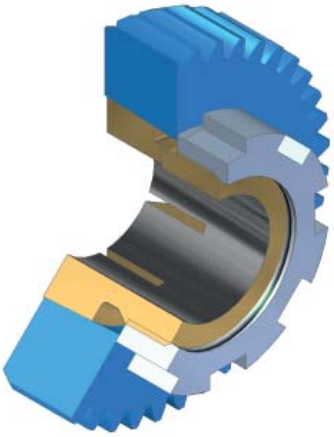
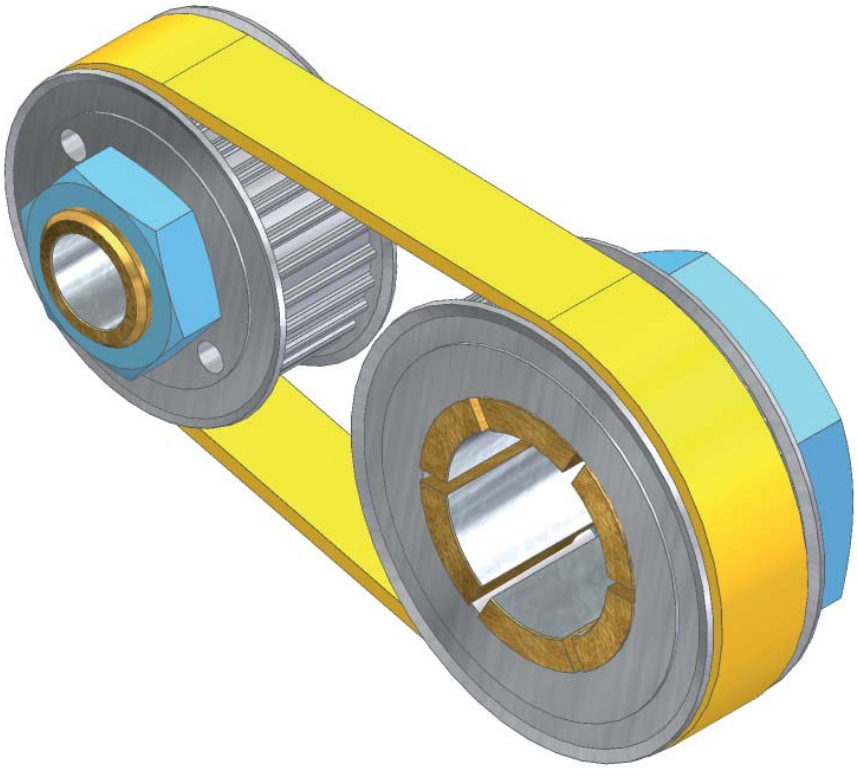
bodo® Tec





Products

2016

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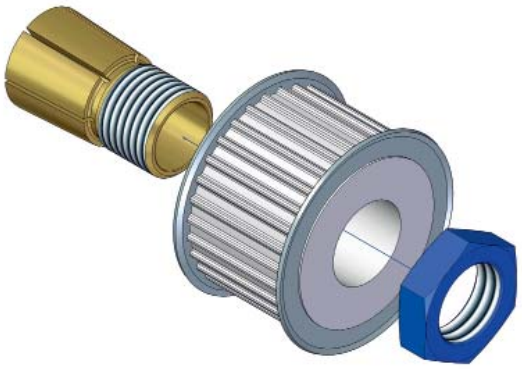
BOQA® Fastening Elements - state-of-the-art shaft-/hub connections

BOQA® fastening elements, also known as ‚clamping sleeves' or ‚clamping collets', were developed by Georg F. Boda and introduced to the market in 1993.

Georg F. Boda was inspired to work on this project by the fact that expensive drive solutions often failed due to disconnected shaft-hub connections on chain or toothed belt components.



These problems were further increased by developments in the field of linear technology with the advent of more powerful stepper motors which featured faster acceleration, reverse operation, etc..

The rapidly increasing demands of modern drive technology needed to be met with future-oriented, safe, reliable, and easely applicable drive solutions.

BOQA® fastening elements meet requirements with regards to:

- ☆ reliability: longevity through force-fitted connection
- ☆ easy handling: no special tools required
- ☆ precision: elements are machined with a concentricity telerance of 0,01 mm
- ☆ extremely broad product range: great variety in application options (see figure 1 on page 7)

Today, **BOQA®** fastening elements are integral parts of drive technology components and meet the highest requirements

BOQA® fastening elements are also constantly improved by **bodaTec®** GmbH, the company of developer Georg F. Boda. **bodaTec®** GmbH receives valuable input from its network of distribution partners and international top-class customers. This feedback provides further inspiration to increase the range of applications for **BOQA®** fastening elements, to adapt them to rapidly changing technical requirements, and to develop new solutions..

BOQA® *fastening elements incorporate the classic advantages of shaft-hub connection:*

- ☆ easy assembly
- ☆ shaft-hub connection without backlash
- ☆ resistant against extreme load changes
- ☆ no preparations required at the shaft or hub (milling or broaching of grooves)
- ☆ flexible positioning on the shaft, both axially and radially

BOQA® fastening elements also provide additional advantages often developed in collaboration with the users:

BOQA® fastening elements...

- ☆ are normally manufactured using stainless steel. This prevents fretting corrosion and enables effortless disconnection of shaft and hub for maintenance purposes, even after long periods of operation. Maintenance time is reduced.
- ☆ are self-centring and have a precise concentricity of 1/100 mm. Vibrations are reduced to a minimum, imbalances are prevented and drive components are protected from wear.
- ☆ are delivered with fitted, fine-threaded hex nuts for fastening. Nuts are made from galvanised steel; nuts made from stainless steel are available on request for an additional charge. Special nuts are also available.
- ☆ are available for shaft diameters starting from 1.5 mm. The maximum for shaft diameters actually is 60 mm.
- ☆ are also available for shaft diameters in standard inch sizes.
- ☆ are unusually compact, permitting the connection of hubs (belt pulleys, gears, sprockets, etc.) with a relatively small outer diameter (tip diameter) to relatively ‚thick' shafts (see figure 4 on page 8).
- ☆ are supplied with an integrated taper bearing at the thread for counter bearing of small shaft diameters (optionally with an inner ring pressed on for needle bearings). This helps reduce the shaft bending load during tensioning of a toothed belt and prevent downtimes due to material fatigue (see figure 5 on page 8).
- ☆ are available with integrated hex socket at the thread or at the taper bearing to provide stability when fastening the nut with a hex key (simply add „**-ISK**" to the order number, see figure 7 on page 8).
- ☆ can be supplied without a thread for use in special assemblies (more details on request).
- ☆ are available with an inside thread for use in special assemblies (more details on request).

BOQA® Fastening Elements – state-of-the-art shaft-hub connections

BOQA® fastening elements ...

- ☆ offer many more advantages for users, such as our ***broad product range***:

BOQA® fastening elements ...

- ☆ are organised in many different product groups. Every product group covers a specific range of shaft diameters, so that hubs (e.g., belt pulleys, gears, sprockets, etc.) can be connected to different shaft diameters by using a standard inner hub bore corresponding to diameter „**D2**“ of the **BOQA®** fastening elements within the product group. Simply select the corresponding **BOQA®** fastening element for the required shaft diameter from the product group.

Fig.: 1 Product range of **BOQA®** fastening elements based on ***GROUP 2350***

- ☆ are also available for different hub widths. No limits are imposed on users when it comes to their choice of belt pulley width to ensure the optimal design of their planned drive.

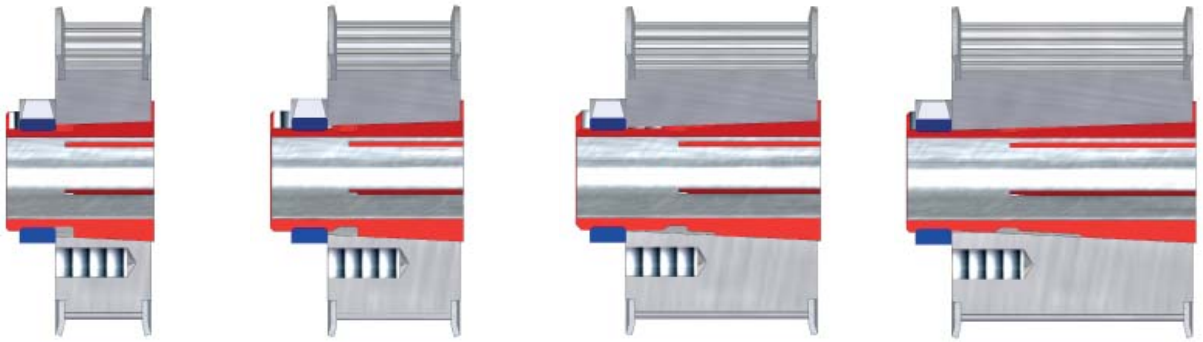


Fig.: 2 Hub width range that can be connected to shafts using the standard versions of **BOQA®** fastening elements based on ***GROUP 2350***

- ☆ are also available from **bodaTec®** GmbH and our distribution partners as ready-to-use assemblies, comprising the **BOQA®** fastening element, fastening nut and the appropriate hub for the use case specified by the customer.

The toothbelt-timing pulleys within the product groups are normally standard toothed pulley-versions adapted to **BOQA®** fastening elements or customised versions tailored to user requirements.

Customised toothbelt-timing pulleys are primarily custmer-specified versions of toothbelt-pulleys, gears, sprockets, or other hubs intended to be connected to a shaft via a **BOQA®** fastening element.

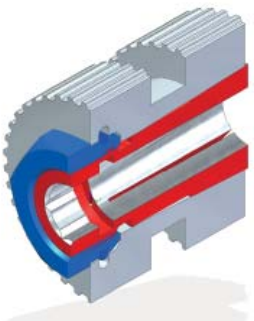


Fig.: 3 Customer-specified belt pulley, sectional view on the right.
The design consists of an **BOQA®** fastening element and a fastening nut.
The assembly also includes an integrated disconnection system developed by **bodaTec®** GmbH for easy removal of the **BOQA®** fastening element retention where disassembly of the toothbelt-pulley is necessary.
Disconnection of the fastening nut automatically also removes the clamping sleeve retention and the toothbelt-pulley module can be easily removed manually from the shaft. This procedure ensures that neither shaft nor other components are damaged mechanically. The hex socket integrated in the fastening element thread provides additional stability when fastening the nut. The hex socket is represented in the item numbers of **BOQA®** fastening elements with the suffix „**ISK**“.

BOQA® Fastening Elements – state-of-the-art shaft-hub connections

BOQA® fastening elements are available in many different versions. They are continuously adapted to the requirements of our customers with regards to reliability, longevity, versatility and easy handling. They provide an economic and safe solution for the challenges of drive technology as demonstrated in the following examples.

BOQA® fastening elements are available for instance...

☆ as a compact assembly without interfering protrusions. The assembly comprises a **BOQA®** fastening element, special nut and integrated disconnection system that enables removal of taper retention and easy disassembly for drive assembly maintenance.

This version is ideal for the realisation of belt redirections in very tight spaces.

This highlights another important advantage of **BOQA®** fastening elements: the favourable ratio between outer diameter **D2** and inner diameter **d1** allows you to fasten toothbelt-pulleys with a low number of teeth (i.e., a relatively small tip diameter) on relatively thick shafts.

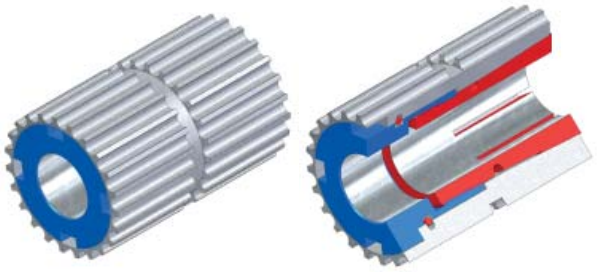


Fig.: 4 Belt pulley assembly with integrated forcing system

☆ as a customised version with an integrated taper bearing to reduce bending load for thin shafts, spindles, etc., when tensioning the toothed belt, and to prevent breakage at the journal due to material fatigue, especially during regular operation.

Counter bearings can be realised inside the housing of the drive enclosure as needle bearings, grooved ball bearings or plastic / bronze bushings.

When the housing is opened the counter bearing neutralises the forces affecting the belt pulley when tensioning of the toothed belt to increase the drive's service life substantially and to counteract machine failure.

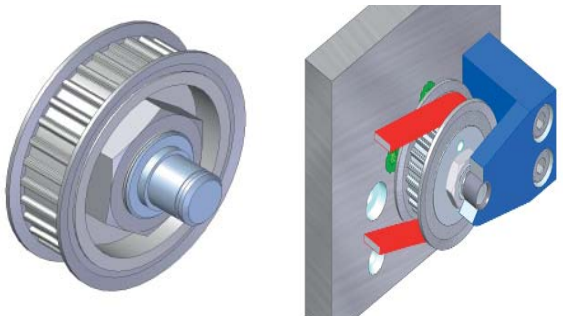


Fig.: 5 Different versions of **BOQA®** fastening elements with integrated counter bearing.

☆ as versions for continuous shafts, i.e., hubs can be positioned flexibly along the shaft due to a continuous bore (seat H7) on the **BOQA®** connection element (see figure 6 on page 8).

Alternatively, **BOQA®** fastening elements can be supplied as a version for connection to shaft ends or tapers with a blind bore (seat H7) and a hex socket integrated into the thread.

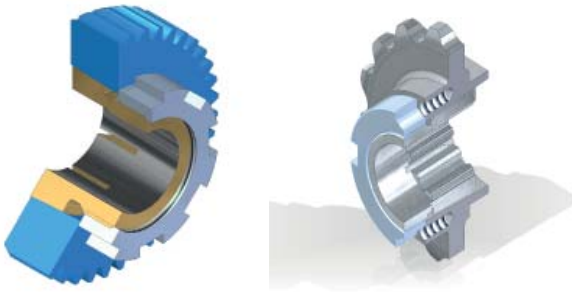
The hex socket provides additional stability when fastening the nut with a hex key (see figure 7 on page 5).

Fig.: 6 **BOQA®** standard fastening element version

Fig.: 7 **BOQA®** fastening element with hex socket

☆ as customised versions to meet requirements for specific shaft-to-hub connections (see figure 3 on page 7).

Due to their great versatility, **BOQA®** fastening elements are not just used to connect belt pulleys to shafts, they are also the first choice for safely incorporating gears or sprockets to form secure shaft-hub connection, as shown in the figures on the right.



BOQA® Fastening Elements – technical information

Tips for easy assembly and disassembly:

Due to their tapers, **BOQA®** fastening elements are self-centring and are exceptionally safe for the permanent connection of hubs on cylindrical shafts.

These are the obvious advantages of a conical, force-fitted connection element.

However, these benefits also include the ‚disadvantage' of taper retention which can frequently pose a problem for disassembly when a worn belt pulley needs to be replaced after a long period of operation.

bodaTec® GmbH has given this issue much thought and dedication. Our customers who would like to use **BOQA®** fastening elements as part of a ready-to-use assembly, together with a hub (e.g., tooth lock washer), are spoilt for choice between the following solutions:

1. The basic solution

bodaTec® GmbH provides a standard toothbelt-pulley – width, number of teeth, tooth geometry, etc. based on customer specifications – with a conical inside bore matching the respective **BOQA®** fastening element (see figure 1 on page 7), including the **BOQA®** fastening element ordered by the customer and a standard fastening nut.

For disassembly we recommend the use of a commercially available gear puller, as depicted in figure 8, to release the **BOQA®** fastening element retention and remove the hub module from the shaft.

We recommend the following procedure:

Unscrew the fastening nut approx. 3 full rotations (do not remove from the **BOQA®** fastening element thread!), then position the gear puller so that the rod applies pressure directly on the fastening nut (***but not the drive shaft!***) via an inserted pressure piece (shim or similar).

Pressure from the rod releases the taper retention with a crack and the belt pulley can then be manually removed from the shaft together with the **BOQA®** fastening element.

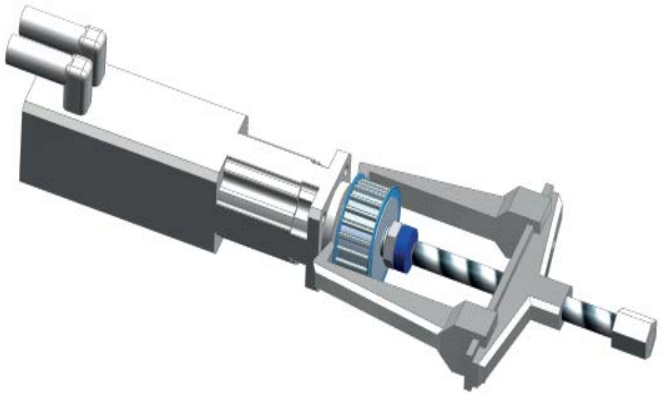


Fig.: 8 The disconnection procedure: releasing the **BOQA®** fastening element retention using a commercially available gear puller

2. The economic solution

bodaTec® GmbH supplies the belt pulley ordered by the customer with two opposing threaded bores (blind bores) on the side of the fastening nut in addition to a conical inside bore matching the applicable **BOQA®** fastening element (see figure 9 on this page).

These bores are positioned on a pitch circle diameter for the spanner size of the fastening nut so that a socket head screw **DIN 912** can be screwed into the thread on each side next to the nut's contact surfaces (see figures 10 to 13 on page 10).

CAUTION: The nut has to be loosened first by **2 - 3** full rotations before disassembly and adjusted so that the opposing contact surfaces are positioned orthogonally to the bores inside the thread.

The length of the required screws can be determined using the following rule of thumb:

Thread length = ***nut length + 3 mm*** (distance between nut and the tooth lock washer's front surface after loosening by 2-3 rotations) ***+ 4 mm*** (depth of insertion of screws in the threaded bores).

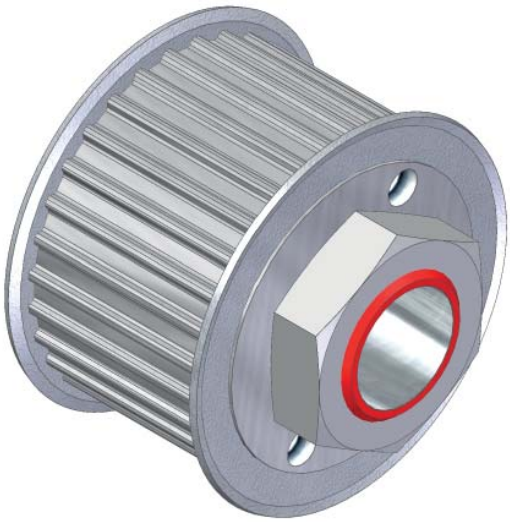


Fig.: 9 Belt pulley with **BOQA®** fastening elements as a ready-to-use assembly with 2 forcing thread bores

Procedure for disassembly:

Loosen the fastening nut of the **BOQA®** fastening element approx. **2 - 3** full rotations (figure 10; the exact number of rotations may vary due to the thread pitch of the respective nut) leaving a space of **2 - 4,5** mm between nut and front surface of the belt pulley.

Fig.: 10 Fastening nut loosened by about 2-3 full rotations

Fig.: 11 First forcing screw positioned

Fig.: 12 Second forcing screw positioned

Fig.: 13 Retention released, assembly can be removed

Then align the fastening nut in a way that two opposing contact surfaces of the hex nut are positioned orthogonally to the two bores inside the thread (figure 10).

Now manually screw the first socket head screw (**DIN 912**) into the thread until the lower edge of the cylindrical head is aligned with the front surface of the hex nut (figure 11).

Then manually screw the second socket head screw (**DIN 912**) into the thread until the lower edge of the cylindrical head is aligned with the front surface of the hex nut (figure 12).

Tighten both screws evenly using a hex key until the retention of the **BOQA®** fastening element comes loose with an audible crack.

The belt pulley module can then be removed manually from the shaft without any damage (figure 13).

CAUTION:

Smaller belt pulley assemblies that require forcing thread screws with an **M3** thread also require the use of an additional forcing plate (see figures 15 - 17 on this page) to prevent the forcing screws from shifting out of position and to make the disconnection procedure reliable and safe.

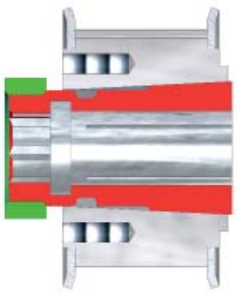


Fig.: 14 Fastening nut loosened by about 2-3 full rotations

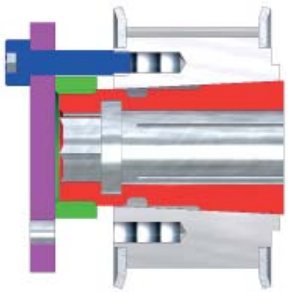


Fig.: 15 First forcing screw with forcingplate positioned

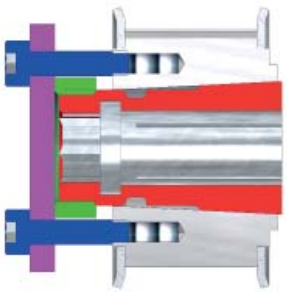


Fig.: 16 Second forcing screw with forcingplate positioned

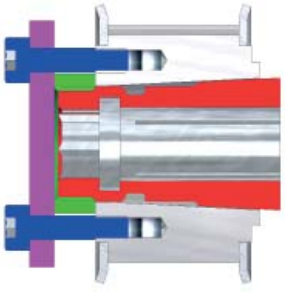


Fig.: 17 Retention removed and module can be removed

3. The premium solution, more expensive but with the easiest handling

bodaTec® GmbH has created a method to release the taper's retention together with the fastening nut.

In this approach the mechanism for releasing the retention is already integrated into the belt pulley module.

Tightening the fastening nut causes the required hub clamping on the shaft, loosening the fastening nut releases the retention when it is unscrewed even further.

Note: This substantially reduces maintenance time and outlay and prevents damage when disconnecting the shaft and hub

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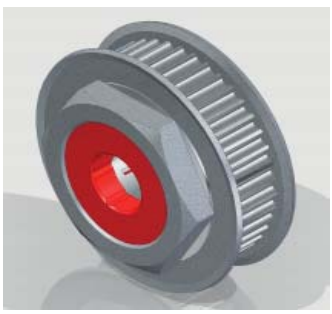

Fig.: 18 Belt pulley assembly with integrated forcing system

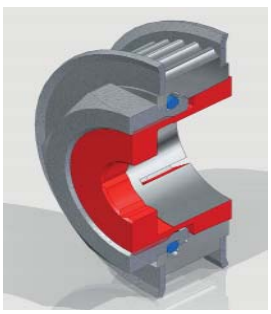

Fig.: 19 Belt pulley assembly (sectional view)

BOQA® Fastening Elements – selling points

Good reasons to use BOQA® fastening elements by bodaTec® GmbH:

BOQA® fastening elements, also known as **BOQA®** clamping collets, have been on the market since 1993. They offer numerous advantages for connecting various hubs to cylindrical shafts or tapers.

They meet all customer requirements regarding quality and precision, as well as longevity and easy handling.

Products using **BOQA®** fastening elements evidence high reliability and significantly increased service life compared to products using conventional shaft-to-hub connections.

BOQA® fastening elements ....

- ☆ are manufactured with highest precision and feature a concentricity of 0.01 mm
- ☆ are always manufactured from stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9)

  Customers know that their shaft-hub connections can be easily released, even after years of operation, as fretting corrosion is avoided when using **BOQA®** fastening elements.
- ☆ can be supplied for almost every shaft diameter between 1.5 mm and 60.0 mm, and for every hub width between 6.0 mm and 100.0 mm
- ☆ are equally suitable for the connection of toothed or cogged belt pulleys, eccentrics, control cams, sprockets and sprocket wheels, etc.
- ☆ have continuously been improved and developed since 1993, and come in a wide range of versions and almost all required dimensions, such as:
  - ♦ continuous bores (seat H7 at the unslotted end)
  - ♦ blind bores and hex sockets for increased stability when fastening the nut
  - ♦ blind bores and integrated counter bearings on the thread to fit an inner ring for a needle bearing
  - ♦ blind bores and integrated counter bearings on the thread with bearing seat for a grooved ball bearing

    Counter bearing is recommended for small shaft diameters to reduce the shaft bearing load when tensioning the toothed belt, minimising risk of machine failure, e.g., due to breaking of the journal
- ☆ are extremely compact and can be used for belt pulleys with a small tip diameter, even in tight spaces where conventional connection systems cannot be used due to their bulk and design
- ☆ facilitate assembly as they are self-centring

  They reach the exact position as soon as the nut has been slightly tightened. This allows for fine alignment before the final connection

  Uncontrolled slipping of the connection element within the hub, which can happen with cylindrical connection elements used in a cylindrical bore inside the hub, is not possible
- ☆ provide secure transmission of power

  The taper retention prevents unintentional disconnection of the shaft and hub, increasing drive component reliability and reducing drive unit downtimes to a minimum

  Additional fastening nut securing is not necessary
- ☆ are fully resistant against extreme load changes, providing optimal safety during reversing operations in modern linear systems

  Shaft-hub connections with **BOQA®** fastening elements are also resistant against abrupt acceleration/braking forces produced by powerful stepper motors
- ☆ will not evidence wear out or play even after a long, high-stress operating life

  Shaft-hub connections using **BOQA®** fastening elements will remain play-free over their entire service life
- ☆ can be reused with a new hub when the old hub has worn out
- ☆ will always provide a suitable shaft-hub connection for the intended purpose due to our wide product range and will actively help to reduce storage costs

BOQA® Fastening Elements – selling points

BOQA® fastening elements are organised in product groups:

Group designation is based on the diameter ‚**D2**', the largest diameter at the front taper end of the clamping sleeve

Each product group includes **BOQA®** fastening elements with identical outer dimensions but with different inner bores. I.e., a hub with an inner bore = **D2** of the **BOQA®** fastening elements can be connected to different shaft diameters by simply changing to the corresponding **BOQA®** fastening element from those available within this product group

This results in greatly reduced storage requirements for pre-bored hub designs, e.g., belt pulleys, and saves money

All without hindering material storage space for regular production requirements

☆ can be delivered as ready-to-use pre-packaged belt pulley assemblies by **bodaTec®** GmbH and our distribution partners

Customers can choose from three different options:

- *Option 1, the basic solution*

  bodaTec® GmbH supplies a standard belt pulley together with the requested **BOQA®** fastening element

- *Option 2, the economic solution*

  bodaTec® GmbH supplies a standard belt pulley with two integrated threaded bores for easier release of taper retention via two forcing screws in case of disassembly

- *Option 3, the premium solution with optimal integration*

  bodaTec® GmbH supplies a complete ready-to-use belt pulley assembly – specially developed by **bodaTec®** GmbH – which already includes the complete release mechanism for the taper retention

  In this option connecting the belt pulley to the shaft is as easy as disassembly. Loosening the fastening nut also automatically releases the tapers retention and the belt pulley module can be completely and easily removed manually from the shaft

☆ can naturally be supplied as special designs, developed in coordination with the customer

- **bodaTec®** GmbH supports their distribution partners in finding individual solutions for customer requests with competent advice
- On request, **bodaTec®** GmbH can develop solutions for their distribution partners and provide **CAD** models for their customers
- **bodaTec®** GmbH delivers customised solutions for higher cost efficiency and customer satisfaction

☆ and, last but not least, small sample quantities can be delivered ex-stock within a few days; delivery times for larger quantities lie between two and four weeks after the order has been received

Please contact us directly for further information about **BOQA®** fastening elements, samples, etc., at:

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Postbox 12 51
72646 Wolfschlugen

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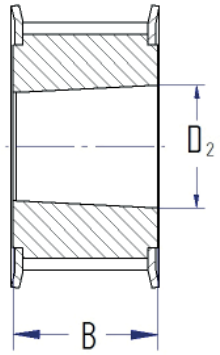
Email : bodatec.gmbh@t-online.de
Internet: www.boda-online.com

DBGM
DBP
bodaTec-Form-Nr.: 94 07 845 / 94 10 725
: 44 16 292.8
: boqa2016.idd

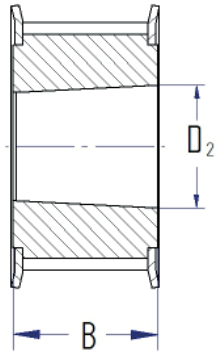
Product range - overview BOQA®-group 0950



D2 = 9,50 mm

shaft-ø	B = 6,00 mm	B = 9,00 mm	B = 10,00 mm	B = 12,00 mm
		BOQA® - Article-No.:		
4,00 mm	10023A-4k	10023A-4	10023-2013-4	11023A-4
4,00 mm	10023-4kz		10023-4z	
4,00 mm			10225-4skr	
5,00 mm	10023A-5k	10023	10023-2013-5	11023
5,00 mm	10023-k	10023A-5		11023A-5
5,00 mm				
6,00 mm	10023A-6k	10023A-6	10023-2013-6	11023A-6
6,00 mm				
6,00 mm				
6,00 mm				
6,00 mm				
6,00 mm				
6,35 mm	10023A-6.35k	10023A-6.35	10023-2013-6.35	1023A-6.35
6,35 mm				
6,35 mm				

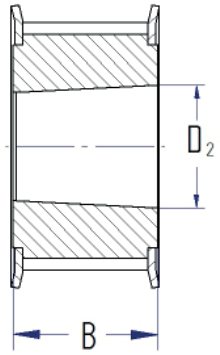
Product range - overview BOQA®-group 0950



D2 = 9,50 mm

shaft-ø	B = 13,00 mm	B = 14,00 mm	B = 16,00 mm	B = 19,00 mm
		BOQA® - Article-No.:		
4,00 mm	10024A-4S	11024A-4	10024-4z VE	
4,00 mm			10024-4	
4,00 mm			10024A-4	
5,00 mm	10024A-5S	10024	10024-5z VE	10025
5,00 mm	10024-S	11024A-5	10024	
5,00 mm			10024A-5	
6,00 mm	10024A-6S	11024A-6	10024-6z VA	
6,00 mm			10024-6	
6,00 mm			10024-6skr	
6,00 mm			10024-6L-ISK	
6,00 mm			10024-6Lskr	
6,00 mm			10024A-6	
6,35 mm	10024-6.35	10024A-6.35	10024-6.35z	
6,35 mm	10024A-6.35S		10024A-6.35	
6,35 mm			10024-6.35Lskr	

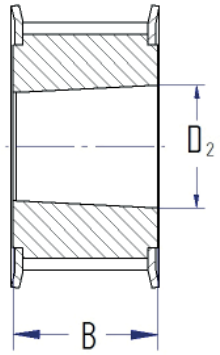
Product range - overview BOQA®-group 1130



D2 = 11,30 mm

shaft-ø	B = 8,00 mm	B = 10,00 mm	B = 12,00 mm	B = 16,00 mm
		BOQA® - Article-No.:		
5,00 mm	11025k	10128ma	10128	10129S
5,00 mm	11025k-ISK	11025	10128-ISK	10129S-ISK
5,00 mm		11025-ISK		
6,00 mm	11130k	11130	10132	10133S
6,00 mm	11130k-ISK	11130-ISK	10132-ISK	10133S-ISK
6,00 mm				
6,00 mm				
6,00 mm				
6,00 mm				
6,35 mm	11134k	11134	10075	10076S
6,35 mm	11134k-ISK	11134-ISK	10075-ISK	10076S-ISK
6,35 mm				
7,00 mm	11077k	11077	10146	10147S
7,00 mm	11077k-ISK	11077-ISK	10146-ISK	10147S-ISK
8,00 mm	11077-8k	11077-8		
8,00 mm	11077-8k-ISK	11077-8-ISK		

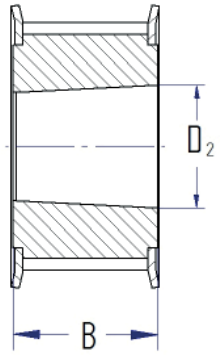
Product range - overview BOQA®-group 1130



D2 = 11,30 mm

shaft-ø	B = 19,00 mm	B = 22,00 mm	B =	B =
	BOQA® - Article-No.:			
5,00 mm	10129			
5,00 mm	10129-ISK			
5,00 mm				
6,00 mm	10133	10134		
6,00 mm	10133-ISK	10134-ISK		
6,00 mm				
6,00 mm				
6,00 mm				
6,00 mm				
6,35 mm	10076	10077		
6,35 mm	10076-ISK	10077-ISK		
6,35 mm				
7,00 mm	10147	10148		
7,00 mm	10147-ISK	1018-ISK		
8,00 mm				
8,00 mm				

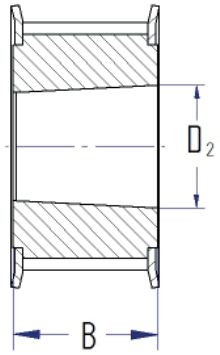
Product range - overview BOQA®-group 1360



D2 = 13,60 mm

shaft-ø	B = 11,00 mm	B = 12,00 mm	B = 16,00 mm	B = 22,00 mm
		BOQA® - Article-No.:		
5,00 mm		10135-5	10137-5	10138
5,00 mm		10135-5-ISK	10137-5-ISK	10138-ISK
5,00 mm				
6,00 mm		10136	10137	10138
6,00 mm		10136-ISK	10137-ISK	10138-ISK
6,00 mm				
6,00 mm				
6,00 mm				
6,00 mm				
6,35 mm	10079ma	10079	10080	10081
6,35 mm		10079-ISK	10080-ISK	10081-ISK
6,35 mm				
7,00 mm		10150	10151	10152
7,00 mm		10150-ISK	10151-ISK	10152-ISK
8,00 mm	10160ma	10160	10161	10162
8,00 mm		10160-ISK	10161-ISK	10162-ISK
9,00 mm		10160-9	10161-9	10162-9
9,00 mm		10160-9-ISK	10161-9-ISK	10162-9-ISK
9,52 mm				
9,52 mm				
10,00 mm		10160-10	10161-10	10162-10
10,00 mm		10160-10-ISK	10161-10-ISK	10162-10-ISK
10,00 mm			10161-skr	
10,00 mm			10161-10skr-ISK	

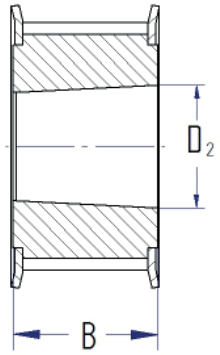
Product range - overview BOQA®-group 1610



D2 = 16,10 mm

shaft-ø	B = 12,00 mm	B = 16,00 mm	B = 22,00 mm	B = 26,00 mm
		BOQA® - Article-No.:		
6,00 mm	10140k	10140	10141	10142
6,00 mm	10140k-ISK	10140-ISK	10141-ISK	10142-ISK
6,00 mm				
6,00 mm				
6,00 mm				
6,00 mm				
6,35 mm	10083k	10083	10084	10085
6,35 mm	10083k-ISK	10083-ISK	10084-ISK	10085-ISK
6,35 mm				
7,00 mm	10154k	10154	10155	10156
7,00 mm	10154k-ISK	10154-ISK	10155-ISK	10156-ISK
8,00 mm	10164k	10164	10165	10166
8,00 mm	10164k-ISK	10164-ISK	10165-ISK	10166-ISK
9,00 mm	10170k	10170	10171	10172
9,00 mm	10170k-ISK	10170-ISK	10171-ISK	10172-ISK
9,52 mm	10122k	10122	10123	10124-S
9,52 mm	10122k-ISK	10122-ISK	10123-ISK	10124-S-ISK
10,00 mm	10027k	10027	10028	10029-S
10,00 mm	10027k-ISK	10027-ISK	10028-ISK	10029-S-ISK
11,00 mm	10027-11k	10027-11	10028-11	10029-11S
11,00 mm	10027-11k-ISK	10027-11-ISK	10028-11-ISK	10029-11S-ISK

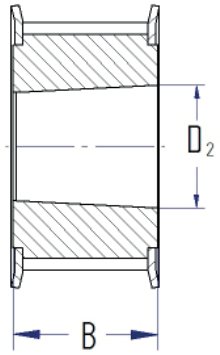
Product range - overview BOQA®-group 1610



D2 = 16,10 mm

shaft-ø	B = 30,00 mm	B =	B =	B =
	BOQA® - Article-No.:			
6,00 mm				
6,00 mm				
6,00 mm				
6,00 mm				
6,00 mm				
6,00 mm				
6,35 mm				
6,35 mm				
6,35 mm				
7,00 mm				
7,00 mm				
8,00 mm	10166-L			
8,00 mm	10166-L-ISK			
9,00 mm	10172-L			
9,00 mm	10172-L-ISK			
9,52 mm	10124-L			
9,52 mm	10124-L-ISK			
10,00 mm	10029-L			
10,00 mm	10029-L-ISK			
11,00 mm	10029.11L			
11,00 mm	10029-11L-ISK			

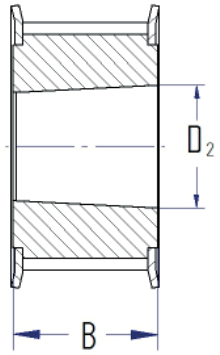
Product range - overview BOQA®-group 1810



D2 = 18,10 mm

shaft-ø	B = 16,00 mm	B = 22,00 mm	B = 30,00 mm	B =
	BOQA® - Article-No.:			
6,00 mm	10143	10144		
6,00 mm	10143-ISK	10144-ISK		
6,35 mm	10086	10087		
6,35 mm	10086-ISK	10087-ISK		
7,00 mm	10157	10158		
7,00 mm	10157-ISK	10158-ISK		
8,00 mm	10167	10168	10169	
8,00 mm	10167-ISK	10168-ISK	10169-ISK	
9,00 mm	10173	10174	10175	
9,00 mm	10173-ISK	10174-ISK	10175-ISK	
9,52 mm	10125	10126	10127	
9,52 mm	10125-ISK	10126-ISK	10127-ISK	
10,00 mm	10030	10031	10032	
10,00 mm	10030-ISK	10031-ISK	10032-ISK	
11,00 mm	10036	10037	10038	
11,00 mm	10036-ISK	10037-ISK	10038-ISK	
12,00 mm	10042	10043	10044	
12,00 mm	10042-ISK	10043-ISK	10044-ISK	
12,70 mm	10042-12.7	10043-12.7	10044-12.7	
12,70 mm	10042-12.7-ISK	10043-12.7-ISK	10044-12.7-ISK	

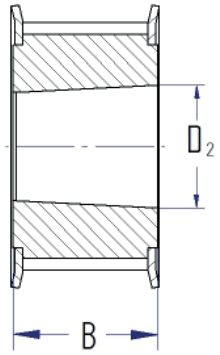
Product range - overview BOQA®-group 2350



D2 = 23,50 mm

shaft-ø	B = 10,00 mm	B = 12,00 mm	B = 14,00 mm	B = 19,00 mm
	BOQA® - Article-No.:			
6,00 mm				
8,00 mm 8,00 mm				
9,00 mm 9,00 mm	10033-9k 10033-9k-ISK			10033-9 10033-9-ISK
10,00 mm 10,00 mm	10033k 10033k-ISK		10033ho 10033ho-ISK	10033 10033-ISK
11,00 mm 11,00 mm	10039k 10039k-ISK		10039ho 10039ho-ISK	10039 10039-ISK
12,00 mm 12,00 mm	10045k 10045k-ISK		10045ho 10045ho-ISK	10045 10045-ISK
12,70 mm 12,70 mm				
13,00 mm 13,00 mm	10048k 10048k-ISK	10050skr-ISK	10048ho 10048ho-ISK	10048 10048-ISK
14,00 mm 14,00 mm	10051k 10051k-ISK		10051ho 10051ho-ISK	10051 10051-ISK
15,00 mm 15,00 mm	10054 10054-ISK		10054ho 10054ho-ISK	10054 10054-ISK
16,00 mm 16,00 mm	10060k 10060k-ISK		10060ho 10060ho-ISK	10060 10060-ISK

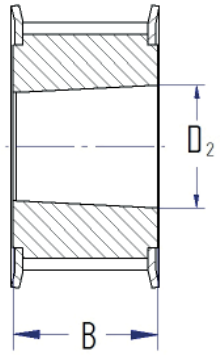
Product range - overview BOQA®-group 2350



D2 = 23,50 mm

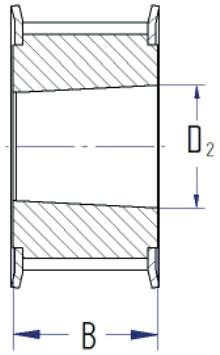
shaft-ø	B = 25,00 mm	B = 27,00 mm	B = 35,00 mm	B = 40,00 mm
		BOQA® - Article-No.:		
6,00 mm		BO584706		
8,00 mm		BO584705	10035-8	
8,00 mm			10035-8-ISK	
9,00 mm		BO585130	10035-9	
9,00 mm			10035-9-ISK	
10,00 mm	10034		10035-10	10035-10ho
10,00 mm	10034-ISK		10035-10-ISK	10035-10ho-ISK
11,00 mm	10040		10041	10041ho
11,00 mm	10040-ISK		10041-ISK	10041ho-ISK
12,00 mm	10046		10047	10047ho
12,00 mm	10046-ISK		10047-ISK	10047ho-ISK
12,70 mm				
12,70 mm				
13,00 mm	10049		10050	10050ho
13,00 mm	10049-ISK		10050-ISK	10050ho-ISK
14,00 mm	10052	BO584707	10053	10053ho
14,00 mm	10052-ISK	BO585131	10053-ISK	10053ho-ISK
		B14-584707		
15,00 mm	10055		10056	10056ho
15,00 mm	10055-ISK		10056-ISK	10056ho-ISK
16,00 mm	10061		10062	10062ho
16,00 mm	10061-ISK		10062-ISK	10062ho-ISK

Product range - overview BOQA®-group 2730



D2 = 27,30 mm

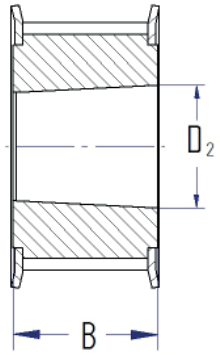
shaft-ø	B = 13,00 mm	B = 16,00 mm	B = 22,00 mm	B = 30,00 mm
	BOQA® - Article-No.:			
6,35 mm	12106.35			
6,35 mm	12106.35-ISK			
8,00 mm	12108			
8,00 mm	12108-ISK			
9,00 mm	12109			
9,00 mm	12109-ISK			
10,00 mm	12110			
10,00 mm	12110-ISK			
12,00 mm	12112	10212	10312	10412
12,00 mm	12112-ISK	10212-ISK	10312-ISK	10412-ISK
13,00 mm	12113	10213	10313	10413
13,00 mm	12113-ISK	10213-ISK	10313-ISK	10413-ISK
14,00 mm	12114	10214	10314	10414
14,00 mm	12114-ISK	10214-ISK	10314-ISK	10414-ISK
15,00 mm	12115	10215	10315	10415
15,00 mm	12115-ISK	10215-ISK	10315-ISK	10415-ISK
16,00 mm	12116	10216	10316	10416
16,00 mm	12116-ISK	10216-ISK	10316-ISK	10416-ISK
17,00 mm	12117	10217	10317	10417
17,00 mm	12117-ISK	10217-ISK	10317-ISK	10417-ISK
18,00 mm	12118	10218	10318	10418
18,00 mm	12118-ISK	10218-ISK	10318-ISK	10418-ISK
19,00 mm	12119	10219	10319	10419
19,00 mm	12119-ISK	10219-ISK	10319-ISK	10419-ISK
20,00 mm	12120	10220	10320	10420
20,00 mm	12120-ISK	10220-ISK	10320-ISK	10420-ISK



D2 = 27,30 mm

shaft-ø	B = 40,00 mm	B =	B =	B =
	BOQA® - Article-No.:			
6,35 mm				
6,35 mm				
8,00 mm				
8,00 mm				
9,00 mm				
9,00 mm				
10,00 mm				
10,00 mm				
12,00 mm	10512			
12,00 mm	10512-ISK			
13,00 mm	10513			
13,00 mm	10513-ISK			
14,00 mm	10514			
14,00 mm	10514-ISK			
15,00 mm	10515			
15,00 mm	10515-ISK			
16,00 mm	10516			
16,00 mm	10516-ISK			
17,00 mm	10517			
17,00 mm	10517-ISK			
18,00 mm	10518			
18,00 mm	10518-ISK			
19,00 mm	10519			
19,00 mm	10519-ISK			
20,00 mm	10520			
20,00 mm	10520-ISK			

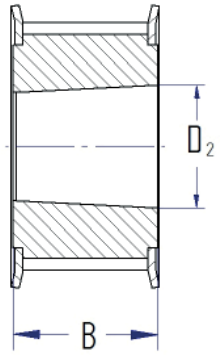
Product range - overview BOQA®-group 3400



D2 = 34,00 mm

shaft-ø	B = 16,00 mm	B = 22,00 mm	B = 28,00 mm	B = 35,00 mm
	BOQA® - Article-No.:			
14 mm 14 mm	10057k-14 10057k-14-ISK	10057-14 10057-14-ISK	10058-14 10058-14-ISK	10059-14 10059-14-ISK
15 mm 15 mm	10057k-15 10057k-15-ISK	10057-15 10057-15-ISK	10058-15 10058-15-ISK	10059-15 10059-15-ISK
16 mm 16 mm	10063k 10063k-ISK	10063 10063-ISK	10064 10064-ISK	10065 10065-ISK
17 mm 17 mm	10066k 10066k-ISK	10066 10066-ISK	10067 10067-ISK	10068 10068-ISK
18 mm 18 mm	10069k 10069k-ISK	10069 10069-ISK	10070 10070-ISK	10071 10071-ISK
19 mm 19 mm	10072k 10072k-ISK	10072 10072-ISK	10073 10073-ISK	10074 10074-ISK
20 mm 20 mm	10089k 10089k-ISK	10089 10089-ISK	10090 10090-ISK	10091 10091-ISK
21 mm 21 mm	10095k 10095k-ISK	10095 10095-ISK	10096 10096-ISK	10097 10097-ISK
22 mm 22 mm	10101k 10101k-ISK	10101 10101-ISK	10102 10102-ISK	10103 10103-ISK
24 mm 24 mm	10107k 10107k-ISK	10107 10107-ISK	10108 10108-ISK	10109 10109-ISK
25 mm 25 mm	10107k-25 10107k-25-ISK	10107-25 10107-25-ISK	10108-25 10108-25-ISK	10109-25 10109-25-ISK

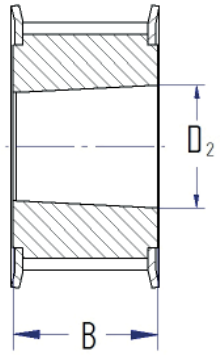
Product range - overview BOQA®-group 3400



D2 = 34,00 mm

shaft-ø	B = 40,00 mm	B =	B =	B =
	BOQA® - Article-No.:			
14 mm	10059-14L			
14 mm	10059-14L-ISK			
15 mm	10059-15L			
15 mm	10059-15L-ISK			
16 mm	10065L			
16 mm	10065L-ISK			
17 mm	10068L			
17 mm	10068L-ISK			
18 mm	10071L			
18 mm	10071L-ISK			
19 mm	10074L			
19 mm	10074L-ISK			
20 mm	10091L			
20 mm	10091L-ISK			
21 mm	10097L			
21 mm	10097L-ISK			
22 mm	10103L			
22 mm	10103L-ISK			
24 mm	10109L			
24 mm	10109L-ISK			
25 mm	10109-25L			
25 mm	10109-25L-ISK			

Product range - overview BOQA®-group 3980



D2 = 39,80 mm

shaft-ø	B = 25,00 mm	B = 35,00 mm	B = 45,00 mm	B =
		BOQA® - Article-No.:		
18 mm				
18 mm				
19 mm	10093-19	10094-19		
19 mm	10093-19-ISK	10094-19-ISK		
20 mm	10093	10094	11095	
20 mm	10093-ISK	10094-ISK	11095-ISK	
21 mm	10099	10100	11101	
21 mm	10099-ISK	10100-ISK	11101-ISK	
22 mm	10105	10106	11107	
22 mm	10105-ISK	10106-ISK	11107-ISK	
24 mm	10111	10112	11113	
24 mm	10111-ISK	10112-ISK	11113-ISK	
25 mm	10114-25	10115	11115-25	
25 mm	10114-25-ISK	10115-ISK	11115-25-ISK	
26 mm	10114-26	10115-26	11115-26	
26 mm	10114-26-ISK	10115-26-ISK	11115-26-ISK	
28 mm	10117	10118	11118	
28 mm	10117-ISK	10118-ISK	11118-ISK	
30 mm	10119	10120	11121	
30 mm	10119-ISK	10120-ISK	11121-ISK	
32 mm		10120-32		
32 mm		10120-32-ISK		

BOQA® Fastening Elements product group 0470 for shaft diameter = 1.50 mm

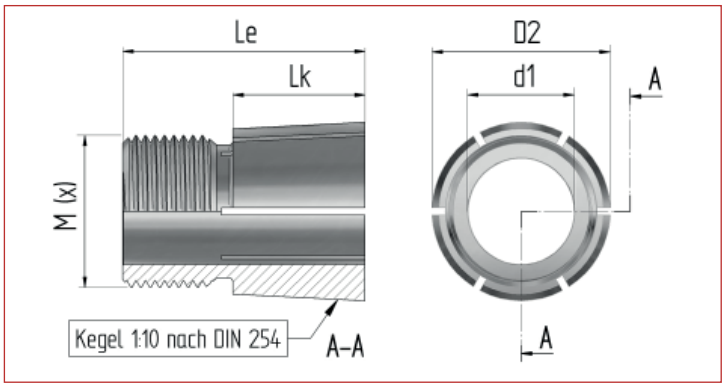
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.: **10011-1.5**

for shaft diameters (d1)	mm	1,50
Hub width (B) max.	mm	7,50
Taper diameter front (D2)	mm	4,70
Taper length (L_k)	mm	5,20
Counter bearing, length	mm	-
Counter bearing, diameter	mm	-
Bore depth for shaft journal	mm	-
Overall length (L_e)	mm	10,00
Taper ratio (C)	C=1:x	1:10
Taper angle (α)	°	5,725
Thread (metric DIN)	M (x)	M4
Hex socket key width (SW)	mm	-

