loosening torque, refer to *Product data*, **page 1098**.

Table 1

SKF industrial lock nuts

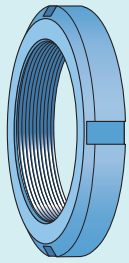
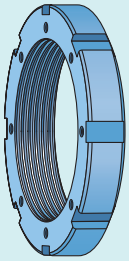
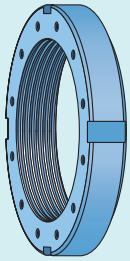
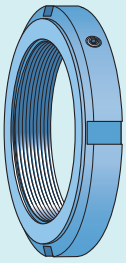
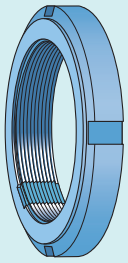
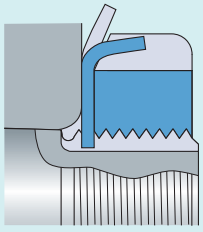
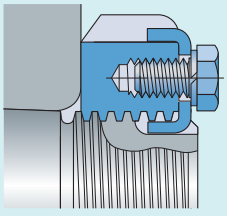
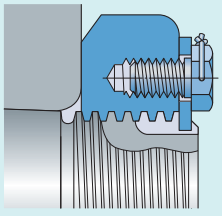
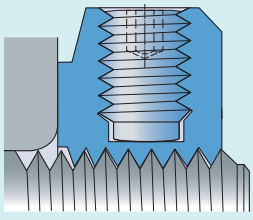
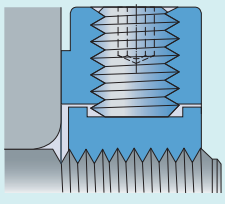
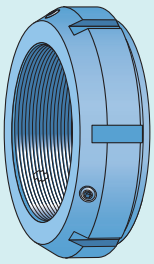
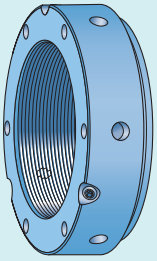
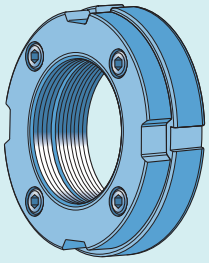
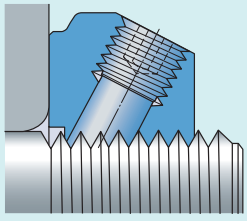
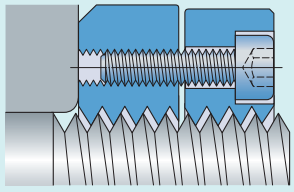
				
KM, KML, HM .. T, AN and N Lock nuts with a lock washer	**HM and HME** Lock nuts with a locking clip	**N** Lock nuts with a locking plate	**KMFE** Lock nuts with an integral locking screw	**KMK** Lock nuts with an integral locking device
KM and KML: thread 10 to 200 mm (sizes 0 to 40) **HM .. T:** thread 210 to 280 mm (sizes 42 to 56) **AN and N:** thread 0.391 to 8.628 in. (sizes: N 00 to N 14, AN 15 to AN 40 and N 022 to N 044) These lock nuts are not listed in this catalogue, but can be found online at skf.com/go/17000-25-8.	thread 220 to 1 120 mm (sizes 44 to /1120) HME design lock nuts are not listed in this catalogue, but can be found online at skf.com/go/17000-25-3.	thread 9.442 to 37.410 in. (sizes 056 to 950) These lock nuts are not listed in this catalogue, but can be found online at skf.com/go/17000-25-8.	thread 20 to 200 mm (sizes 4 to 40)	thread 10 to 100 mm (sizes 0 to 20) These lock nuts are not listed in this catalogue, but can be found online at skf.com/go/17000-25-5.
A simple, stable and reliable fastening element	A simple, stable and reliable fastening element	A simple, stable and reliable fastening element	Fastened with an integral locking screw and front face adapted for use with certain CARB and sealed bearings	Fastened with a threaded steel insert and a grub screw
Reusable with new locking device	Reusable with new locking device	Reusable with new locking device	Reusable	Reusable
Simple to install and remove	Simple to install and remove	Simple to install and remove	Simple to install and robust locking	Simple to install
Keyway in shaft thread required for lock washer	Keyway in shaft thread required for locking clip	Keyway in shaft thread required for locking plate	For shaft threads without keyways	For shaft threads without keyways
Locking principle				
				
Locks with a separate lock washer engaged in a keyway in the shaft thread and having a tab that is bent over into one of the slots in the nut	Locks with a separate locking clip that is attached to the nut and engages with a keyway in the shaft thread and one of the slots in the nut	Locks with a locking plate that engages with a keyway in the shaft thread and is secured to the nut by two screws and locking wire	Locks by tightening the grub screw to press the lock nut thread against the shaft thread	Locks by tightening the grub screws to press a threaded steel insert in the lock nut against the shaft thread

Table 2

SKF precision lock nuts

		
KMT Precision lock nuts with locking pins	**KMTA**	**KMD** Precision lock nuts with axial locking screws
thread 10 to 200 mm (sizes 0 to 40) Larger sizes on request	thread 25 to 200 mm (sizes 5 to 40)	thread 20 to 105 mm (sizes 4 to21) These lock nuts are not listed in this catalogue, but can be found online at skf.com/go/17000-25-6.
Maximum axial run-out between the locating face and thread: 0,005 mm		Maximum axial run-out between the locating face and thread: 0,005 mm
Can be adjusted to compensate for slight angular deviations		Effective axial locking, simple to position
Reusable		Reusable
Simple to install and remove		Simple to install and remove
For shaft threads without keyways		For shaft threads without keyways
Designed for frequent installation and removal		Designed for frequent installation and removal
High axial load capacity		

Locking principle

	
Locks to the shaft thread by friction generated by tightening three radial locking pins with grub screws against its unloaded flanks	Locks to the shaft thread by friction generated by tightening four axial screws that press the rear part of the nut against the unloaded thread flanks