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M4
Key width (SW)	mm	7
Nut height (m)	mm	2,20
Recommended tightening torque[1]	Nm	2,60

Transmission Values [2]

Torque (M)	Nm	1,60
Thrust (F_e)	kN	0,48
Hub load ($_pF$)	N/mm²	98,36

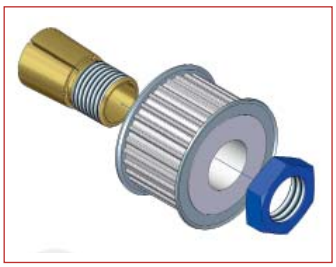
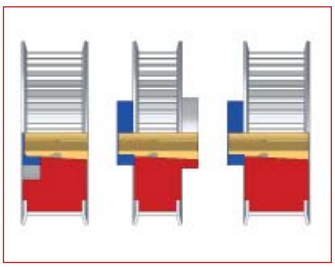
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

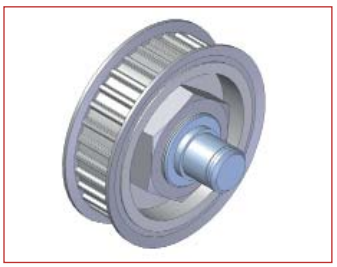
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10011-1.5**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 0470 for shaft diameter = 2.00 mm

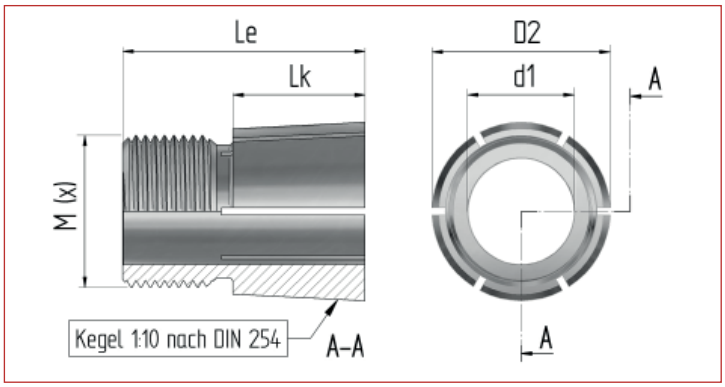
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10011**	**10011-skr**	**10011-S**
for shaft diameters (d1)	mm	2,00	2,00	2,00
Hub width (B) max.	mm	7,50	3,00	7,50
Taper diameter front (D2)	mm	4,70	4,70	4,70
Taper length (L_k)	mm	5,20	2,80	5,20
Counter bearing, length	mm	-	-	3,00
Counter bearing, diameter	mm	-	-	2h6
Bore depth for shaft journal	mm	-	-	6,90
Overall length (L_e)	mm	10,00	5,50	13,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M4	M4 x 0,35	M4
Hex socket key width (SW)	mm	-	-	-

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M4	M4 x 0,35	M4
Key width (SW)	mm	7	7	7
Nut height (m)	mm	2,20	2,20	2,20
Recommended tightening torque[1]	Nm	2,60	1,50	2,60

Transmission Values [2]

Torque (M)	Nm	1,60	0,90	1,60
Thrust (F_e)	kN	0,48	0,27	0,48
Hub load ($_pF$)	N/mm²	98,36	99,91	98,36

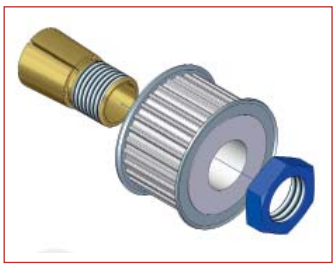
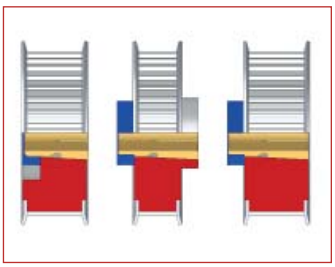
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

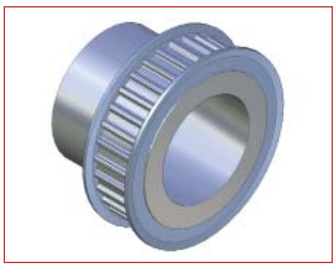
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10011** **10011-skr** **10011-S**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 0470 for shaft diameter = 3.00 mm

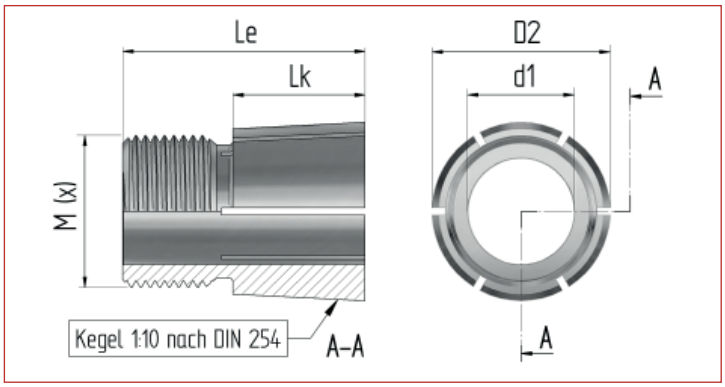
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.: **10011-3skr**

for shaft diameters (d1)	mm	3,00
Hub width (B) max.	mm	3,00
Taper diameter front (D2)	mm	4,70
Taper length (L_k)	mm	2,80
Counter bearing, length	mm	-
Counter bearing, diameter	mm	-
Bore depth for shaft journal	mm	-
Overall length (L_e)	mm	5,50
Taper ratio (C)	C=1:x	1:10
Taper angle (α)	°	5,725
Thread (metric DIN)	M (x)	M4 x 0,35
Hex socket key width (SW)	mm	-

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M4 x 0,35
Key width (SW)	mm	7
Nut height (m)	mm	2,20
Recommended tightening torque[1]	Nm	1,50

Transmission Values [2]

Torque (M)	Nm	0,90
Thrust (F_e)	kN	0,27
Hub load ($_pF$)	N/mm²	99,91

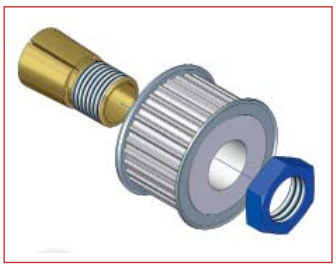
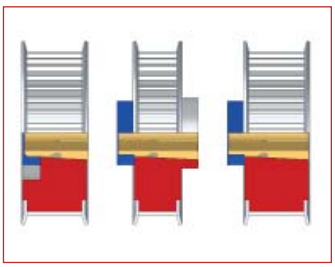
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

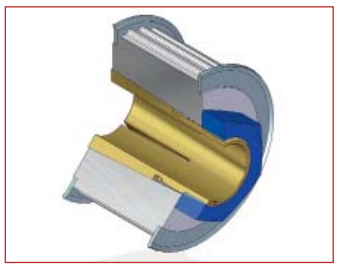
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10011-3skr**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 0600 for shaft diameter = 3.00 mm

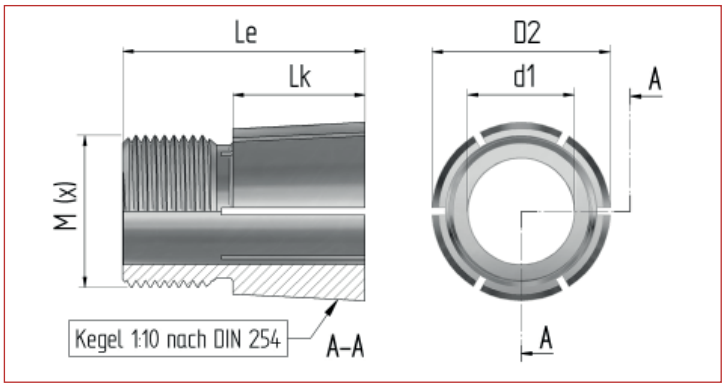
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10015**	**10015-z**
for shaft diameters (d1)	mm	3,00	3,00
Hub width (B) max.	mm	7,50	9,00
Taper diameter front (D2)	mm	6,00	6,00
Taper length (L_k)	mm	5,30	6,00
Counter bearing, length	mm	-	4,00
Counter bearing, diameter	mm	-	3,00
Bore depth for shaft journal	mm	-	6,00
Overall length (L_e)	mm	10,50	16,00
Taper ratio (C)	C=1:x	1:10	1:10
Taper angle (α)	°	5,725	5,725
Thread (metric DIN)	M (x)	M5	M5
Hex socket key width (SW)	mm	-	-

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)			
Thread (metric DIN)	M (x)	M5	M5
Key width (SW)	mm	8	8
Nut height (m)	mm	2,60	2,60
Recommended tightening torque[1]	Nm	3,50	4,00

Transmission Values [2]			
Torque (M)	Nm	1,90	2,10
Thrust (F_e)	kN	0,44	0,50
Hub load ($_pF$)	N/mm²	68,30	69,80

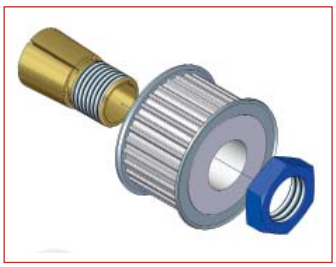
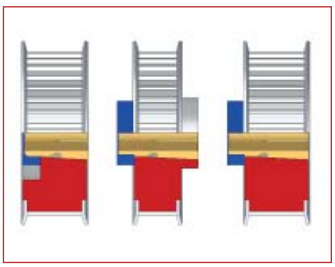
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10015** **10015-z**

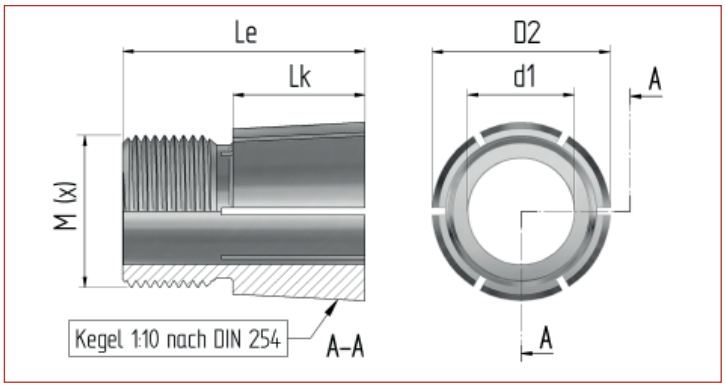
The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

BOQA® Fastening Elements product group 0680 for shaft diameter = 3.00 mm

Technical Data (general)

Material	:	Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)
Cocentricity	:	Concentricity tolerance approx. 0,01 mm
Surface quality	:	Ra = 3,2 µm (shaft) Ra = 1,6 µm (taper)
Seat (bore)	:	d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.: **11017**

for shaft diameters (d1)	mm	3,00
Hub width (B) max.	mm	12,50
Taper diameter front (D2)	mm	6,80
Taper length (L_k)	mm	8,50
Counter bearing, length	mm	-
Counter bearing, diameter	mm	-
Bore depth for shaft journal	mm	-
Overall length (L_e)	mm	15,00
Taper ratio (C)	C=1:x	1:10
Taper angle (α)	°	5,725
Thread (metric DIN)	M (x)	M6 x 0,5
Hex socket key width (SW)	mm	-

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M6 x 0,5
Key width (SW)	mm	8
Nut height (m)	mm	2,5
Recommended tightening torque[1]	Nm	4,00

Transmission Values [2]

Torque (M)	Nm	2,00
Thrust (F_e)	kN	0,45
Hub load ($_pF$)	N/mm²	39,72

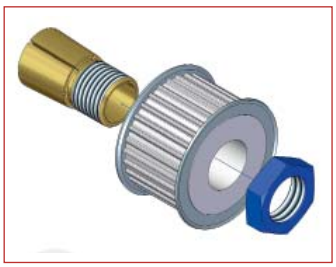
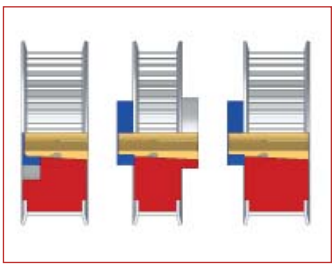
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

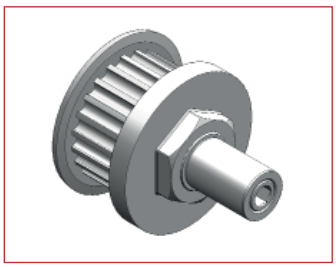
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **11017**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 0680 for shaft diameter = 4.00 mm

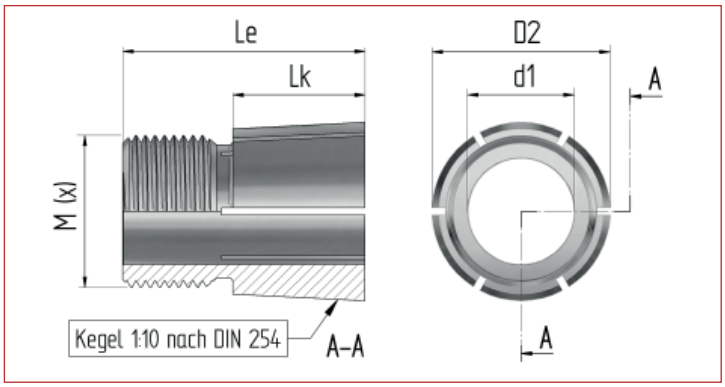
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10018-skr**	**10018**	**10019**	**11019**	**10018-z**
for shaft diameters (d1)	mm	4,00	4,00	4,00	4,00	4,00
Hub width (B) max.	mm	4,70	7,00	8,00	12,50	8,50
Taper diameter front (D2)	mm	6,80	6,80	6,80	6,80	6,80
Taper length (L_k)	mm	3,50	4,60	5,60	8,50	5,60
Counter bearing, length	mm	-	-	-	-	4,50
Counter bearing, diameter	mm	-	-	-	-	5,00
Bore depth for shaft journal	mm	-	-	-	-	9,50
Overall length (L_e)	mm	7,20	9,80	10,80	15,00	15,80
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M6 x 0,5	M6 x 0,5	M6 x 0,5	M6 x 0,5	M6 x 0,5
Hex socket key width (SW)	mm	-	-	-	-	-
Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)						
Thread (metric DIN)	M (x)	M6 x 0,5	M6 x 0,5	M6 x 0,5	M6 x 0,5	M6 x 0,5
Key width (SW)	mm	8	8	8	8	8
Nut height (m)	mm	2,50	2,50	2,50	2,50	2,50
Recommended tightening torque [1]	Nm	4,00	4,50	4,50	5,00	4,50
Transmission Values [2]						
Torque (M)	Nm	2,20	2,40	2,40	2,70	2,40
Thrust (F_e)	kN	0,44	0,49	0,50	0,57	0,50
Hub load ($_pF$)	N/mm²	89,32	77,74	64,84	49,65	64,84

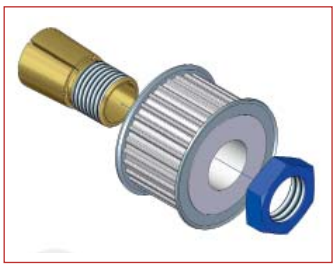
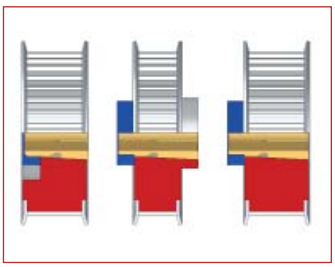
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10018-skr** **10018** **10019** **11019** **10018-z**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

BOQA® Fastening Elements product group 0950 for shaft diameter = 4.00 mm

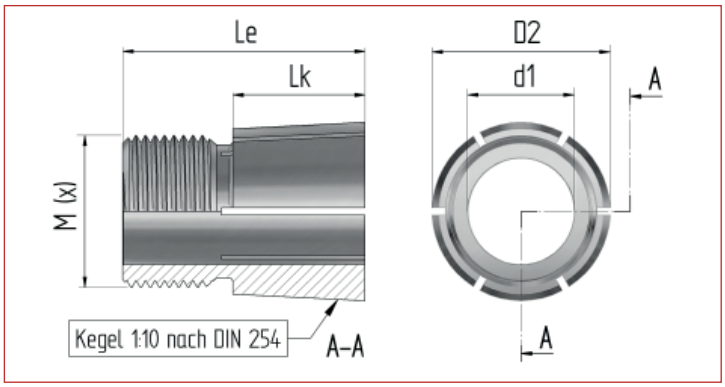
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10023A-4k**	**10023-4kz**	**10023A-4**	**10023-2013-4**	**10023-4z**
for shaft diameters (d1)	mm	4,00	4,00	4,00	4,00	4,00
Hub width (B) max.	mm	6,00	6,00	9,00	10,00	10,00
Taper diameter front (D2)	mm	9,50	9,50	9,50	9,50	9,50
Taper length (L_k)	mm	4,60	4,40	6,00	7,00	7,00
Counter bearing, length	mm	-	5,00	-	-	5,00
Counter bearing, diameter	mm	-	5,00	-	-	5,00
Bore depth for shaft journal	mm	-	12,00	-	-	9,00
Overall length (L_e)	mm	10,00	15,00	12,30	13,00	18,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M8 x 0,5	M8 x 0,5	M8 x 0,5	M8 x 0,5	M8 x 0,5
Hex socket key width (SW)	mm	-	-	-	-	-
Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)						
Thread (metric DIN)	M (x)	M8 x 0,5	M8 x 0,5	M8 x 0,5	M8 x 0,5	M8 x 0,5
Key width (SW)	mm	10	10	10	10	10
Nut height (m)	mm	3,00	3,00	3,00	3,00	3,00
Recommended tightening torque [1]	Nm	5,00	5,00	7,00	7,50	7,50
Transmission Values [2]						
Torque (M)	Nm	2,00	2,00	2,90	3,10	3,10
Thrust (F_e)	kN	0,29	0,29	0,42	0,45	0,45
Hub load ($_pF$)	N/mm²	32,84	34,26	35,79	33,23	33,23

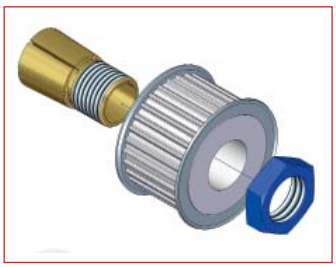
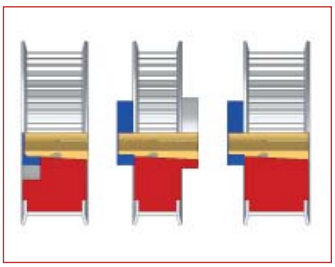
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10023A-4k** **10023-4kz** **10023A-4** **10023-2013-4** **10023-4z** **10225-4skr**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

BOQA® Fastening Elements product group 0950 for shaft diameter = 4.00 mm

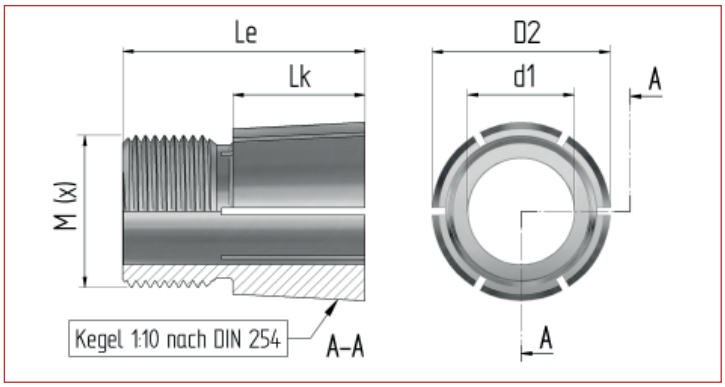
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.: **10224-4skr . 10225-4skr**

for shaft diameters (d1)	mm	4,00 ... 4,00
Hub width (B) max.	mm	10,00 ... 10,00
Taper diameter front (D2)	mm	9,50 ... 9,50
Taper length (L_k)	mm	7,00 ... 8,50
Counter bearing, length	mm	- ... -
Counter bearing, diameter	mm	8h7 ... -
Bore depth for shaft journal	mm	- ... -
Overall length (L_e)	mm	18,00 ... 13,50
Taper ratio (C)	C=1:x	1:10 ... 1:10
Taper angle (α)	°	5,725 ... 5,725
Thread (metric DIN)	M (x)	- ... M8 x 1,0
Hex socket key width (SW)	mm	- ... -

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	Lagerpassung ... M8 x 1,0
Key width (SW)	mm	10
Nut height (m)	mm	3,00
Recommended tightening torque [1]	Nm	8,00

Transmission Values [2]

Torque (M)	Nm	3,30
Thrust (F_e)	kN	0,48
Hub load ($_pF$)	N/mm²	29,67

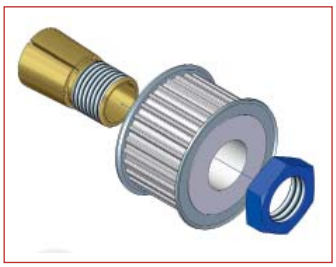
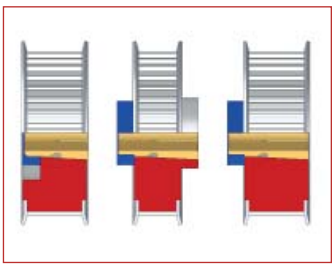
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10023A-4k** ... **10023-4kz** ... **10023A-4** ... **10023-2013-4** ... **10023-4z** ... **10225-4skr**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

BOQA® Fastening Elements product group 0950 for shaft diameter = 4.00 mm

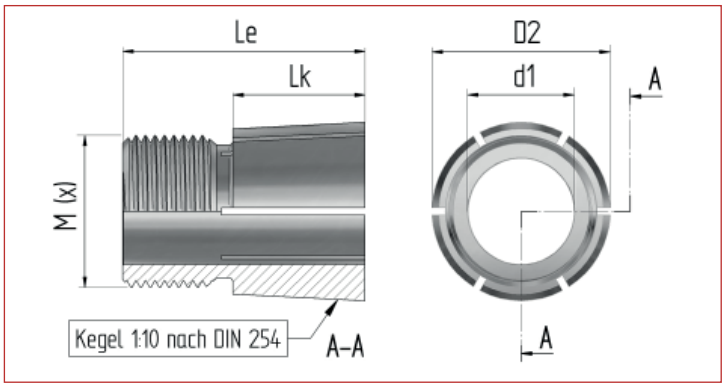
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**11023A-4**	**10024A-4S**	**11024A-4**	**10024-4z VAR.E**	**10024-4**	**10024A-4**
for shaft diameters (d1)	mm	4,00	4,00	4,00	4,00	4,00	4,00
Hub width (B) max.	mm	12,00	13,00	14,00	16,00	16,00	16,00
Taper diameter front (D2)	mm	9,50	9,50	9,50	9,50	9,50	9,50
Taper length (L_k)	mm	8,50	9,40	10,30	9,40	10,90	10,90
Counter bearing, length	mm	-	-	-	5,20	-	-
Counter bearing, diameter	mm	-	-	-	5,00	-	-
Bore depth for shaft journal	mm	-	-	10,30	-	-	
Overall length (L_e)	mm	14,80	16,00	16,60	25,00	18,80	18,80
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M8 x 0,5	M8 x 0,5	M8 x 0,5	M8 x 1,0	M8 x 1,0	M8 x 0,5
Hex socket key width (SW)	mm	-	-	-	-	-	-
Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)							
Thread (metric DIN)	M (x)	M8 x 0,5	M8 x 0,5	M8 x 0,5	M8 x 1,0	M8 x 1,0	M8 x 0,5
Key width (SW)	mm	10	10	10	10	10	10
Nut height (m)	mm	3,00	3,00	3,00	3,00	3,00	3,00
Recommended tightening torque [1]	Nm	8,00	8,50	9,00	8,50	10,00	10,00
Transmission Values [2]							
Torque (M)	Nm	3,30	3,50	3,70	3,50	4,10	4,10
Thrust (F_e)	kN	0,48	0,51	0,55	0,51	0,61	0,61
Hub load ($_pF$)	N/mm²	29,67	28,79	28,10	28,79	29,71	29,71

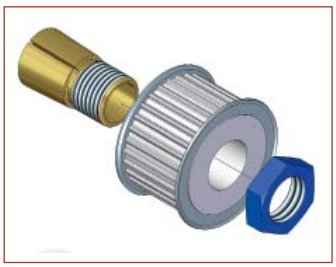
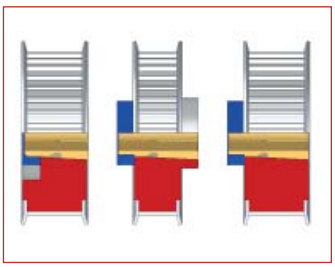
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **11023A-4** **10024A-4S** **11024A-4** **10024-4z VAR.E** **10024-4** **10024A-4**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

BOQA® Fastening Elements product group 0950 for shaft diameter = 5.00 mm

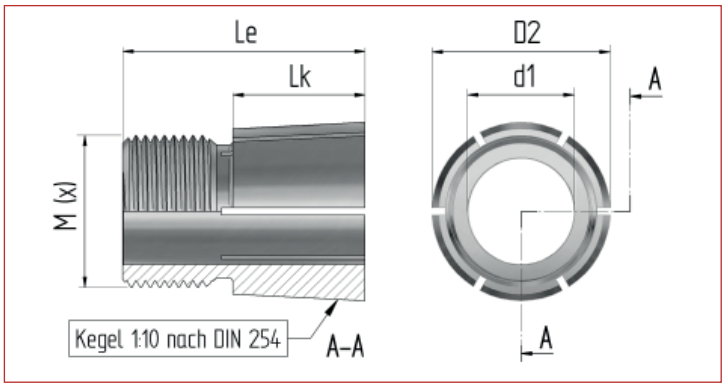
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10023A-5k**	**10023-k**	**10023**	**10023A-5**	**10023-2013-5**	**11023**
for shaft diameters (d1)	mm	5,00	5,00	5,00	5,00	5,00	5,00
Hub width (B) max.	mm	6,00	6,00	9,00	9,00	10,00	12,00
Taper diameter front (D2)	mm	9,50	9,50	9,50	9,50	9,50	9,50
Taper length (L_k)	mm	4,60	4,60	6,00	6,00	7,00	8,50
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	
Overall length (L_e)	mm	10,00	10,00	12,30	12,30	13,00	14,80
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M8 x 0,5	M8 x 1,0	M8 x 1,0	M8 x 0,5	M8 x 0,5	M8 x 1,0
Hex socket key width (SW)	mm	-	-	-	-	-	-

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M8 x 0,5	M8 x 1,0	M8 x 1,0	M8 x 0,5	M8 x 0,5	M8 x 1,0
Key width (SW)	mm	10	10	10	10	10	10
Nut height (m)	mm	3,00	3,00	3,00	3,00	3,00	3,00
Recommended tightening torque [1]	Nm	6,00	6,00	7,00	7,00	8,00	8,50

Transmission Values [2]

Torque (M)	Nm	2,40	2,40	2,90	2,90	3,30	3,50
Thrust (F_e)	kN	0,35	0,35	0,42	0,42	0,48	0,51
Hub load ($_pF$)	N/mm²	39,41	39,41	35,79	35,79	35,44	31,53

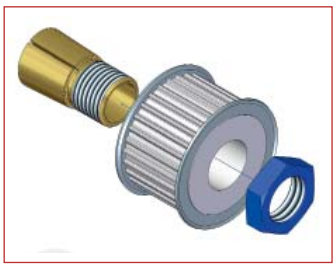
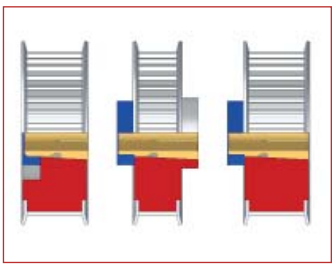
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.:	**10023A-5k**	**10023-k**	**10023**	**10023A-5**	**10023-2013-5**	**11023**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

BOQA® Fastening Elements product group 0950 for shaft diameter = 5.00 mm

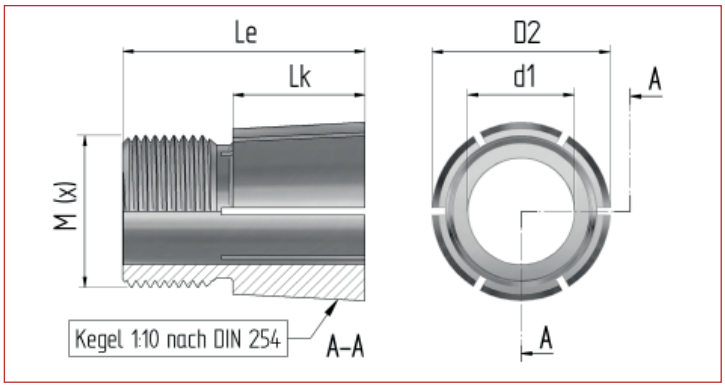
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**11023A-5**	**10024A-5S**	**10024-S**	**11024**	**11024A-5**	**10024-5z VAR.E**
for shaft diameters (d1)	mm	5,00	5,00	5,00	5,00	5,00	5,00
Hub width (B) max.	mm	12,00	13,00	13,00	14,00	14,00	16,00
Taper diameter front (D2)	mm	9,50	9,50	9,50	9,50	9,50	9,50
Taper length (L_k)	mm	8,50	9,40	9,40	10,30	10,30	9,40
Counter bearing, length	mm	-	-	-	-	-	5,20
Counter bearing, diameter	mm	-	-	-	-	-	5,00
Bore depth for shaft journal	mm	-	-	-	-	10,30	
Overall length (L_e)	mm	14,80	16,00	16,00	16,60	16,60	25,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M8 x 0,5	M8 x 0,5	M8 x 1,0	M8 x 1,0	M8 x 0,5	M8 x 1,0
Hex socket key width (SW)	mm	-	-	-	-	-	-

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M8 x 0,5	M8 x 0,5	M8 x 1,0	M8 x 1,0	M8 x 0,5	M8 x 1,0
Key width (SW)	mm	10	10	10	10	10	10
Nut height (m)	mm	3,00	3,00	3,00	3,00	3,00	3,00
Recommended tightening torque [1]	Nm	8,50	9,00	9,00	9,50	9,50	9,50

Transmission Values [2]

Torque (M)	Nm	3,50	3,70	3,70	3,90	3,90	3,90
Thrust (F_e)	kN	0,51	0,54	0,54	0,58	0,58	0,57
Hub load ($_pF$)	N/mm²	31,53	30,49	30,49	29,67	29,67	32,18

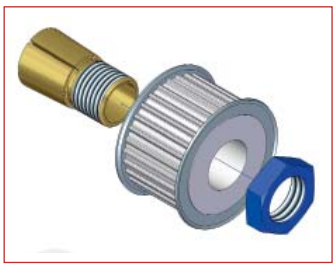
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

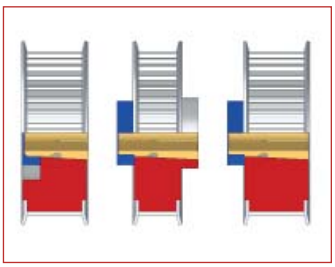
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **11023A-5** **10024A-5S** **10024-S** **11024** **11024A-5** **10024-5z VAR.E**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.





BOQA® Fastening Elements product group 0950 for shaft diameter = 5.00 mm

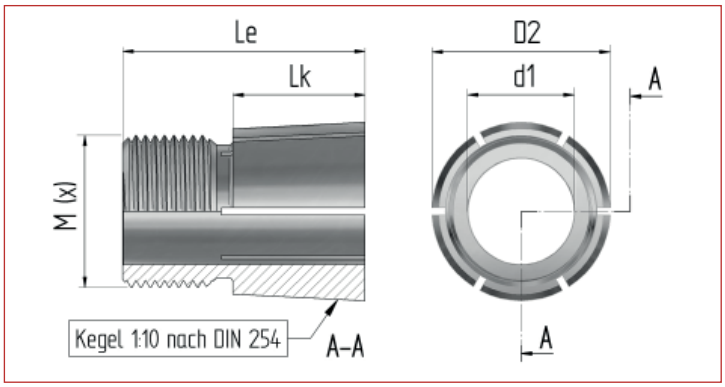
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10024**	**10024A-5**	**10025**
for shaft diameters (d1)	mm	5,00	5,00	5,00
Hub width (B) max.	mm	16,00	16,00	19,00
Taper diameter front (D2)	mm	9,50	9,50	9,50
Taper length (L_k)	mm	10,90	10,90	11,50
Counter bearing, length	mm	-	-	-
Counter bearing, diameter	mm	-	-	-
Bore depth for shaft journal	mm	-	-	-
Overall length (L_e)	mm	18,80	18,80	22,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M8 x 1,0	M8 x 0,5	M8 x 1,0
Hex socket key width (SW)	mm	-	-	-

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M8 x 1,0	M8 x 0,5	M8 x 1,0
Key width (SW)	mm	10	10	10
Nut height (m)	mm	3,00	3,00	3,00
Recommended tightening torque [1]	Nm	10,00	10,00	10,50

Transmission Values [2]

Torque (M)	Nm	4,10	4,10	4,30
Thrust (F_e)	kN	0,61	0,61	0,64
Hub load ($_pF$)	N/mm²	29,71	29,71	29,76

1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10024** **10024A-5** **10025**

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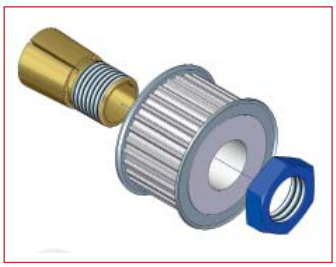
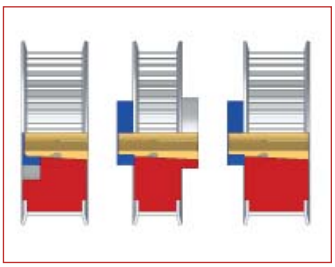
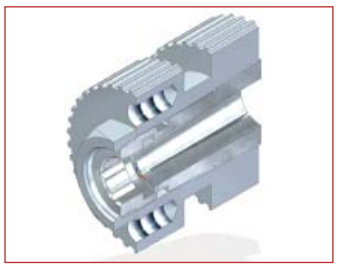





BOQA® Fastening Elements product group 0950 for shaft diameter = 6.00 mm

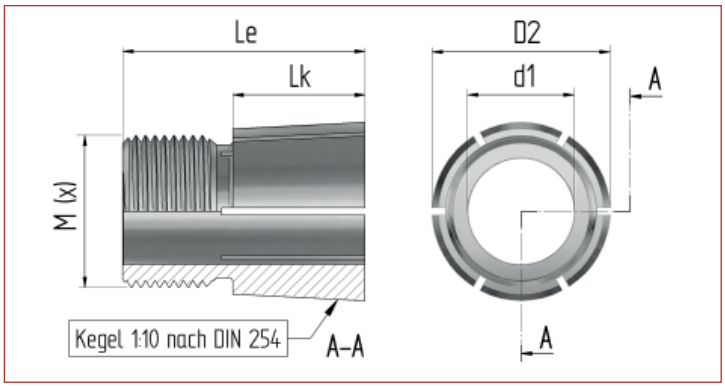
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10023A-6k**	**10023A-6**	**10023-2013-6**	**11023A-6**	**10024A-6S**	**10024-6z VAR.A**
for shaft diameters (d1)	mm	6,00	6,00	6,00	6,00	6,00	6,00
Hub width (B) max.	mm	6,00	9,00	10,00	12,00	13,00	16,00
Taper diameter front (D2)	mm	9,50	9,50	9,50	9,50	9,50	9,50
Taper length (L_k)	mm	4,60	6,00	7,00	8,50	9,40	9,40
Counter bearing, length	mm	-	-	-	-	-	5,20
Counter bearing, diameter	mm	-	-	-	-	-	5,00
Bore depth for shaft journal	mm	-	-	-	-	8,50	
Overall length (L_e)	mm	10,00	12,30	13,00	14,80	16,00	25,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M8 x 0,5	M8 x 0,5	M8 x 0,5	M8 x 0,5	M8 x 0,5	M8 x 1,0
Hex socket key width (SW)	mm	-	-	-	-	-	-

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M8 x 0,5	M8 x 0,5	M8 x 0,5	M8 x 0,5	M8 x 0,5	M8 x 1,0
Key width (SW)	mm	10	10	10	10	10	10
Nut height (m)	mm	3,00	3,00	3,00	3,00	3,00	3,00
Recommended tightening torque [1]	Nm	7,00	7,50	8,00	8,50	9,00	9,00

Transmission Values [2]

Torque (M)	Nm	2,90	3,10	3,30	3,50	3,70	3,70
Thrust (F_e)	kN	0,41	0,45	0,48	0,51	0,54	0,54
Hub load ($_pF$)	N/mm²	45,98	38,35	35,44	31,53	30,49	30,49

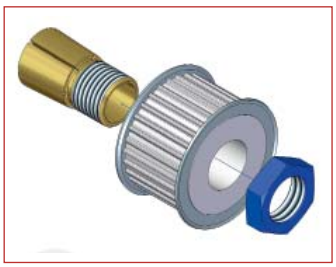
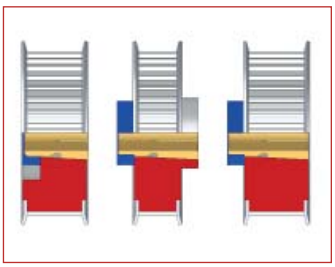
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10023A-6k** **10023A-6** **10023-2013-6** **11023A-6** **10024A-6S** **10024-6z VAR.A**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

BOQA® Fastening Elements product group 0950 for shaft diameter = 6.00 mm

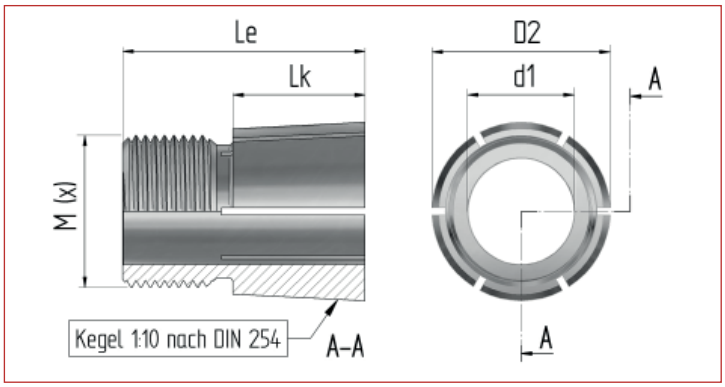
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**11024A-6**	**10024-6**	**10024-6skr**	**10024-6L-ISK**	**10024-6Lskr**	**10024A-6**
for shaft diameters (d1)	mm	6,00	6,00	6,00	6,00	6,00	6,00
Hub width (B) max.	mm	14,00	16,00	16,00	16,00	16,00	16,00
Taper diameter front (D2)	mm	9,50	9,50	9,50	9,50	9,50	9,50
Taper length (L_k)	mm	10,30	10,90	10,90	11,00	11,00	12,50
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	
Overall length (L_e)	mm	16,60	18,80	18,80	19,50	19,50	21,30
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M8 x 0,5	M8 x 1,0	M8 x 0,5	M8 x 0,5	M8 x 0,5	M8 x 1,0
Hex socket key width (SW)	mm	-	-	-	4 mm	-	-

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M8 x 0,5	M8 x 1,0	M8 x 0,5	M8 x 0,5	M8 x 0,5	M8 x 1,0
Key width (SW)	mm	10	10	10	10	10	10
Nut height (m)	mm	3,00	3,00	3,00	3,00	3,00	3,00
Recommended tightening torque [1]	Nm	9,50	10,00	10,00	10,50	10,50	11,00

Transmission Values [2]

Torque (M)	Nm	3,90	4,10	4,10	4,30	4,30	4,50
Thrust (F_e)	kN	0,58	0,61	0,61	0,64	0,64	0,68
Hub load ($_pF$)	N/mm²	29,67	29,71	29,71	30,94	30,49	29,01

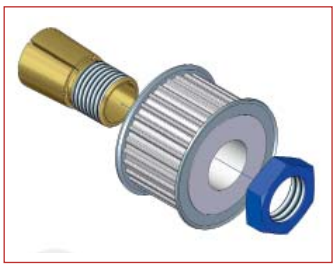
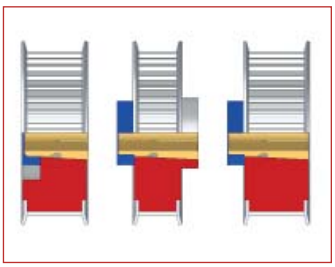
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

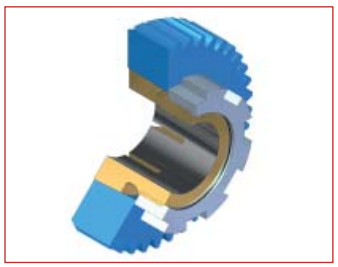
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **11024A-6** **10024-6** **10024-6skr** **10024-6L-ISK** **10024-6Lskr** **10024A-6**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 0950 for shaft diameter = 6.35 mm (1/4“)

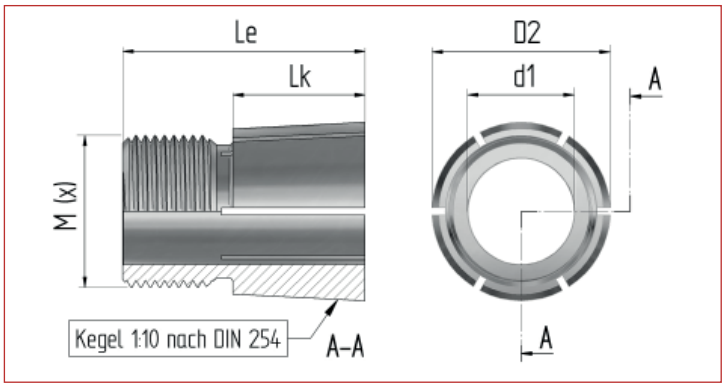
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10023A-6.35k**	**10023A-6.35**	**10023-2013-6.35**	**11023A-6.35**	**10024-6.35**	**10024-6.35z**
for shaft diameters (d1)	mm	6,35	6,35	6,35	6,35	6,35	6,35
Hub width (B) max.	mm	6,00	9,00	10,00	12,00	13,00	16,00
Taper diameter front (D2)	mm	9,50	9,50	9,50	9,50	9,50	9,50
Taper length (L_k)	mm	4,60	6,00	7,00	8,50	9,40	9,40
Counter bearing, length	mm	-	-	-	-	-	5,20
Counter bearing, diameter	mm	-	-	-	-	-	5,00
Bore depth for shaft journal	mm	-	-	-	-	8,50	
Overall length (L_e)	mm	10,00	12,30	13,00	14,80	16,00	25,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M8 x 0,5	M8 x 0,5	M8 x 0,5	M8 x 0,5	M8 x 0,5	M8 x 1,0
Hex socket key width (SW)	mm	-	-	-	-	-	-

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M8 x 0,5	M8 x 0,5	M8 x 0,5	M8 x 0,5	M8 x 0,5	M8 x 1,0
Key width (SW)	mm	10	10	10	10	10	10
Nut height (m)	mm	3,00	3,00	3,00	3,00	3,00	3,00
Recommended tightening torque [1]	Nm	8,00	8,50	9,00	9,50	10,00	10,00

Transmission Values [2]

Torque (M)	Nm	3,30	3,50	3,70	3,90	4,10	4,10
Thrust (F_e)	kN	0,47	0,50	0,54	0,57	0,60	0,60
Hub load ($_pF$)	N/mm²	52,55	43,46	39,87	35,24	33,88	33,88

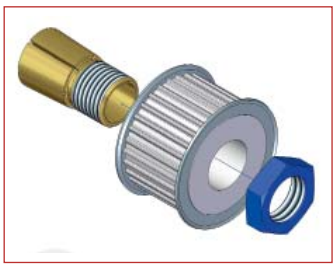
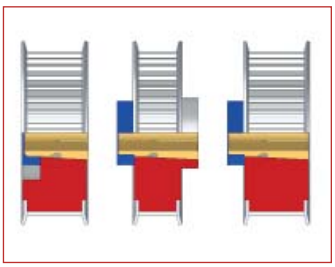
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

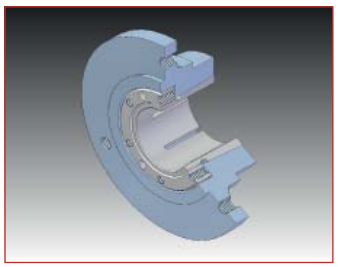
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10023A-6.35k** **10023A-6.35** **10023-2013-6.35** **11023A-6.35** **10024-6.35** **10024-6.35z**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 0950 for shaft diameter = 6.35 mm (1/4“)

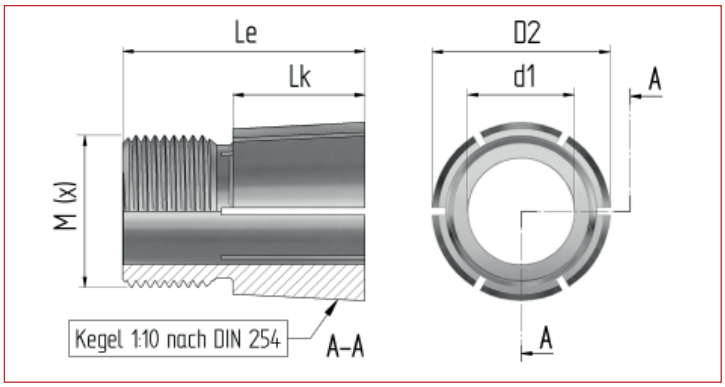
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10024A-6.35S**	**11024A-6.35**	**10024A-6.35**	**10024-6.35Lskr**
for shaft diameters (d1)	mm	6,35	6,35	6,35	6,35
Hub width (B) max.	mm	13,00	14,00	16,00	16,00
Taper diameter front (D2)	mm	9,50	9,50	9,50	9,50
Taper length (L_k)	mm	9,40	10,30	10,90	11,00
Counter bearing, length	mm	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-
Overall length (L_e)	mm	16,00	16,60	18,80	19,50
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M8 x 0,5	M8 x 0,5	M8 x 0,5	M8 x 0,5
Hex socket key width (SW)	mm	-	-	-	-

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M8 x 0,5	M8 x 0,5	M8 x 0,5	M8 x 0,5
Key width (SW)	mm	10	10	10	10
Nut height (m)	mm	3,00	3,00	3,00	3,00
Recommended tightening torque [1]	Nm	10,00	10,50	11,00	12,00

Transmission Values [2]

Torque (M)	Nm	4,10	4,30	4,50	4,90
Thrust (F_e)	kN	0,60	0,64	0,67	0,73
Hub load ($_pF$)	N/mm²	33,88	32,79	32,68	35,36

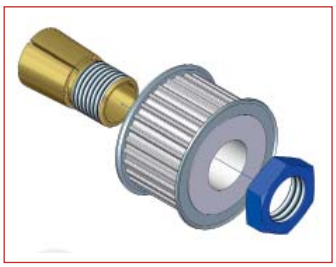
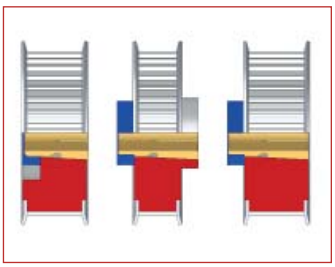
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

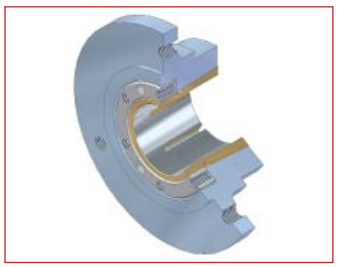
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.:	**10024A-6.35S**	**11024A-6.35**	**10024A-6.35**	**10024-6.35skr**	**10024-6.35Lskr**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 1130 for shaft diameter = 5.00 mm

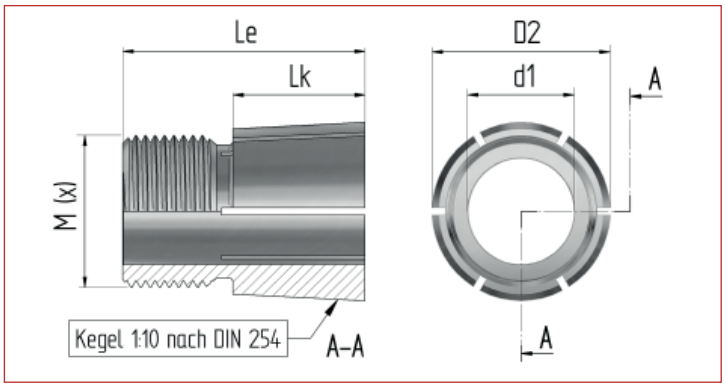
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**11025k**	**11025k-ISK**	**10128ma**	**11025**	**11025-ISK**
for shaft diameters (d1)	mm	5,00	5,00	5,00	5,00	5,00
Hub width (B) max.	mm	8,00	8,00	10,00	10,00	10,00
Taper diameter front (D2)	mm	11,30	11,30	11,30	11,30	11,30
Taper length (L_k)	mm	5,40	5,40	6,10	6,50	6,50
Counter bearing, length	mm	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-
Overall length (L_e)	mm	12,00	12,00	13,60	14,00	14,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M10 x 0,75	M10 x 0,75	M10 x 1,0	M10 x 0,75	M10 x 0,75
Hex socket key width (SW)	mm	-	6 mm	-	-	6 mm
Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)						
Thread (metric DIN)	M (x)	M10 x 0,75	M10 x 0,75	M10 x 1,0	M10 x 0,75	M10 x 0,75
Key width (SW)	mm	13	13	13	13	13
Nut height (m)	mm	3,50	3,50	3,00	3,50	3,50
Recommended tightening torque [1]	Nm	12,00	12,00	13,00	14,00	14,00
Transmission Values [2]						
Torque (M)	Nm	7,20	7,20	7,80	8,40	8,40
Thrust (F_e)	kN	0,87	0,87	0,95	1,02	1,02
Hub load ($_pF$)	N/mm²	69,51	69,51	67,09	68,05	68,05

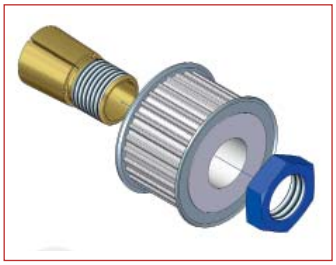
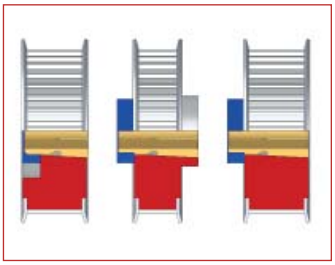
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **11025k** **11025k-ISK** **10128ma** **11025** **11025-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

BOQA® Fastening Elements product group 1130 for shaft diameter = 5.00 mm

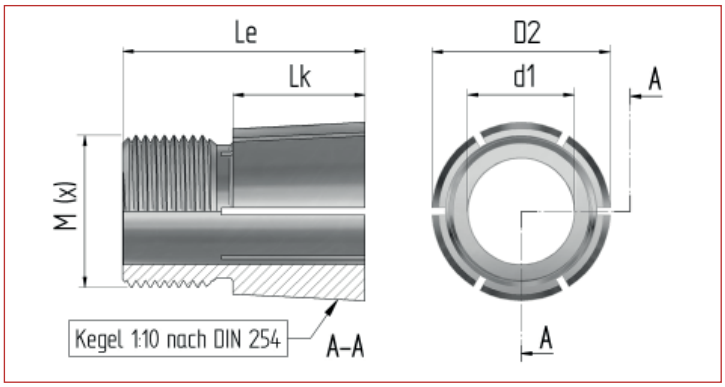
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10128**	**10128-ISK**	**10129S**	**10129S-ISK**	**10129**	**10129-ISK**
for shaft diameters (d1)	mm	5,00	5,00	5,00	5,00	5,00	5,00
Hub width (B) max.	mm	12,00	12,00	16,00	16,00	19,00	19,00
Taper diameter front (D2)	mm	11,30	11,30	11,30	11,30	11,30	11,30
Taper length (L_k)	mm	7,70	7,70	10,20	10,20	12,50	12,50
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	16,00	16,00	19,00	19,00	22,00	22,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M10 x 1,0	M10 x 1,0	M10 x 1,0	M10 x 1,0	M10 x 1,0	M10 x 1,0
Hex socket key width (SW)	mm	-	6 mm	-	6 mm	-	6 mm
Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)							
Thread (metric DIN)	M (x)	M10 x 1,0	M10 x 1,0	M10 x 1,0	M10 x 1,0	M10 x 1,0	M10 x 1,0
Key width (SW)	mm	13	13	13	13	13	13
Nut height (m)	mm	3,50	3,50	3,50	3,50	3,50	3,50
Recommended tightening torque [1]	Nm	15,00	15,00	16,00	16,00	17,00	17,00
Transmission Values [2]							
Torque (M)	Nm	9,00	9,00	9,60	9,60	10,20	10,20
Thrust (F_e)	kN	1,10	1,10	1,19	1,19	1,27	1,27
Hub load ($_pF$)	N/mm²	62,23	62,23	51,27	51,27	45,42	45,42

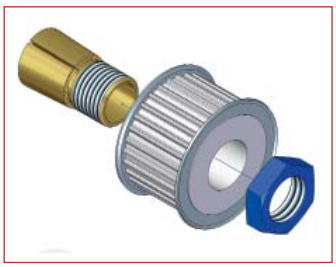
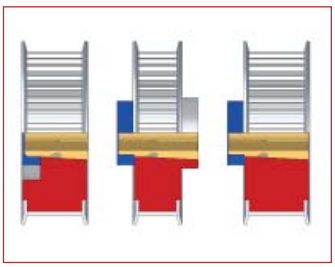
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

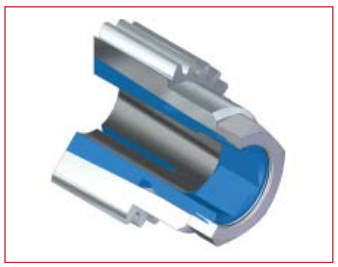
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10128** **10128-ISK** **10129S** **10129S-ISK** **10129** **10129-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 1130 for shaft diameter = 6.00 mm

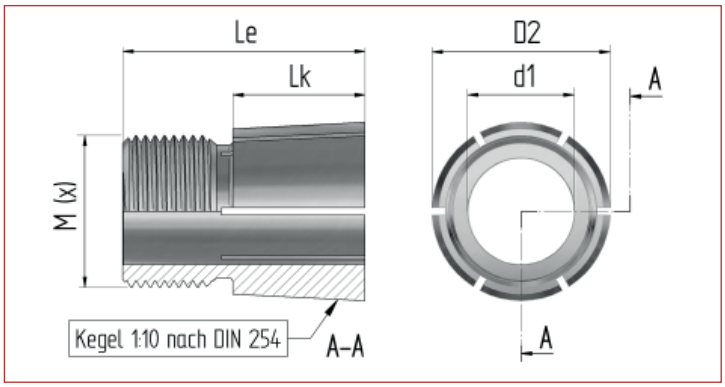
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**11130k**	**11130k-ISK**	**11130**	**11130-ISK**	**10132**	**10132-ISK**
for shaft diameters (d1)	mm	6,00	6,00	6,00	6,00	6,00	6,00
Hub width (B) max.	mm	8,00	8,00	10,00	10,00	12,00	12,00
Taper diameter front (D2)	mm	11,30	11,30	11,30	11,30	11,30	11,30
Taper length (L_k)	mm	5,40	5,40	6,50	6,50	7,70	7,70
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	12,00	12,00	14,00	14,00	16,00	16,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M10 x 0,75	M10 x 0,75	M10 x 0,75	M10 x 0,75	M10 x 1,0	M10 x 1,0
Hex socket key width (SW)	mm	-	6 mm	-	6 mm	-	6 mm
Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)							
Thread (metric DIN)	M (x)	M10 x 0,75	M10 x 0,75	M10 x 0,75	M10 x 0,75	M10 x 1,0	M10 x 1,0
Key width (SW)	mm	13	13	13	13	13	13
Nut height (m)	mm	3,50	3,50	3,50	3,50	3,50	3,50
Recommended tightening torque [1]	Nm	13,00	13,00	14,00	14,00	15,00	15,00
Transmission Values [2]							
Torque (M)	Nm	7,80	7,80	8,40	8,40	9,00	9,00
Thrust (F_e)	kN	0,94	0,94	1,02	1,02	1,10	1,10
Hub load ($_pF$)	N/mm²	73,30	73,30	68,05	68,05	62,23	62,23

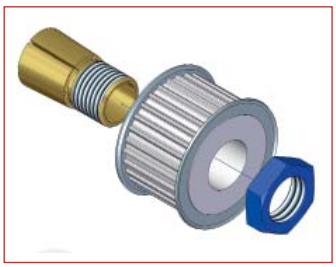
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

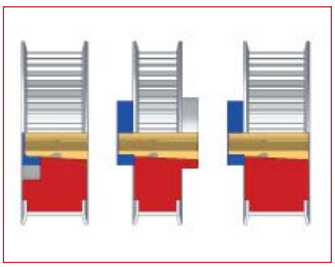
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

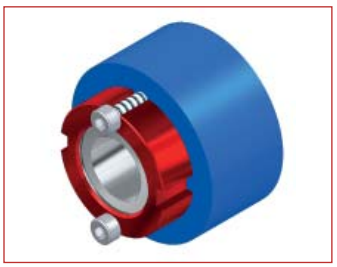
BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **11130k** **11130k-ISK** **11130** **11130-ISK** **10132** **10132-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.







BOQA® Fastening Elements product group 1130 for shaft diameter = 6.00 mm

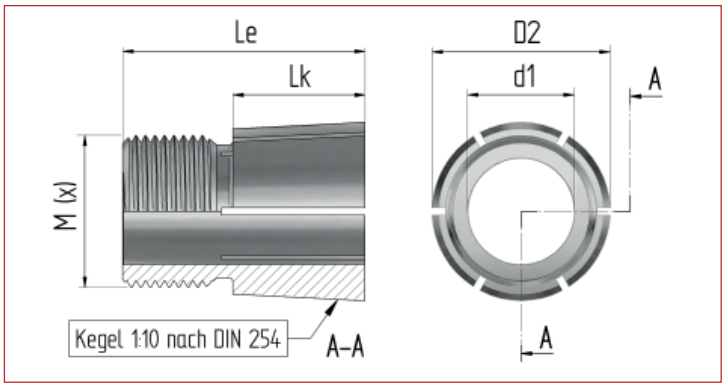
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10133S**	**10133S-ISK**	**10133**	**10133-ISK**	**10134**	**10134-ISK**
for shaft diameters (d1)	mm	6,00	6,00	6,00	6,00	6,00	6,00
Hub width (B) max.	mm	16,00	16,00	19,00	19,00	22,00	22,00
Taper diameter front (D2)	mm	11,30	11,30	11,30	11,30	11,30	11,30
Taper length (L_k)	mm	10,20	10,20	12,50	12,50	16,50	16,50
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	19,00	19,00	22,00	22,00	26,00	26,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M10 x 1,0	M10 x 1,0	M10 x 1,0	M10 x 1,0	M10 x 1,0	M10 x 1,0
Hex socket key width (SW)	mm	-	6 mm	-	6 mm	-	6 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M10 x 1,0	M10 x 1,0	M10 x 1,0	M10 x 1,0	M10 x 1,0	M10 x 1,0
Key width (SW)	mm	13	13	13	13	13	13
Nut height (m)	mm	3,50	3,50	3,50	3,50	3,50	3,50
Recommended tightening torque [1]	Nm	16,00	16,00	17,00	17,00	18,00	18,00

Transmission Values [2]

Torque (M)	Nm	9,60	9,60	10,20	10,20	10,80	10,80
Thrust (F_e)	kN	1,19	1,19	1,27	1,27	1,37	1,37
Hub load ($_pF$)	N/mm²	51,27	51,27	45,42	45,42	37,84	37,84

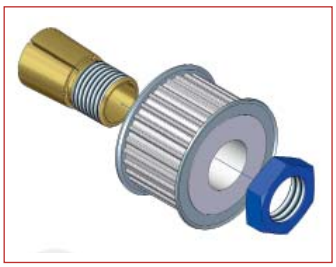
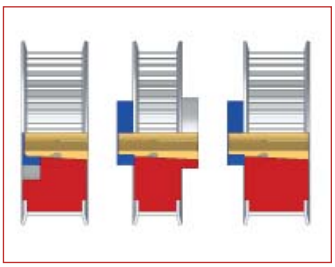
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

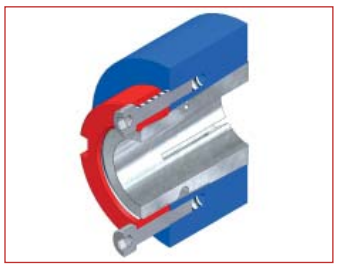
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10133S** **10133S-ISK** **10133** **10133-ISK** **10134** **10134-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 1130 for shaft diameter = 6.35 mm (1/4“)

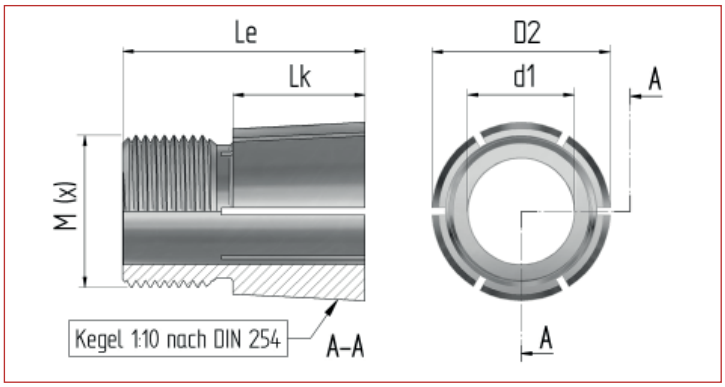
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**11134k**	**11134k-ISK**	**11134**	**11134-ISK**	**10075**	**10075-ISK**
for shaft diameters (d1)	mm	6,35	6,35	6,35	6,35	6,35	6,35
Hub width (B) max.	mm	8,00	8,00	10,00	10,00	12,00	12,00
Taper diameter front (D2)	mm	11,30	11,30	11,30	11,30	11,30	11,30
Taper length (L_k)	mm	5,40	5,40	6,50	6,50	7,70	7,70
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	12,00	12,00	14,00	14,00	16,00	16,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M10 x 0,75	M10 x 0,75	M10 x 0,75	M10 x 0,75	M10 x 1,0	M10 x 1,0
Hex socket key width (SW)	mm	-	6 mm	-	6 mm	-	6 mm
Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)							
Thread (metric DIN)	M (x)	M10 x 0,75	M10 x 0,75	M10 x 0,75	M10 x 0,75	M10 x 1,0	M10 x 1,0
Key width (SW)	mm	13	13	13	13	13	13
Nut height (m)	mm	3,50	3,50	3,50	3,50	3,50	3,50
Recommended tightening torque [1]	Nm	14,00	14,00	15,00	15,00	16,00	16,00
Transmission Values [2]							
Torque (M)	Nm	8,40	8,40	9,00	9,00	9,50	9,50
Thrust (F_e)	kN	1,02	1,02	1,09	1,09	1,17	1,17
Hub load ($_pF$)	N/mm²	81,10	81,10	72,91	72,91	66,37	66,37

1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.:	**11134k**	**11134k-ISK**	**11134**	**11134-ISK**	**10075**	**10075-ISK**

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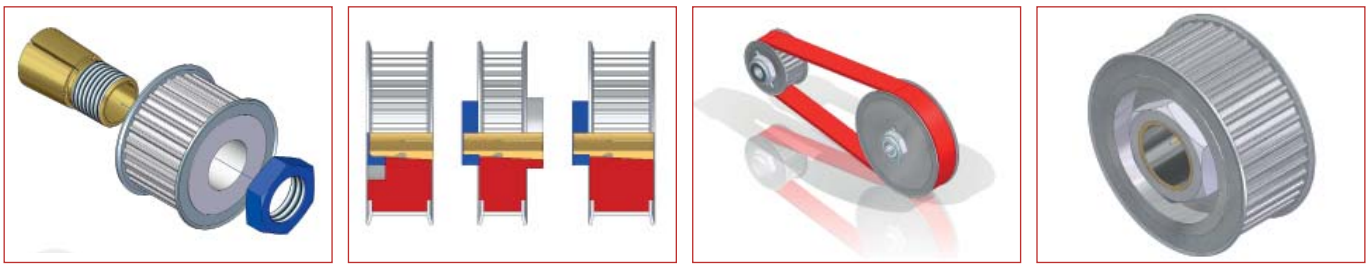


BOQA® Befestigungselement Gruppe 1130 für Wellen-ø = 6,35 mm (¼")

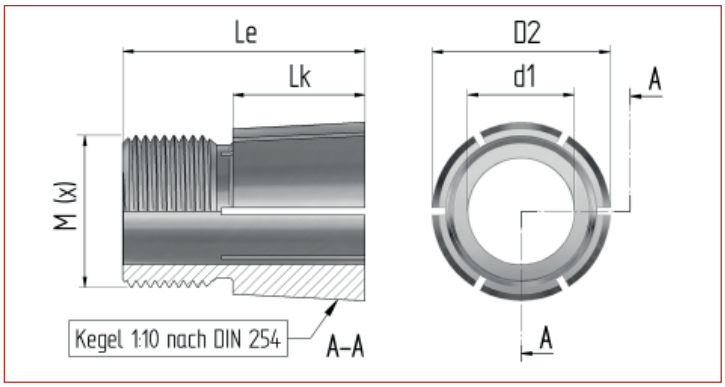
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10076S**	**10076S-ISK**	**10076**	**10076-ISK**	**10077**	**10077-ISK**
for shaft diameters (d1)	mm	6,35	6,35	6,35	6,35	6,35	6,35
Hub width (B) max.	mm	16,00	16,00	19,00	19,00	22,00	22,00
Taper diameter front (D2)	mm	11,30	11,30	11,30	11,30	11,30	11,30
Taper length (L_k)	mm	10,20	10,20	12,50	12,50	16,50	16,50
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	19,00	19,00	22,00	22,00	26,00	26,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M10 x 1,0	M10 x 1,0	M10 x 1,0	M10 x 1,0	M10 x 1,0	M10 x 1,0
Hex socket key width (SW)	mm	-	6 mm	-	6 mm	-	6 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M10 x 1,0	M10 x 1,0	M10 x 1,0	M10 x 1,0	M10 x 1,0	M10 x 1,0
Key width (SW)	mm	13	13	13	13	13	13
Nut height (m)	mm	3,50	3,50	3,50	3,50	3,50	3,50
Recommended tightening torque [1]	Nm	17,00	17,00	18,00	18,00	19,00	19,00

Transmission Values [2]

Torque (M)	Nm	10,20	10,20	10,80	10,80	11,40	11,40
Thrust (F_e)	kN	1,26	1,26	1,35	1,35	1,45	1,45
Hub load ($_pF$)	N/mm²	54,48	54,48	48,09	48,09	39,94	39,94

1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10076S** **10076S-ISK** **10076** **10076-ISK** **10077** **10077-ISK**

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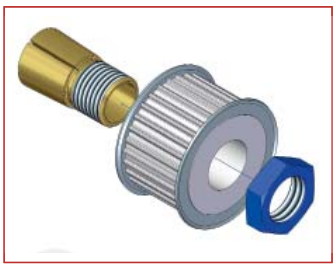
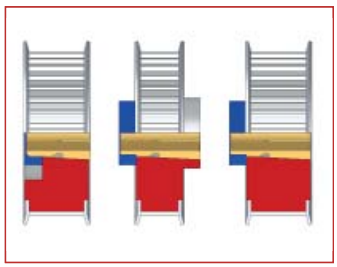
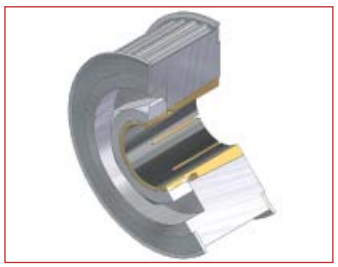





BOQA® Fastening Elements product group 1130 for shaft diameter = 7.00 mm

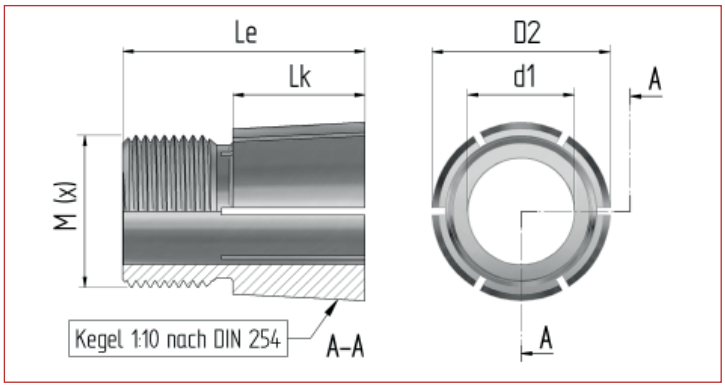
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**11077k**	**11077k-ISK**	**11077**	**11077-ISK**	**10146**	**10146-ISK**
for shaft diameters (d1)	mm	7,00	7,00	7,00	7,00	7,00	7,00
Hub width (B) max.	mm	8,00	8,00	10,00	10,00	12,00	12,00
Taper diameter front (D2)	mm	11,30	11,30	11,30	11,30	11,30	11,30
Taper length (L_k)	mm	5,30	5,30	6,50	6,50	7,70	7,70
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	12,00	12,00	14,00	14,00	16,00	16,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M10 x 0,75	M10 x 0,75	M10 x 0,75	M10 x 0,75	M10 x 1,0	M10 x 1,0
Hex socket key width (SW)	mm	-	6 mm	-	6 mm	-	6 mm
Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)							
Thread (metric DIN)	M (x)	M10 x 0,75	M10 x 0,75	M10 x 0,75	M10 x 0,75	M10 x 1,0	M10 x 1,0
Key width (SW)	mm	13	13	13	13	13	13
Nut height (m)	mm	3,50	3,50	3,50	3,50	3,50	3,50
Recommended tightening torque [1]	Nm	15,00	15,00	16,00	16,00	17,00	17,00
Transmission Values [2]							
Torque (M)	Nm	9,00	9,00	9,60	9,60	10,20	10,20
Thrust (F_e)	kN	1,09	1,09	1,17	1,17	1,25	1,25
Hub load ($_pF$)	N/mm²	86,89	86,89	77,77	77,77	70,52	70,52

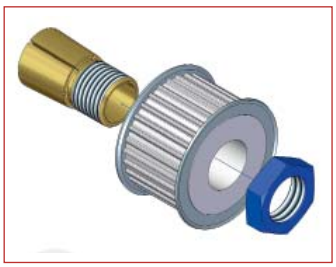
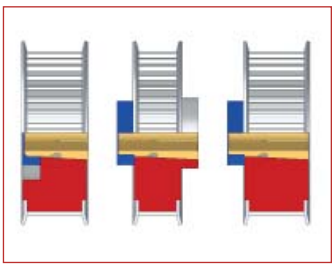
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

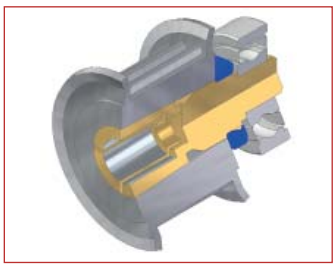
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.:	**11077k**	**11077k-ISK**	**11077**	**11077-ISK**	**10146**	**10146-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 1130 for shaft diameter = 7.00 mm

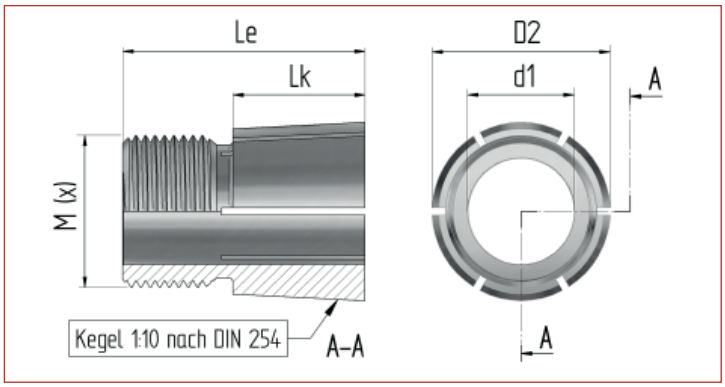
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10147S**	**10147S-ISK**	**10147**	**10147-ISK**	**10148**	**10148-ISK**
for shaft diameters (d1)	mm	7,00	7,00	7,00	7,00	7,00	7,00
Hub width (B) max.	mm	16,00	16,00	19,00	19,00	22,00	22,00
Taper diameter front (D2)	mm	11,30	11,30	11,30	11,30	11,30	11,30
Taper length (L_k)	mm	10,20	10,20	12,50	12,50	16,50	16,50
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	19,00	19,00	22,00	22,00	26,00	26,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M10 x 1,0	M10 x 1,0	M10 x 1,0	M10 x 1,0	M10 x 1,0	M10 x 1,0
Hex socket key width (SW)	mm	-	6 mm	-	6 mm	-	6 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M10 x 1,0	M10 x 1,0	M10 x 1,0	M10 x 1,0	M10 x 1,0	M10 x 1,0
Key width (SW)	mm	13	13	13	13	13	13
Nut height (m)	mm	3,50	3,50	3,50	3,50	3,50	3,50
Recommended tightening torque [1]	Nm	18,00	18,00	19,00	19,00	20,00	20,00

Transmission Values [2]

Torque (M)	Nm	10,80	10,80	11,40	11,40	12,00	12,00
Thrust (F_e)	kN	1,33	1,33	1,42	1,42	1,53	1,53
Hub load ($_pF$)	N/mm²	57,68	57,68	50,76	50,76	42,04	42,04

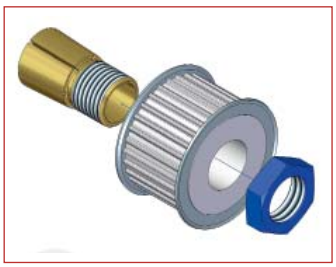
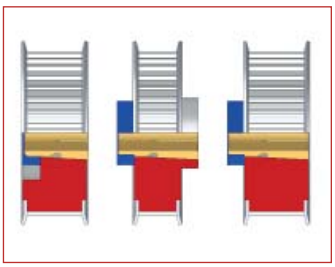
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

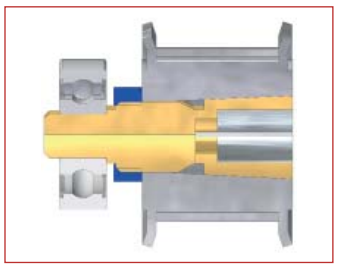
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.:	**10147S**	**10147S-ISK**	**10147**	**10147-ISK**	**10148**	**10148-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 1130 for shaft diameter = 8.00 mm

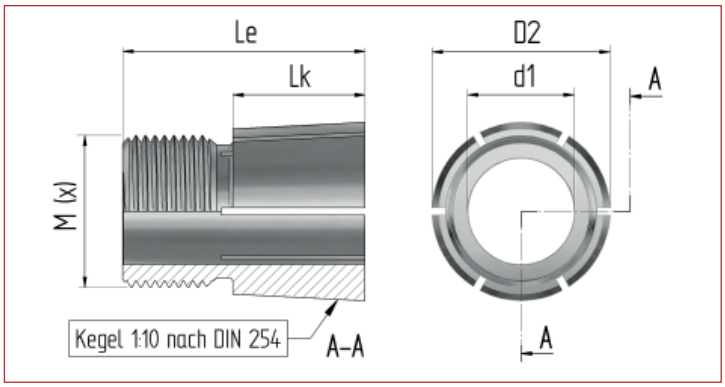
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**11077-8k**	**11077-8k-ISK**	**11077-8**	**11077-8-ISK**
for shaft diameters (d1)	mm	8,00	8,00	8,00	8,00
Hub width (B) max.	mm	8,00	8,00	10,00	10,00
Taper diameter front (D2)	mm	11,30	11,30	11,30	11,30
Taper length (L_k)	mm	5,40	5,40	6,50	6,50
Counter bearing, length	mm	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-
Overall length (L_e)	mm	12,00	12,00	14,00	14,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M10 x 0,75	M10 x 0,75	M10 x 0,75	M10 x 0,75
Hex socket key width (SW)	mm	-	6 mm	-	6 mm
Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)					
Thread (metric DIN)	M (x)	M10 x 0,75	M10 x 0,75	M10 x 0,75	M10 x 0,75
Key width (SW)	mm	13	13	13	13
Nut height (m)	mm	3,50	3,50	3,50	3,50
Recommended tightening torque [1]	Nm	16,00	16,00	17,00	17,00
Transmission Values [2]					
Torque (M)	Nm	9,60	9,60	10,20	10,20
Thrust (F_e)	kN	1,16	1,16	1,24	1,24
Hub load ($_pF$)	N/mm²	92,68	92,68	82,63	82,63

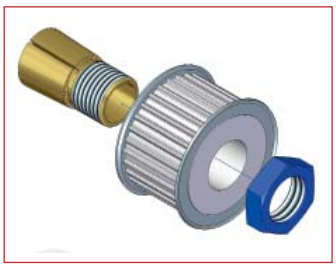
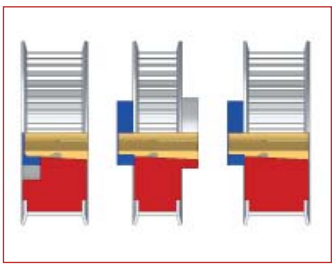
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **11077-8k** **11077-8k-ISK** **11077-8** **11077-8-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

BOQA® Fastening Elements product group 1360 for shaft diameter = 5.00 mm

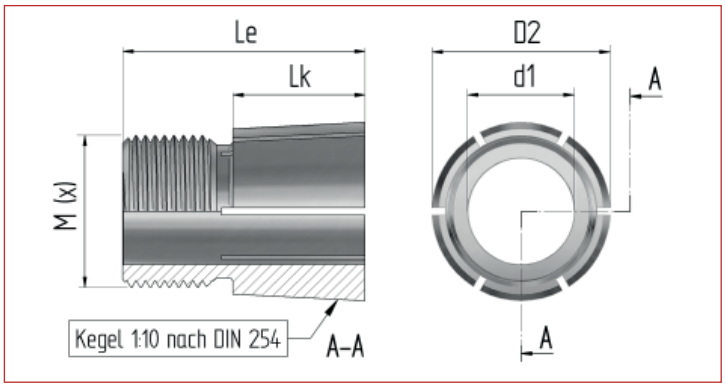
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10136-5**	**10136-5-ISK**	**10137-5**	**10137-5-ISK**	**10138-5**	**10138-5-ISK**
for shaft diameters (d1)	mm	5,00	5,00	5,00	5,00	5,00	5,00
Hub width (B) max.	mm	12,00	12,00	16,00	16,00	22,00	22,00
Taper diameter front (D2)	mm	13,60	13,60	13,60	13,60	13,60	13,60
Taper length (L_k)	mm	7,00	7,00	12,00	12,00	17,00	17,00
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	16,00	16,00	21,00	21,00	26,00	26,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M12 x 1	M12 x 1	M12 x 1	M12 x 1	M12 x 1	M12 x 1
Hex socket key width (SW)	mm	-	8 mm	-	8 mm	-	8 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M12 x 1	M12 x 1	M12 x 1	M12 x 1	M12 x 1	M12 x 1
Key width (SW)	mm	15	15	15	15	15	15
Nut height (m)	mm	4,00	4,00	4,00	4,00	4,00	4,00
Recommended tightening torque [1]	Nm	18,00	18,00	23,00	23,00	24,00	24,00

Transmission Values [2]

Torque (M)	Nm	10,80	10,80	13,80	13,80	14,40	14,40
Thrust (F_e)	kN	1,09	1,09	1,42	1,42	1,51	1,51
Hub load ($_pF$)	N/mm²	56,08	56,08	43,42	43,42	33,25	33,25

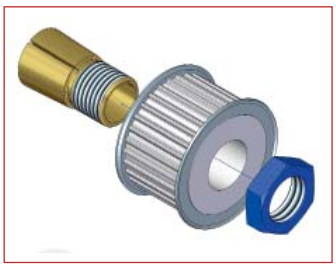
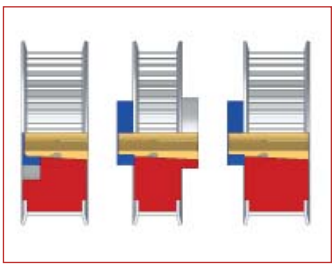
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

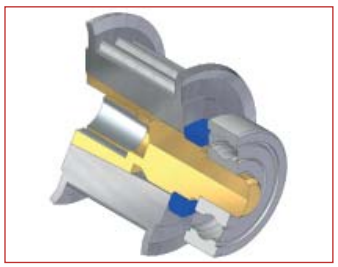
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.:	**10136-5**	**10136-5-ISK**	**10137-5**	**10137-5-ISK**	**10138-5**	**10138-5-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 1360 for shaft diameter = 6.00 mm

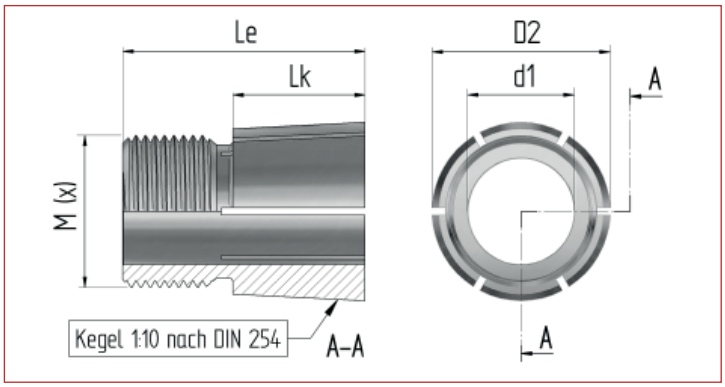
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10136**	**10136-ISK**	**10137**	**10137-ISK**	**10138**	**10138-ISK**
for shaft diameters (d1)	mm	6,00	6,00	6,00	6,00	6,00	6,00
Hub width (B) max.	mm	12,00	12,00	16,00	16,00	22,00	22,00
Taper diameter front (D2)	mm	13,60	13,60	13,60	13,60	13,60	13,60
Taper length (L_k)	mm	7,00	7,00	12,00	12,00	17,00	17,00
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	16,00	16,00	21,00	21,00	26,00	26,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M12 x 1	M12 x 1	M12 x 1	M12 x 1	M12 x 1	M12 x 1
Hex socket key width (SW)	mm	-	8 mm	-	8 mm	-	8 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M12 x 1	M12 x 1	M12 x 1	M12 x 1	M12 x 1	M12 x 1
Key width (SW)	mm	15	15	15	15	15	15
Nut height (m)	mm	4,00	4,00	4,00	4,00	4,00	4,00
Recommended tightening torque [1]	Nm	19,00	19,00	24,00	24,00	25,00	25,00

Transmission Values [2]

Torque (M)	Nm	11,40	11,40	14,40	14,40	15,00	15,00
Thrust (F_e)	kN	1,15	1,15	1,49	1,49	1,58	1,58
Hub load ($_pF$)	N/mm²	59,19	59,19	45,31	45,31	34,64	34,64

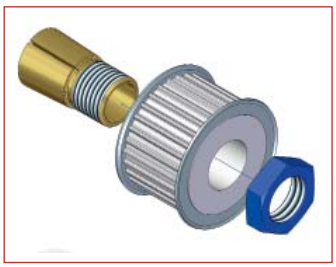
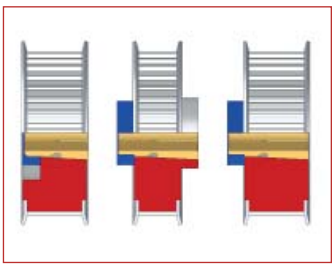
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10136** **10136-ISK** **10137** **10137-ISK** **10138** **10138-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

BOQA® Fastening Elements product group 1360 for shaft diameter = 6.35 mm (1/4“)

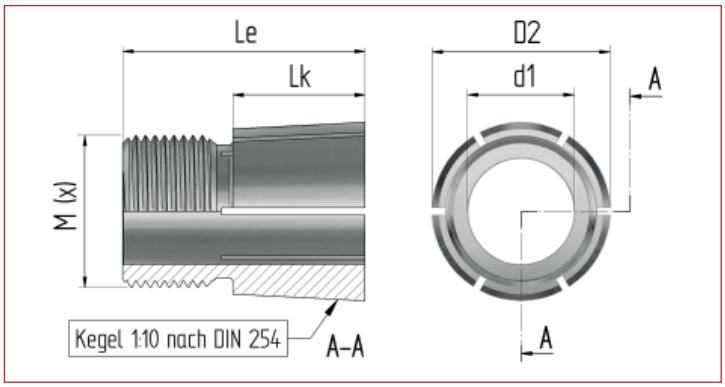
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10079**	**10079-ISK**	**10080**	**10080-ISK**	**10081**	**10081-ISK**
for shaft diameters (d1)	mm	6,35	6,35	6,35	6,35	6,35	6,35
Hub width (B) max.	mm	12,00	12,00	16,00	16,00	22,00	22,00
Taper diameter front (D2)	mm	13,60	13,60	13,60	13,60	13,60	13,60
Taper length (L_k)	mm	7,00	7,00	12,00	12,00	17,00	17,00
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	16,00	16,00	21,00	21,00	26,00	26,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M12 x 1	M12 x 1	M12 x 1	M12 x 1	M12 x 1	M12 x 1
Hex socket key width (SW)	mm	-	8 mm	-	8 mm	-	8 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M12 x 1	M12 x 1	M12 x 1	M12 x 1	M12 x 1	M12 x 1
Key width (SW)	mm	15	15	15	15	15	15
Nut height (m)	mm	4,00	4,00	4,00	4,00	4,00	4,00
Recommended tightening torque [1]	Nm	20,00	20,00	25,00	25,00	26,00	26,00

Transmission Values [2]

Torque (M)	Nm	12,00	12,00	15,00	15,00	15,60	15,60
Thrust (F_e)	kN	1,22	1,22	1,55	1,55	1,64	1,64
Hub load ($_pF$)	N/mm²	62,31	62,31	47,20	47,20	36,02	36,02

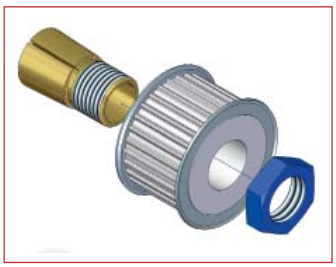
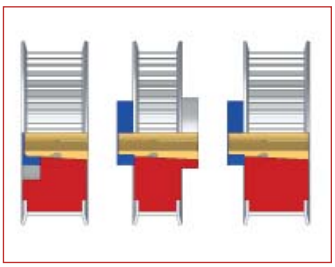
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.:	**10079**	**10079-ISK**	**10080**	**10080-ISK**	**10081**	**10081-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

BOQA® Fastening Elements product group 1360 for shaft diameter = 7.00 mm

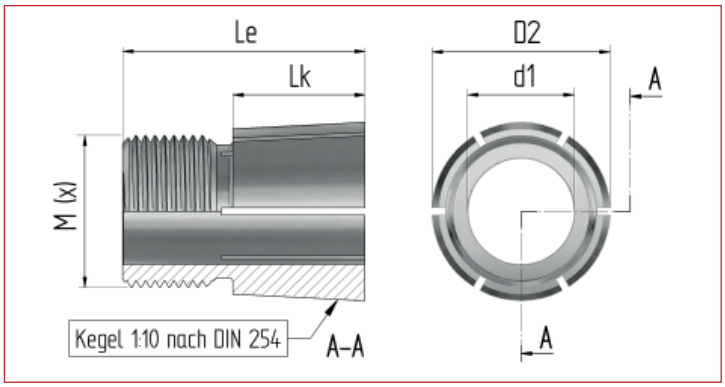
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10150**	**10150-ISK**	**10151**	**10151-ISK**	**10152**	**10152-ISK**
for shaft diameters (d1)	mm	7,00	7,00	7,00	7,00	7,00	7,00
Hub width (B) max.	mm	12,00	12,00	16,00	16,00	22,00	22,00
Taper diameter front (D2)	mm	13,60	13,60	13,60	13,60	13,60	13,60
Taper length (L_k)	mm	7,00	7,00	12,00	12,00	17,00	17,00
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	16,00	16,00	21,00	21,00	26,00	26,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M12 x 1	M12 x 1	M12 x 1	M12 x 1	M12 x 1	M12 x 1
Hex socket key width (SW)	mm	-	8 mm	-	8 mm	-	8 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M12 x 1	M12 x 1	M12 x 1	M12 x 1	M12 x 1	M12 x 1
Key width (SW)	mm	15	15	15	15	15	15
Nut height (m)	mm	4,00	4,00	4,00	4,00	4,00	4,00
Recommended tightening torque [1]	Nm	21,00	21,00	26,00	26,00	27,00	27,00

Transmission Values [2]

Drehmoment (M)	Nm	12,60	12,60	15,60	15,60	16,30	16,30
Thrust (F_e)	kN	1,28	1,28	1,61	1,61	1,70	1,70
Hub load ($_pF$)	N/mm²	65,42	65,42	49,09	49,09	37,41	37,41

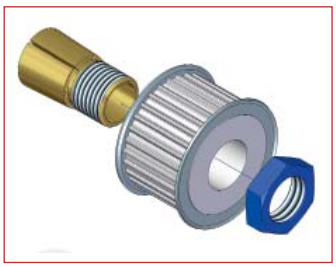
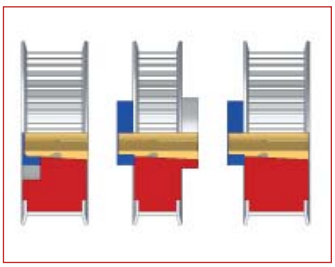
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10150** **10150-ISK** **10151** **10151-ISK** **10152** **10152-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

BOQA® Fastening Elements product group 1360 for shaft diameter = 8.00 mm

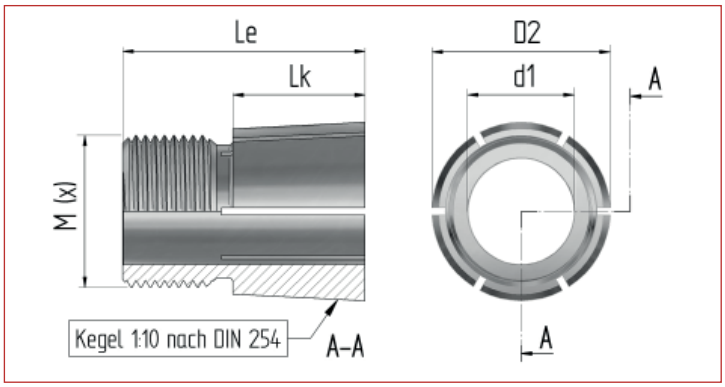
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10160**	**10160-ISK**	**10161**	**10161-ISK**	**10162**	**10162-ISK**
for shaft diameters (d1)	mm	8,00	8,00	8,00	8,00	8,00	8,00
Hub width (B) max.	mm	12,00	12,00	16,00	16,00	22,00	22,00
Taper diameter front (D2)	mm	13,60	13,60	13,60	13,60	13,60	13,60
Taper length (L_k)	mm	7,00	7,00	12,00	12,00	17,00	17,00
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	16,00	16,00	21,00	21,00	26,00	26,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M12 x 1	M12 x 1	M12 x 1	M12 x 1	M12 x 1	M12 x 1
Hex socket key width (SW)	mm	-	8 mm	-	8 mm	-	8 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M12 x 1	M12 x 1	M12 x 1	M12 x 1	M12 x 1	M12 x 1
Key width (SW)	mm	15	15	15	15	15	15
Nut height (m)	mm	4,00	4,00	4,00	4,00	4,00	4,00
Recommended tightening torque [1]	Nm	24,00	24,00	27,00	27,00	28,00	28,00

Transmission Values [2]

Torque (M)	Nm	14,40	14,40	16,30	16,30	16,90	16,90
Thrust (F_e)	kN	1,46	1,46	1,67	1,67	1,77	1,77
Hub load ($_pF$)	N/mm²	74,77	74,77	50,97	50,97	38,79	38,79

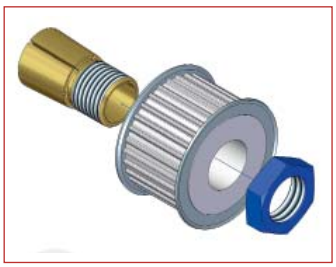
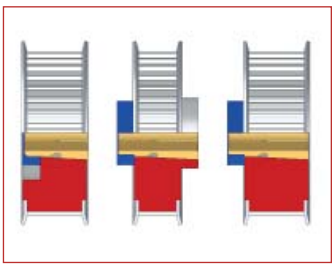
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

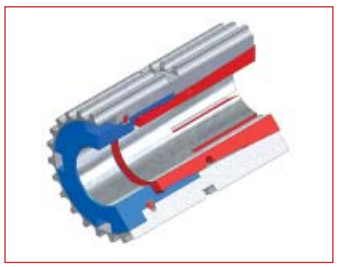
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10160** **10160-ISK** **10161** **10161-ISK** **10162** **10162-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 1360 for shaft diameter = 9.00 mm

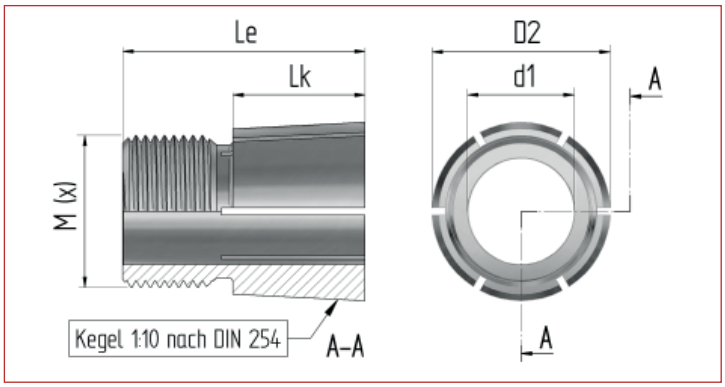
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10160-9**	**10160-9-ISK**	**10161-9**	**10161-9-ISK**	**10162-9**	**10162-9-ISK**
for shaft diameters (d1)	mm	9,00	9,00	9,00	9,00	9,00	9,00
Hub width (B) max.	mm	12,00	12,00	16,00	16,00	22,00	22,00
Taper diameter front (D2)	mm	13,60	13,60	13,60	13,60	13,60	13,60
Taper length (L_k)	mm	7,00	7,00	12,00	12,00	17,00	17,00
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	16,00	16,00	21,00	21,00	26,00	26,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M12 x 1	M12 x 1	M12 x 1	M12 x 1	M12 x 1	M12 x 1
Hex socket key width (SW)	mm	-	8 mm	-	8 mm	-	8 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M12 x 1	M12 x 1	M12 x 1	M12 x 1	M12 x 1	M12 x 1
Key width (SW)	mm	15	15	15	15	15	15
Nut height (m)	mm	4,00	4,00	4,00	4,00	4,00	4,00
Recommended tightening torque [1]	Nm	25,00	25,00	28,00	28,00	29,00	29,00

Transmission Values [2]

Torque (M)	Nm	15,00	15,00	16,90	16,90	17,50	17,50
Thrust (F_e)	kN	1,52	1,52	1,73	1,73	1,83	1,83
Hub load ($_pF$)	N/mm²	77,89	77,89	52,86	52,86	40,18	40,18

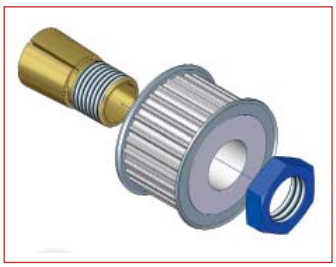
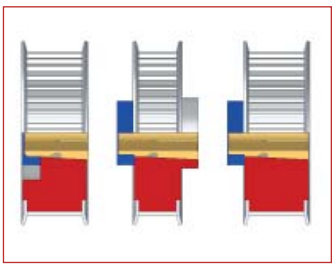
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

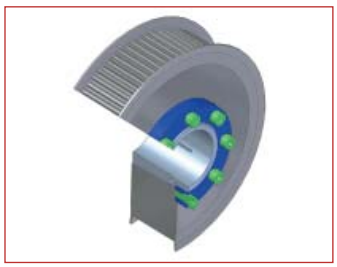
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.:	**10160-9**	**10160-9-ISK**	**10161-9**	**10161-9-ISK**	**10162-9**	**10162-9-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 1360 for shaft diameter = 9.00 mm

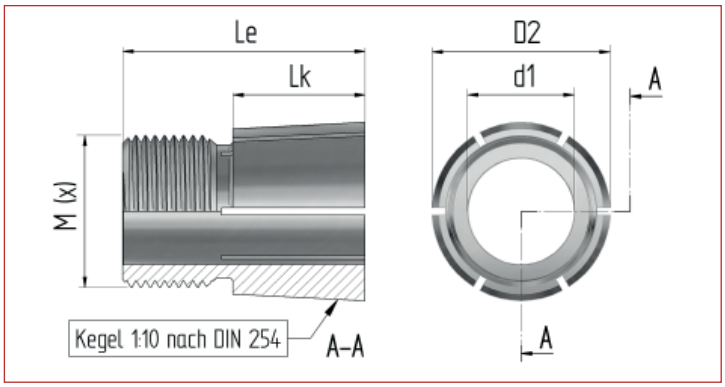
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10160-10**	**10160-10-ISK**	**10161-10**	**10161-10-ISK**	**10162-10**	**10162-10-ISK**
for shaft diameters (d1)	mm	9,00	9,00	9,00	9,00	9,00	9,00
Hub width (B) max.	mm	12,00	12,00	16,00	16,00	22,00	22,00
Taper diameter front (D2)	mm	13,60	13,60	13,60	13,60	13,60	13,60
Taper length (L_k)	mm	7,00	7,00	12,00	12,00	17,00	17,00
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	16,00	16,00	21,00	21,00	26,00	26,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M12 x 1	M12 x 1	M12 x 1	M12 x 1	M12 x 1	M12 x 1
Hex socket key width (SW)	mm	-	8 mm	-	8 mm	-	8 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M12 x 1	M12 x 1	M12 x 1	M12 x 1	M12 x 1	M12 x 1
Key width (SW)	mm	15	15	15	15	15	15
Nut height (m)	mm	4,00	4,00	4,00	4,00	4,00	4,00
Recommended tightening torque [1]	Nm	26,00	26,00	29,00	29,00	30,00	30,00

Transmission Values [2]

Torque (M)	Nm	15,60	15,60	17,50	17,50	18,10	18,10
Thrust (F_e)	kN	1,58	1,58	1,80	1,80	1,89	1,89
Hub load ($_pF$)	N/mm²	81,00	81,00	54,75	54,75	41,56	41,56

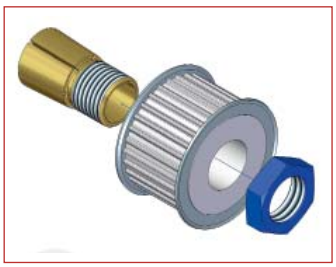
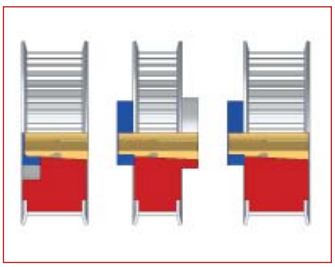
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

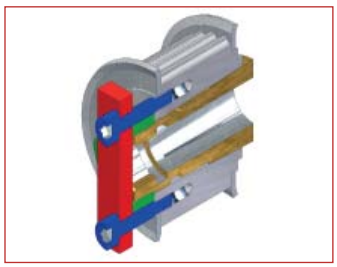
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10160-10** **10160-10-ISK** **10161-10** **10161-10-ISK** **10162-10** **10162-10-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 1360 (special solutions)

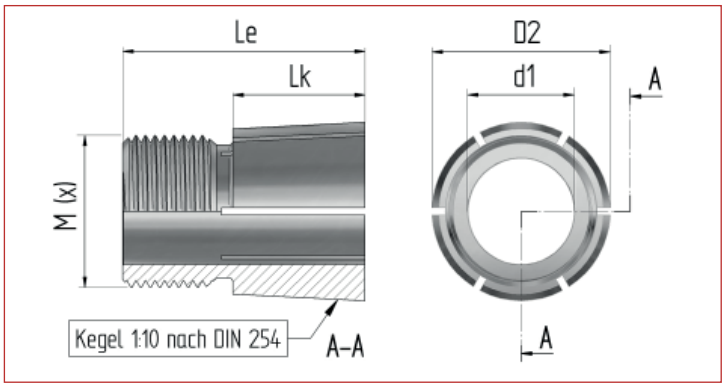
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10079-ma**	**10160-ma**	**10161-10skr**	**10161-10skr-ISK**
for shaft diameters (d1)	mm	6,35	8,00	10,00	10,00
Hub width (B) max.	mm	11,00	11,00	16,00	16,00
Taper diameter front (D2)	mm	13,60	13,60	13,60	13,60
Taper length (L_k)	mm	6,50	6,50	10,50	10,50
Counter bearing, length	mm	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-
Overall length (L_e)	mm	14,00	14,00	18,50	18,50
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M12 x 1	M12 x 1	M12 x 1	M12 x 1
Hex socket key width (SW)	mm	-	8 mm	-	8 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M12 x 1	M12 x 1	M12 x 1	M12 x 1
Key width (SW)	mm	15	15	15	15
Nut height (m)	mm	4,00	4,00	4,00	4,00
Recommended tightening torque [1]	Nm	19,00	22,00	28,00	28,00

Transmission Values [2]

Torque (M)	Nm	11,40	13,20	16,90	16,90
Thrust (F_e)	kN	1,15	1,33	1,73	1,73
Hub load ($_pF$)	N/mm²	63,51	73,53	57,23	57,23

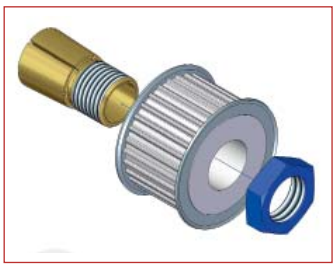
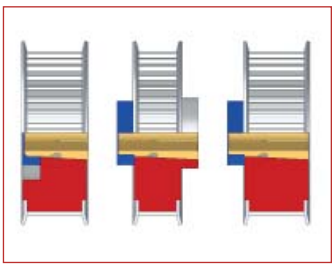
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10079-ma** **10160-ma** **10161-10skr** **10161-10skr-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

BOQA® Fastening Elements product group 1610 for shaft diameter = 6.00 mm

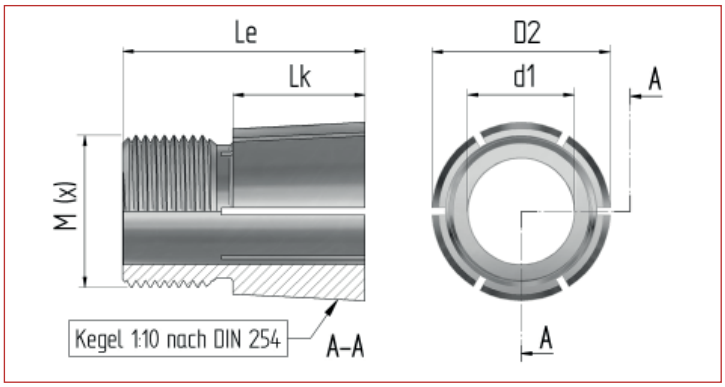
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10140k**	**10140k-ISK**	**10140**	**10140-ISK**
for shaft diameters (d1)	mm	6,00	6,00	6,00	6,00
Hub width (B) max.	mm	12,00	12,00	16,00	16,00
Taper diameter front (D2)	mm	16,10	16,10	16,10	16,10
Taper length (L_k)	mm	7,50	7,50	10,90	10,90
Counter bearing, length	mm	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-
Overall length (L_e)	mm	16,50	16,50	21,50	21,50
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M14 x 1	M14 x 1	M14 x 1	M14 x 1
Hex socket key width (SW)	mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M14 x 1	M14 x 1	M14 x 1	M14 x 1
Key width (SW)	mm	17	17	17	17
Nut height (m)	mm	5,00	5,00	5,00	5,00
Recommended tightening torque [1]	Nm	24,00	24,00	26,00	26,00

Transmission Values [2]

Torque (M)	Nm	14,40	14,40	15,60	15,60
Thrust (F_e)	kN	1,22	1,22	1,34	1,34
Hub load ($_pF$)	N/mm²	49,38	49,38	37,61	37,61

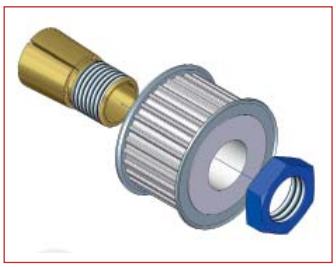
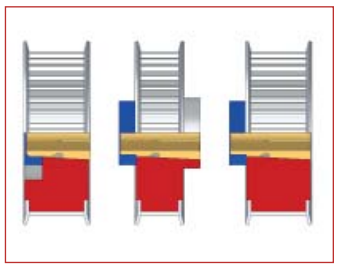
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

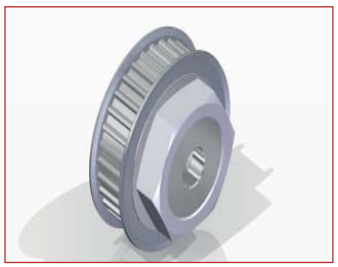
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10140k** **10140k-ISK** **10140** **10140-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 1610 for shaft diameter = 6.00 mm

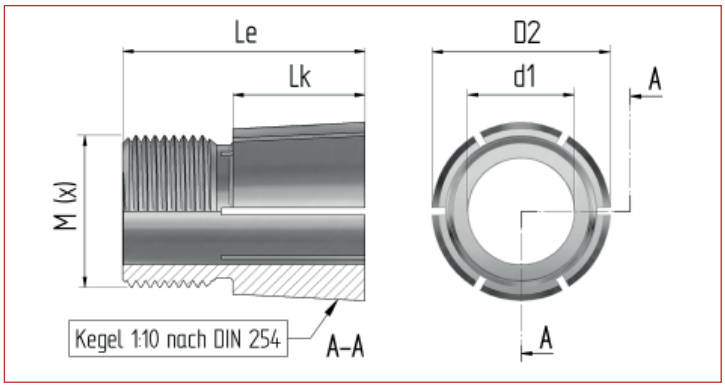
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10141**	**10141-ISK**	**10142**	**10142-ISK**
for shaft diameters (d1)	mm	6,00	6,00	6,00	6,00
Hub width (B) max.	mm	22,00	22,00	26,00	26,00
Taper diameter front (D2)	mm	16,10	16,10	16,10	16,10
Taper length (L_k)	mm	16,40	16,40	20,40	20,40
Counter bearing, length	mm	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-
Overall length (L_e)	mm	27,00	27,00	31,00	31,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M14 x 1	M14 x 1	M14 x 1	M14 x 1
Hex socket key width (SW)	mm	-	10 mm	-	10 mm
Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)					
Thread (metric DIN)	M (x)	M14 x 1	M14 x 1	M14 x 1	M14 x 1
Key width (SW)	mm	17	17	17	17
Nut height (m)	mm	5,00	5,00	5,00	5,00
Recommended tightening torque [1]	Nm	28,00	28,00	30,00	30,00
Transmission Values [2]					
Torque (M)	Nm	16,80	16,80	18,00	18,00
Thrust (F_e)	kN	1,47	1,47	1,60	1,60
Hub load ($_pF$)	N/mm²	27,90	27,90	24,67	24,67

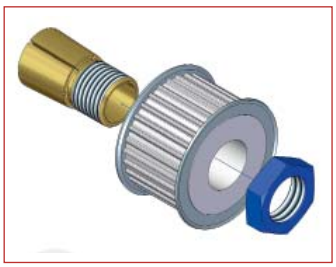
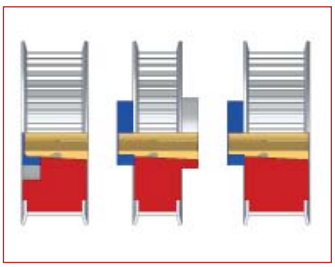
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

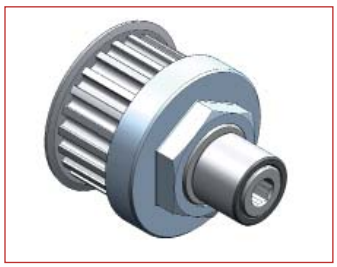
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10141** **10141-ISK** **10142** **10142-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 1610 for shaft diameter = 6.35 mm (1/4“)

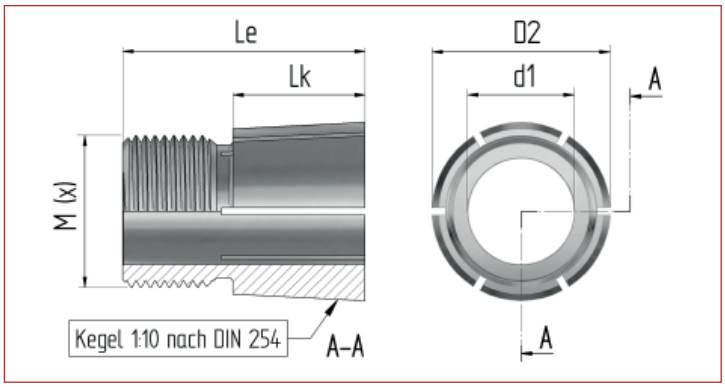
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10083k**	**10083k-ISK**	**10083**	**10083-ISK**
for shaft diameters (d1)	mm	6,35	6,35	6,35	6,35
Hub width (B) max.	mm	12,00	12,00	16,00	16,00
Taper diameter front (D2)	mm	16,10	16,10	16,10	16,10
Taper length (L_k)	mm	7,50	7,50	10,90	10,90
Counter bearing, length	mm	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-
Overall length (L_e)	mm	16,50	16,50	21,50	21,50
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M14 x 1	M14 x 1	M14 x 1	M14 x 1
Hex socket key width (SW)	mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M14 x 1	M14 x 1	M14 x 1	M14 x 1
Key width (SW)	mm	17	17	17	17
Nut height (m)	mm	5,00	5,00	5,00	5,00
Recommended tightening torque [1]	Nm	26,00	26,00	28,00	28,00

Transmission Values [2]

Torque (M)	Nm	15,60	15,60	16,80	16,80
Thrust (F_e)	kN	1,33	1,33	1,44	1,44
Hub load ($_pF$)	N/mm²	53,49	53,49	40,51	40,51

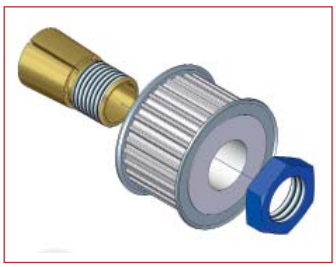
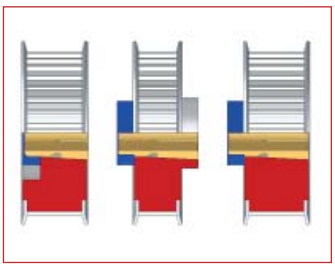
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

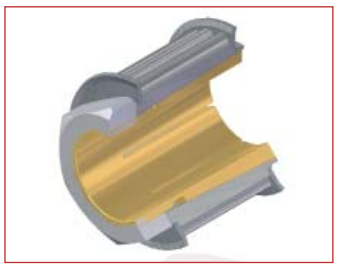
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10083k** **10083k-ISK** **10083** **10083-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 1610 for shaft diameter = 6.35 mm (1/4“)

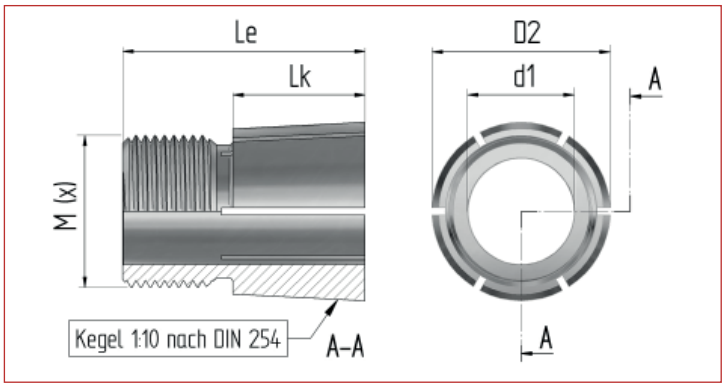
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10084**	**10084-ISK**	**10085**	**10085-ISK**
for shaft diameters (d1)	mm	6,35	6,35	6,35	6,35
Hub width (B) max.	mm	22,00	22,00	26,00	26,00
Taper diameter front (D2)	mm	16,10	16,10	16,10	16,10
Taper length (L_k)	mm	16,40	16,40	20,40	20,40
Counter bearing, length	mm	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-
Overall length (L_e)	mm	27,00	27,00	31,00	31,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M14 x 1	M14 x 1	M14 x 1	M14 x 1
Hex socket key width (SW)	mm	-	10 mm	-	10 mm
Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)					
Thread (metric DIN)	M (x)	M14 x 1	M14 x 1	M14 x 1	M14 x 1
Key width (SW)	mm	17	17	17	17
Nut height (m)	mm	5,00	5,00	5,00	5,00
Recommended tightening torque [1]	Nm	30,00	30,00	32,00	32,00
Transmission Values [2]					
Torque (M)	Nm	18,00	18,00	19,20	19,20
Thrust (F_e)	kN	1,58	1,58	1,70	1,70
Hub load ($_pF$)	N/mm²	29,89	29,89	26,32	26,32

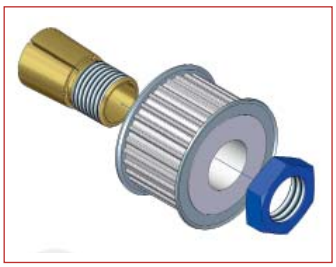
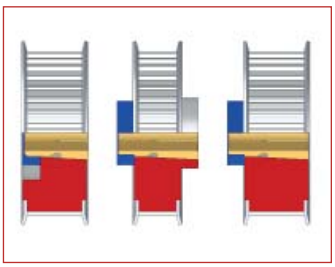
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

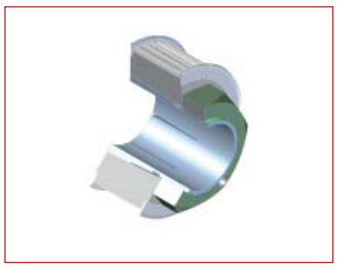
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10084** **10084-ISK** **10085** **10085-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 1610 for shaft diameter = 7.00 mm

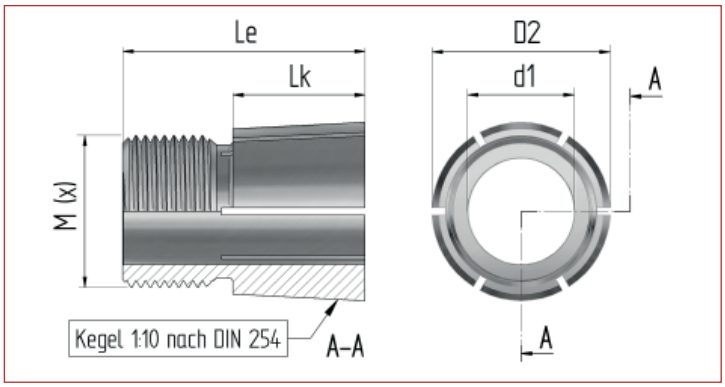
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10154k**	**10154k-ISK**	**10154**	**10154-ISK**
for shaft diameters (d1)	mm	7,00	7,00	7,00	7,00
Hub width (B) max.	mm	12,00	12,00	16,00	16,00
Taper diameter front (D2)	mm	16,10	16,10	16,10	16,10
Taper length (L_k)	mm	7,50	7,50	10,90	10,90
Counter bearing, length	mm	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-
Overall length (L_e)	mm	16,50	16,50	21,50	21,50
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M14 x 1	M14 x 1	M14 x 1	M14 x 1
Hex socket key width (SW)	mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M14 x 1	M14 x 1	M14 x 1	M14 x 1
Key width (SW)	mm	17	17	17	17
Nut height (m)	mm	5,00	5,00	5,00	5,00
Recommended tightening torque [1]	Nm	28,00	28,00	30,00	30,00

Transmission Values [2]

Torque (M)	Nm	16,80	16,80	18,00	18,00
Thrust (F_e)	kN	1,43	1,43	1,55	1,55
Hub load ($_pF$)	N/mm²	57,61	57,61	43,40	43,40

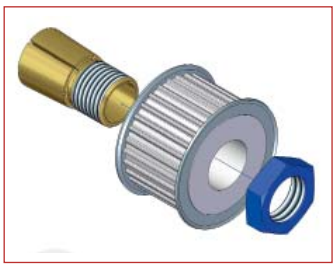
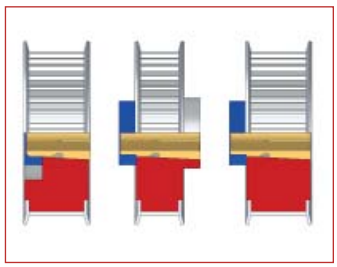
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

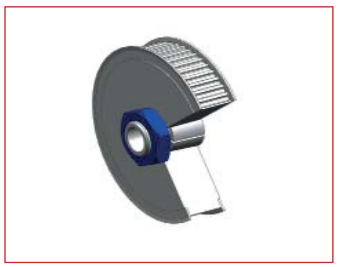
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10154k** **10154k-ISK** **10154** **10154-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 1610 for shaft diameter = 7.00 mm

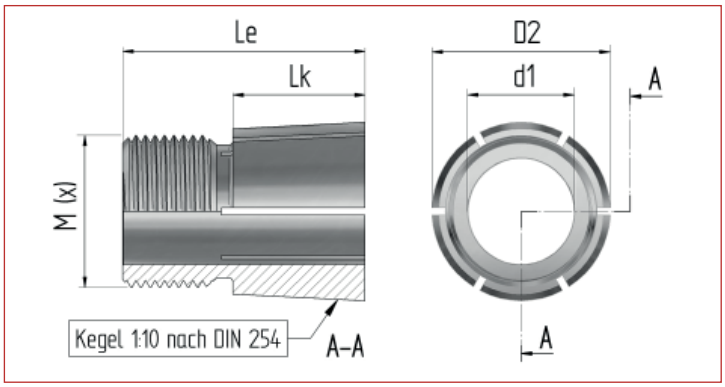
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10155**	**10155-ISK**	**10156**	**10156-ISK**
for shaft diameters (d1)	mm	7,00	7,00	7,00	7,00
Hub width (B) max.	mm	22,00	22,00	26,00	26,00
Taper diameter front (D2)	mm	16,10	16,10	16,10	16,10
Taper length (L_k)	mm	16,40	16,40	20,40	20,40
Counter bearing, length	mm	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-
Overall length (L_e)	mm	27,00	27,00	31,00	31,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M14 x 1	M14 x 1	M14 x 1	M14 x 1
Hex socket key width (SW)	mm	-	10 mm	-	10 mm
Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)					
Thread (metric DIN)	M (x)	M14 x 1	M14 x 1	M14 x 1	M14 x 1
Key width (SW)	mm	17	17	17	17
Nut height (m)	mm	5,00	5,00	5,00	5,00
Recommended tightening torque [1]	Nm	32,00	32,00	34,00	34,00
Transmission Values [2]					
Torque (M)	Nm	19,20	19,20	20,40	20,40
Thrust (F_e)	kN	1,68	1,68	1,81	1,81
Hub load ($_pF$)	N/mm²	31,89	31,89	27,96	27,96

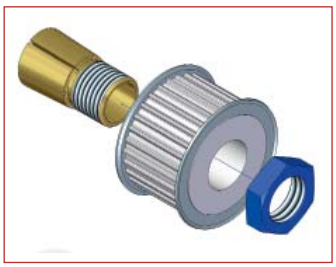
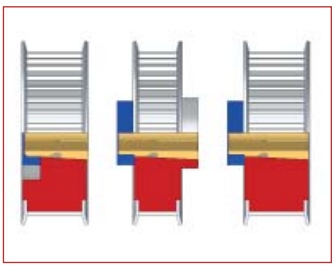
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10155** **10155-ISK** **10156** **10156-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

BOQA® Fastening Elements product group 1610 for shaft diameter = 8.00 mm

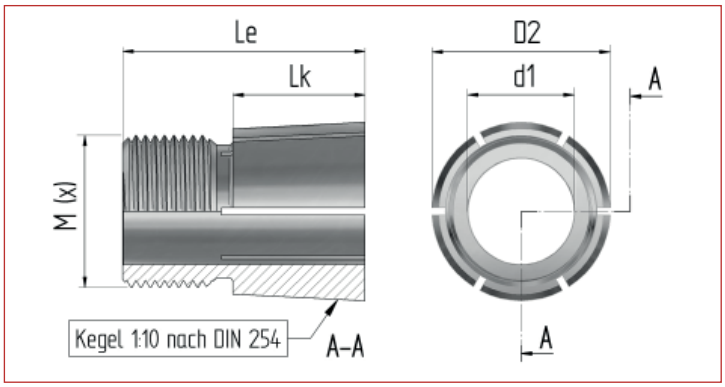
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10164k**	**10164k-ISK**	**10164**	**10164-ISK**
for shaft diameters (d1)	mm	8,00	8,00	8,00	8,00
Hub width (B) max.	mm	12,00	12,00	16,00	16,00
Taper diameter front (D2)	mm	16,10	16,10	16,10	16,10
Taper length (L_k)	mm	7,50	7,50	10,90	10,90
Counter bearing, length	mm	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-
Overall length (L_e)	mm	16,50	16,50	21,50	21,50
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M14 x 1	M14 x 1	M14 x 1	M14 x 1
Hex socket key width (SW)	mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M14 x 1	M14 x 1	M14 x 1	M14 x 1
Key width (SW)	mm	17	17	17	17
Nut height (m)	mm	5,00	5,00	5,00	5,00
Recommended tightening torque [1]	Nm	28,00	28,00	30,00	30,00

Transmission Values [2]

Torque (M)	Nm	16,80	16,80	18,00	18,00
Thrust (F_e)	kN	1,43	1,43	1,55	1,55
Hub load ($_pF$)	N/mm²	57,61	57,61	43,40	43,40

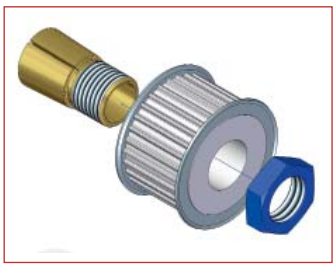
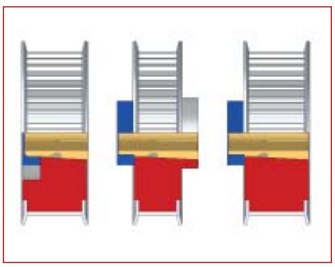
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10164k** **10164k-ISK** **10164** **10164-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

BOQA® Fastening Elements product group 1610 for shaft diameter = 8.00 mm

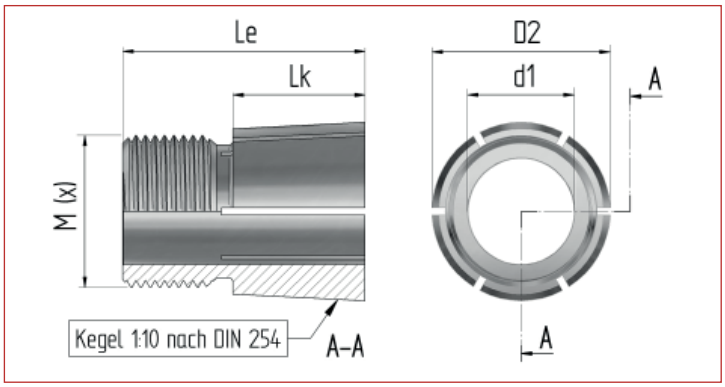
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10165**	**10165-ISK**	**10166-S**	**10166-S-ISK**	**10166-L**	**10166-L-ISK**
for shaft diameters (d1)	mm	8,00	8,00	8,00	8,00	8,00	8,00
Hub width (B) max.	mm	22,00	22,00	26,00	26,00	30,00	30,00
Taper diameter front (D2)	mm	16,10	16,10	16,10	16,10	16,10	16,10
Taper length (L_k)	mm	16,40	16,40	20,40	20,40	25,20	25,20
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	27,00	27,00	31,00	31,00	35,80	35,80
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M14 x 1	M14 x 1	M14 x 1	M14 x 1	M14 x 1	M14 x 1
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M14 x 1	M14 x 1	M14 x 1	M14 x 1	M14 x 1	M14 x 1
Key width (SW)	mm	17	17	17	17	17	17
Nut height (m)	mm	5,00	5,00	5,00	5,00	5,00	5,00
Recommended tightening torque [1]	Nm	32,00	32,00	34,00	34,00	36,00	36,00

Transmission Values [2]

Torque (M)	Nm	19,20	19,20	20,40	20,40	21,60	21,60
Thrust (F_e)	kN	1,68	1,68	1,81	1,81	1,95	1,95
Hub load ($_pF$)	N/mm²	31,89	31,89	27,96	27,96	24,75	24,75

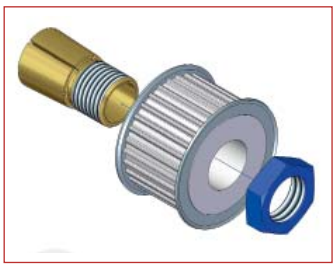
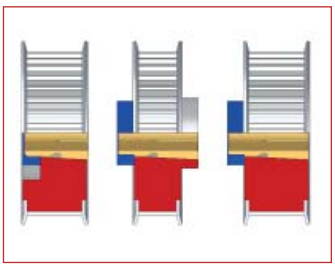
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.:	**10165**	**10165-ISK**	**10166-S**	**10166-S-ISK**	**10166-L**	**10166-L-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

BOQA® Fastening Elements product group 1610 for shaft diameter = 9.00 mm

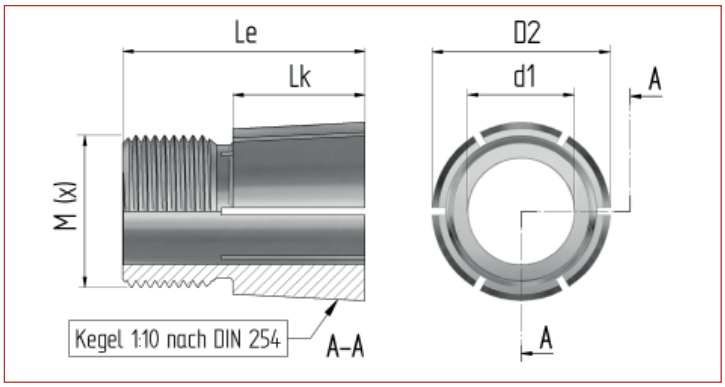
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10170k**	**10170k-ISK**	**10170**	**10170-ISK**
for shaft diameters (d1)	mm	9,00	9,00	9,00	9,00
Hub width (B) max.	mm	12,00	12,00	16,00	16,00
Taper diameter front (D2)	mm	16,10	16,10	16,10	16,10
Taper length (L_k)	mm	7,50	7,50	10,90	10,90
Counter bearing, length	mm	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-
Overall length (L_e)	mm	16,50	16,50	21,50	21,50
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M14 x 1	M14 x 1	M14 x 1	M14 x 1
Hex socket key width (SW)	mm	-	10 mm	-	10 mm
Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)					
Thread (metric DIN)	M (x)	M14 x 1	M14 x 1	M14 x 1	M14 x 1
Key width (SW)	mm	17	17	17	17
Nut height (m)	mm	5,00	5,00	5,00	5,00
Recommended tightening torque [1]	Nm	29,00	29,00	31,00	31,00
Transmission Values [2]					
Torque (M)	Nm	17,40	17,40	18,60	18,60
Thrust (F_e)	kN	1,48	1,48	1,60	1,60
Hub load ($_pF$)	N/mm²	59,66	59,66	44,85	44,85

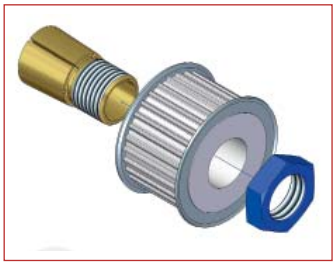
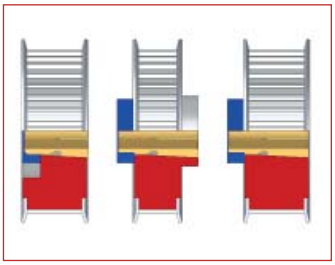
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

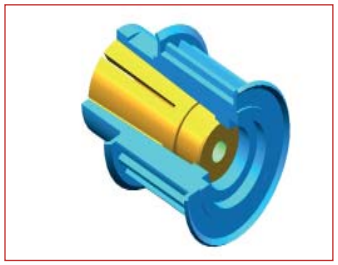
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10170k** **10170k-ISK** **10170** **10170-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 1610 for shaft diameter = 9.00 mm

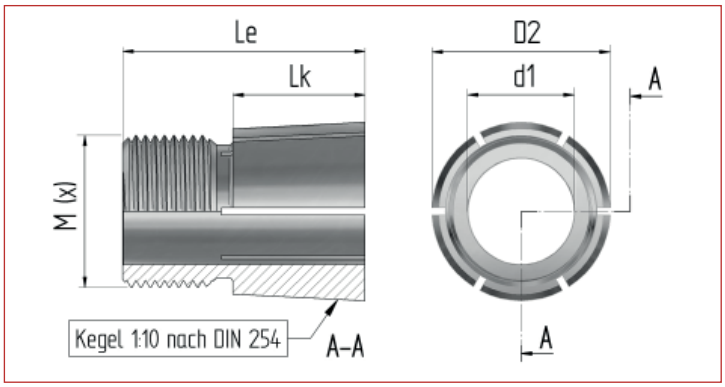
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10171**	**10171-ISK**	**10172-S**	**10172-S-ISK**	**10172-L**	**10172-L-ISK**
for shaft diameters (d1)	mm	9,00	9,00	9,00	9,00	9,00	9,00
Hub width (B) max.	mm	22,00	22,00	26,00	26,00	30,00	30,00
Taper diameter front (D2)	mm	16,10	16,10	16,10	16,10	16,10	16,10
Taper length (L_k)	mm	16,40	16,40	20,40	20,40	25,20	25,20
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	27,00	27,00	31,00	31,00	35,80	35,80
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M14 x 1	M14 x 1	M14 x 1	M14 x 1	M14 x 1	M14 x 1
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M14 x 1	M14 x 1	M14 x 1	M14 x 1	M14 x 1	M14 x 1
Key width (SW)	mm	17	17	17	17	17	17
Nut height (m)	mm	5,00	5,00	5,00	5,00	5,00	5,00
Recommended tightening torque [1]	Nm	33,00	33,00	35,00	35,00	37,00	37,00

Transmission Values [2]

Torque (M)	Nm	19,80	19,80	21,00	21,00	22,20	22,20
Thrust (F_e)	kN	1,73	1,73	1,86	1,86	2,00	2,00
Hub load ($_pF$)	N/mm²	32,88	32,88	28,79	27,79	25,44	25,44

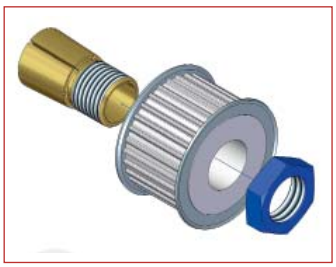
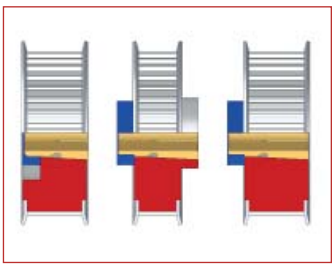
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

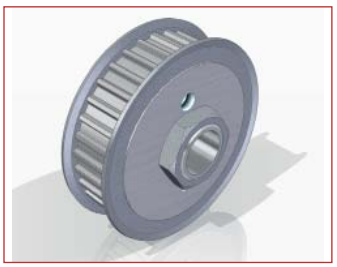
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10171** **10171-ISK** **10172-S** **10172-S-ISK** **10172-L** **10172-L-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 1610 for shaft diameter = 9.52 mm (3/8“)

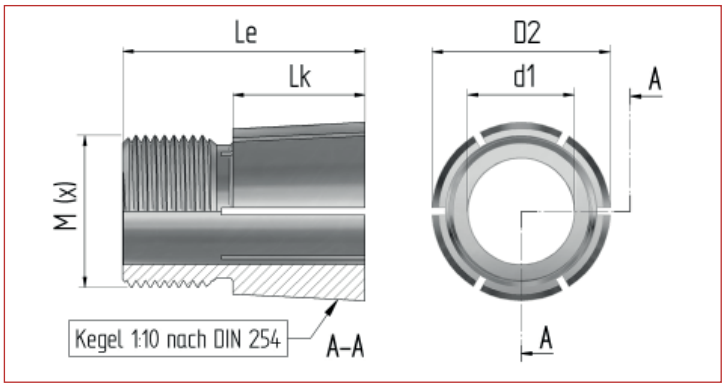
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10122k**	**10122k-ISK**	**10122**	**10122-ISK**
for shaft diameters (d1)	mm	9,52	9,52	9,52	9,52
Hub width (B) max.	mm	12,00	12,00	16,00	16,00
Taper diameter front (D2)	mm	16,10	16,10	16,10	16,10
Taper length (L_k)	mm	7,50	7,50	10,90	10,90
Counter bearing, length	mm	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-
Overall length (L_e)	mm	16,50	16,50	21,50	21,50
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M14 x 1	M14 x 1	M14 x 1	M14 x 1
Hex socket key width (SW)	mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M14 x 1	M14 x 1	M14 x 1	M14 x 1
Key width (SW)	mm	17	17	17	17
Nut height (m)	mm	5,00	5,00	5,00	5,00
Recommended tightening torque [1]	Nm	30,00	30,00	32,00	32,00

Transmission Values [2]

Torque (M)	Nm	18,00	18,00	19,20	19,20
Thrust (F_e)	kN	1,53	1,53	1,65	1,65
Hub load ($_pF$)	N/mm²	61,72	61,72	46,29	46,29

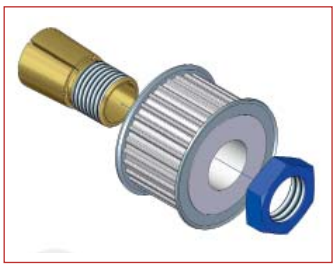
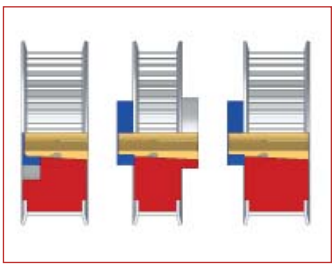
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10122k** **10122k-ISK** **10122** **10122-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

BOQA® Fastening Elements product group 1610 for shaft diameter = 9.52 mm (3/8“)

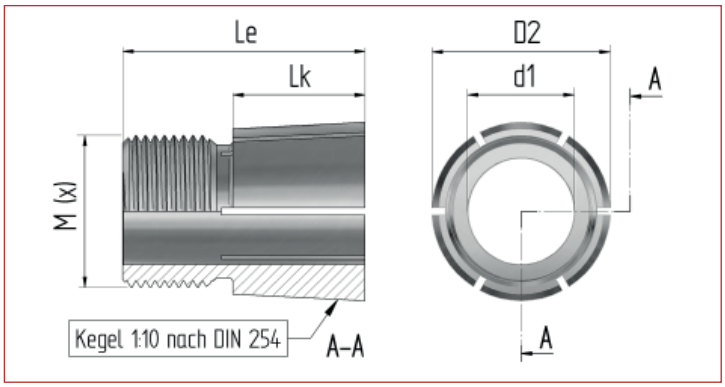
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10123**	**10123-ISK**	**10124-S**	**10124-S-ISK**	**10124-L**	**10124-L-ISK**
for shaft diameters (d1)	mm	9,52	9,52	9,52	9,52	9,52	9,52
Hub width (B) max.	mm	22,00	22,00	26,00	26,00	30,00	30,00
Taper diameter front (D2)	mm	16,10	16,10	16,10	16,10	16,10	16,10
Taper length (L_k)	mm	16,40	16,40	20,40	20,40	25,20	25,20
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	27,00	27,00	31,00	31,00	35,80	35,80
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M14 x 1	M14 x 1	M14 x 1	M14 x 1	M14 x 1	M14 x 1
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M14 x 1	M14 x 1	M14 x 1	M14 x 1	M14 x 1	M14 x 1
Key width (SW)	mm	17	17	17	17	17	17
Nut height (m)	mm	5,00	5,00	5,00	5,00	5,00	5,00
Recommended tightening torque [1]	Nm	34,00	34,00	36,00	36,00	38,00	38,00

Transmission Values [2]

Torque (M)	Nm	20,40	20,40	21,60	21,60	22,80	22,80
Thrust (F_e)	kN	1,79	1,79	1,92	1,92	2,05	2,05
Hub load ($_pF$)	N/mm²	33,88	33,88	29,61	29,61	26,13	26,13

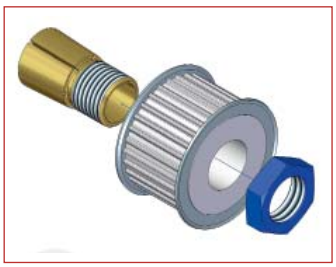
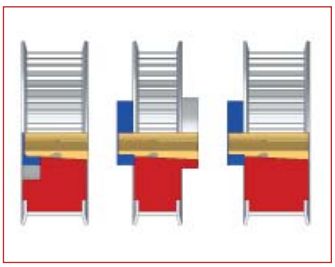
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

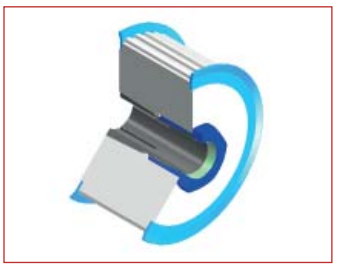
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10123** **10123-ISK** **10124-S** **10124-S-ISK** **10124-L** 10124-L-ISK

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 1610 for shaft diameter = 10.00 mm

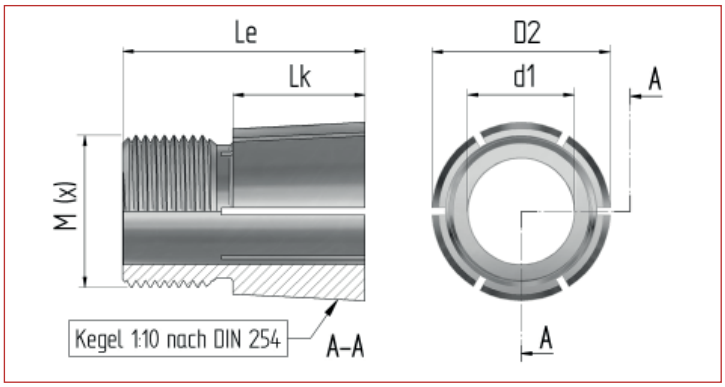
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10027k**	**10027k-ISK**	**10027**	**10027-ISK**
for shaft diameters (d1)	mm	10,00	10,00	10,00	10,00
Hub width (B) max.	mm	12,00	12,00	16,00	16,00
Taper diameter front (D2)	mm	16,10	16,10	16,10	16,10
Taper length (L_k)	mm	7,50	7,50	10,90	10,90
Counter bearing, length	mm	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-
Overall length (L_e)	mm	16,50	16,50	21,50	21,50
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M14 x 1	M14 x 1	M14 x 1	M14 x 1
Hex socket key width (SW)	mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M14 x 1	M14 x 1	M14 x 1	M14 x 1
Key width (SW)	mm	17	17	17	17
Nut height (m)	mm	5,00	5,00	5,00	5,00
Recommended tightening torque [1]	Nm	31,00	31,00	33,00	33,00

Transmission Values [2]

Torque (M)	Nm	18,60	18,60	19,80	19,80
Thrust (F_e)	kN	1,58	1,58	1,70	1,70
Hub load ($_pF$)	N/mm²	63,78	63,78	47,74	47,74

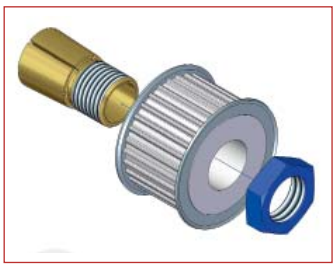
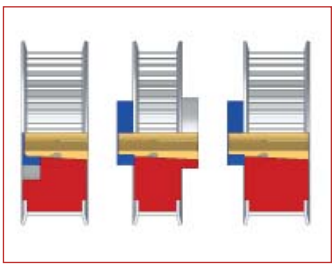
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

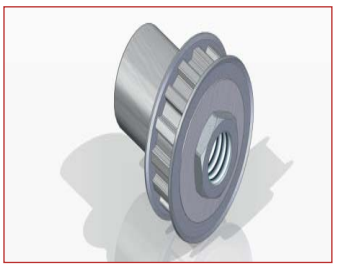
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10027k** **10027k-ISK** **10027** **10027-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 1610 for shaft diameter = 10.00 mm

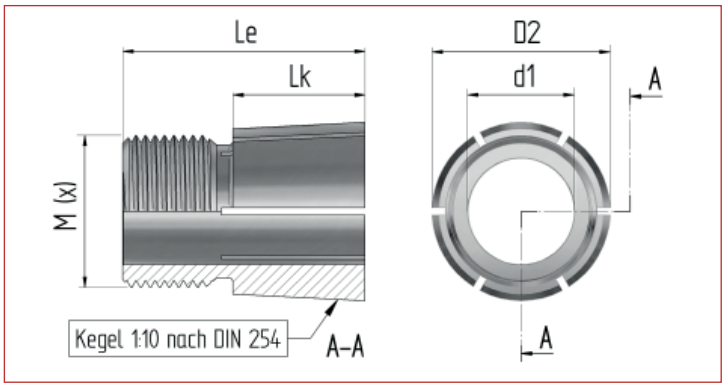
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10028**	**10028-ISK**	**10029-S**	**10029-S-ISK**	**10029-L**	**10029-L-ISK**
for shaft diameters (d1)	mm	10,00	10,00	10,00	10,00	10,00	10,00
Hub width (B) max.	mm	22,00	22,00	26,00	26,00	30,00	30,00
Taper diameter front (D2)	mm	16,10	16,10	16,10	16,10	16,10	16,10
Taper length (L_k)	mm	16,40	16,40	20,40	20,40	25,20	25,20
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	27,00	27,00	31,00	31,00	35,80	35,80
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M14 x 1	M14 x 1	M14 x 1	M14 x 1	M14 x 1	M14 x 1
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm
Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)							
Thread (metric DIN)	M (x)	M14 x 1	M14 x 1	M14 x 1	M14 x 1	M14 x 1	M14 x 1
Key width (SW)	mm	17	17	17	17	17	17
Nut height (m)	mm	5,00	5,00	5,00	5,00	5,00	5,00
Recommended tightening torque [1]	Nm	35,00	35,00	37,00	37,00	39,00	39,00
Transmission Values [2]							
Torque (M)	Nm	21,00	21,00	22,20	22,20	23,40	23,40
Thrust (F_e)	kN	1,84	1,84	1,97	1,97	2,11	2,11
Hub load ($_pF$)	N/mm²	34,88	34,88	30,43	30,43	26,81	26,81

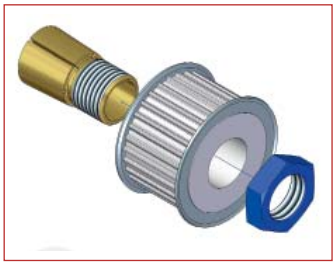
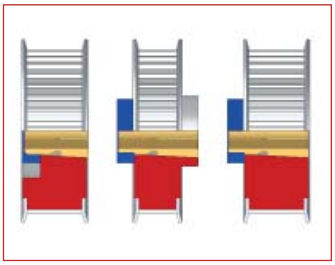
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10028** **10028-ISK** **10029-S** **10029-S-ISK** **10029-L** **10029-L-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

BOQA® Fastening Elements product group 1610 for shaft diameter = 11.00 mm

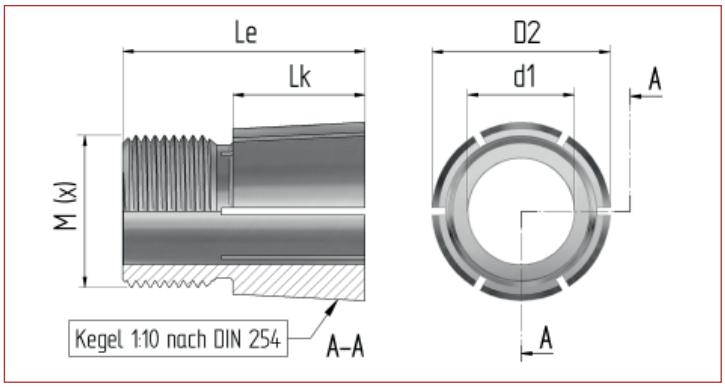
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10027-11k**	**10027-11k-ISK**	**10027-11**	**10027-11-ISK**
for shaft diameters (d1)	mm	11,00	11,00	11,00	11,00
Hub width (B) max.	mm	12,00	12,00	16,00	16,00
Taper diameter front (D2)	mm	16,10	16,10	16,10	16,10
Taper length (L_k)	mm	7,50	7,50	10,90	10,90
Counter bearing, length	mm	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-
Overall length (L_e)	mm	16,50	16,50	21,50	21,50
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M14 x 1	M14 x 1	M14 x 1	M14 x 1
Hex socket key width (SW)	mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M14 x 1	M14 x 1	M14 x 1	M14 x 1
Key width (SW)	mm	17	17	17	17
Nut height (m)	mm	5,00	5,00	5,00	5,00
Recommended tightening torque [1]	Nm	32,00	32,00	34,00	34,00

Transmission Values [2]

Torque (M)	Nm	19,20	19,20	20,40	20,40
Thrust (F_e)	kN	1,63	1,63	1,75	1,75
Hub load ($_pF$)	N/mm²	65,84	65,84	40,19	40,19

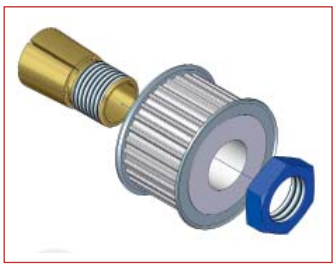
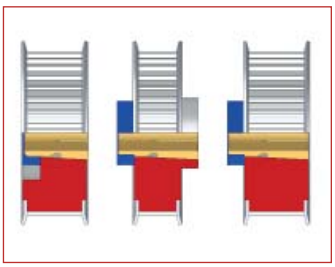
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

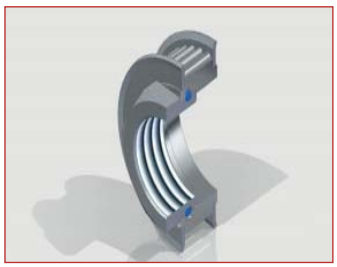
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10027-11k** . **10027-11k-ISK** ... **10027-11** ... **10027-11-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 1610 for shaft diameter = 11.00 mm

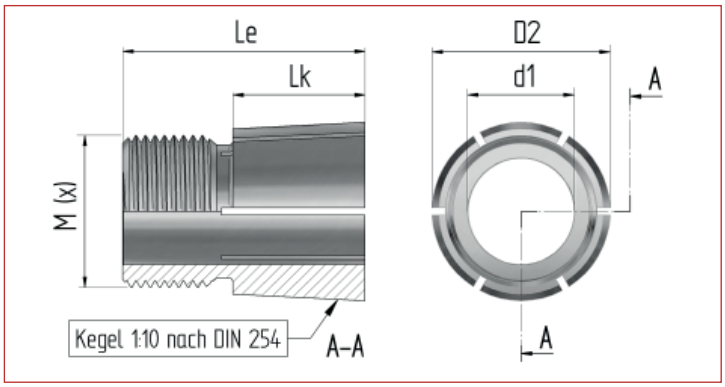
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10028-11**	**10028-11-ISK**	**10029-11S**	**10029-11S-ISK**	**10029-11L**	**10029-11L-ISK**
for shaft diameters (d1)	mm	11,00	11,00	11,00	11,00	11,00	11,00
Hub width (B) max.	mm	22,00	22,00	26,00	26,00	30,00	30,00
Taper diameter front (D2)	mm	16,10	16,10	16,10	16,10	16,10	16,10
Taper length (L_k)	mm	16,40	16,40	20,40	20,40	25,20	25,20
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	27,00	27,00	31,00	31,00	35,80	35,80
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M14 x 1	M14 x 1	M14 x 1	M14 x 1	M14 x 1	M14 x 1
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M14 x 1	M14 x 1	M14 x 1	M14 x 1	M14 x 1	M14 x 1
Key width (SW)	mm	17	17	17	17	17	17
Nut height (m)	mm	5,00	5,00	5,00	5,00	5,00	5,00
Recommended tightening torque [1]	Nm	36,00	36,00	38,00	38,00	40,00	40,00

Transmission Values [2]

Torque (M)	Nm	21,60	21,60	22,80	22,80	24,00	24,00
Thrust (F_e)	kN	1,89	1,89	2,02	2,02	2,16	2,16
Hub load ($_pF$)	N/mm²	35,87	35,87	31,25	31,25	27,50	27,50

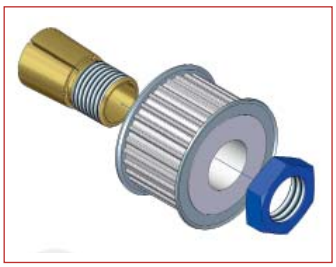
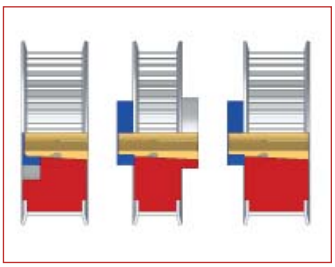
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

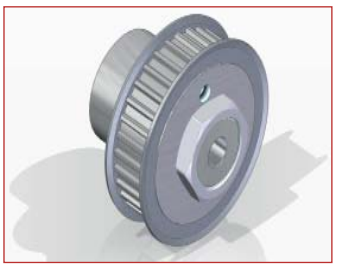
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.:	**10028-11**	**10028-11-ISK**	**10029-11S**	**10029-11S-ISK**	**10029-11L**	**10029-11L-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



DBGM : 94 07 845 / 94 10 725
DBP : 44 16 292.8
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BOQA® Fastening Elements product group 1810 for shaft diameter = 6.00 mm

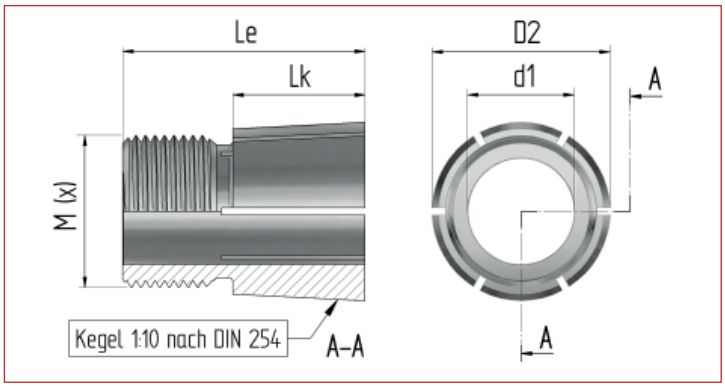
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10143**	**10143-ISK**	**10144**	**10144-ISK**
for shaft diameters (d1)	mm	6,00	6,00	6,00	6,00
Hub width (B) max.	mm	16,00	16,00	22,00	22,00
Taper diameter front (D2)	mm	18,10	18,10	18,10	18,10
Taper length (L_k)	mm	10,00	10,00	15,70	15,70
Counter bearing, length	mm	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-
Overall length (L_e)	mm	21,90	21,90	27,60	27,60
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M16 x 1	M16 x 1	M16 x 1	M16 x 1
Hex socket key width (SW)	mm	-	10 mm	-	10 mm
Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)					
Thread (metric DIN)	M (x)	M16 x 1	M16 x 1	M16 x 1	M16 x 1
Key width (SW)	mm	19	19	19	19
Nut height (m)	mm	5,00	5,00	5,00	5,00
Recommended tightening torque [1]	Nm	15,00	15,00	20,00	20,00
Transmission Values [2]					
Torque (M)	Nm	9,00	9,00	12,00	12,00
Thrust (F_e)	kN	0,68	0,68	0,93	0,93
Hub load ($_pF$)	N/mm²	18,48	18,48	16,21	16,21

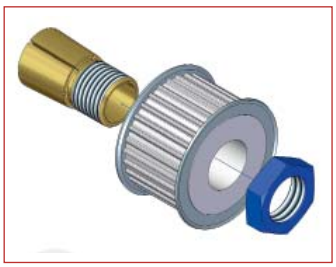
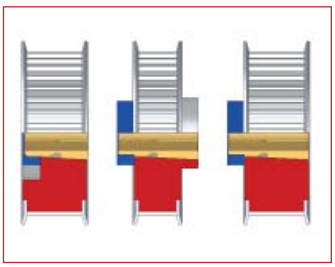
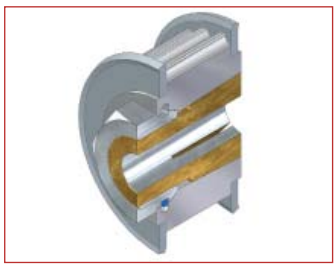
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10143** **10143-ISK** **10144** **10144-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.


BOQA® Fastening Elements product group 1810 for shaft diameter = 6.35 mm (1/4“)

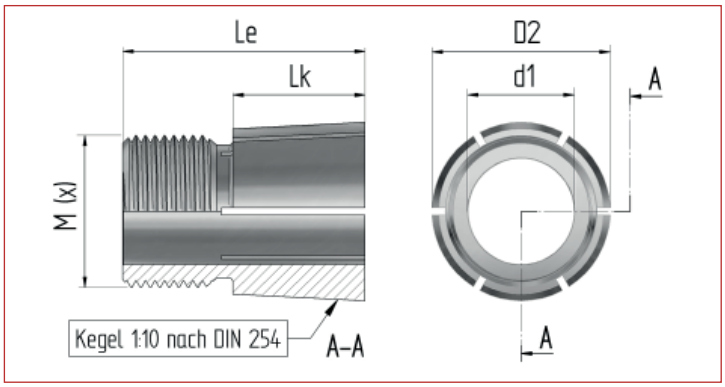
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10086**	**10086-ISK**	**10087**	**10087-ISK**
for shaft diameters (d1)	mm	6,35	6,35	6,35	6,35
Hub width (B) max.	mm	16,00	16,00	22,00	22,00
Taper diameter front (D2)	mm	18,10	18,10	18,10	18,10
Taper length (L_k)	mm	10,00	10,00	15,70	15,70
Counter bearing, length	mm	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-
Overall length (L_e)	mm	21,90	21,90	27,60	27,60
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M16 x 1	M16 x 1	M16 x 1	M16 x 1
Hex socket key width (SW)	mm	-	10 mm	-	10 mm
Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)					
Thread (metric DIN)	M (x)	M16 x 1	M16 x 1	M16 x 1	M16 x 1
Key width (SW)	mm	19	19	19	19
Nut height (m)	mm	5,00	5,00	5,00	5,00
Recommended tightening torque [1]	Nm	19,00	19,00	24,00	24,00
Transmission Values [2]					
Torque (M)	Nm	11,40	11,40	14,40	14,40
Thrust (F_e)	kN	0,87	0,87	1,11	1,11
Hub load ($_pF$)	N/mm²	23,40	23,40	19,45	19,45

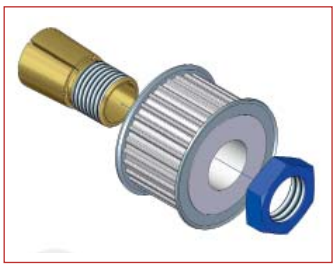
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

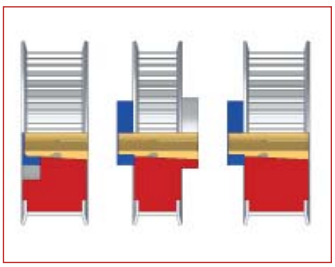
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

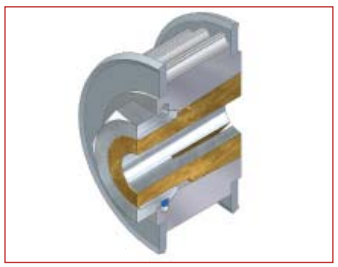
BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10086** **10086-ISK** **10087** **10087-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.







BOQA® Fastening Elements product group 1810 for shaft diameter = 7.00 mm

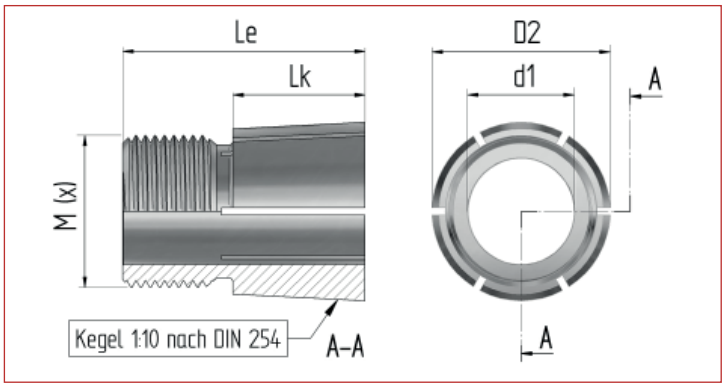
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10157**	**10157-ISK**	**10158**	**10158-ISK**
for shaft diameters (d1)	mm	7,00	7,00	7,00	7,00
Hub width (B) max.	mm	16,00	16,00	22,00	22,00
Taper diameter front (D2)	mm	18,10	18,10	18,10	18,10
Taper length (L_k)	mm	10,00	10,00	15,70	15,70
Counter bearing, length	mm	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-
Overall length (L_e)	mm	21,90	21,90	27,60	27,60
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M16 x 1	M16 x 1	M16 x 1	M16 x 1
Hex socket key width (SW)	mm	-	10 mm	-	10 mm
Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)					
Thread (metric DIN)	M (x)	M16 x 1	M16 x 1	M16 x 1	M16 x 1
Key width (SW)	mm	19	19	19	19
Nut height (m)	mm	5,00	5,00	5,00	5,00
Recommended tightening torque [1]	Nm	20,00	20,00	30,00	30,00
Transmission Values [2]					
Torque (M)	Nm	12,00	12,00	18,00	18,00
Thrust (F_e)	kN	0,91	0,91	1,39	1,39
Hub load ($_pF$)	N/mm²	24,64	24,64	24,32	24,32

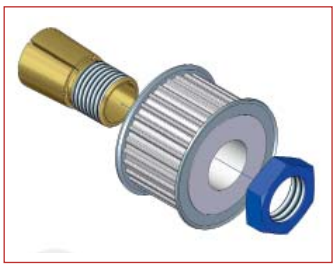
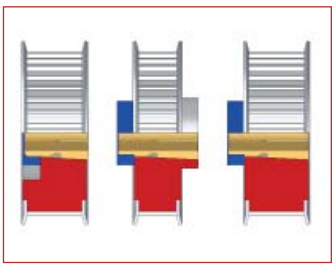
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

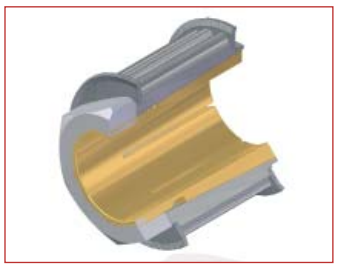
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10157** **10157-ISK** **10158** **10158-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 1810 for shaft diameter = 8.00 mm

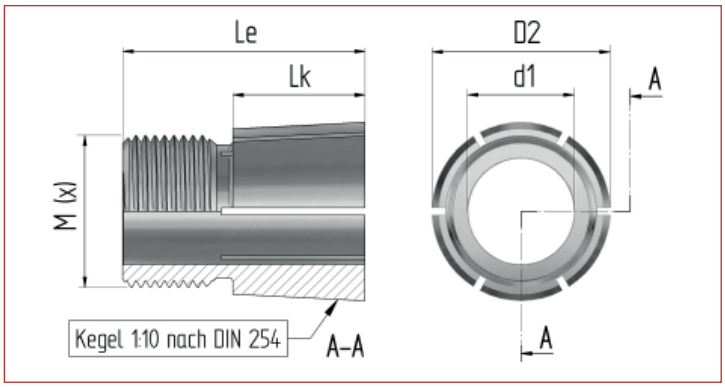
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10167**	**10167-ISK**	**10168**	**10168-ISK**	**10169**	**10169-ISK**
for shaft diameters (d1)	mm	8,00	8,00	8,00	8,00	8,00	8,00
Hub width (B) max.	mm	16,00	16,00	22,00	22,00	30,00	30,00
Taper diameter front (D2)	mm	18,10	18,10	18,10	18,10	18,10	18,10
Taper length (L_k)	mm	10,00	10,00	15,70	15,70	24,40	24,40
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	21,90	21,90	27,60	27,60	36,90	36,90
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M16 x 1	M16 x 1	M16 x 1	M16 x 1	M16 x 1	M16 x 1
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm
Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)							
Thread (metric DIN)	M (x)	M16 x 1	M16 x 1	M16 x 1	M16 x 1	M16 x 1	M16 x 1
Key width (SW)	mm	19	19	19	19	19	19
Nut height (m)	mm	5,00	5,00	5,00	5,00	5,00	5,00
Recommended tightening torque [1]	Nm	22,00	22,00	32,00	32,00	42,00	42,00
Transmission Values [2]							
Torque (M)	Nm	13,20	13,20	19,20	19,20	25,20	25,20
Thrust (F_e)	kN	1,00	1,00	1,48	1,48	1,99	1,99
Hub load ($_pF$)	N/mm²	27,10	27,10	25,94	25,94	23,05	23,05

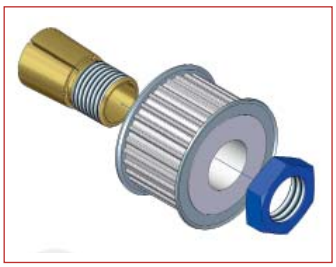
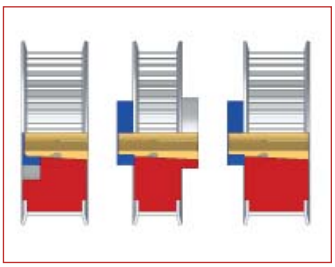
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

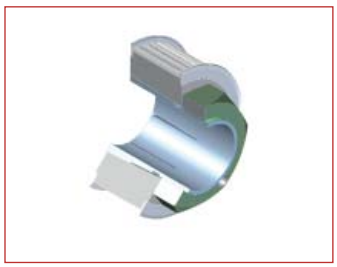
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10167** **10167-ISK** **10168** **10168-ISK** **10169** **10169-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 1810 for shaft diameter = 9.00 mm

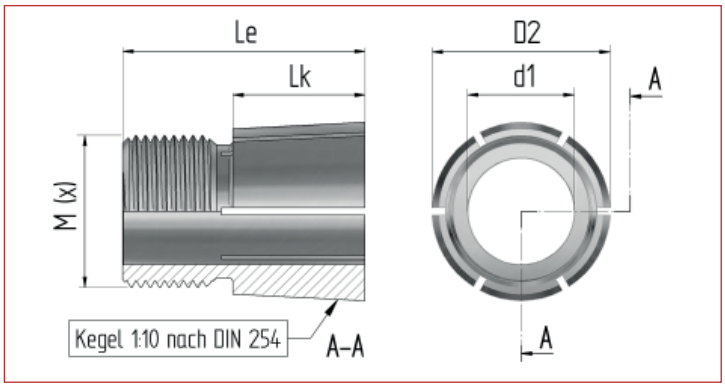
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10173**	**10173-ISK**	**10174**	**10174-ISK**	**10175**	**10175-ISK**
for shaft diameters (d1)	mm	9,00	9,00	9,00	9,00	9,00	9,00
Hub width (B) max.	mm	16,00	16,00	22,00	22,00	30,00	30,00
Taper diameter front (D2)	mm	18,10	18,10	18,10	18,10	18,10	18,10
Taper length (L_k)	mm	10,00	10,00	15,70	15,70	24,40	24,40
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	21,90	21,90	27,60	27,60	36,90	36,90
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M16 x 1	M16 x 1	M16 x 1	M16 x 1	M16 x 1	M16 x 1
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M16 x 1	M16 x 1	M16 x 1	M16 x 1	M16 x 1	M16 x 1
Key width (SW)	mm	19	19	19	19	19	19
Nut height (m)	mm	5,00	5,00	5,00	5,00	5,00	5,00
Recommended tightening torque [1]	Nm	24,00	24,00	34,00	34,00	44,00	44,00

Transmission Values [2]

Torque (M)	Nm	14,40	14,40	20,40	20,40	26,40	26,40
Thrust (F_e)	kN	1,09	1,09	1,58	1,58	2,09	2,09
Hub load ($_pF$)	N/mm²	29,56	29,56	27,56	27,56	24,15	24,15

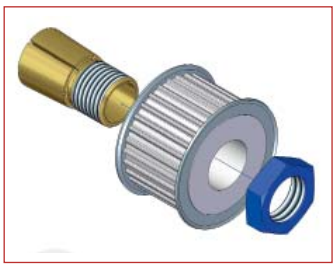
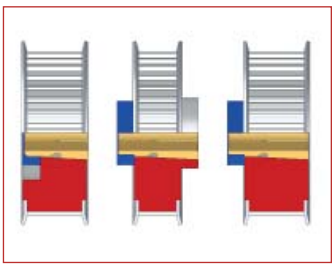
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10173** **10173-ISK** **10174** **10174-ISK** **10175** **10175-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

BOQA® Fastening Elements product group 1810 for shaft diameter = 9.52 mm (3/8“)

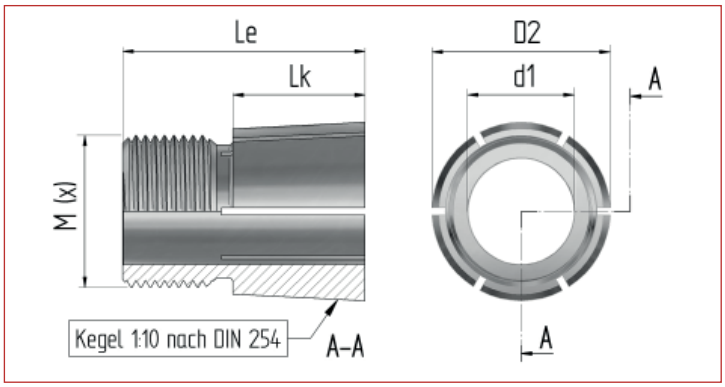
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10125**	**10125-ISK**	**10126**	**10126-ISK**	**10127**	**10127-ISK**
for shaft diameters (d1)	mm	9,52	9,52	9,52	9,52	9,52	9,52
Hub width (B) max.	mm	16,00	16,00	22,00	22,00	30,00	30,00
Taper diameter front (D2)	mm	18,10	18,10	18,10	18,10	18,10	18,10
Taper length (L_k)	mm	10,00	10,00	15,70	15,70	24,40	24,40
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	21,90	21,90	27,60	27,60	36,90	36,90
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M16 x 1	M16 x 1	M16 x 1	M16 x 1	M16 x 1	M16 x 1
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M16 x 1	M16 x 1	M16 x 1	M16 x 1	M16 x 1	M16 x 1
Key width (SW)	mm	19	19	19	19	19	19
Nut height (m)	mm	5,00	5,00	5,00	5,00	5,00	5,00
Recommended tightening torque [1]	Nm	26,00	26,00	36,00	36,00	46,00	46,00

Transmission Values [2]

Torque (M)	Nm	15,60	15,60	21,60	21,60	27,60	27,60
Thrust (F_e)	kN	1,19	1,19	1,67	1,67	2,19	2,19
Hub load ($_pF$)	N/mm²	32,03	32,03	29,18	29,18	25,24	25,24

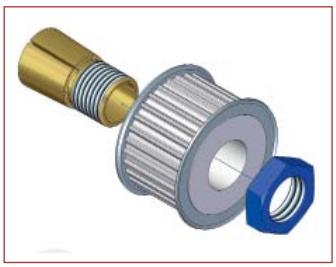
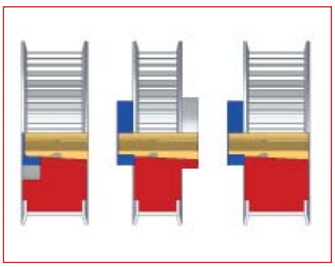
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

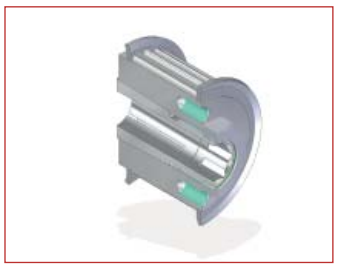
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.:	**10125**	**10125-ISK**	**10126**	**10126-ISK**	**10127**	**10127-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 1810 for shaft diameter = 10.00 mm

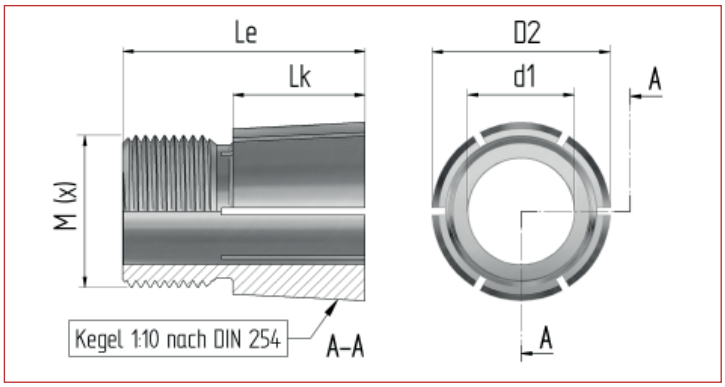
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10030**	**10030-ISK**	**10031**	**10031-ISK**	**10032**	**10032-ISK**
for shaft diameters (d1)	mm	10,00	10,00	10,00	10,00	10,00	10,00
Hub width (B) max.	mm	16,00	16,00	22,00	22,00	30,00	30,00
Taper diameter front (D2)	mm	18,10	18,10	18,10	18,10	18,10	18,10
Taper length (L_k)	mm	10,00	10,00	15,70	15,70	24,40	24,40
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	21,90	21,90	27,60	27,60	36,90	36,90
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M16 x 1	M16 x 1	M16 x 1	M16 x 1	M16 x 1	M16 x 1
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M16 x 1	M16 x 1	M16 x 1	M16 x 1	M16 x 1	M16 x 1
Key width (SW)	mm	19	19	19	19	19	19
Nut height (m)	mm	5,00	5,00	5,00	5,00	5,00	5,00
Recommended tightening torque [1]	Nm	28,00	28,00	38,00	38,00	48,00	48,00

Transmission Values [2]

Torque (M)	Nm	16,80	16,80	22,80	22,80	28,80	28,80
Thrust (F_e)	kN	1,28	1,28	1,76	1,76	2,28	2,28
Hub load ($_pF$)	N/mm²	34,49	34,49	30,80	30,80	26,34	26,34

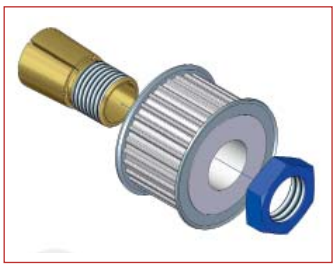
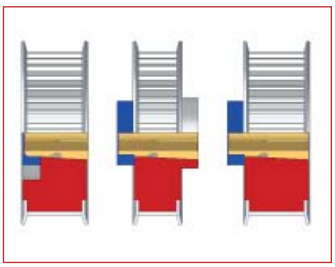
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.:	**10030**	**10030-ISK**	**10031**	**10031-ISK**	**10032**	**10032-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

BOQA® Fastening Elements product group 1810 for shaft diameter = 11.00 mm

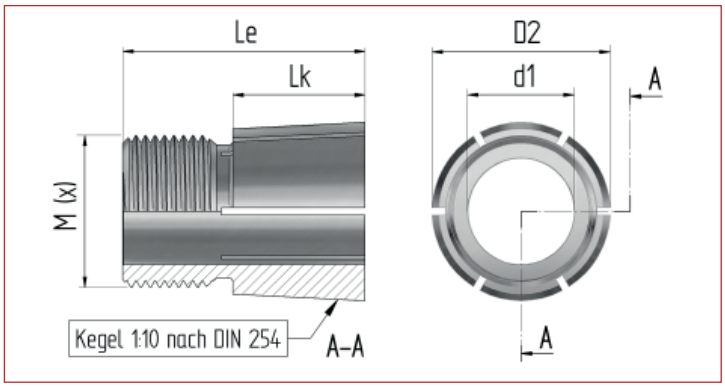
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10036**	**10036-ISK**	**10037**	**10037-ISK**	**10038**	**10038-ISK**
for shaft diameters (d1)	mm	11,00	11,00	11,00	11,00	11,00	11,00
Hub width (B) max.	mm	16,00	16,00	22,00	22,00	30,00	30,00
Taper diameter front (D2)	mm	18,10	18,10	18,10	18,10	18,10	18,10
Taper length (L_k)	mm	10,00	10,00	15,70	15,70	24,40	24,40
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	21,90	21,90	27,60	27,60	36,90	36,90
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M16 x 1	M16 x 1	M16 x 1	M16 x 1	M16 x 1	M16 x 1
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M16 x 1	M16 x 1	M16 x 1	M16 x 1	M16 x 1	M16 x 1
Key width (SW)	mm	19	19	19	19	19	19
Nut height (m)	mm	5,00	5,00	5,00	5,00	5,00	5,00
Recommended tightening torque [1]	Nm	30,00	30,00	40,00	40,00	50,00	50,00

Transmission Values [2]

Torque (M)	Nm	18,00	18,00	24,00	24,00	30,00	30,00
Thrust (F_e)	kN	1,37	1,37	1,85	1,85	2,38	2,38
Hub load ($_pF$)	N/mm²	36,95	36,95	32,42	32,42	27,44	27,44

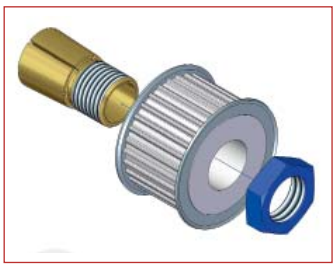
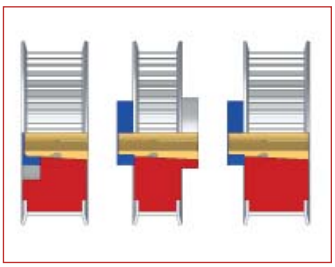
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

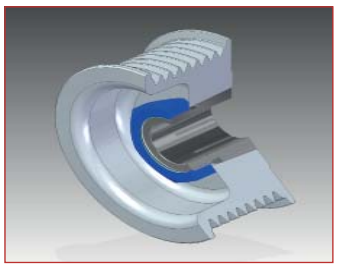
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10036** **10036-ISK** **10037** **10037-ISK** **10038** **10038-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 1810 for shaft diameter = 12.00 mm

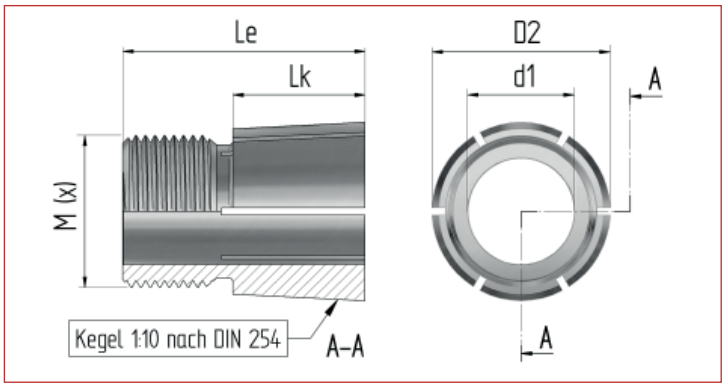
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10042**	**10042-ISK**	**10043**	**10043-ISK**	**10044**	**10044-ISK**
for shaft diameters (d1)	mm	12,00	12,00	12,00	12,00	12,00	12,00
Hub width (B) max.	mm	16,00	16,00	22,00	22,00	30,00	30,00
Taper diameter front (D2)	mm	18,10	18,10	18,10	18,10	18,10	18,10
Taper length (L_k)	mm	10,00	10,00	15,70	15,70	24,40	24,40
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	21,90	21,90	27,60	27,60	36,90	36,90
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M16 x 1	M16 x 1	M16 x 1	M16 x 1	M16 x 1	M16 x 1
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M16 x 1	M16 x 1	M16 x 1	M16 x 1	M16 x 1	M16 x 1
Key width (SW)	mm	19	19	19	19	19	19
Nut height (m)	mm	5,00	5,00	5,00	5,00	5,00	5,00
Recommended tightening torque [1]	Nm	32,00	32,00	42,00	42,00	52,00	52,00

Transmission Values [2]

Torque (M)	Nm	19,20	19,20	25,20	25,20	31,20	31,20
Thrust (F_e)	kN	1,46	1,46	1,95	1,95	2,47	2,47
Hub load ($_pF$)	N/mm²	39,42	39,42	34,05	34,05	28,54	28,54

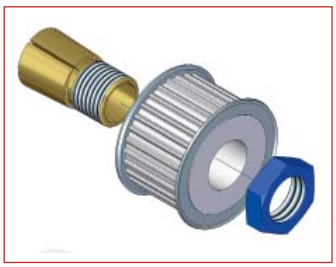
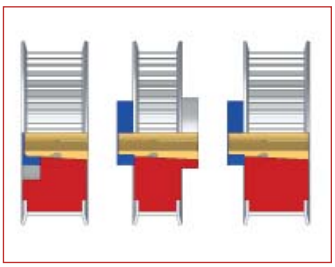
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10042** **10042-ISK** **10043** **10043-ISK** **10044** **10044-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

BOQA® Fastening Elements product group 1810 for shaft diameter = 12.70 mm (1/2“)

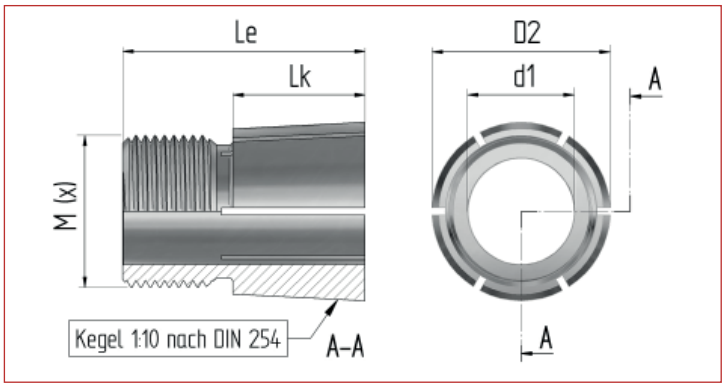
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10042-12.7**	**10042-12.7-ISK**	**10043-12.7**	**10043-12.7-ISK**	**10044-12.7**	**10044-12.7-ISK**
for shaft diameters (d1)	mm	12,70	12,70	12,70	12,70	12,70	12,70
Hub width (B) max.	mm	16,00	16,00	22,00	22,00	30,00	30,00
Taper diameter front (D2)	mm	18,10	18,10	18,10	18,10	18,10	18,10
Taper length (L_k)	mm	10,00	10,00	15,70	15,70	24,40	24,40
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	21,90	21,90	27,60	27,60	36,90	36,90
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M16 x 1	M16 x 1	M16 x 1	M16 x 1	M16 x 1	M16 x 1
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M16 x 1	M16 x 1	M16 x 1	M16 x 1	M16 x 1	M16 x 1
Key width (SW)	mm	19	19	19	19	19	19
Nut height (m)	mm	5,00	5,00	5,00	5,00	5,00	5,00
Recommended tightening torque [1]	Nm	34,00	34,00	44,00	44,00	54,00	54,00

Transmission Values [2]

Torque (M)	Nm	20,40	20,40	26,40	26,50	32,40	32,40
Thrust (F_e)	kN	1,55	1,55	2,04	2,04	2,57	2,57
Hub load ($_pF$)	N/mm²	41,88	41,88	35,67	35,67	29,64	29,64

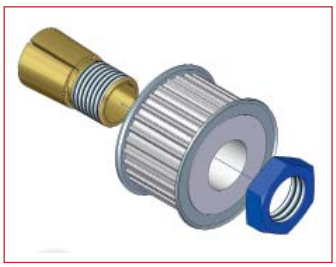
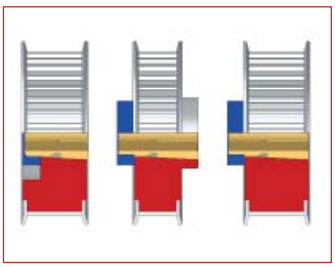
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

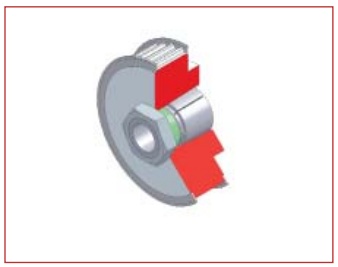
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10042-12.7** **10042-12.7ISK** **10043-12.7** **10043-12.7ISK** **10044-12.7** **10044-12.7ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 2350 for shaft diameter = 8.00 mm

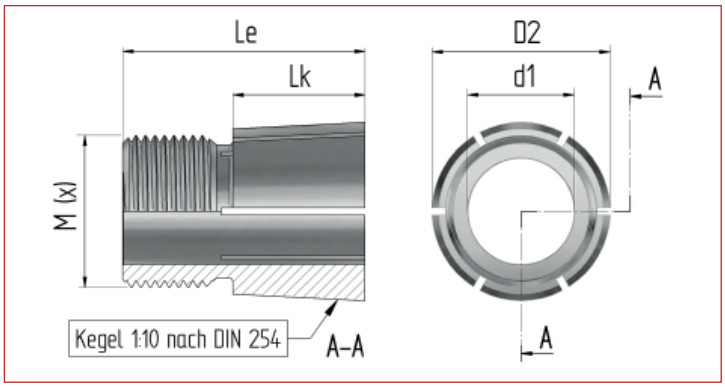
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10035-8**	**10035-8-ISK**
for shaft diameters (d1)	mm	8,00	8,00
Hub width (B) max.	mm	35,00	35,00
Taper diameter front (D2)	mm	23,50	23,50
Taper length (L_k)	mm	22,20	22,20
Counter bearing, length	mm	-	-
Counter bearing, diameter	mm	-	-
Bore depth for shaft journal	mm	-	-
Overall length (L_e)	mm	40,80	40,80
Taper ratio (C)	C=1:x	1:10	1:10
Taper angle (α)	°	5,725	5,725
Thread (metric DIN)	M (x)	M20 x 1,25	M20 x 1,25
Hex socket key width (SW)	mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M20 x 1,25	M20 x 1,25
Key width (SW)	mm	24	24
Nut height (m)	mm	6,00	6,00
Recommended tightening torque [1]	Nm	45,00	45,00

Transmission Values [2]

Torque (M)	Nm	27,20	27,20
Thrust (F_e)	kN	1,62	1,62
Hub load ($_pF$)	N/mm²	15,55	15,55

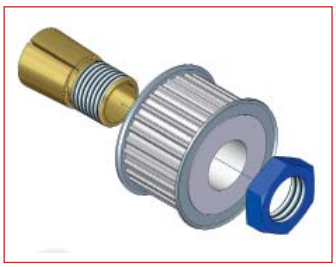
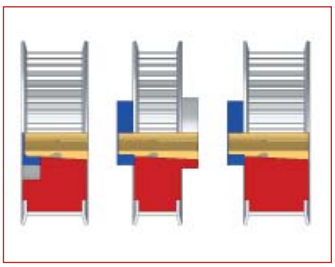
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

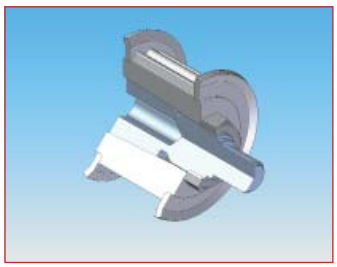
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10035-8** **10035-8-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 2350 for shaft diameter = 9.00 mm

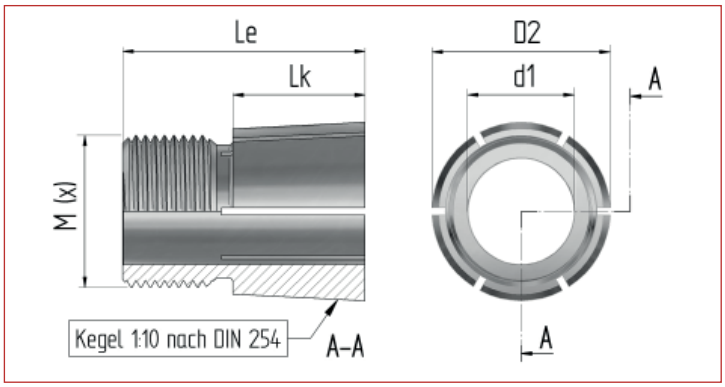
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10033-9k**	**10033-9k-ISK**	**10033-9**	**10033-9-ISK**	**10035-9**	**10035-9-ISK**
for shaft diameters (d1)	mm	9,00	9,00	9,00	9,00	9,00	9,00
Hub width (B) max.	mm	10,00	10,00	19,00	19,00	35,00	35,00
Taper diameter front (D2)	mm	23,50	23,50	23,50	23,50	23,50	23,50
Taper length (L_k)	mm	6,50	6,50	13,40	13,40	22,20	22,20
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	16,00	16,00	24,80	24,80	40,80	40,80
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25
Key width (SW)	mm	24	24	24	24	24	24
Nut height (m)	mm	6,00	6,00	6,00	6,00	6,00	6,00
Recommended tightening torque [1]	Nm	32,00	32,00	43,00	43,00	50,00	50,00

Transmission Values [2]

Torque (M)	Nm	18,90	18,90	25,40	25,40	30,20	30,20
Thrust (F_e)	kN	2,40	2,40	3,30	3,30	1,81	1,81
Hub load ($_pF$)	N/mm²	58,30	58,30	39,10	39,10	17,27	17,27

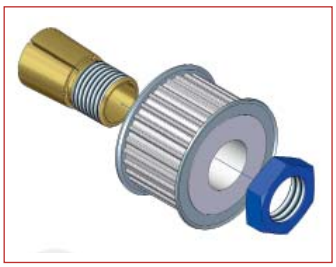
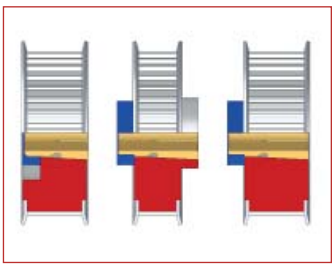
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10033-9k** **10033-9k-ISK** **10033-9** **10033-9-ISK** **10035-9** **10035-9-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

BOQA® Fastening Elements product group 2350 for shaft diameter = 10.00 mm

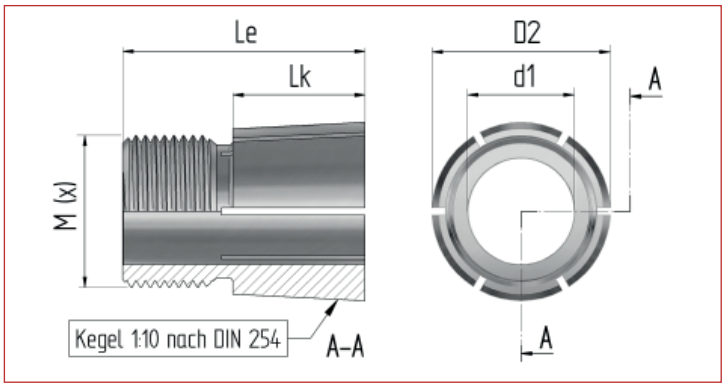
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10033k**	**10033k-ISK**	**10033ho**	**10033ho-ISK**	**10033**	**10033-ISK**
for shaft diameters (d1)	mm	10,00	10,00	10,00	10,00	10,00	10,00
Hub width (B) max.	mm	10,00	10,00	14,00	14,00	19,00	19,00
Taper diameter front (D2)	mm	23,50	23,50	23,50	23,50	23,50	23,50
Taper length (L_k)	mm	6,50	6,50	10,00	10,00	13,40	13,40
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	16,00	16,00	20,00	20,00	24,80	24,80
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25
Key width (SW)	mm	24	24	24	24	24	24
Nut height (m)	mm	6,00	6,00	6,00	6,00	6,00	6,00
Recommended tightening torque [1]	Nm	30,00	30,00	35,00	35,00	40,00	40,00

Transmission Values [2]

Torque (M)	Nm	18,10	18,10	21,20	21,20	24,20	24,20
Thrust (F_e)	kN	1,05	1,05	1,23	1,23	1,42	1,42
Hub load ($_pF$)	N/mm²	33,04	33,04	25,44	25,44	22,02	22,02

1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.:	**10033k**	**10033k-ISK**	**10033ho**	**10033ho-ISK**	**10033**	**10033-ISK**

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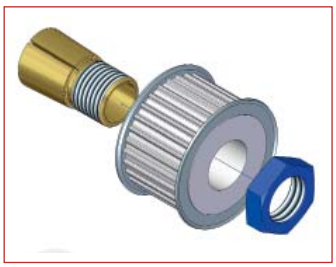
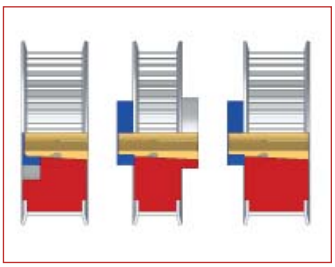



BOQA® Fastening Elements product group 2350 for shaft diameter = 10.00 mm

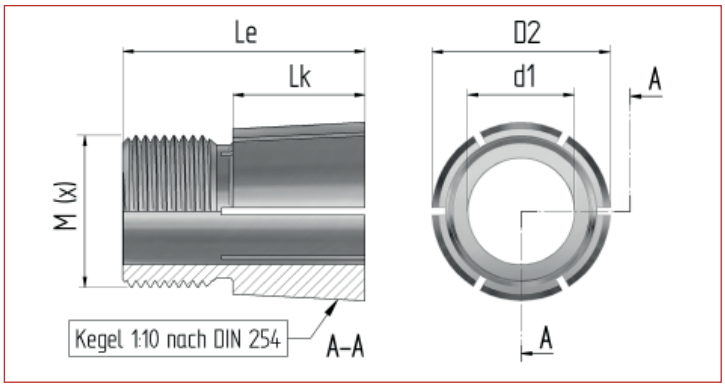
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10034**	**10034-ISK**	**10035-10**	**10035-10-ISK**	**10035-10ho**	**10035-10ho-ISK**
for shaft diameters (d1)	mm	10,00	10,00	10,00	10,00	10,00	10,00
Hub width (B) max.	mm	25,00	25,00	35,00	35,00	40,00	40,00
Taper diameter front (D2)	mm	23,50	23,50	23,50	23,50	23,50	23,50
Taper length (L_k)	mm	17,50	17,50	22,20	22,20	29,40	29,40
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	32,00	32,00	40,80	40,80	48,00	48,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25
Key width (SW)	mm	24	24	24	24	24	24
Nut height (m)	mm	6,00	6,00	6,00	6,00	6,00	6,00
Recommended tightening torque [1]	Nm	45,00	45,00	50,00	50,00	55,00	55,00

Transmission Values [2]

Torque (M)	Nm	27,20	27,20	30,20	30,20	33,20	33,20
Thrust (F_e)	kN	1,61	1,61	1,81	1,81	2,02	2,02
Hub load ($_pF$)	N/mm²	19,31	19,31	17,27	17,27	14,82	14,82

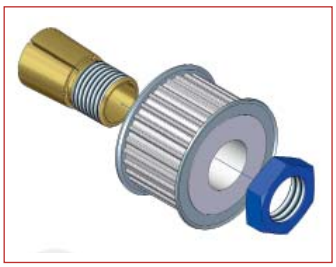
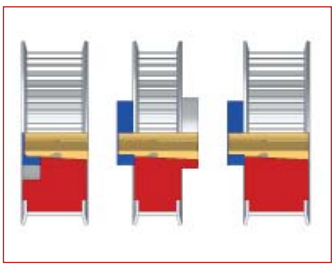
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

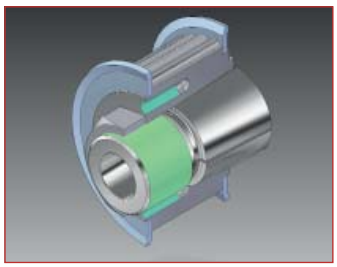
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10034** **10034-ISK** **10035-10** **10035-10-ISK** **10035-10ho** **10035-10ho-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 2350 for shaft diameter = 11.00 mm

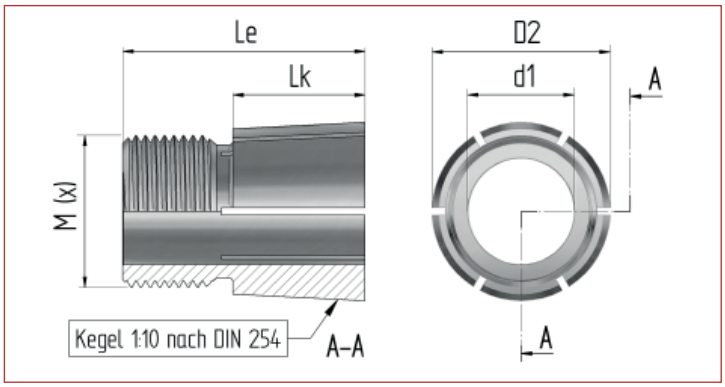
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10039k**	**10039k-ISK**	**10039ho**	**10039ho-ISK**	**10039**	**10039-ISK**
for shaft diameters (d1)	mm	11,00	11,00	11,00	11,00	11,00	11,00
Hub width (B) max.	mm	10,00	10,00	14,00	14,00	19,00	19,00
Taper diameter front (D2)	mm	23,50	23,50	23,50	23,50	23,50	23,50
Taper length (L_k)	mm	6,50	6,50	10,00	10,00	13,40	13,40
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	16,00	16,00	20,00	20,00	24,80	24,80
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25
Key width (SW)	mm	24	24	24	24	24	24
Nut height (m)	mm	6,00	6,00	6,00	6,00	6,00	6,00
Recommended tightening torque [1]	Nm	31,00	31,00	36,00	36,00	41,00	41,00

Transmission Values [2]

Torque (M)	Nm	18,70	18,70	21,80	21,80	24,80	24,80
Thrust (F_e)	kN	1,81	1,81	1,27	1,27	1,45	1,45
Hub load ($_pF$)	N/mm²	34,14	34,14	26,16	26,16	22,57	22,57

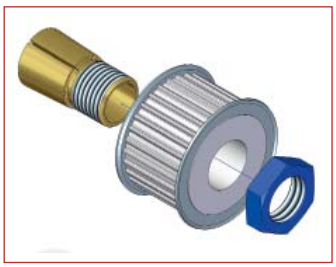
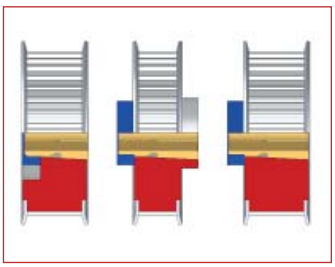
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.:	**10039k**	**10039k-ISK**	**10039ho**	**10039ho-ISK**	**10039**	**10039-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

BOQA® Fastening Elements product group 2350 for shaft diameter = 11.00 mm

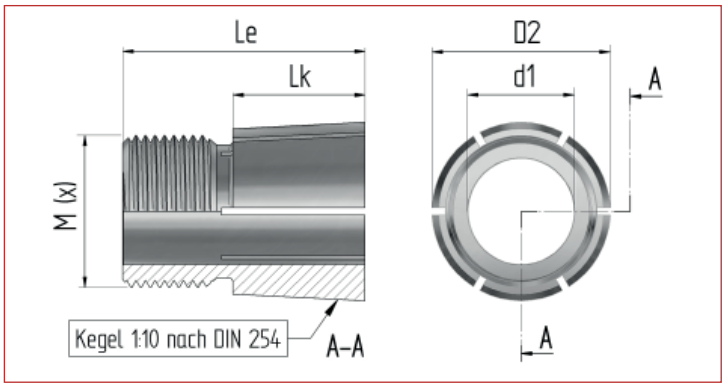
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10040**	**10040-ISK**	**10041**	**10041-ISK**	**10041ho**	**10041ho-ISK**
for shaft diameters (d1)	mm	11,00	11,00	11,00	11,00	11,00	11,00
Hub width (B) max.	mm	25,00	25,00	35,00	35,00	40,00	40,00
Taper diameter front (D2)	mm	23,50	23,50	23,50	23,50	23,50	23,50
Taper length (L_k)	mm	17,50	17,50	22,20	22,20	29,40	29,40
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	32,00	32,00	40,80	40,80	48,00	48,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25
Key width (SW)	mm	24	24	24	24	24	24
Nut height (m)	mm	6,00	6,00	6,00	6,00	6,00	6,00
Recommended tightening torque [1]	Nm	46,00	46,00	51,00	51,00	56,00	56,00

Transmission Values [2]

Torque (M)	Nm	27,80	27,80	30,80	30,80	33,80	33,80
Thrust (F_e)	kN	1,64	1,64	1,84	1,84	2,05	2,05
Hub load ($_pF$)	N/mm²	19,74	19,74	17,62	17,62	15,09	15,09

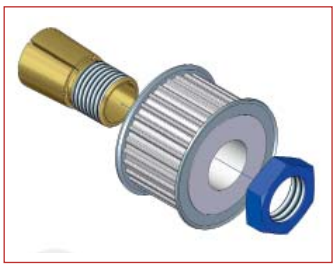
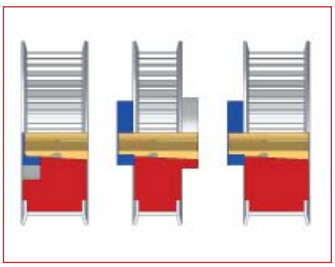
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.:	**10040**	**10040-ISK**	**10041**	**10041-ISK**	**10041ho**	**10041ho-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

DBGM : 94 07 845 / 94 10 725
DBP : 44 16 292.8
bodaTec-Form-Nr.: : boqa2016.idd

BOQA® Fastening Elements product group 2350 for shaft diameter = 12.00 mm

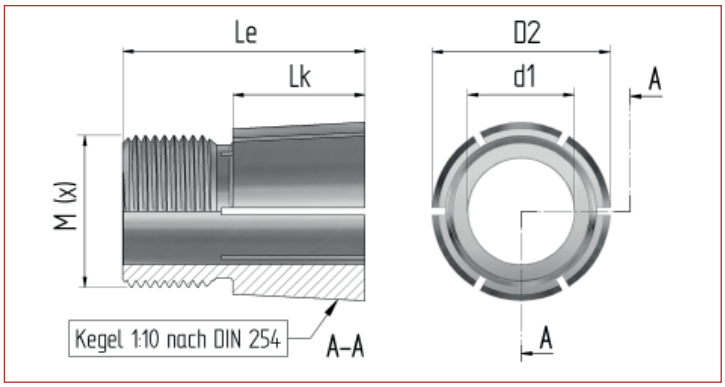
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10045k**	**10045k-ISK**	**10045ho**	**10045ho-ISK**	**10045**	**10045-ISK**
for shaft diameters (d1)	mm	12,00	12,00	12,00	12,00	12,00	12,00
Hub width (B) max.	mm	10,00	10,00	14,00	14,00	19,00	19,00
Taper diameter front (D2)	mm	23,50	23,50	23,50	23,50	23,50	23,50
Taper length (L_k)	mm	6,50	6,50	10,00	10,00	13,40	13,40
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	16,00	16,00	20,00	20,00	24,80	24,80
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25
Key width (SW)	mm	24	24	24	24	24	24
Nut height (m)	mm	6,00	6,00	6,00	6,00	6,00	6,00
Recommended tightening torque [1]	Nm	32,00	32,00	37,00	37,00	42,00	42,00

Transmission Values [2]

Torque (M)	Nm	19,30	19,30	22,40	22,40	25,40	25,40
Thrust (F_e)	kN	1,12	1,12	1,30	1,30	1,49	1,49
Hub load ($_pF$)	N/mm²	35,24	35,24	26,89	26,89	23,12	23,12

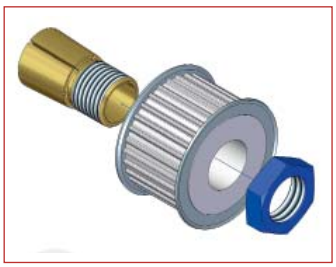
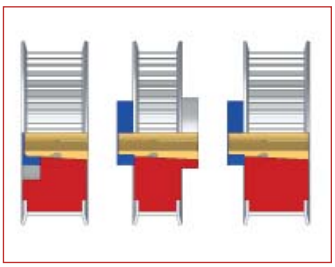
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10045k** **10045k-ISK** **10045ho** **10045ho-ISK** **10045** **10045-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

BOQA® Fastening Elements product group 2350 for shaft diameter = 12.00 mm

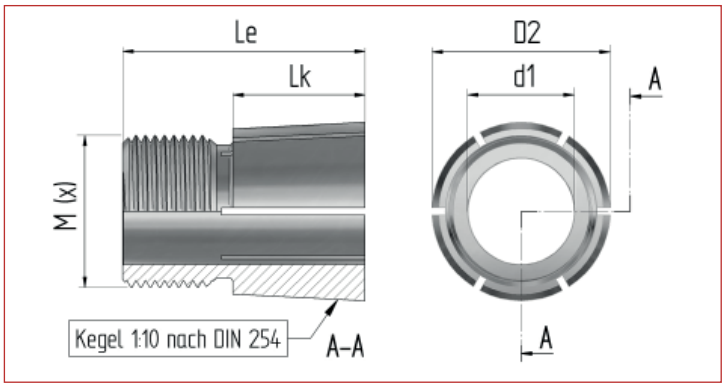
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10046**	**10046-ISK**	**10047**	**10047-ISK**	**10047ho**	**10047ho-ISK**
for shaft diameters (d1)	mm	12,00	12,00	12,00	12,00	12,00	12,00
Hub width (B) max.	mm	25,00	25,00	35,00	35,00	40,00	40,00
Taper diameter front (D2)	mm	23,50	23,50	23,50	23,50	23,50	23,50
Taper length (L_k)	mm	17,50	17,50	22,20	22,20	29,40	29,40
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	32,00	32,00	40,80	40,80	48,00	48,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25
Key width (SW)	mm	24	24	24	24	24	24
Nut height (m)	mm	6,00	6,00	6,00	6,00	6,00	6,00
Recommended tightening torque [1]	Nm	47,00	47,00	52,00	52,00	57,00	57,00

Transmission Values [2]

Torque (M)	Nm	28,40	27,80	31,40	31,40	34,40	34,40
Thrust (F_e)	kN	1,68	1,64	1,88	1,88	2,09	2,09
Hub load ($_pF$)	N/mm²	20,17	20,17	17,96	17,96	15,36	15,36

1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.:	**10046**	**10046-ISK**	**10047**	**10047-ISK**	**10047ho**	**10047ho-ISK**

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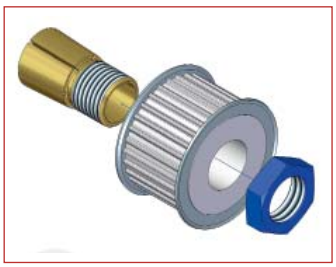
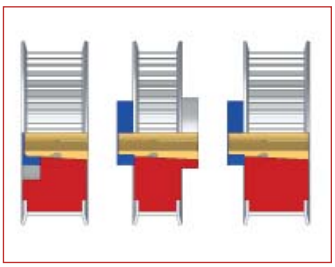



BOQA® Fastening Elements product group 2350 for shaft diameter = 13.00 mm

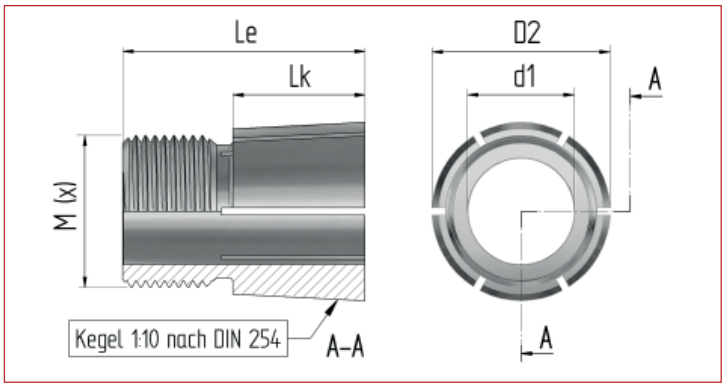
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10048k**	**10048k-ISK**	**10048ho**	**10048ho-ISK**	**10048**	**10048-ISK**
for shaft diameters (d1)	mm	13,00	13,00	13,00	13,00	13,00	13,00
Hub width (B) max.	mm	10,00	10,00	14,00	14,00	19,00	19,00
Taper diameter front (D2)	mm	23,50	23,50	23,50	23,50	23,50	23,50
Taper length (L_k)	mm	6,50	6,50	10,00	10,00	13,40	13,40
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	16,00	16,00	20,00	20,00	24,80	24,80
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25
Key width (SW)	mm	24	24	24	24	24	24
Nut height (m)	mm	6,00	6,00	6,00	6,00	6,00	6,00
Recommended tightening torque [1]	Nm	33,00	33,00	39,00	39,00	43,00	43,00

Transmission Values [2]

Torque (M)	Nm	19,90	19,90	23,80	23,80	26,00	26,00
Thrust (F_e)	kN	1,15	1,15	1,38	1,38	1,52	1,52
Hub load ($_pF$)	N/mm²	36,34	36,34	28,59	28,59	23,67	23,67

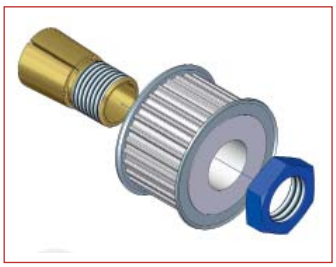
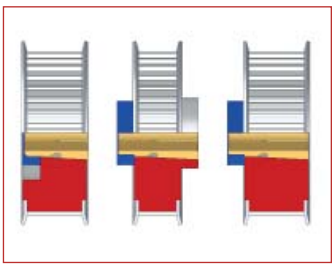
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

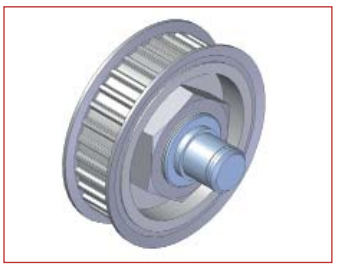
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10048k** **10048k-ISK** **10048ho** **10048ho-ISK** **10048** **10048-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 2350 for shaft diameter = 13.00 mm

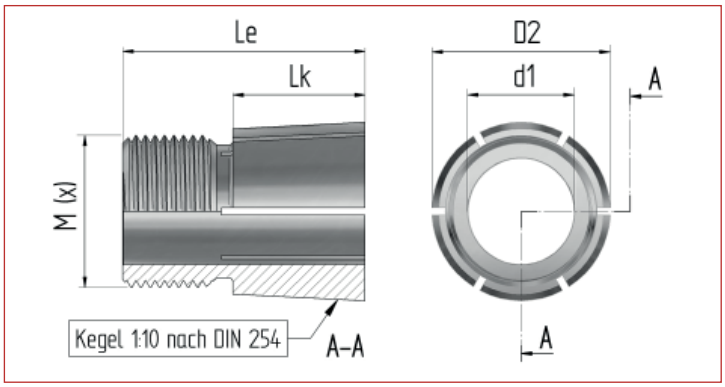
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10049**	**10049-ISK**	**10050**	**10050-ISK**	**10050ho**	**10050ho-ISK**
for shaft diameters (d1)	mm	13,00	13,00	13,00	13,00	13,00	13,00
Hub width (B) max.	mm	25,00	25,00	35,00	35,00	40,00	40,00
Taper diameter front (D2)	mm	23,50	23,50	23,50	23,50	23,50	23,50
Taper length (L_k)	mm	17,50	17,50	22,20	22,20	29,40	29,40
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	32,00	32,00	40,80	40,80	48,00	48,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25
Key width (SW)	mm	24	24	24	24	24	24
Nut height (m)	mm	6,00	6,00	6,00	6,00	6,00	6,00
Recommended tightening torque [1]	Nm	48,00	48,00	53,00	53,00	58,00	58,00

Transmission Values [2]

Torque (M)	Nm	29,00	29,00	32,00	32,00	35,10	35,10
Thrust (F_e)	kN	1,71	1,71	1,91	1,91	2,13	2,13
Hub load ($_pF$)	N/mm²	20,60	20,60	18,31	18,31	15,63	15,63

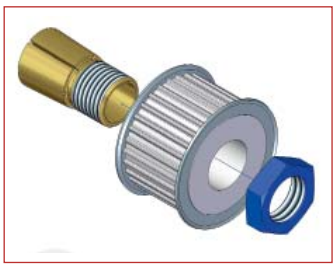
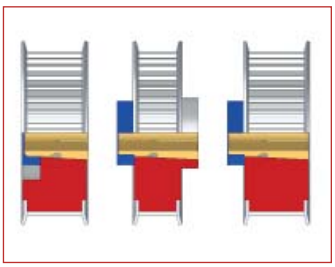
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10049** **10049-ISK** **10050** **10050-ISK** **10050ho** **10050ho-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

BOQA® Fastening Elements product group 2350 for shaft diameter = 13.00 mm

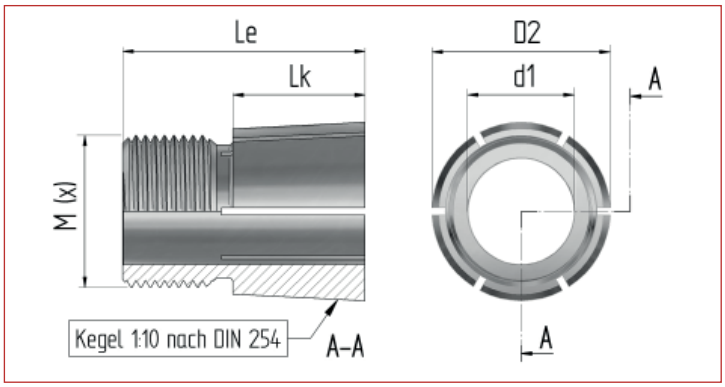
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.: **10050skr-ISK**

for shaft diameters (d1)	mm	13,00
Hub width (B) max.	mm	12,00
Taper diameter front (D2)	mm	23,50
Taper length (L_k)	mm	10,00
Counter bearing, length	mm	-
Counter bearing, diameter	mm	-
Bore depth for shaft journal	mm	-
Overall length (L_e)	mm	20,00
Taper ratio (C)	C=1:x	1:10
Taper angle (α)	°	5,725
Thread (metric DIN)	M (x)	M20 x 1,25
Hex socket key width (SW)	mm	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M20 x 1,25
Key width (SW)	mm	24
Nut height (m)	mm	6,00
Recommended tightening torque [1]	Nm	38,00

Transmission Values [2]

Torque (M)	Nm	23,00
Thrust (F_e)	kN	1,34
Hub load ($_pF$)	N/mm²	27,62

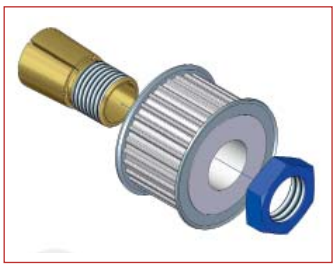
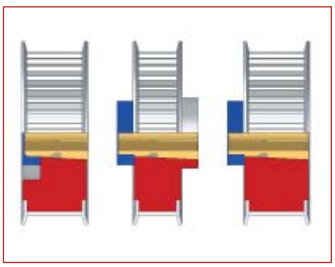
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

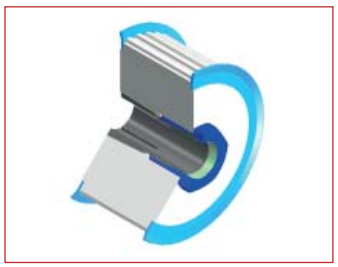
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10050skr-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 2350 for shaft diameter = 14.00 mm

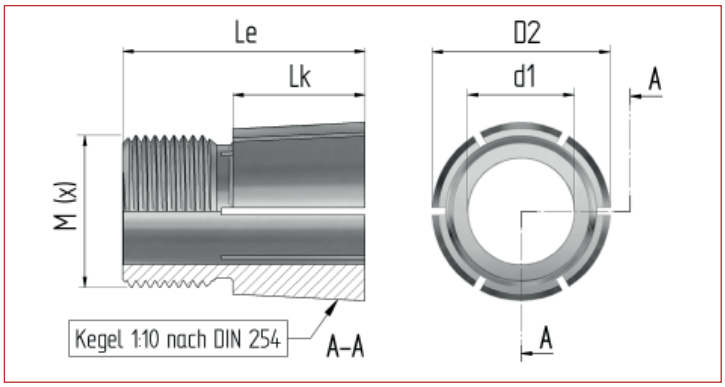
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10051k**	**10051k-ISK**	**10051ho**	**10051ho-ISK**	**10051**	**10051-ISK**
for shaft diameters (d1)	mm	14,00	14,00	14,00	14,00	14,00	14,00
Hub width (B) max.	mm	10,00	10,00	14,00	14,00	19,00	19,00
Taper diameter front (D2)	mm	23,50	23,50	23,50	23,50	23,50	23,50
Taper length (L_k)	mm	6,50	6,50	10,00	10,00	13,40	13,40
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	16,00	16,00	20,00	20,00	24,80	24,80
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25
Key width (SW)	mm	24	24	24	24	24	24
Nut height (m)	mm	6,00	6,00	6,00	6,00	6,00	6,00
Recommended tightening torque [1]	Nm	34,00	34,00	39,00	39,00	44,00	44,00

Transmission Values [2]

Torque (M)	Nm	20,50	20,50	23,60	23,60	26,60	26,60
Thrust (F_e)	kN	1,19	1,19	1,37	1,37	1,56	1,56
Hub load ($_pF$)	N/mm²	37,44	37,44	28,34	28,34	24,22	24,22

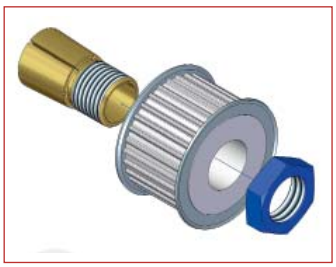
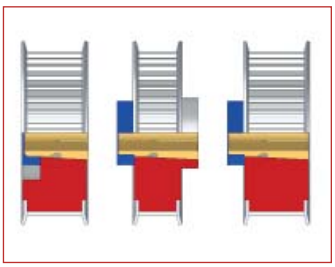
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10051k** **10051k-ISK** **10051ho** **10051ho-ISK** **10051** **10051-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

BOQA® Fastening Elements product group 2350 for shaft diameter = 14.00 mm

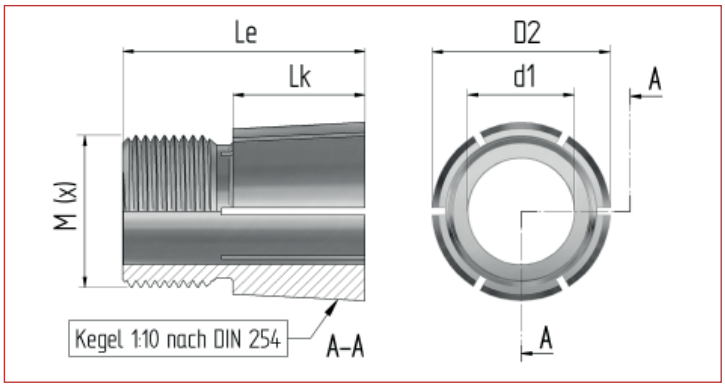
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10052**	**10052-ISK**	**10053**	**10053-ISK**	**10053ho**	**10053ho-ISK**
for shaft diameters (d1)	mm	14,00	14,00	14,00	14,00	14,00	14,00
Hub width (B) max.	mm	25,00	25,00	35,00	35,00	40,00	40,00
Taper diameter front (D2)	mm	23,50	23,50	23,50	23,50	23,50	23,50
Taper length (L_k)	mm	17,50	17,50	22,20	22,20	29,40	29,40
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	32,00	32,00	40,80	40,80	48,00	48,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25
Key width (SW)	mm	24	24	24	24	24	24
Nut height (m)	mm	6,00	6,00	6,00	6,00	6,00	6,00
Recommended tightening torque [1]	Nm	49,00	49,00	54,00	54,00	59,00	59,00

Transmission Values [2]

Torque (M)	Nm	29,60	29,60	32,60	32,60	35,70	35,70
Thrust (F_e)	kN	1,75	1,75	1,95	1,95	2,16	2,16
Hub load ($_pF$)	N/mm²	21,03	21,03	18,65	18,65	15,90	15,90

1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10052** **10052-ISK** **10053** **10053-ISK** **10053ho** **10053ho-ISK**

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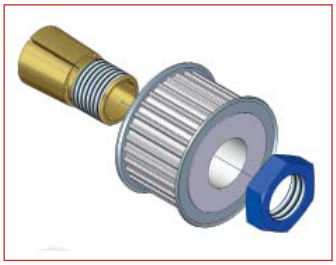
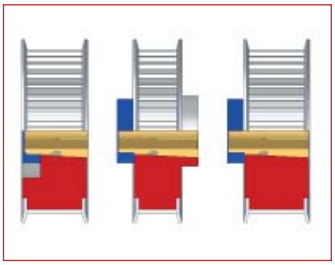



BOQA® Fastening Elements product group 2350 for shaft diameter = 15.00 mm

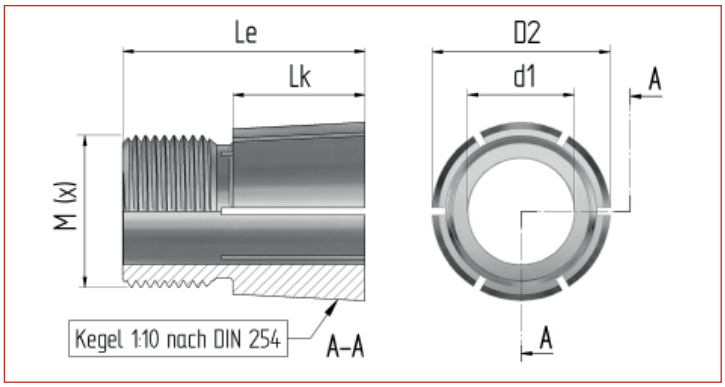
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10054k**	**10054k-ISK**	**10054ho**	**10054ho-ISK**	**10054**	**10054-ISK**
for shaft diameters (d1)	mm	15,00	15,00	15,00	15,00	15,00	15,00
Hub width (B) max.	mm	10,00	10,00	14,00	14,00	19,00	19,00
Taper diameter front (D2)	mm	23,50	23,50	23,50	23,50	23,50	23,50
Taper length (L_k)	mm	6,50	6,50	10,00	10,00	13,40	13,40
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	16,00	16,00	20,00	20,00	24,80	24,80
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25
Key width (SW)	mm	24	24	24	24	24	24
Nut height (m)	mm	6,00	6,00	6,00	6,00	6,00	6,00
Recommended tightening torque [1]	Nm	35,00	35,00	40,00	40,00	45,00	45,00

Transmission Values [2]

Torque (M)	Nm	21,20	21,20	24,20	24,20	27,20	27,20
Thrust (F_e)	kN	1,22	1,22	1,41	1,41	1,59	1,59
Hub load ($_pF$)	N/mm²	38,54	38,54	29,07	29,07	24,77	24,77

1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10054k** **10054k-ISK** **10054ho** **10054ho-ISK** **10054** **10054-ISK**

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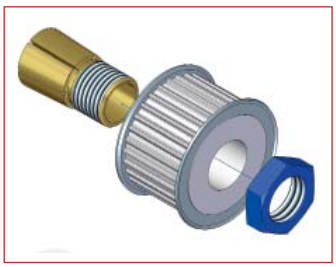
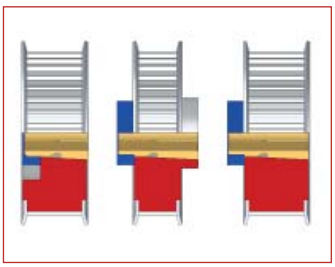



BOQA® Fastening Elements product group 2350 for shaft diameter = 15.00 mm

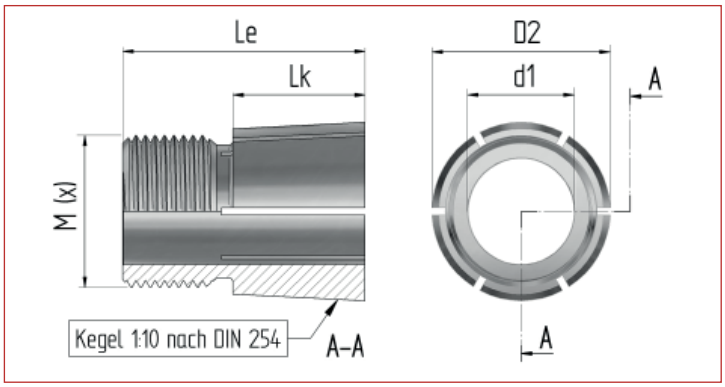
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10055**	**10055-ISK**	**10056**	**10056-ISK**	**10056ho**	**10056ho-ISK**
for shaft diameters (d1)	mm	15,00	15,00	15,00	15,00	15,00	15,00
Hub width (B) max.	mm	25,00	25,00	35,00	35,00	40,00	40,00
Taper diameter front (D2)	mm	23,50	23,50	23,50	23,50	23,50	23,50
Taper length (L_k)	mm	17,50	17,50	22,20	22,20	29,40	29,40
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	32,00	32,00	40,80	40,80	48,00	48,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25
Key width (SW)	mm	24	24	24	24	24	24
Nut height (m)	mm	6,00	6,00	6,00	6,00	6,00	6,00
Recommended tightening torque [1]	Nm	50,00	50,00	55,00	55,00	60,00	60,00

Transmission Values [2]

Torque (M)	Nm	30,20	30,20	33,20	33,20	36,30	36,30
Thrust (F_e)	kN	1,79	1,79	1,99	1,99	2,20	2,20
Hub load ($_pF$)	N/mm²	21,46	21,46	19,00	19,00	16,17	16,17

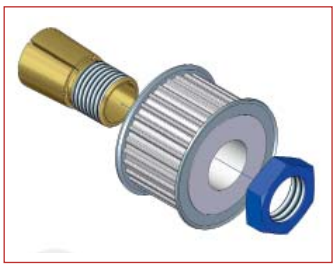
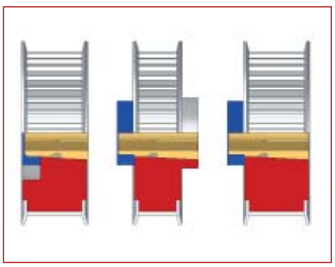
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

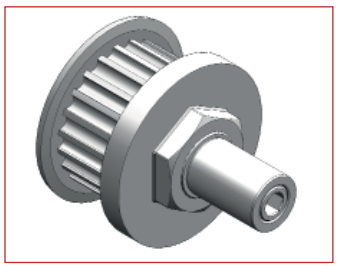
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.:	**10055**	**10055-ISK**	**10056**	**10056-ISK**	**10056ho**	**10056ho-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 2350 for shaft diameter = 16.00 mm

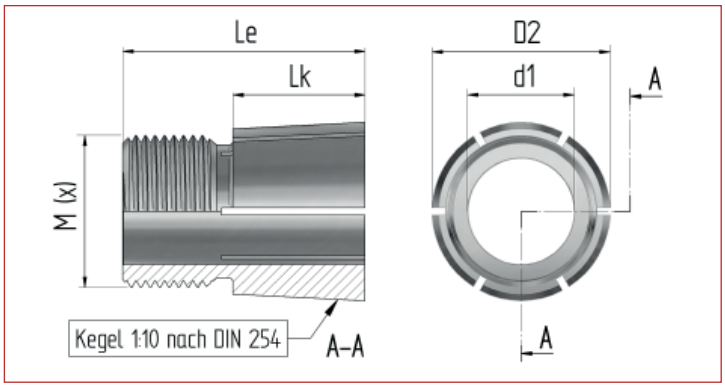
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10060k**	**10060k-ISK**	**10060ho**	**10060ho-ISK**	**10060**	**10060-ISK**
for shaft diameters (d1)	mm	16,00	16,00	16,00	16,00	16,00	16,00
Hub width (B) max.	mm	10,00	10,00	14,00	14,00	19,00	19,00
Taper diameter front (D2)	mm	23,50	23,50	23,50	23,50	23,50	23,50
Taper length (L_k)	mm	6,50	6,50	10,00	10,00	13,40	13,40
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	16,00	16,00	20,00	20,00	24,80	24,80
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25
Key width (SW)	mm	24	24	24	24	24	24
Nut height (m)	mm	6,00	6,00	6,00	6,00	6,00	6,00
Recommended tightening torque [1]	Nm	36,00	36,00	41,00	41,00	46,00	46,00

Transmission Values [2]

Torque (M)	Nm	21,80	21,80	24,80	24,80	27,80	27,80
Thrust (F_e)	kN	1,26	1,26	1,44	1,44	1,63	1,63
Hub load ($_pF$)	N/mm²	39,65	39,65	29,80	29,80	25,32	25,32

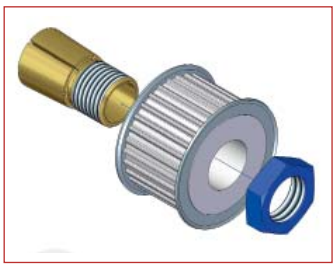
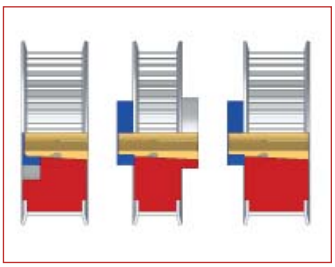
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

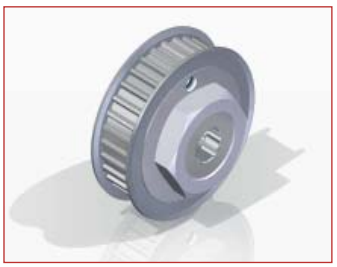
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.:	**10060k**	**10060k-ISK**	**10060ho**	**10060ho-ISK**	**10060**	**10060-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 2350 for shaft diameter = 16.00 mm

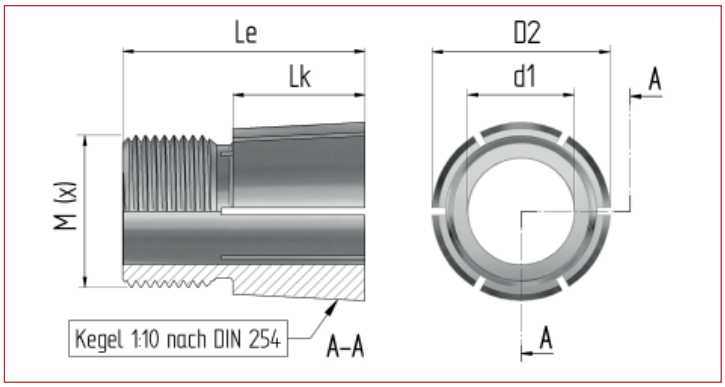
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10061**	**10061-ISK**	**10062**	**10062-ISK**	**10062ho**	**10062ho-ISK**
for shaft diameters (d1)	mm	16,00	16,00	16,00	16,00	16,00	16,00
Hub width (B) max.	mm	25,00	25,00	35,00	35,00	40,00	40,00
Taper diameter front (D2)	mm	23,50	23,50	23,50	23,50	23,50	23,50
Taper length (L_k)	mm	17,50	17,50	22,20	22,20	29,40	29,40
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	32,00	32,00	40,80	40,80	48,00	48,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25
Key width (SW)	mm	24	24	24	24	24	24
Höhe der Mutter(m)	mm	6,00	6,00	6,00	6,00	6,00	6,00
Recommended tightening torque [1]	Nm	51,00	51,00	56,00	56,00	61,00	61,00

Transmission Values [2]

Torque (M)	Nm	30,80	30,80	33,80	33,80	36,90	36,90
Thrust (F_e)	kN	1,82	1,82	2,02	2,02	2,24	2,24
Hub load ($_pF$)	N/mm²	21,89	21,89	19,35	19,35	16,44	16,44

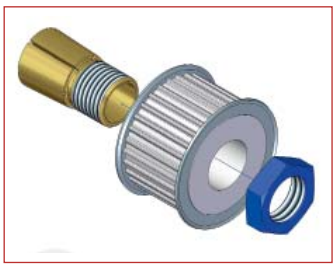
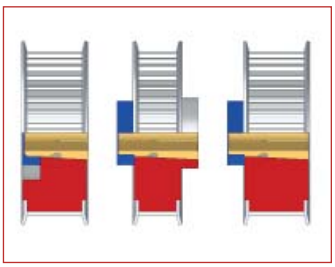
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

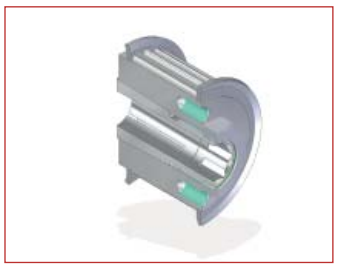
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.:	**10061**	**10061-ISK**	**10062**	**10062-ISK**	**10062ho**	**10062ho-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 2350 (special solutions)

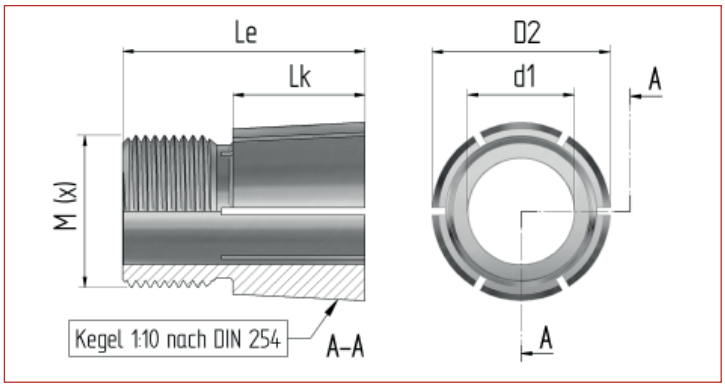
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**BO584705**	**BO584706**	**BO584707**	**BO585130**	**BO585131**	**B14-584707**
for shaft diameters (d1)	mm	8,00	6,00	14,00	9,00	14,00	14,00
Hub width (B) max.	mm	27,00	27,00	27,00	27,00	27,00	35,00
Taper diameter front (D2)	mm	23,50	23,50	23,50	23,50	23,50	23,50
Taper length (L_k)	mm	16,10	16,10	16,10	16,10	16,10	21,10
Counter bearing, length	mm	20,00	20,00	20,00	-	-	13,00
Counter bearing, diameter	mm	10,00	10,00	10,00	-	-	10,00
Bore depth for shaft journal	mm	26,00	26,00	26,00	-	-	31,00
Overall length (L_e)	mm	55,00	55,00	55,00	35,00	35,00	51,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25
Hex socket key width (SW)	mm	6 mm	6 mm	6 mm	12 mm	12 mm	6 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25	M20 x 1,25
Key width (SW)	mm	24	24	24	24	24	24
Nut height (m)	mm	6,00	6,00	6,00	6,00	6,00	6,00
Recommended tightening torque [1]	Nm	40,00	35,00	50,00	45,00	50,00	60,00

Transmission Values [2]

Torque (M)	Nm	24,20	21,20	30,50	27,20	30,20	36,30
Thrust (F_e)	kN	1,42	1,25	1,79	1,60	1,78	2,16
Hub load ($_pF$)	N/mm²	18,54	16,23	23,38	20,86	23,18	21,70

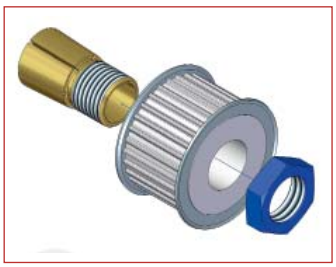
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

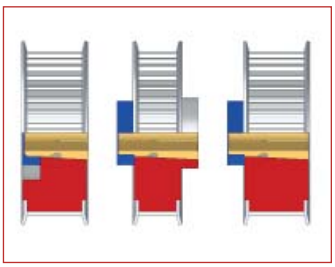
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

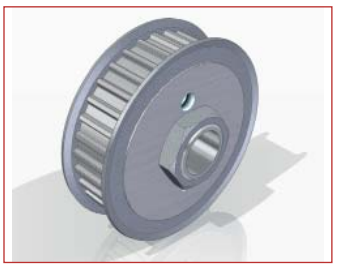
BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **BO584705** **BO584706** **BO584707** **BO585130** **BO585131** **B14-584707**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.







BOQA® Fastening Elements product group 2730 for shaft diameter = 6.35 mm (1/4“)

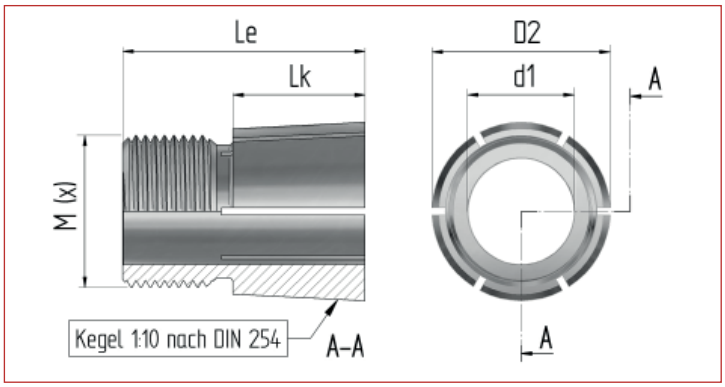
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**12106.35**	**12106.35-ISK**
for shaft diameters (d1)	mm	6,35	6,35
Hub width (B) max.	mm	13,00	13,00
Taper diameter front (D2)	mm	27,30	27,30
Taper length (L_k)	mm	6,80	6,80
Counter bearing, length	mm	-	-
Counter bearing, diameter	mm	-	-
Bore depth for shaft journal	mm	-	-
Overall length (L_e)	mm	17,50	17,50
Taper ratio (C)	C=1:x	1:10	1:10
Taper angle (α)	°	5,725	5,725
Thread (metric DIN)	M (x)	M24 x 1,25	M24 x 1,25
Hex socket key width (SW)	mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M24 x 1,25	M24 x 1,25
Key width (SW)	mm	30	30
Nut height (m)	mm	8,00	8,00
Recommended tightening torque [1]	Nm	50,00	50,00

Transmission Values [2]

Torque (M)	Nm	27,20	27,20
Thrust (F_e)	kN	1,35	1,35
Hub load ($_pF$)	N/mm²	34,95	34,95

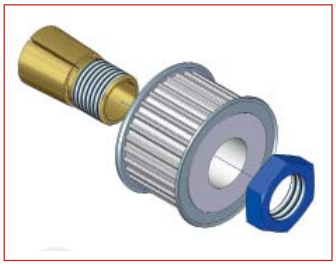
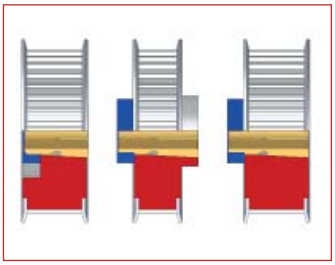
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

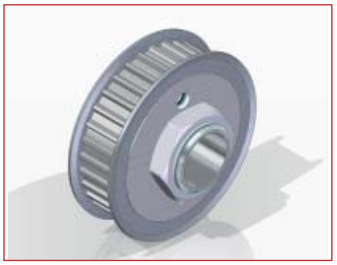
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **12106.35** **12106.35-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 2730 for shaft diameter = 8.00 mm

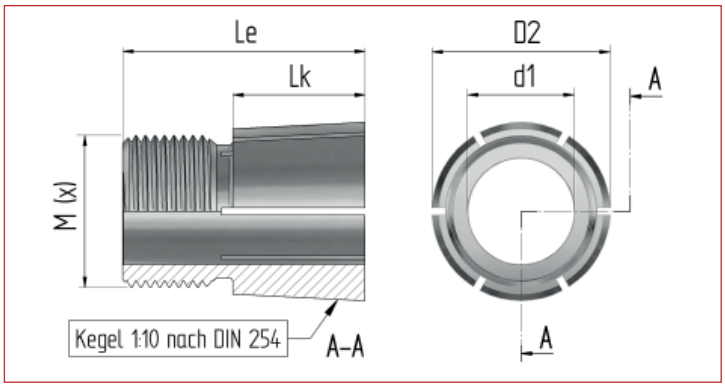
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**12108**	**12108-ISK**
for shaft diameters (d1)	mm	8,00	8,00
Hub width (B) max.	mm	13,00	13,00
Taper diameter front (D2)	mm	27,30	27,30
Taper length (L_k)	mm	6,80	6,80
Counter bearing, length	mm	-	-
Counter bearing, diameter	mm	-	-
Bore depth for shaft journal	mm	-	-
Overall length (L_e)	mm	17,50	17,50
Taper ratio (C)	C=1:x	1:10	1:10
Taper angle (α)	°	5,725	5,725
Thread (metric DIN)	M (x)	M24 x 1,25	M24 x 1,25
Hex socket key width (SW)	mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M24 x 1,25	M24 x 1,25
Key width (SW)	mm	30	30
Nut height (m)	mm	8,00	8,00
Recommended tightening torque [1]	Nm	52,00	52,00

Transmission Values [2]

Torque (M)	Nm	28,30	28,30
Thrust (F_e)	kN	1,40	1,40
Hub load ($_pF$)	N/mm²	36,36	36,36

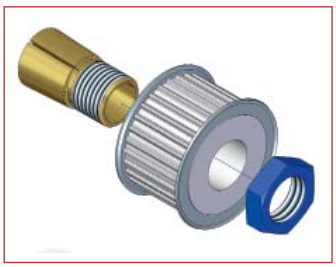
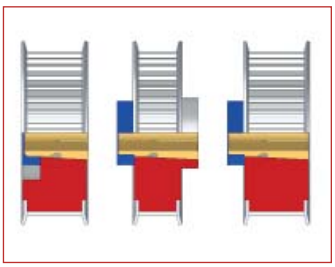
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

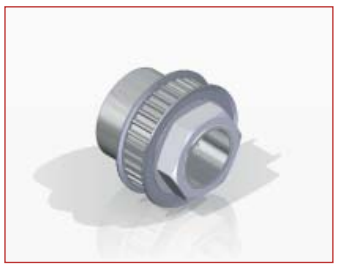
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **12108** **12108-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 2730 for shaft diameter = 9.00 mm

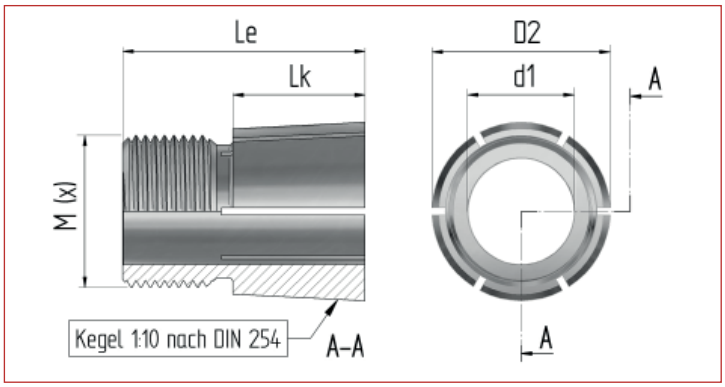
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**12109**	**12109-ISK**
for shaft diameters (d1)	mm	9,00	9,00
Hub width (B) max.	mm	13,00	13,00
Taper diameter front (D2)	mm	27,30	27,30
Taper length (L_k)	mm	6,80	6,80
Counter bearing, length	mm	-	-
Counter bearing, diameter	mm	-	-
Bore depth for shaft journal	mm	-	-
Overall length (L_e)	mm	17,50	17,50
Taper ratio (C)	C=1:x	1:10	1:10
Taper angle (α)	°	5,725	5,725
Thread (metric DIN)	M (x)	M24 x 1,25	M24 x 1,25
Hex socket key width (SW)	mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M24 x 1,25	M24 x 1,25
Key width (SW)	mm	30	30
Nut height (m)	mm	8,00	8,00
Recommended tightening torque [1]	Nm	54,00	54,00

Transmission Values [2]

Torque (M)	Nm	29,30	29,30
Thrust (F_e)	kN	1,46	1,46
Hub load ($_pF$)	N/mm²	37,76	37,76

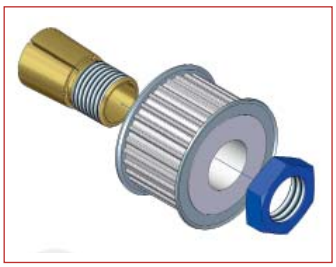
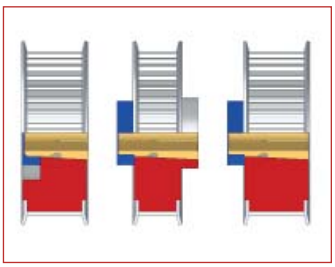
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **12109** **12109-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

BOQA® Fastening Elements product group 2730 for shaft diameter = 9.52 mm (3/8“)

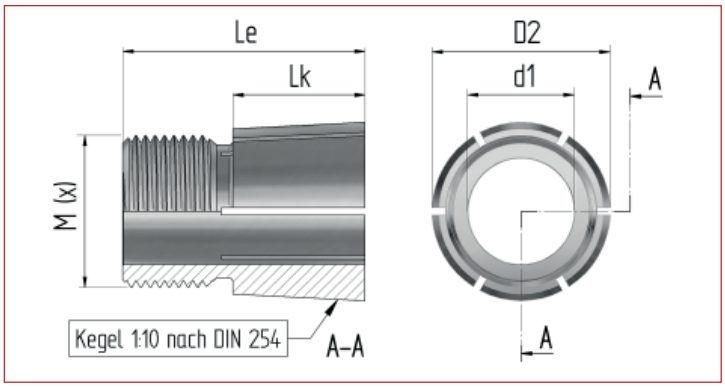
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.: ..... **12109.52** **12109.52-ISK**

for shaft diameters (d1)	mm	9,52	9,52
Hub width (B) max.	mm	13,00	13,00
Taper diameter front (D2)	mm	27,30	27,30
Taper length (L_k)	mm	6,80	6,80
Counter bearing, length	mm	-	-
Counter bearing, diameter	mm	-	-
Bore depth for shaft journal	mm	-	-
Overall length (L_e)	mm	17,50	17,50
Taper ratio (C)	C=1:x	1:10	1:10
Taper angle (α)	°	5,725	5,725
Thread (metric DIN)	M (x)	M24 x 1,25	M24 x 1,25
Hex socket key width (SW)	mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M24 x 1,25	M24 x 1,25
Key width (SW)	mm	30	30
Nut height (m)	mm	8,00	8,00
Recommended tightening torque [1]	Nm	55,00	55,00

Transmission Values [2]

Torque (M)	Nm	33,50	33,50
Thrust (F_e)	kN	1,66	1,66
Hub load ($_pF$)	N/mm²	43,15	43,15

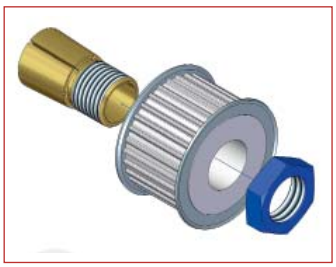
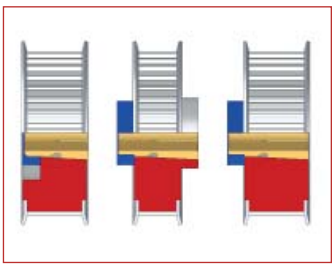
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

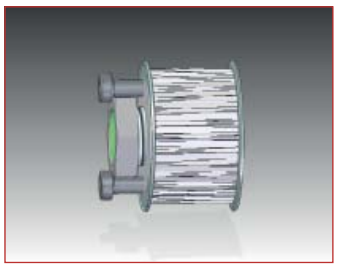
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: ..... **12109.52** **12109.52-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 2730 for shaft diameter = 10.00 mm

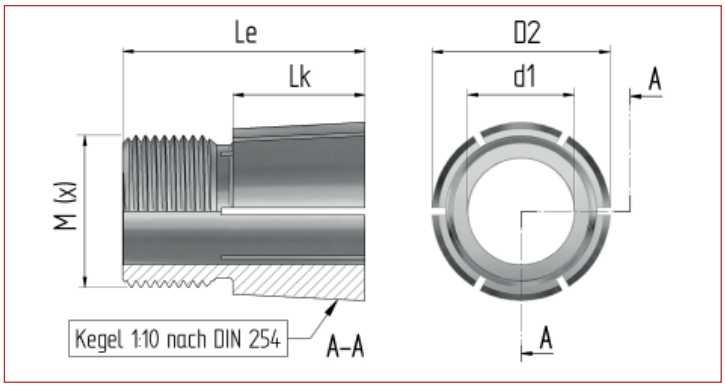
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**12110**	**12110-ISK**
for shaft diameters (d1)	mm	10,00	10,00
Hub width (B) max.	mm	13,00	13,00
Taper diameter front (D2)	mm	27,30	27,30
Taper length (L_k)	mm	6,80	6,80
Counter bearing, length	mm	-	-
Counter bearing, diameter	mm	-	-
Bore depth for shaft journal	mm	-	-
Overall length (L_e)	mm	17,50	17,50
Taper ratio (C)	C=1:x	1:10	1:10
Taper angle (α)	°	5,725	5,725
Thread (metric DIN)	M (x)	M24 x 1,25	M24 x 1,25
Hex socket key width (SW)	mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M24 x 1,25	M24 x 1,25
Key width (SW)	mm	30	30
Nut height (m)	mm	8,00	8,00
Recommended tightening torque [1]	Nm	56,00	56,00

Transmission Values [2]

Torque (M)	Nm	30,40	30,40
Thrust (F_e)	kN	1,51	1,51
Hub load ($_pF$)	N/mm²	39,16	39,16

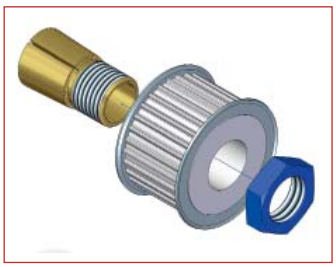
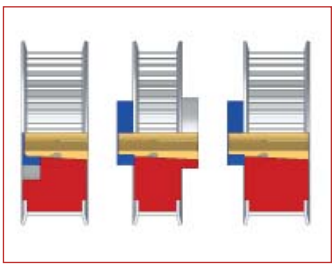
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

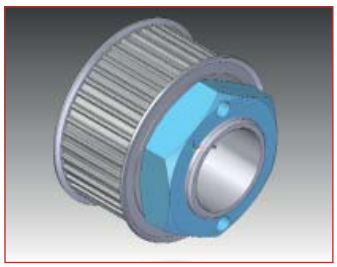
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **12110** **12110-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 2730 for shaft diameter = 12.00 mm

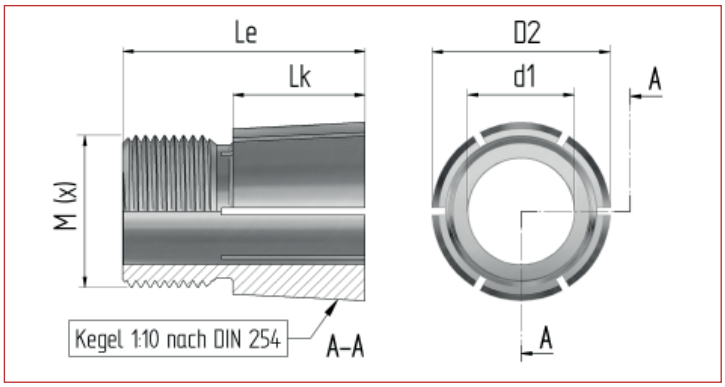
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**12112**	**12112-ISK**	**10212**	**10212-ISK**	**10312**	**10312-ISK**
for shaft diameters (d1)	mm	12,00	12,00	12,00	12,00	12,00	12,00
Hub width (B) max.	mm	13,00	13,00	16,00	16,00	22,00	22,00
Taper diameter front (D2)	mm	27,30	27,30	27,30	27,30	27,30	27,30
Taper length (L_k)	mm	6,80	6,80	13,00	13,00	17,50	17,50
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	17,50	17,50	24,00	24,00	30,00	30,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25
Key width (SW)	mm	30	30	30	30	30	30
Nut height (m)	mm	8,00	8,00	8,00	8,00	8,00	8,00
Recommended tightening torque [1]	Nm	52,00	52,00	54,00	54,00	56,00	56,00

Transmission Values [2]

Torque (M)	Nm	28,30	28,30	29,30	29,30	30,40	30,40
Thrust (F_e)	kN	1,41	1,41	1,47	1,47	1,54	1,54
Hub load ($_pF$)	N/mm²	36,36	36,36	20,21	20,21	15,84	15,84

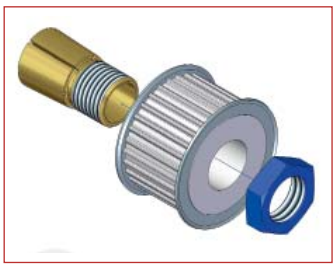
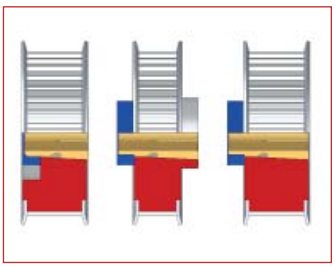
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **12112** **12112-ISK** **10212** **10212-ISK** **10312** **10312-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

BOQA® Fastening Elements product group 2730 for shaft diameter = 12.00 mm

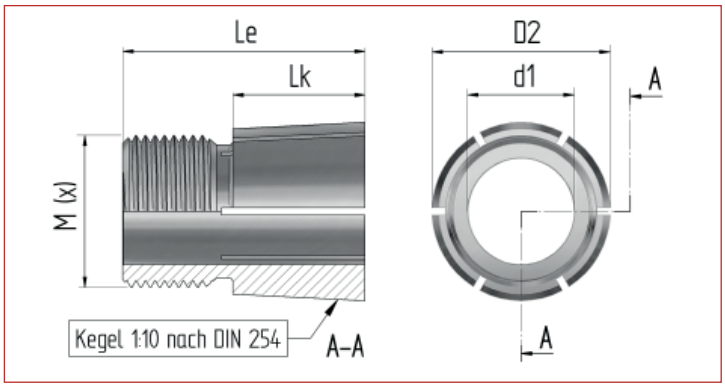
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10412**	**10412-ISK**	**10512**	**10512-ISK**
for shaft diameters (d1)	mm	12,00	12,00	12,00	12,00
Hub width (B) max.	mm	30,00	30,00	40,00	40,00
Taper diameter front (D2)	mm	27,30	27,30	27,30	27,30
Taper length (L_k)	mm	26,00	26,00	36,00	36,00
Counter bearing, length	mm	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-
Overall length (L_e)	mm	40,00	40,00	50,00	50,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25
Hex socket key width (SW)	mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25
Key width (SW)	mm	30	30	30	30
Nut height (m)	mm	8,00	8,00	8,00	8,00
Recommended tightening torque [1]	Nm	58,00	58,00	60,00	60,00

Transmission Values [2]

Torque (M)	Nm	31,50	31,50	32,60	32,60
Thrust (F_e)	kN	1,62	1,62	1,71	1,71
Hub load ($_pF$)	N/mm²	11,40	11,40	8,86	8,86

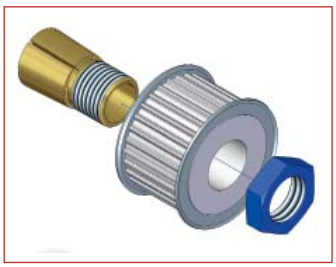
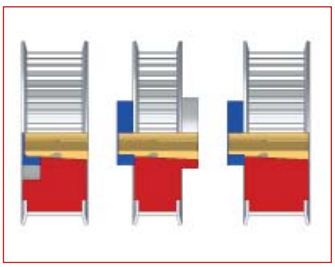
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10412** **10412-ISK** **10512** **10512-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

BOQA® Fastening Elements product group 2730 for shaft diameter = 13.00 mm

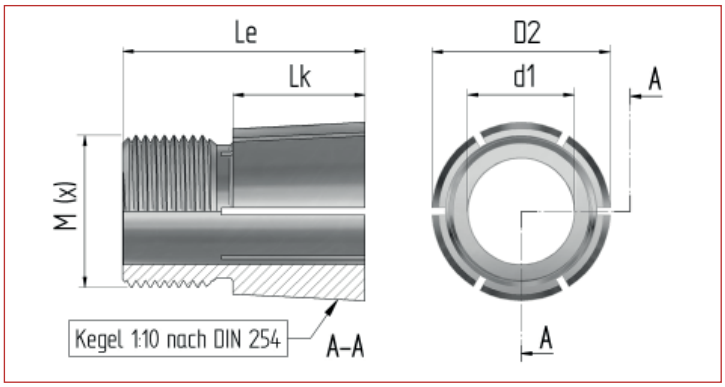
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**12113**	**12113-ISK**	**10213**	**10213-ISK**	**10313**	**10313-ISK**
for shaft diameters (d1)	mm	13,00	13,00	13,00	13,00	13,00	13,00
Hub width (B) max.	mm	13,00	13,00	16,00	16,00	22,00	22,00
Taper diameter front (D2)	mm	27,30	27,30	27,30	27,30	27,30	27,30
Taper length (L_k)	mm	6,80	6,80	13,00	13,00	17,50	17,50
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	17,50	17,50	24,00	24,00	30,00	30,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25
Key width (SW)	mm	30	30	30	30	30	30
Nut height (m)	mm	8,00	8,00	8,00	8,00	8,00	8,00
Recommended tightening torque [1]	Nm	54,00	54,00	56,00	56,00	58,00	58,00

Transmission Values [2]

Torque (M)	Nm	29,30	29,30	30,40	30,40	31,50	31,50
Thrust (F_e)	kN	1,46	1,46	1,53	1,53	1,59	1,59
Hub load ($_pF$)	N/mm²	37,76	37,76	20,96	20,96	16,40	16,40

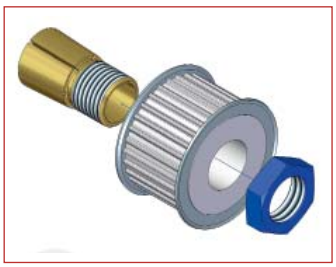
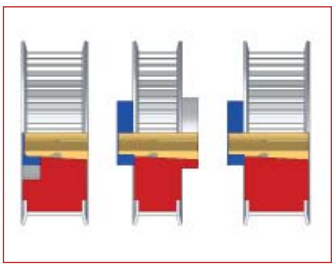
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

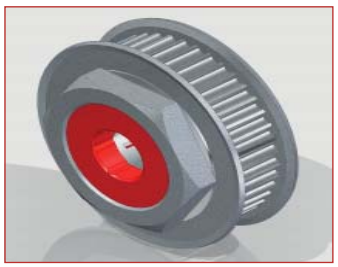
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **12113** **12113-ISK** **10213** **10213-ISK** **10313** **10313-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 2730 for shaft diameter = 13.00 mm

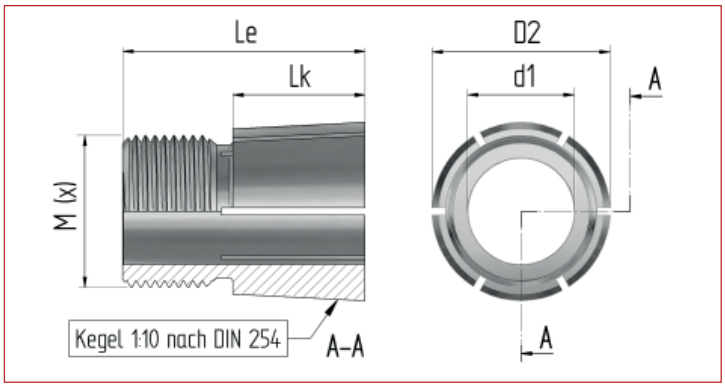
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10413**	**10413-ISK**	**10513**	**10513-ISK**
for shaft diameters (d1)	mm	13,00	13,00	13,00	13,00
Hub width (B) max.	mm	30,00	30,00	40,00	40,00
Taper diameter front (D2)	mm	27,30	27,30	27,30	27,30
Taper length (L_k)	mm	26,00	26,00	36,00	36,00
Counter bearing, length	mm	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-
Overall length (L_e)	mm	40,00	40,00	50,00	50,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25
Hex socket key width (SW)	mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25
Key width (SW)	mm	30	30	30	30
Nut height (m)	mm	8,00	8,00	8,00	8,00
Recommended tightening torque [1]	Nm	60,00	60,00	62,00	62,00

Transmission Values [2]

Torque (M)	Nm	32,60	32,60	33,70	33,70
Thrust (F_e)	kN	1,68	1,68	1,77	1,77
Hub load ($_pF$)	N/mm²	11,80	11,80	9,15	9,15

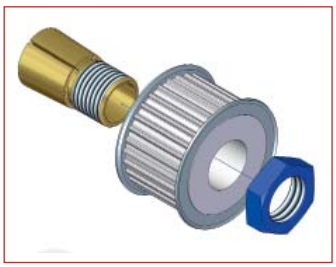
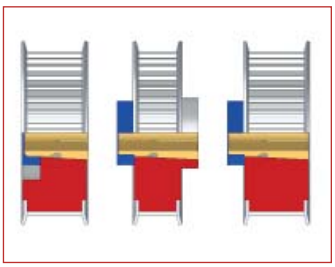
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

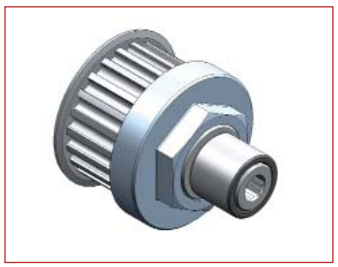
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10413** **10413-ISK** **10513** **10513-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 2730 for shaft diameter = 14.00 mm

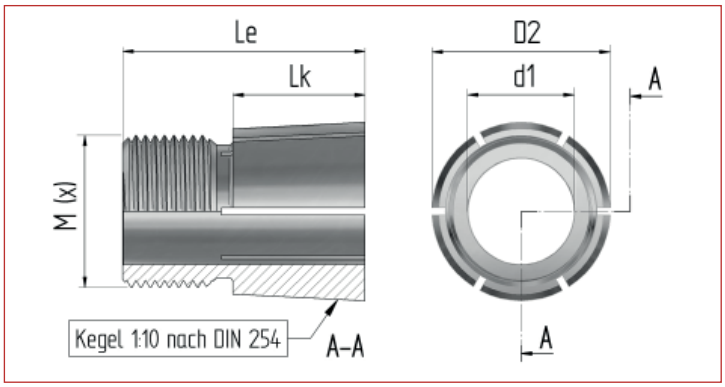
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**12114**	**12114-ISK**	**10214**	**10214-ISK**	**10314**	**10314-ISK**
for shaft diameters (d1)	mm	14,00	14,00	14,00	14,00	14,00	14,00
Hub width (B) max.	mm	13,00	13,00	16,00	16,00	22,00	22,00
Taper diameter front (D2)	mm	27,30	27,30	27,30	27,30	27,30	27,30
Taper length (L_k)	mm	6,80	6,80	13,00	13,00	17,50	17,50
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	17,50	17,50	24,00	24,00	30,00	30,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25
Key width (SW)	mm	30	30	30	30	30	30
Nut height (m)	mm	8,00	8,00	8,00	8,00	8,00	8,00
Recommended tightening torque [1]	Nm	56,00	56,00	58,00	58,00	60,00	60,00

Transmission Values [2]

Torque (M)	Nm	30,40	30,40	31,50	31,50	32,60	32,60
Thrust (F_e)	kN	1,51	1,51	1,58	1,58	1,65	1,65
Hub load ($_pF$)	N/mm²	39,16	39,16	21,71	21,71	16,97	16,97

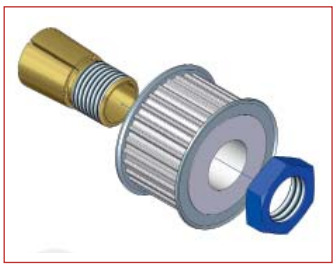
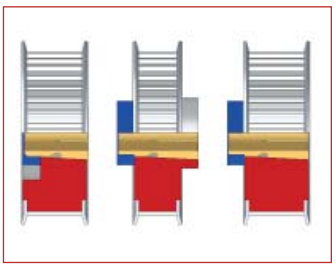
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

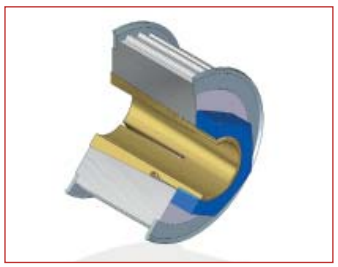
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **12114** **12114-ISK** **10214** **10214-ISK** **10314** **10314-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 2730 for shaft diameter = 14.00 mm

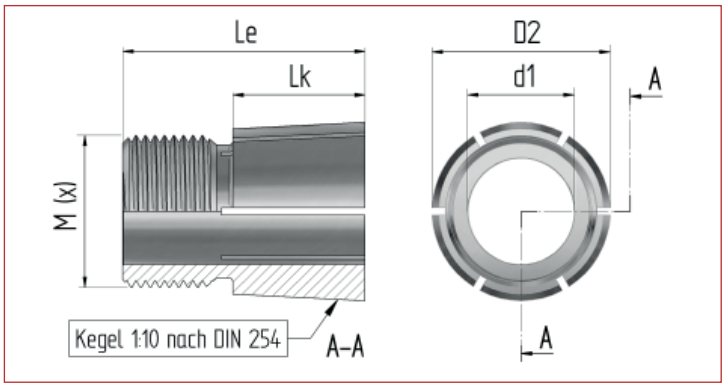
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10414**	**10414-ISK**	**10514**	**10514-ISK**
for shaft diameters (d1)	mm	14,00	14,00	14,00	14,00
Hub width (B) max.	mm	30,00	30,00	40,00	40,00
Taper diameter front (D2)	mm	27,30	27,30	27,30	27,30
Taper length (L_k)	mm	26,00	26,00	36,00	36,00
Counter bearing, length	mm	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-
Overall length (L_e)	mm	40,00	40,00	50,00	50,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25
Hex socket key width (SW)	mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25
Key width (SW)	mm	30	30	30	30
Nut height (m)	mm	8,00	8,00	8,00	8,00
Recommended tightening torque [1]	Nm	62,00	62,00	64,00	64,00

Transmission Values [2]

Torque (M)	Nm	33,70	33,70	34,80	34,80
Thrust (F_e)	kN	1,73	1,73	1,82	1,82
Hub load ($_pF$)	N/mm²	12,19	12,19	9,45	9,45

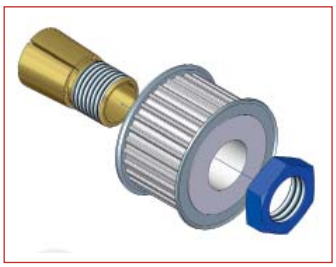
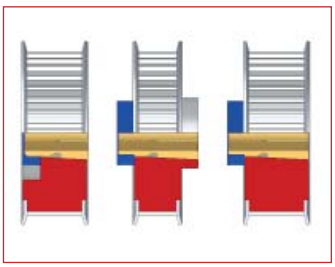
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10414** **10414-ISK** **10514** **10514-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

BOQA® Fastening Elements product group 2730 for shaft diameter = 15.00 mm

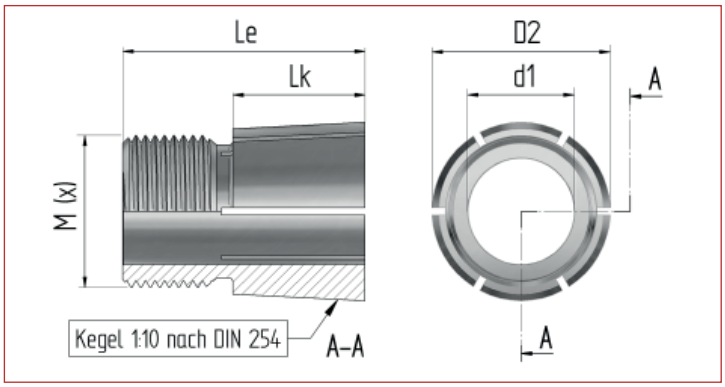
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**12115**	**12115-ISK**	**10215**	**10215-ISK**	**10315**	**10315-ISK**
for shaft diameters (d1)	mm	15,00	15,00	15,00	15,00	15,00	15,00
Hub width (B) max.	mm	13,00	13,00	16,00	16,00	22,00	22,00
Taper diameter front (D2)	mm	27,30	27,30	27,30	27,30	27,30	27,30
Taper length (L_k)	mm	6,80	6,80	13,00	13,00	17,50	17,50
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	17,50	17,50	24,00	24,00	30,00	30,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25
Key width (SW)	mm	30	30	30	30	30	30
Höhe der Mutter(m)	mm	8,00	8,00	8,00	8,00	8,00	8,00
Recommended tightening torque [1]	Nm	58,00	58,00	60,00	60,00	62,00	62,00

Transmission Values [2]

Torque (M)	Nm	31,50	31,50	32,60	32,60	33,70	33,70
Thrust (F_e)	kN	1,56	1,56	1,64	1,64	1,70	1,70
Hub load ($_pF$)	N/mm²	40,56	40,56	22,46	22,46	17,54	17,54

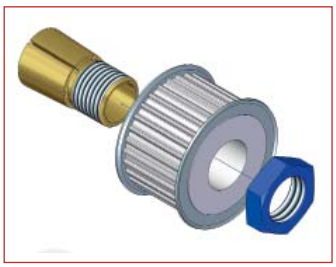
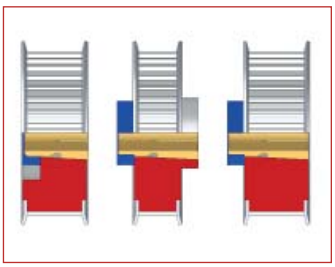
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **12115** **12115-ISK** **10215** **10215-ISK** **10315** **10315-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

BOQA® Fastening Elements product group 2730 for shaft diameter = 15.00 mm

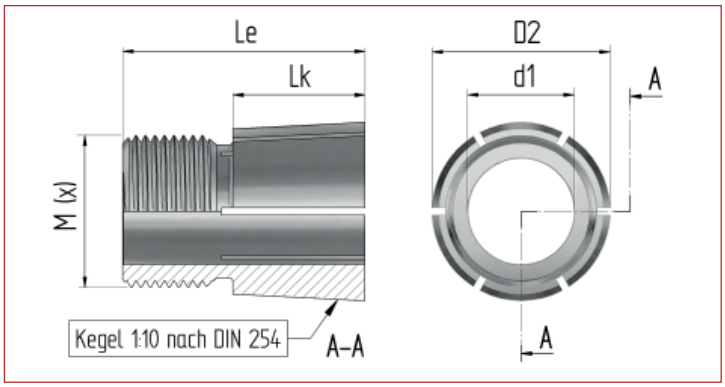
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10415**	**10415-ISK**	**10515**	**10515-ISK**
for shaft diameters (d1)	mm	15,00	15,00	15,00	15,00
Hub width (B) max.	mm	30,00	30,00	40,00	40,00
Taper diameter front (D2)	mm	27,30	27,30	27,30	27,30
Taper length (L_k)	mm	26,00	26,00	36,00	36,00
Counter bearing, length	mm	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-
Overall length (L_e)	mm	40,00	40,00	50,00	50,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25
Hex socket key width (SW)	mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25
Key width (SW)	mm	30	30	30	30
Nut height (m)	mm	8,00	8,00	8,00	8,00
Recommended tightening torque [1]	Nm	64,00	64,00	66,00	66,00

Transmission Values [2]

Torque (M)	Nm	34,80	34,80	35,90	35,90
Thrust (F_e)	kN	1,79	1,79	1,88	1,88
Hub load ($_pF$)	N/mm²	12,58	12,58	9,74	9,74

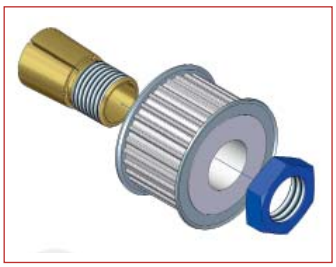
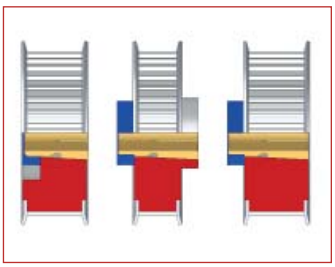
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10415** **10415-ISK** **10515** **10515-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

BOQA® Fastening Elements product group 2730 for shaft diameter = 16.00 mm

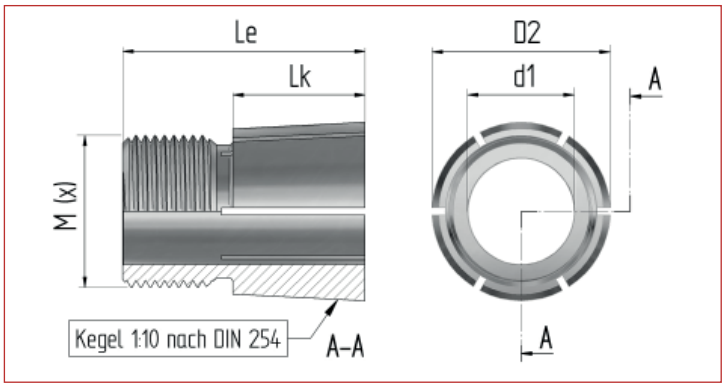
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**12116**	**12116-ISK**	**10216**	**10216-ISK**	**10316**	**10316-ISK**
for shaft diameters (d1)	mm	16,00	16,00	16,00	16,00	16,00	16,00
Hub width (B) max.	mm	13,00	13,00	16,00	16,00	22,00	22,00
Taper diameter front (D2)	mm	27,30	27,30	27,30	27,30	27,30	27,30
Taper length (L_k)	mm	6,80	6,80	13,00	13,00	17,50	17,50
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	17,50	17,50	24,00	24,00	30,00	30,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25
Key width (SW)	mm	30	30	30	30	30	30
Nut height (m)	mm	8,00	8,00	8,00	8,00	8,00	8,00
Recommended tightening torque [1]	Nm	60,00	60,00	62,00	62,00	64,00	64,00

Transmission Values [2]

Torque (M)	Nm	32,60	32,60	33,70	33,70	34,80	34,80
Thrust (F_e)	kN	1,62	1,62	1,69	1,69	1,76	1,76
Hub load ($_pF$)	N/mm²	41,96	41,96	23,21	23,21	18,10	18,10

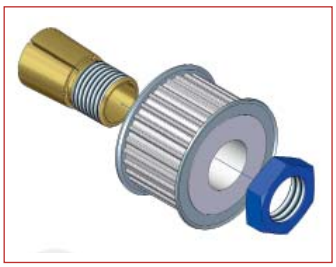
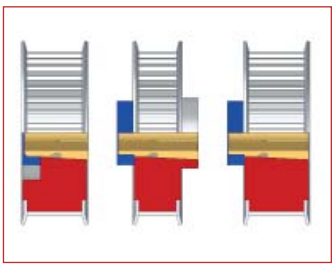
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.:	**12116**	**12116-ISK**	**10216**	**10216-ISK**	**10316**	**10316-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

BOQA® Fastening Elements product group 2730 for shaft diameter = 16.00 mm

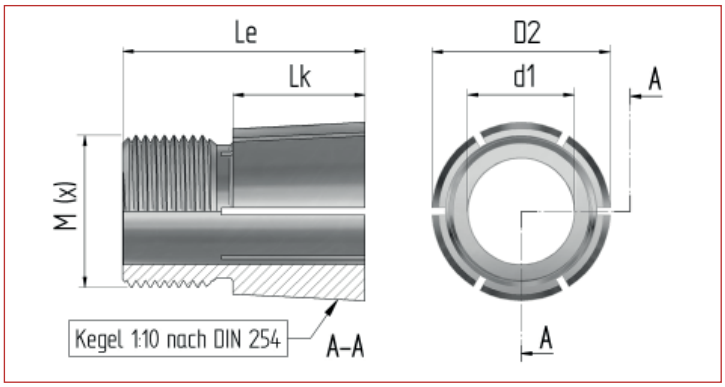
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10416**	**10416-ISK**	**10516**	**10516-ISK**
for shaft diameters (d1)	mm	16,00	16,00	16,00	16,00
Hub width (B) max.	mm	30,00	30,00	40,00	40,00
Taper diameter front (D2)	mm	27,30	27,30	27,30	27,30
Taper length (L_k)	mm	26,00	26,00	36,00	36,00
Counter bearing, length	mm	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-
Overall length (L_e)	mm	40,00	40,00	50,00	50,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25
Hex socket key width (SW)	mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25
Key width (SW)	mm	30	30	30	30
Nut height (m)	mm	8,00	8,00	8,00	8,00
Recommended tightening torque [1]	Nm	66,00	66,00	68,00	68,00

Transmission Values [2]

Torque (M)	Nm	35,90	35,90	36,90	36,90
Thrust (F_e)	kN	1,84	1,84	1,94	1,94
Hub load ($_pF$)	N/mm²	12,98	12,98	10,04	10,04

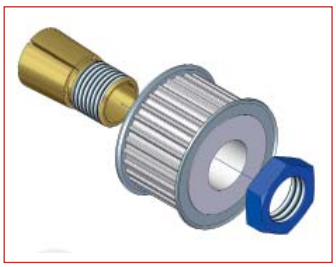
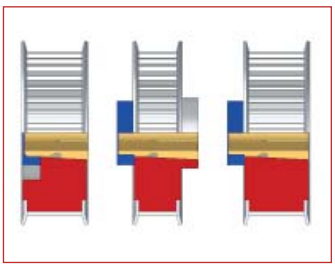
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

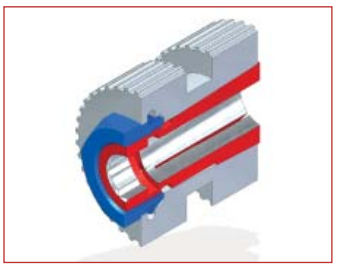
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10416** **10416-ISK** **10516** **10516-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 2730 for shaft diameter = 17.00 mm

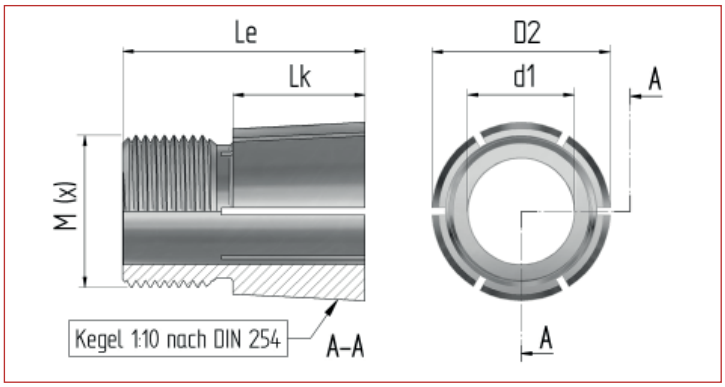
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**12117**	**12117-ISK**	**10217**	**10217-ISK**	**10317**	**10317-ISK**
for shaft diameters (d1)	mm	17,00	17,00	17,00	17,00	17,00	17,00
Hub width (B) max.	mm	13,00	13,00	16,00	16,00	22,00	22,00
Taper diameter front (D2)	mm	27,30	27,30	27,30	27,30	27,30	27,30
Taper length (L_k)	mm	6,80	6,80	13,00	13,00	17,50	17,50
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	17,50	17,50	24,00	24,00	30,00	30,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25
Key width (SW)	mm	30	30	30	30	30	30
Nut height (m)	mm	8,00	8,00	8,00	8,00	8,00	8,00
Recommended tightening torque [1]	Nm	62,00	62,00	64,00	64,00	66,00	66,00

Transmission Values [2]

Torque (M)	Nm	33,70	33,70	34,80	34,80	35,90	35,90
Thrust (F_e)	kN	1,67	1,67	1,75	1,75	1,81	1,81
Hub load ($_pF$)	N/mm²	43,35	43,35	23,96	23,96	18,67	18,67

1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.:	**12117**	**12117-ISK**	**10217**	**10217-ISK**	**10317**	**10317-ISK**

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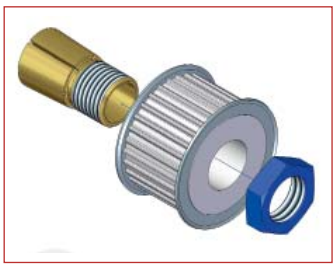
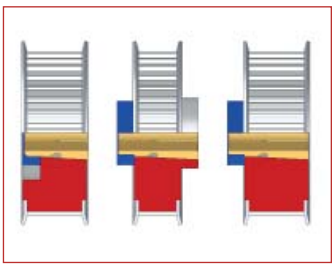



BOQA® Fastening Elements product group 2730 for shaft diameter = 17.00 mm

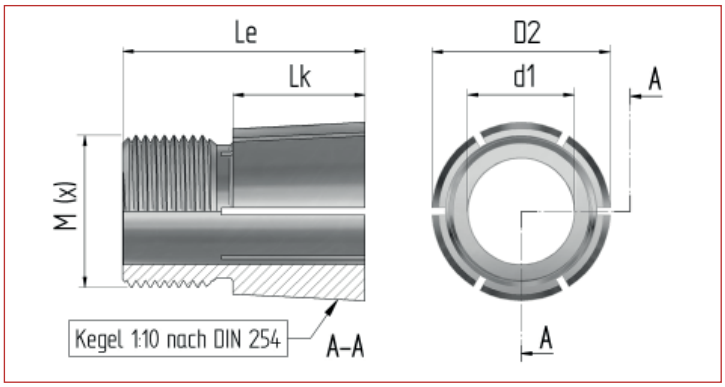
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10417**	**10417-ISK**	**10517**	**10517-ISK**
for shaft diameters (d1)	mm	17,00	17,00	17,00	17,00
Hub width (B) max.	mm	30,00	30,00	40,00	40,00
Taper diameter front (D2)	mm	27,30	27,30	27,30	27,30
Taper length (L_k)	mm	26,00	26,00	36,00	36,00
Counter bearing, length	mm	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-
Overall length (L_e)	mm	40,00	40,00	50,00	50,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25
Hex socket key width (SW)	mm	-	10 mm	-	10 mm
Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)					
Thread (metric DIN)	M (x)	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25
Key width (SW)	mm	30	30	30	30
Nut height (m)	mm	8,00	8,00	8,00	8,00
Recommended tightening torque [1]	Nm	68,00	68,00	70,00	70,00
Transmission Values [2]					
Torque (M)	Nm	36,90	36,90	38,00	38,00
Thrust (F_e)	kN	1,90	1,90	1,99	1,99
Hub load ($_pF$)	N/mm²	13,37	13,37	10,33	10,33

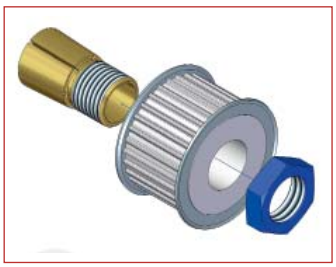
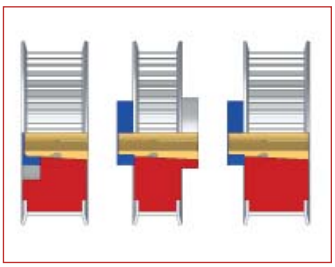
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10417** **10417-ISK** **10517** **10517-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

BOQA® Fastening Elements product group 2730 for shaft diameter = 18.00 mm

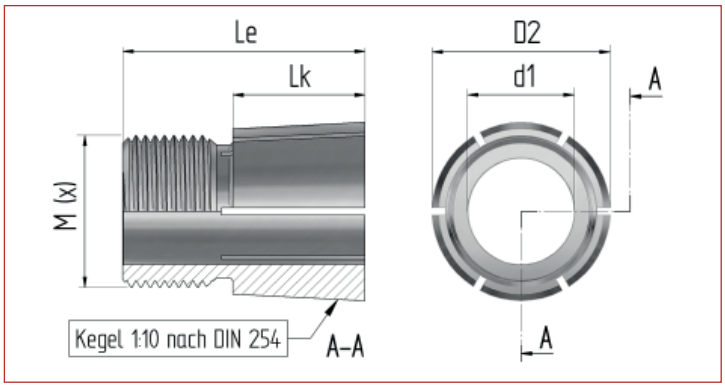
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**12118**	**12118-ISK**	**10218**	**10218-ISK**	**10318**	**10318-ISK**
for shaft diameters (d1)	mm	18,00	18,00	18,00	18,00	18,00	18,00
Hub width (B) max.	mm	13,00	13,00	16,00	16,00	22,00	22,00
Taper diameter front (D2)	mm	27,30	27,30	27,30	27,30	27,30	27,30
Taper length (L_k)	mm	6,80	6,80	13,00	13,00	17,50	17,50
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	17,50	17,50	24,00	24,00	30,00	30,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25
Schlüsselweite (SW)	mm	30	30	30	30	30	30
Nut height (m)	mm	8,00	8,00	8,00	8,00	8,00	8,00
Recommended tightening torque [1]	Nm	64,00	64,00	66,00	66,00	68,00	68,00

Transmission Values [2]

Torque (M)	Nm	34,80	34,70	35,90	35,90	36,90	36,90
Thrust (F_e)	kN	1,73	1,73	1,80	1,80	1,87	1,87
Hub load ($_pF$)	N/mm²	44,75	44,75	24,71	24,71	19,23	19,23

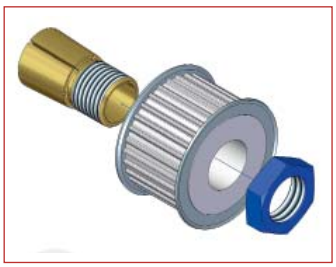
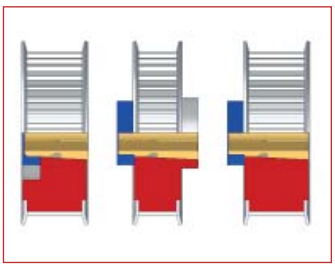
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

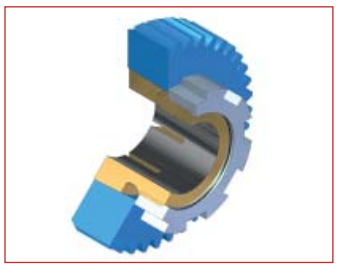
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.:	**12118**	**12118-ISK**	**10218**	**10218-ISK**	**10318**	**10318-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 2730 for shaft diameter = 18.00 mm

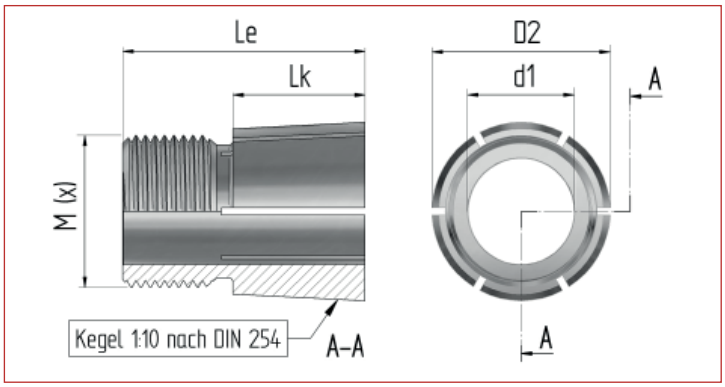
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10418**	**10418-ISK**	**10518**	**10518-ISK**
for shaft diameters (d1)	mm	18,00	18,00	18,00	18,00
Hub width (B) max.	mm	30,00	30,00	40,00	40,00
Taper diameter front (D2)	mm	27,30	27,30	27,30	27,30
Taper length (L_k)	mm	26,00	26,00	36,00	36,00
Counter bearing, length	mm	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-
Overall length (L_e)	mm	40,00	40,00	50,00	50,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25
Hex socket key width (SW)	mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25
Key width (SW)	mm	30	30	30	30
Nut height (m)	mm	8,00	8,00	8,00	8,00
Recommended tightening torque [1]	Nm	70,00	70,00	72,00	72,00

Transmission Values [2]

Torque (M)	Nm	38,00	38,00	39,10	39,10
Thrust (F_e)	kN	1,96	1,96	2,05	2,05
Hub load ($_pF$)	N/mm²	13,76	13,76	10,63	10,63

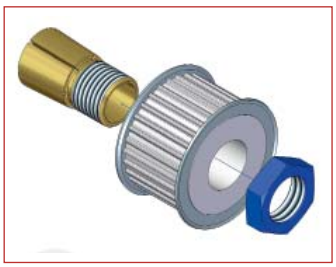
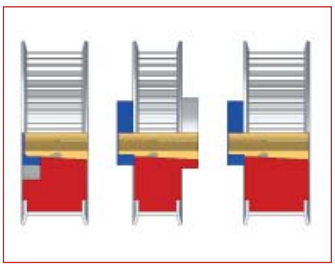
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10418** **10418-ISK** **10518** **10518-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

BOQA® Fastening Elements product group 2730 for shaft diameter = 19.00 mm

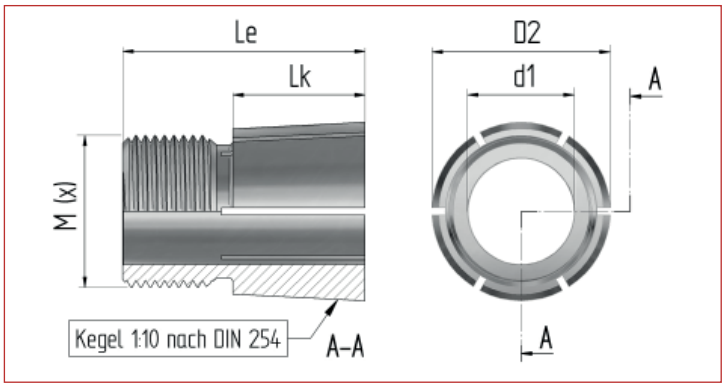
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**12119**	**12119-ISK**	**10219**	**10219-ISK**	**10319**	**10319-ISK**
for shaft diameters (d1)	mm	19,00	19,00	19,00	19,00	19,00	19,00
Hub width (B) max.	mm	13,00	13,00	16,00	16,00	22,00	22,00
Taper diameter front (D2)	mm	27,30	27,30	27,30	27,30	27,30	27,30
Taper length (L_k)	mm	6,80	6,80	13,00	13,00	17,50	17,50
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	17,50	17,50	24,00	24,00	30,00	30,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25
Key width (SW)	mm	30	30	30	30	30	30
Nut height (m)	mm	8,00	8,00	8,00	8,00	8,00	8,00
Recommended tightening torque [1]	Nm	66,00	66,00	68,00	68,00	70,00	70,00

Transmission Values [2]

Torque (M)	Nm	35,90	35,90	36,90	36,90	38,00	38,00
Thrust (F_e)	kN	1,78	1,78	1,85	1,85	1,92	1,92
Hub load ($_pF$)	N/mm²	46,15	46,15	25,45	25,45	19,80	19,80

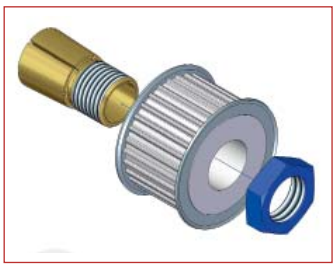
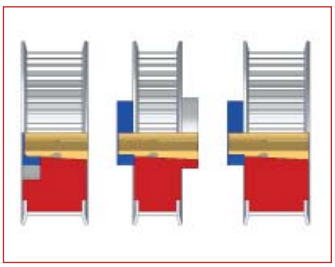
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **12119** **12119-ISK** **10219** **10219-ISK** **10319** **10319-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

BOQA® Fastening Elements product group 2730 for shaft diameter = 19.00 mm

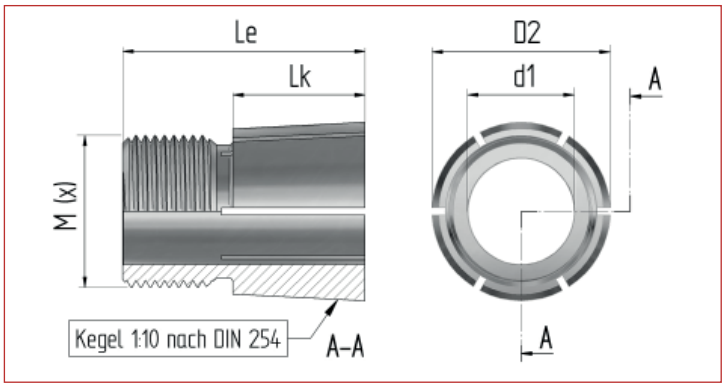
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10419**	**10419-ISK**	**10519**	**10519-ISK**
for shaft diameters (d1)	mm	19,00	19,00	19,00	19,00
Hub width (B) max.	mm	30,00	30,00	40,00	40,00
Taper diameter front (D2)	mm	27,30	27,30	27,30	27,30
Taper length (L_k)	mm	26,00	26,00	36,00	36,00
Counter bearing, length	mm	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-
Overall length (L_e)	mm	40,00	40,00	50,00	50,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25
Hex socket key width (SW)	mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25
Key width (SW)	mm	30	30	30	30
Nut height (m)	mm	8,00	8,00	8,00	8,00
Recommended tightening torque [1]	Nm	72,00	72,00	74,00	74,00

Transmission Values [2]

Torque (M)	Nm	39,10	39,10	40,20	40,20
Thrust (F_e)	kN	2,01	2,01	2,11	2,11
Hub load ($_pF$)	N/mm²	14,16	14,16	10,93	10,93

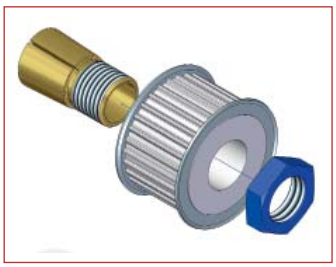
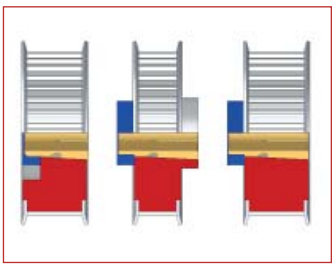
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

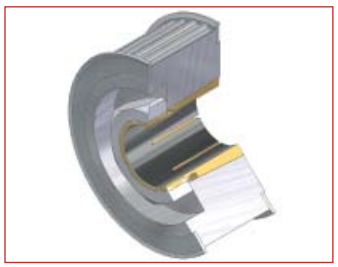
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10419** **10419-ISK** **10519** **10519-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 2730 for shaft diameter = 20.00 mm

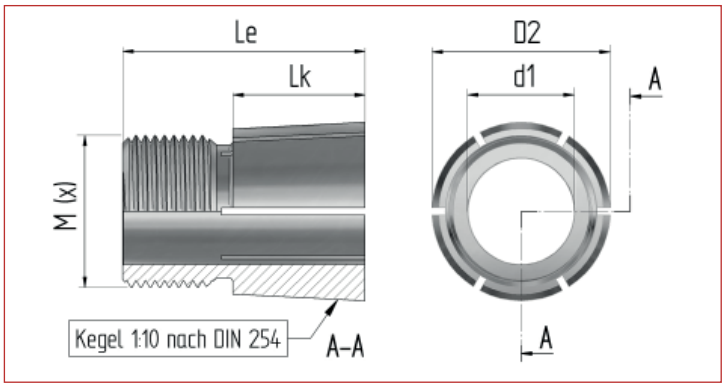
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**12120**	**12120-ISK**	**10220**	**10220-ISK**	**10320**	**10320-ISK**
for shaft diameters (d1)	mm	20,00	20,00	20,00	20,00	20,00	20,00
Hub width (B) max.	mm	13,00	13,00	16,00	16,00	22,00	22,00
Taper diameter front (D2)	mm	27,30	27,30	27,30	27,30	27,30	27,30
Taper length (L_k)	mm	6,80	6,80	13,00	13,00	17,50	17,50
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	17,50	17,50	24,00	24,00	30,00	30,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25
Key width (SW)	mm	30	30	30	30	30	30
Nut height (m)	mm	8,00	8,00	8,00	8,00	8,00	8,00
Recommended tightening torque [1]	Nm	68,00	68,00	70,00	70,00	72,00	72,00

Transmission Values [2]

Torque (M)	Nm	36,90	36,90	38,00	38,00	39,10	39,10
Thrust (F_e)	kN	1,83	1,83	1,91	1,91	1,98	1,98
Hub load ($_pF$)	N/mm²	47,55	47,55	26,20	26,20	20,36	20,36

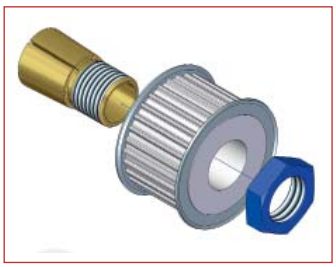
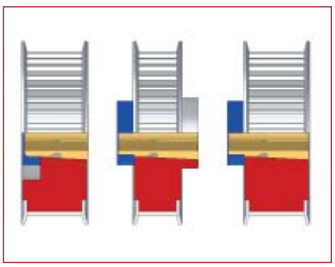
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

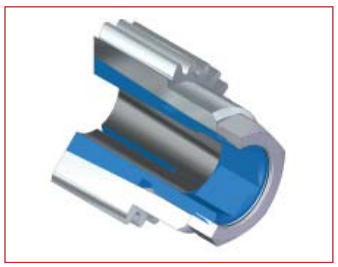
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **12120** **12120-ISK** **10220** **10220-ISK** **10320** **10320-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 2730 for shaft diameter = 20.00 mm

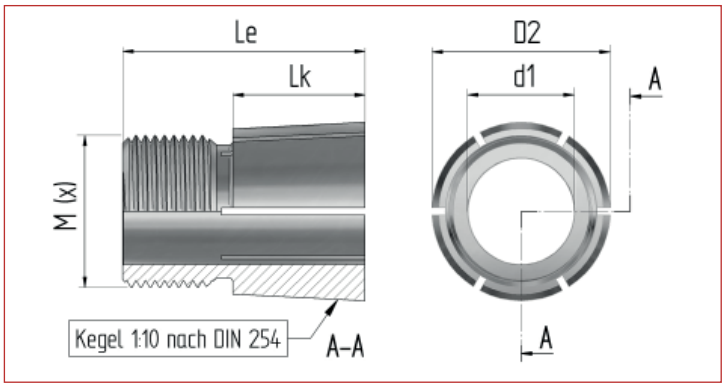
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10420**	**10420-ISK**	**10520**	**10520-ISK**
for shaft diameters (d1)	mm	20,00	20,00	20,00	20,00
Hub width (B) max.	mm	30,00	30,00	40,00	40,00
Taper diameter front (D2)	mm	27,30	27,30	27,30	27,30
Taper length (L_k)	mm	26,00	26,00	36,00	36,00
Counter bearing, length	mm	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-
Overall length (L_e)	mm	40,00	40,00	50,00	50,00
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25
Hex socket key width (SW)	mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M24 x 1,25	M24 x 1,25	M24 x 1,25	M24 x 1,25
Key width (SW)	mm	30	30	30	30
Nut height (m)	mm	8,00	8,00	8,00	8,00
Recommended tightening torque [1]	Nm	74,00	74,00	76,00	76,00

Transmission Values [2]

Torque (M)	Nm	40,20	40,20	41,30	41,30
Thrust (F_e)	kN	2,07	2,07	2,17	2,17
Hub load ($_pF$)	N/mm²	14,55	14,55	11,22	11,22

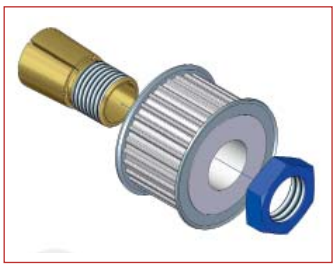
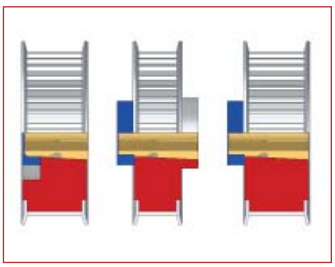
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10420** **10420-ISK** **10520** **10520-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

BOQA® Fastening Elements product group 3400 for shaft diameter = 14.00 mm

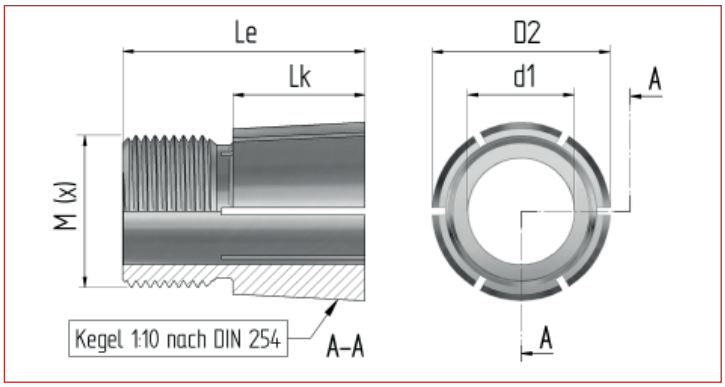
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10057k-14**	**10057k-14-ISK**	**10057-14**	**10057-14-ISK**	**10058-14**	**10058-14-ISK**
for shaft diameters (d1)	mm	14,00	14,00	14,00	14,00	14,00	14,00
Hub width (B) max.	mm	16,00	16,00	22,00	22,00	28,00	28,00
Taper diameter front (D2)	mm	34,00	34,00	34,00	34,00	34,00	34,00
Taper length (L_k)	mm	12,50	12,50	18,60	18,60	23,70	23,70
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	26,00	26,00	33,30	33,30	38,40	38,40
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm
Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)							
Thread (metric DIN)	M (x)	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5
Key width (SW)	mm	36	36	36	36	36	36
Nut height (m)	mm	10,00	10,00	10,00	10,00	10,00	10,00
Recommended tightening torque [1]	Nm	110,00	110,00	115,00	115,00	120,00	120,00
Transmission Values [2]							
Torque (M)	Nm	67,10	67,10	70,20	70,20	73,20	73,20
Thrust (F_e)	kN	2,69	2,69	2,84	2,84	2,98	2,98
Hub load ($_pF$)	N/mm²	30,67	30,67	21,95	21,95	18,25	18,25

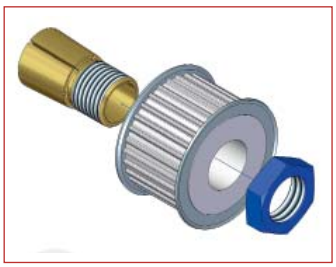
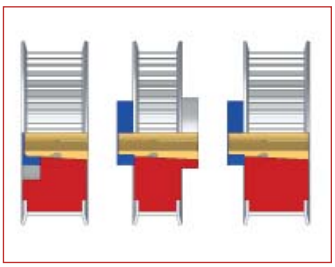
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

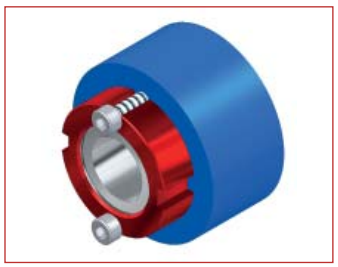
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.:	**10057k-14**	**10057k-14-ISK**	**10057-14**	**10057-14-ISK**	**10058-14**	**10058-14-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 3400 for shaft diameter = 14.00 mm

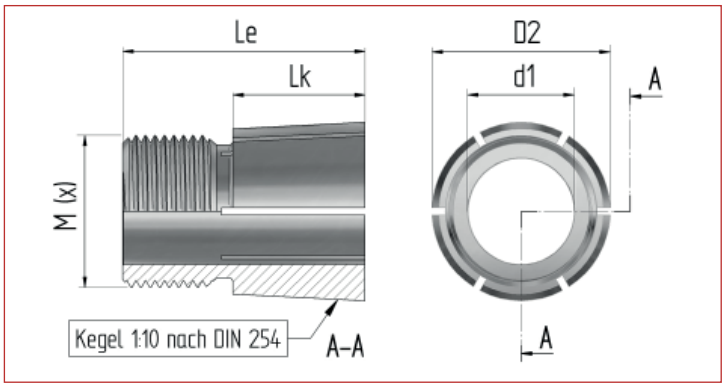
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10059-14**	**10059-14-ISK**	**10059-14L**	**10059-14L-ISK**
for shaft diameters (d1)	mm	14,00	14,00	14,00	14,00
Hub width (B) max.	mm	35,00	35,00	40,00	40,00
Taper diameter front (D2)	mm	34,00	34,00	34,00	34,00
Taper length (L_k)	mm	28,20	28,20	33,50	33,50
Counter bearing, length	mm	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-
Overall length (L_e)	mm	46,00	46,00	51,50	51,50
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5
Hex socket key width (SW)	mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5
Key width (SW)	mm	36	36	36	36
Nut height (m)	mm	10,00	10,00	10,00	10,00
Recommended tightening torque [1]	Nm	125,00	125,00	130,00	130,00

Transmission Values [2]

Torque (M)	Nm	76,30	76,30	79,30	79,30
Thrust (F_e)	kN	3,13	3,13	3,28	3,28
Hub load ($_pF$)	N/mm²	16,20	16,20	14,42	14,42

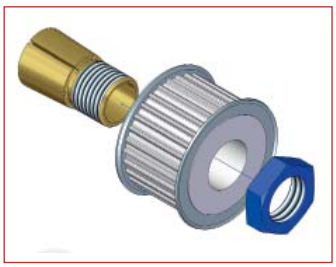
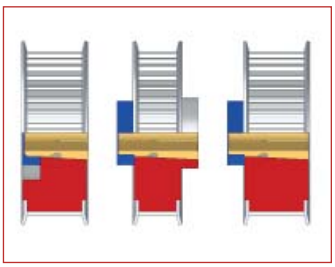
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

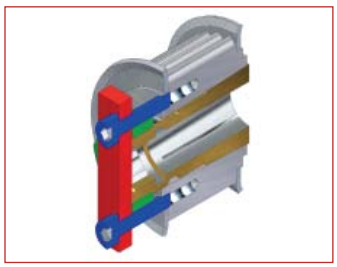
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10059-14** **10059-14-ISK** **10059-14L** **10059-14L-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 3400 for shaft diameter = 15.00 mm

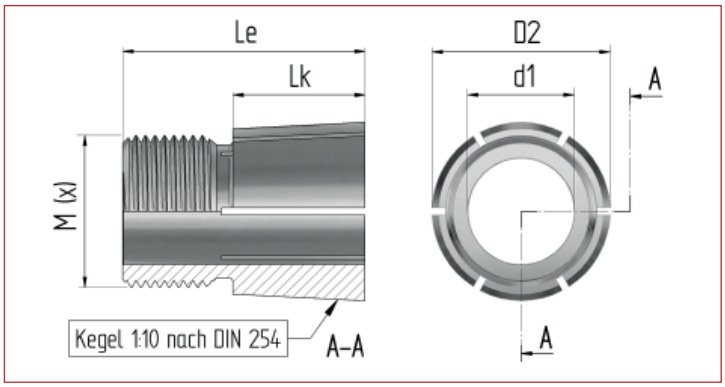
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10057k-15**	**10057k-15-ISK**	**10057-15**	**10057-15-ISK**	**10058-15**	**10058-15-ISK**
for shaft diameters (d1)	mm	15,00	15,00	15,00	15,00	15,00	15,00
Hub width (B) max.	mm	16,00	16,00	22,00	22,00	28,00	28,00
Taper diameter front (D2)	mm	34,00	34,00	34,00	34,00	34,00	34,00
Taper length (L_k)	mm	12,50	12,50	18,60	18,60	23,70	23,70
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (L_e)	mm	26,00	26,00	33,30	33,30	38,40	38,40
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm
Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)							
Thread (metric DIN)	M (x)	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5
Key width (SW)	mm	36	36	36	36	36	36
Nut height (m)	mm	10,00	10,00	10,00	10,00	10,00	10,00
Recommended tightening torque [1]	Nm	115,00	115,00	120,00	120,00	125,00	125,00
Transmission Values [2]							
Torque (M)	Nm	70,20	70,20	73,20	73,20	76,30	76,30
Thrust (F_e)	kN	2,81	2,81	2,96	2,96	3,11	3,11
Hub load ($_pF$)	N/mm²	32,06	32,06	22,90	22,90	19,01	19,01

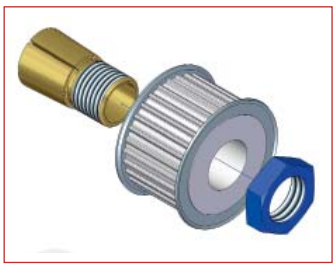
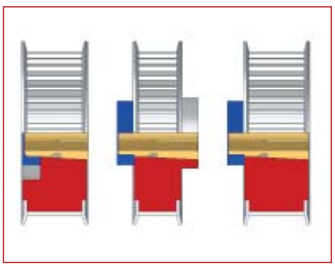
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

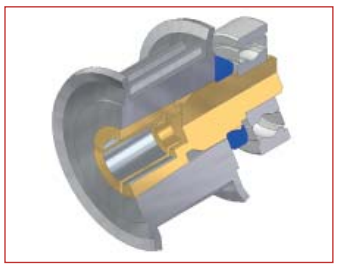
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10057k-15** **10057k-15-ISK** **10057-15** **10057-15-ISK** **10058-15** **10058-15-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 3400 for shaft diameter = 15.00 mm

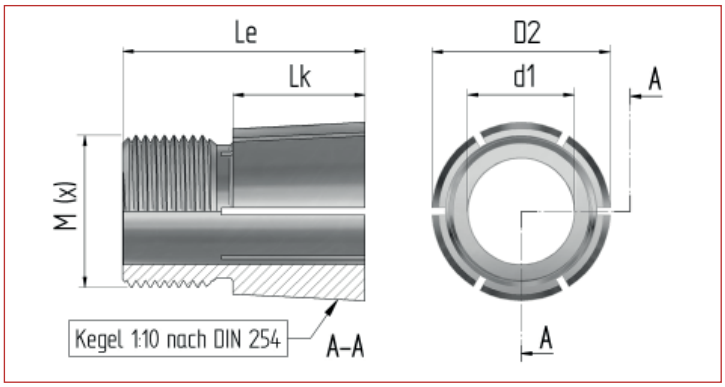
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10059-15**	**10059-15-ISK**	**10059-15L**	**10059-15L-ISK**
for shaft diameters (d1)	mm	15,00	15,00	15,00	15,00
Hub width (B) max.	mm	35,00	35,00	40,00	40,00
Taper diameter front (D2)	mm	34,00	34,00	34,00	34,00
Taper length (L_k)	mm	28,20	28,20	33,50	33,50
Counter bearing, length	mm	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-
Overall length (L_e)	mm	46,00	46,00	51,50	51,50
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5
Hex socket key width (SW)	mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5
Key width (SW)	mm	36	36	36	36
Nut height (m)	mm	10,00	10,00	10,00	10,00
Recommended tightening torque [1]	Nm	130,00	130,00	135,00	135,00

Transmission Values [2]

Torque (M)	Nm	79,30	79,30	82,40	82,40
Thrust (F_e)	kN	3,26	3,26	3,41	3,41
Hub load ($_pF$)	N/mm²	16,85	16,85	14,97	14,97

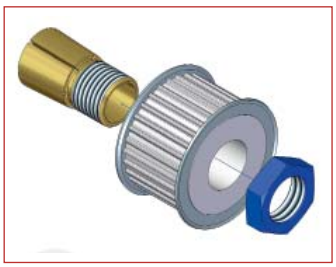
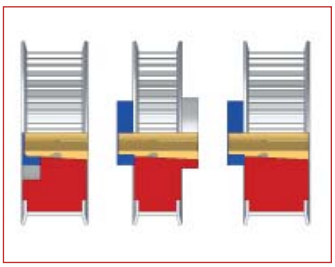
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10059-15** **10059-15-ISK** **10059-15L** **10059-15L-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

BOQA® Fastening Elements product group 3400 for shaft diameter = 16.00 mm

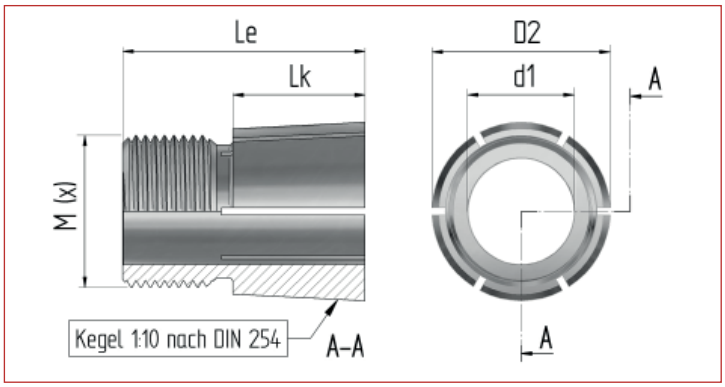
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10063k**	**10063k-ISK**	**10063**	**10063-ISK**	**10064**	**10064-ISK**
for shaft diameters (d1)	mm	16,00	16,00	16,00	16,00	16,00	16,00
Hub width (B) max.	mm	16,00	16,00	22,00	22,00	28,00	28,00
Taper diameter front (D2)	mm	34,00	34,00	34,00	34,00	34,00	34,00
Taper length (L_k)	mm	12,50	12,50	18,60	18,60	23,70	23,70
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (Le)	mm	26,00	26,00	33,30	33,30	38,40	38,40
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm
Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)							
Thread (metric DIN)	M (x)	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5
Key width (SW)	mm	36	36	36	36	36	36
Nut height (m)	mm	10,00	10,00	10,00	10,00	10,00	10,00
Recommended tightening torque [1]	Nm	120,00	120,00	125,00	125,00	130,00	130,00
Übertragungswerte [2]							
Torque (M)	Nm	73,20	73,20	76,30	76,30	79,30	79,30
Thrust (F_e)	kN	2,93	2,93	3,08	3,08	3,23	3,23
Hub load ($_pF$)	N/mm²	33,46	33,46	23,84	23,84	19,77	19,77

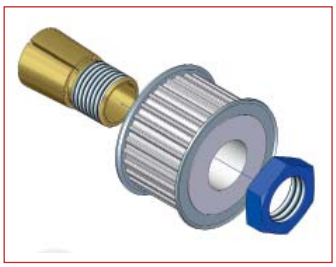
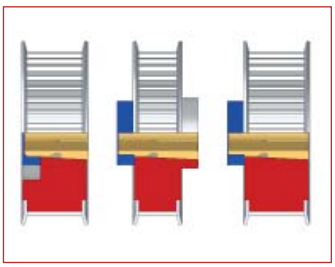
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

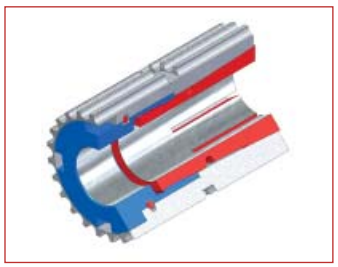
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10063k** **10063k-ISK** **10063** **10063-ISK** **10064** **10064-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 3400 for shaft diameter = 16.00 mm

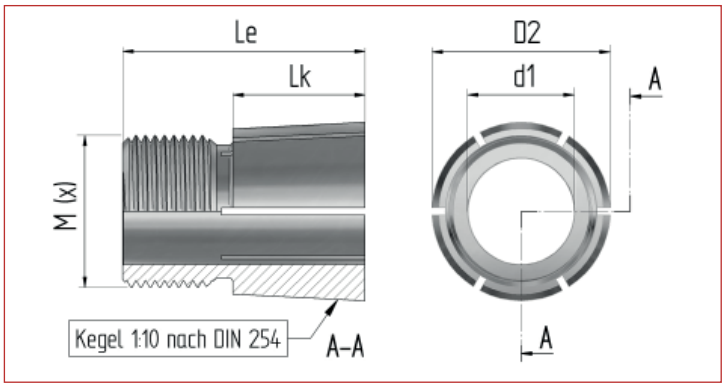
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10065**	**10065-ISK**	**10065L**	**10065L-ISK**
for shaft diameters (d1)	mm	16,00	16,00	16,00	16,00
Hub width (B) max.	mm	35,00	35,00	40,00	40,00
Taper diameter front (D2)	mm	34,00	34,00	34,00	34,00
Taper length (L_k)	mm	28,20	28,20	33,50	33,50
Counter bearing, length	mm	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-
Overall length (Le)	mm	46,00	46,00	51,50	51,50
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5
Hex socket key width (SW)	mm	-	10 mm	-	10 mm

***Fastening Nut (stan**dard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)*

Thread (metric DIN)	M (x)	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5
Key width (SW)	mm	36	36	36	36
Nut height (m)	mm	10,00	10,00	10,00	10,00
Recommended tightening torque [1]	Nm	135,00	135,00	140,00	140,00

Transmission Values [2]

Torque (M)	Nm	82,40	82,40	85,40	85,40
Thrust (F_e)	kN	3,38	3,38	3,53	3,53
Hub load ($_pF$)	N/mm²	17,50	17,50	15,53	15,53

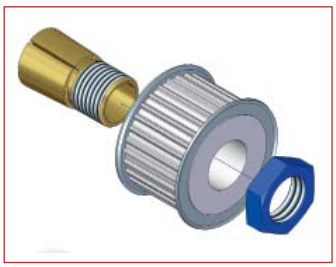
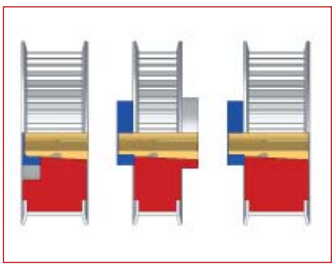
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10065** **10065-ISK** **10065L** **10065L-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

BOQA® Fastening Elements product group 3400 for shaft diameter = 17.00 mm

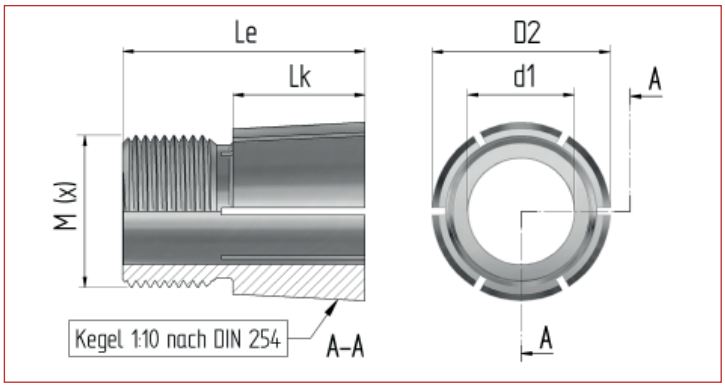
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10066k**	**10066k-ISK**	**10066**	**10066-ISK**	**10067**	**10067-ISK**
for shaft diameters (d1)	mm	17,00	17,00	17,00	17,00	17,00	17,00
Hub width (B) max.	mm	16,00	16,00	22,00	22,00	28,00	28,00
Taper diameter front (D2)	mm	34,00	34,00	34,00	34,00	34,00	34,00
Taper length (L_k)	mm	12,50	12,50	18,60	18,60	23,70	23,70
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (Le)	mm	26,00	26,00	33,30	33,30	38,40	38,40
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm
Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)							
Thread (metric DIN)	M (x)	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5
Key width (SW)	mm	36	36	36	36	36	36
Nut height (m)	mm	10,00	10,00	10,00	10,00	10,00	10,00
Recommended tightening torque [1]	Nm	125,00	125,00	130,00	130,00	135,00	135,00
Transmission Values [2]							
Torque (M)	Nm	76,30	76,30	79,30	79,30	82,40	82,40
Thrust (F_e)	kN	3,06	3,06	3,21	3,21	3,36	3,36
Hub load ($_pF$)	N/mm²	34,85	34,85	24,81	24,81	20,53	20,53

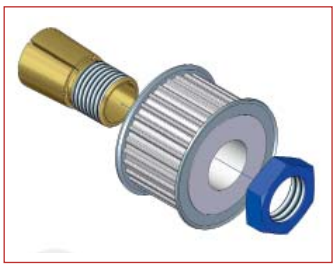
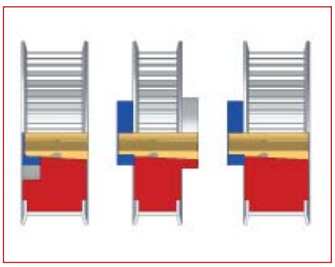
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.:	**10066k**	**10066k-ISK**	**10066**	**10066-ISK**	**10067**	**10067-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

BOQA® Fastening Elements product group 3400 for shaft diameter = 17.00 mm

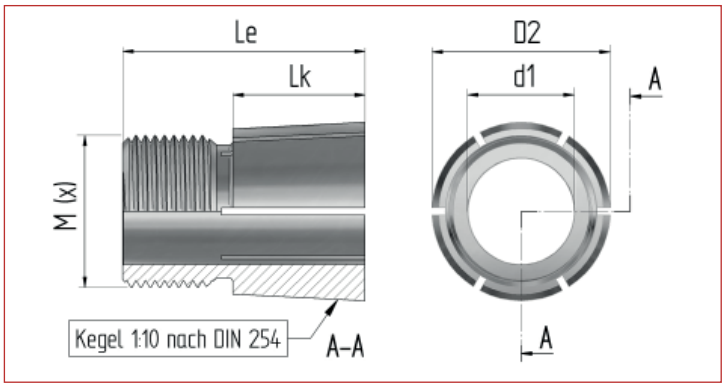
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10068**	**10068-ISK**	**10068L**	**10068L-ISK**
for shaft diameters (d1)	mm	17,00	17,00	17,00	17,00
Hub width (B) max.	mm	35,00	35,00	40,00	40,00
Taper diameter front (D2)	mm	34,00	34,00	34,00	34,00
Taper length (L_k)	mm	28,20	28,20	33,50	33,50
Counter bearing, length	mm	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-
Overall length (Le)	mm	46,00	46,00	51,50	51,50
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5
Hex socket key width (SW)	mm	-	10 mm	-	10 mm
Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)					
Thread (metric DIN)	M (x)	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5
Key width (SW)	mm	36	36	36	36
Nut height (m)	mm	10,00	10,00	10,00	10,00
Recommended tightening torque [1]	Nm	140,00	140,00	145,00	145,00
Transmission Values [2]					
Torque (M)	Nm	85,40	85,40	88,50	88,50
Thrust (F_e)	kN	3,51	3,51	3,66	3,66
Hub load ($_pF$)	N/mm²	18,15	18,15	16,08	16,08

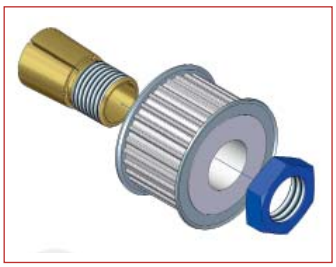
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

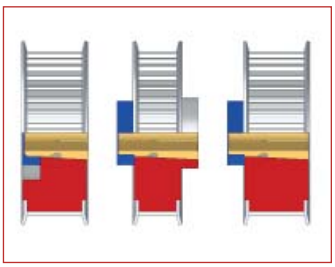
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

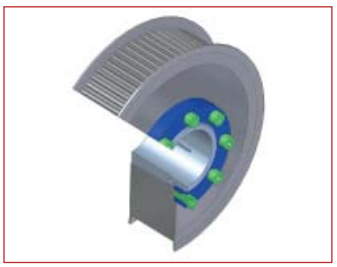
BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10068** **10068-ISK** **10068L** **10068L-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.







BOQA® Fastening Elements product group 3400 for shaft diameter = 18.00 mm

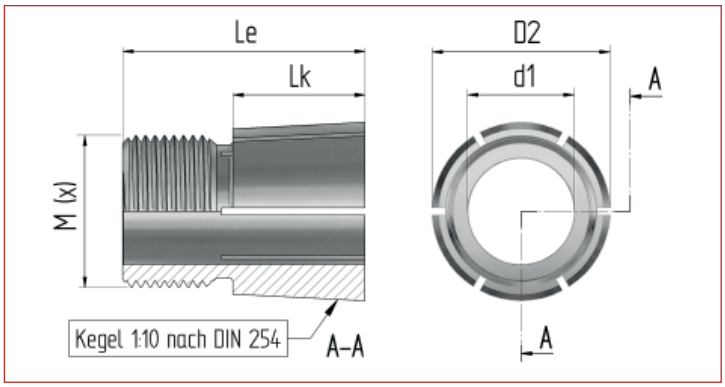
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10069k**	**10069k-ISK**	**10069**	**10069-ISK**	**10070**	**10070-ISK**
for shaft diameters (d1)	mm	18,00	18,00	18,00	18,00	18,00	18,00
Hub width (B) max.	mm	16,00	16,00	22,00	22,00	28,00	28,00
Taper diameter front (D2)	mm	34,00	34,00	34,00	34,00	34,00	34,00
Taper length (L_k)	mm	12,50	12,50	18,60	18,60	23,70	23,70
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (Le)	mm	26,00	26,00	33,30	33,30	38,40	38,40
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5
Key width (SW)	mm	36	36	36	36	36	36
Nut height (m)	mm	10,00	10,00	10,00	10,00	10,00	10,00
Recommended tightening torque [1]	Nm	130,00	130,00	135,00	135,00	140,00	140,00

Transmission Values [2]

Torque (M)	Nm	79,30	79,30	82,40	82,40	85,40	85,40
Thrust (F_e)	kN	3,18	3,18	3,33	3,33	3,48	3,48
Hub load ($_pF$)	N/mm²	36,24	36,24	25,76	25,76	21,30	21,30

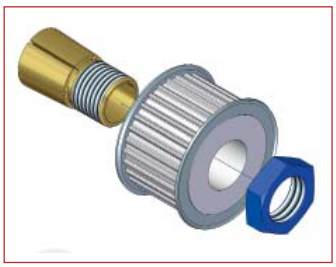
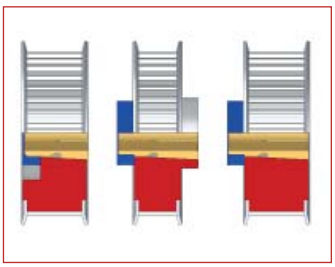
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10069k** **10069k-ISK** **10069** **10069-ISK** **10070** **10070-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

BOQA® Fastening Elements product group 3400 for shaft diameter = 18.00 mm

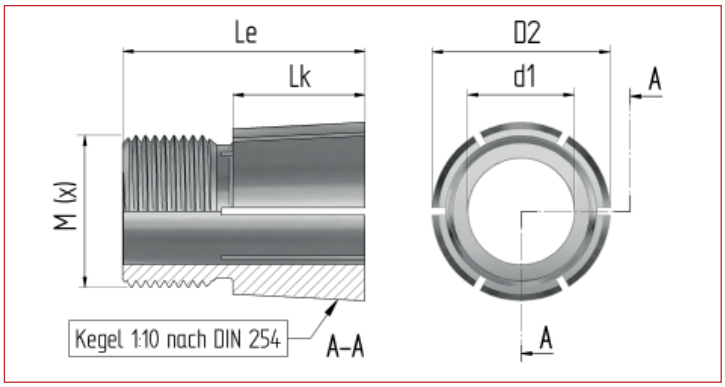
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10071**	**10071-ISK**	**10071L**	**10071L-ISK**
for shaft diameters (d1)	mm	18,00	18,00	18,00	18,00
Hub width (B) max.	mm	35,00	35,00	40,00	40,00
Taper diameter front (D2)	mm	34,00	34,00	34,00	34,00
Taper length (L_k)	mm	28,20	28,20	33,50	33,50
Counter bearing, length	mm	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-
Overall length (Le)	mm	46,00	46,00	51,50	51,50
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5
Hex socket key width (SW)	mm	-	10 mm	-	10 mm
Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)					
Thread (metric DIN)	M (x)	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5
Key width (SW)	mm	36	36	36	36
Nut height (m)	mm	10,00	10,00	10,00	10,00
Recommended tightening torque [1]	Nm	145,00	145,00	150,00	150,00
Transmission Values [2]					
Torque (M)	Nm	88,50	88,50	91,50	91,50
Thrust (F_e)	kN	3,63	3,63	3,79	3,79
Hub load ($_pF$)	N/mm²	18,79	18,79	16,63	16,63

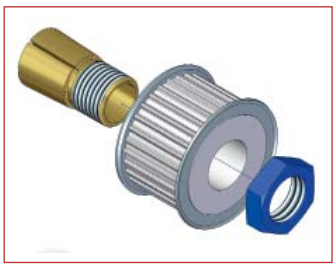
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

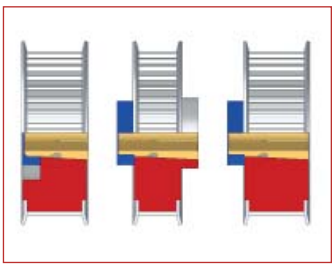
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10071** **10071-ISK** **10071L** **10071L-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.





BOQA® Fastening Elements product group 3400 for shaft diameter = 19.00 mm

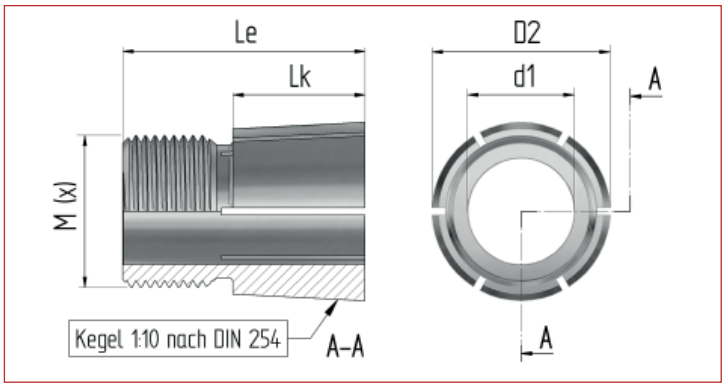
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10072k**	**10072k-ISK**	**10072**	**10072-ISK**	**10073**	**10073-ISK**
for shaft diameters (d1)	mm	19,00	19,00	19,00	19,00	19,00	19,00
Hub width (B) max.	mm	16,00	16,00	22,00	22,00	28,00	28,00
Taper diameter front (D2)	mm	34,00	34,00	34,00	34,00	34,00	34,00
Taper length (L_k)	mm	12,50	12,50	18,60	18,60	23,70	23,70
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (Le)	mm	26,00	26,00	33,30	33,30	38,40	38,40
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm
Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)							
Thread (metric DIN)	M (x)	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5
Key width (SW)	mm	36	36	36	36	36	36
Nut height (m)	mm	10,00	10,00	10,00	10,00	10,00	10,00
Recommended tightening torque [1]	Nm	135,00	135,00	140,00	140,00	145,00	145,00
Transmission Values [2]							
Torque (M)	Nm	82,40	82,40	85,40	85,40	88,50	88,50
Thrust (F_e)	kN	3,30	3,30	3,46	3,46	3,61	3,61
Hub load ($_pF$)	N/mm²	37,64	37,64	26,72	26,72	22,06	22,06

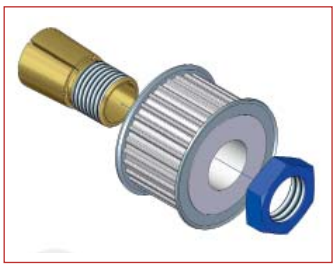
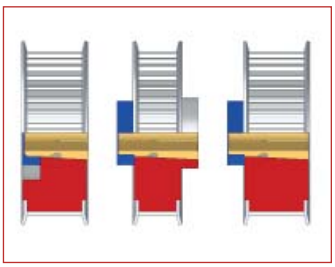
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.:	**10072k**	**10072k-ISK**	**10072**	**10072-ISK**	**10073**	**10073-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

BOQA® Fastening Elements product group 3400 for shaft diameter = 19.00 mm

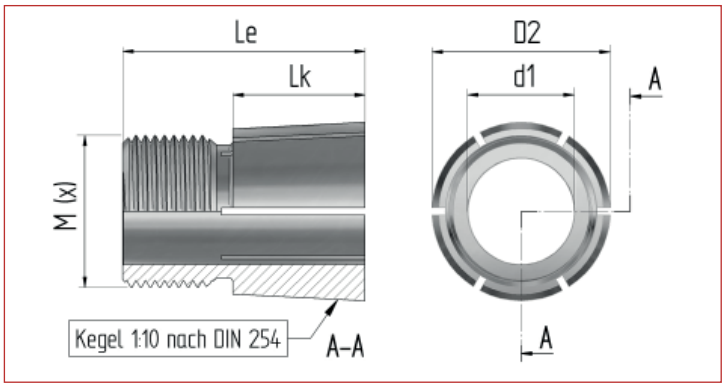
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10074**	**10074-ISK**	**10074L**	**10074L-ISK**
for shaft diameters (d1)	mm	19,00	19,00	19,00	19,00
Hub width (B) max.	mm	35,00	35,00	40,00	40,00
Taper diameter front (D2)	mm	34,00	34,00	34,00	34,00
Taper length (L_k)	mm	28,20	28,20	33,50	33,50
Counter bearing, length	mm	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-
Overall length (Le)	mm	46,00	46,00	51,50	51,50
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5
Hex socket key width (SW)	mm	-	10 mm	-	10 mm
Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)					
Thread (metric DIN)	M (x)	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5
Key width (SW)	mm	36	36	36	36
Nut height (m)	mm	10,00	10,00	10,00	10,00
Recommended tightening torque [1]	Nm	150,00	150,00	155,00	155,00
Transmission Values [2]					
Torque (M)	Nm	91,50	91,50	94,60	94,60
Thrust (F_e)	kN	3,76	3,76	3,91	3,91
Hub load ($_pF$)	N/mm²	19,44	19,44	17,19	17,19

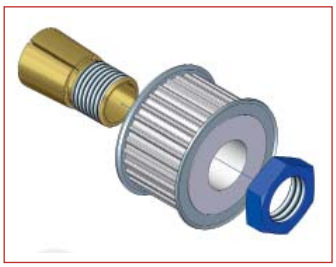
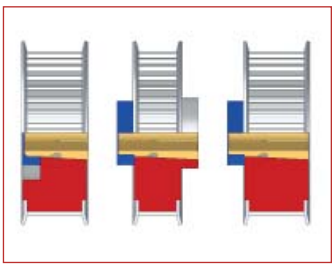
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10074** **10074-ISK** **10074L** **10074L-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

BOQA® Fastening Elements product group 3400 for shaft diameter = 20.00 mm

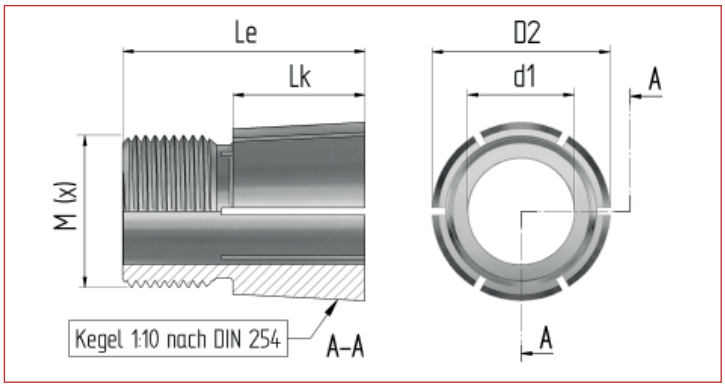
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10089k**	**10089k-ISK**	**10089**	**10089-ISK**	**10090**	**10090-ISK**
for shaft diameters (d1)	mm	20,00	20,00	20,00	20,00	20,00	20,00
Hub width (B) max.	mm	16,00	16,00	22,00	22,00	28,00	28,00
Taper diameter front (D2)	mm	34,00	34,00	34,00	34,00	34,00	34,00
Taper length (L_k)	mm	12,50	12,50	18,60	18,60	23,70	23,70
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (Le)	mm	26,00	26,00	33,30	33,30	38,40	38,40
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm
Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)							
Thread (metric DIN)	M (x)	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5
Key width (SW)	mm	36	36	36	36	36	36
Nut height (m)	mm	10,00	10,00	10,00	10,00	10,00	10,00
Recommended tightening torque [1]	Nm	140,00	140,00	145,00	145,00	150,00	150,00
Transmission Values [2]							
Torque (M)	Nm	85,40	85,40	88,50	88,50	91,50	91,50
Thrust (F_e)	kN	3,42	3,42	3,58	3,58	3,73	3,73
Hub load ($_pF$)	N/mm²	39,03	39,03	27,67	27,67	22,82	22,82

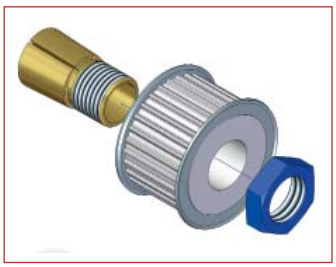
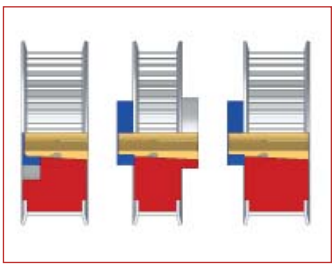
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

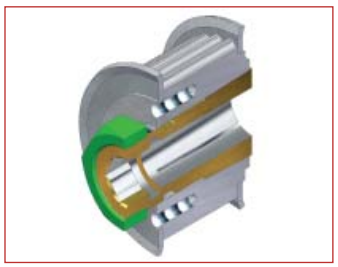
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.:	**10089k**	**10089k-ISK**	**10089**	**10089-ISK**	**10090**	**10090-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 3400 for shaft diameter = 20.00 mm

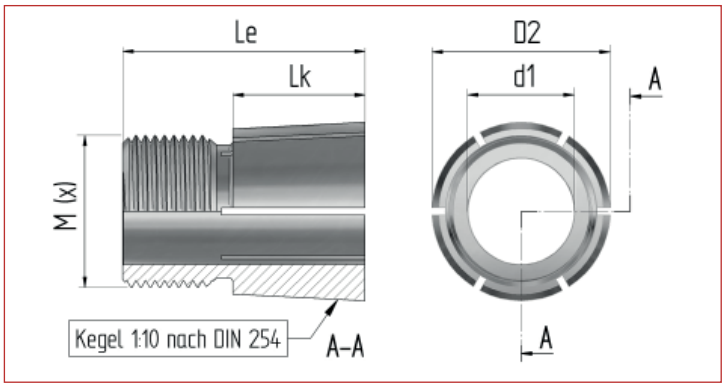
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10091**	**10091-ISK**	**10091L**	**10091L-ISK**
for shaft diameters (d1)	mm	20,00	20,00	20,00	20,00
Hub width (B) max.	mm	35,00	35,00	40,00	40,00
Taper diameter front (D2)	mm	34,00	34,00	34,00	34,00
Taper length (L_k)	mm	28,20	28,20	33,50	33,50
Counter bearing, length	mm	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-
Overall length (Le)	mm	46,00	46,00	51,50	51,50
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5
Hex socket key width (SW)	mm	-	10 mm	-	10 mm

***Fastening Nut (stan**dard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)*

Thread (metric DIN)	M (x)	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5
Key width (SW)	mm	36	36	36	36
Höhe der Mutter(m)	mm	10,00	10,00	10,00	10,00
Recommended tightening torque [1]	Nm	155,00	155,00	160,00	160,00

Transmission Values [2]

Torque (M)	Nm	94,60	94,60	97,60	97,60
Thrust (F_e)	kN	3,88	3,88	4,04	4,04
Hub load ($_pF$)	N/mm²	20,09	20,09	17,74	17,74

1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10091** **10091-ISK** **10091L** **10091L-ISK**

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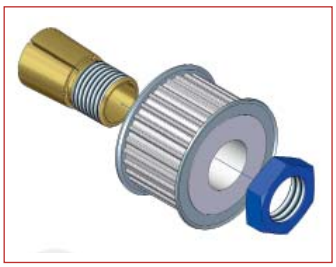
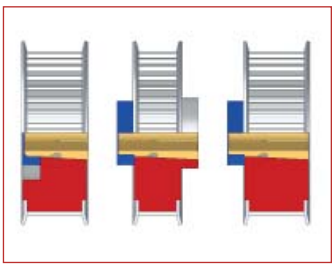



BOQA® Fastening Elements product group 3400 for shaft diameter = 21.00 mm

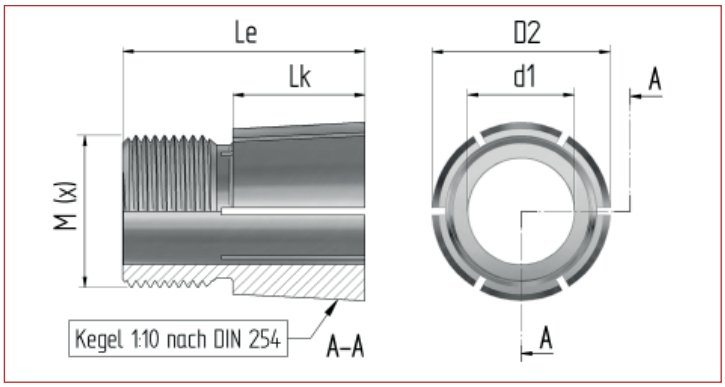
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10095k**	**10095k-ISK**	**10095**	**10095-ISK**	**10096**	**10096-ISK**
for shaft diameters (d1)	mm	21,00	21,00	21,00	21,00	21,00	21,00
Hub width (B) max.	mm	16,00	16,00	22,00	22,00	28,00	28,00
Taper diameter front (D2)	mm	34,00	34,00	34,00	34,00	34,00	34,00
Taper length (L_k)	mm	12,50	12,50	18,60	18,60	23,70	23,70
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (Le)	mm	26,00	26,00	33,30	33,30	38,40	38,40
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm

***Fastening Nut (stan**dard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)*

Thread (metric DIN)	M (x)	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5
Key width (SW)	mm	36	36	36	36	36	36
Nut height (m)	mm	10,00	10,00	10,00	10,00	10,00	10,00
Recommended tightening torque [1]	Nm	145,00	145,00	150,00	150,00	155,00	155,00

Transmission Values [2]

Torque (M)	Nm	88,50	88,50	91,50	91,50	94,60	94,60
Thrust (F_e)	kN	3,55	3,55	3,70	3,70	3,86	3,86
Hub load ($_pF$)	N/mm²	40,43	40,43	28,63	28,63	23,58	23,58

1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.:	**10095k**	**10095k-ISK**	**10095**	**10095-ISK**	**10096**	**10096-ISK**

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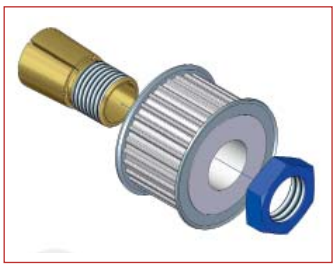
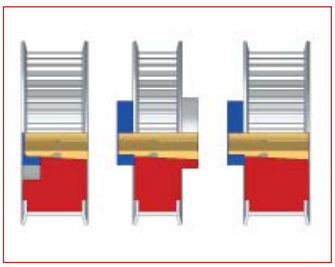



BOQA® Fastening Elements product group 3400 for shaft diameter = 21.00 mm

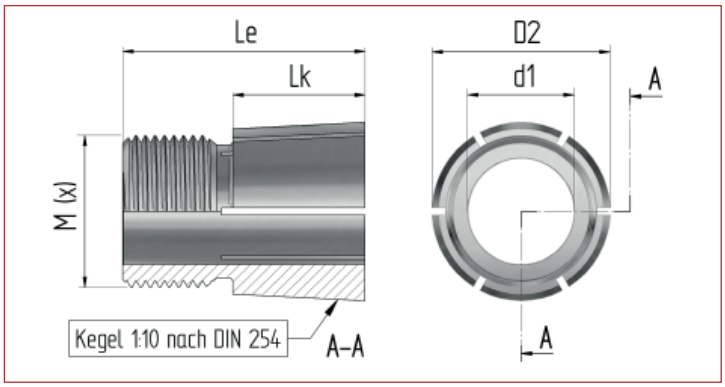
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10097**	**10097-ISK**	**10097L**	**10097L-ISK**
for shaft diameters (d1)	mm	21,00	21,00	21,00	21,00
Hub width (B) max.	mm	35,00	35,00	40,00	40,00
Taper diameter front (D2)	mm	34,00	34,00	34,00	34,00
Taper length (L_k)	mm	28,20	28,20	33,50	33,50
Counter bearing, length	mm	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-
Overall length (Le)	mm	46,00	46,00	51,50	51,50
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5
Hex socket key width (SW)	mm	-	10 mm	-	10 mm
Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)					
Thread (metric DIN)	M (x)	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5
Key width (SW)	mm	36	36	36	36
Nut height (m)	mm	10,00	10,00	10,00	10,00
Recommended tightening torque [1]	Nm	160,00	160,00	165,00	165,00
Transmission Values [2]					
Torque (M)	Nm	97,60	97,60	100,70	100,70
Thrust (F_e)	kN	4,01	4,01	4,17	4,17
Hub load ($_pF$)	N/mm²	20,74	20,74	18,30	18,30

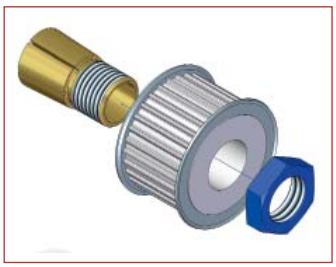
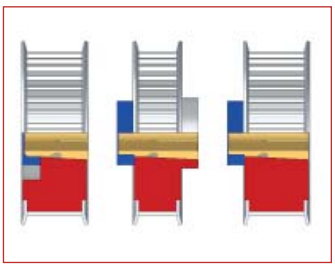
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.:	**10097**	**10097-ISK**	**10097L**	**10097L-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

BOQA® Fastening Elements product group 3400 for shaft diameter = 22.00 mm

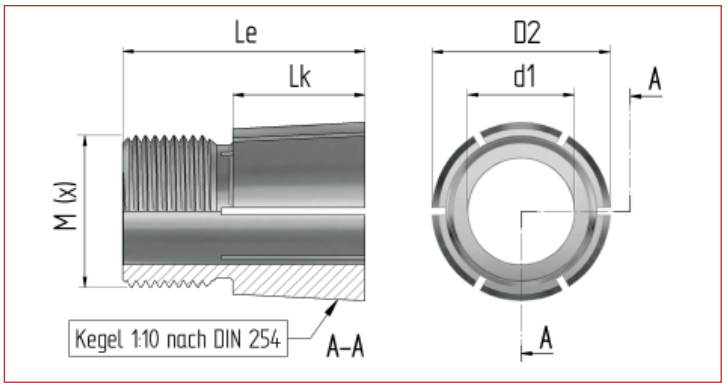
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10101k**	**10101k-ISK**	**10101**	**10101-ISK**	**10102**	**10102-ISK**
for shaft diameters (d1)	mm	22,00	22,00	22,00	22,00	22,00	22,00
Hub width (B) max.	mm	16,00	16,00	22,00	22,00	28,00	28,00
Taper diameter front (D2)	mm	34,00	34,00	34,00	34,00	34,00	34,00
Taper length (L_k)	mm	12,50	12,50	18,60	18,60	23,70	23,70
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	
Overall length (Le)	mm	26,00	26,00	33,30	33,30	38,40	38,40
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm
Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)							
Thread (metric DIN)	M (x)	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5
Key width (SW)	mm	36	36	36	36	36	36
Nut height (m)	mm	10,00	10,00	10,00	10,00	10,00	10,00
Recommended tightening torque [1]	Nm	150,00	150,00	155,00	155,00	160,00	160,00
Transmission Values [2]							
Torque (M)	Nm	91,50	91,50	94,60	94,60	97,60	97,60
Thrust (F_e)	kN	3,67	3,67	3,83	3,83	3,98	3,98
Hub load ($_pF$)	N/mm²	41,82	41,82	29,58	29,58	24,34	24,34

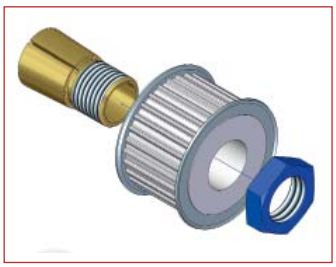
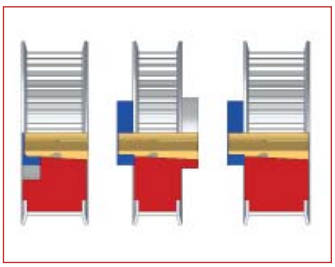
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.:	**10101k**	**10101k-ISK**	**10101**	**10101-ISK**	**10102**	**10102-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

BOQA® Fastening Elements product group 3400 for shaft diameter = 22.00 mm

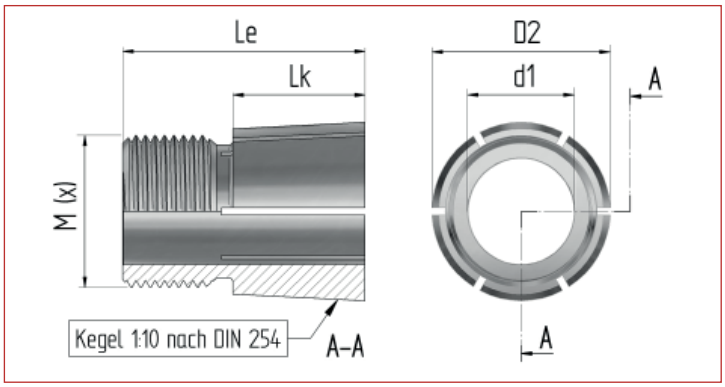
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10103**	**10103-ISK**	**10103L**	**10103L-ISK**
for shaft diameters (d1)	mm	22,00	22,00	22,00	22,00
Hub width (B) max.	mm	35,00	35,00	40,00	40,00
Taper diameter front (D2)	mm	34,00	34,00	34,00	34,00
Taper length (L_k)	mm	28,20	28,20	33,50	33,50
Counter bearing, length	mm	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-
Overall length (Le)	mm	46,00	46,00	51,50	51,50
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5
Hex socket key width (SW)	mm	-	10 mm	-	10 mm
Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)					
Thread (metric DIN)	M (x)	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5
Key width (SW)	mm	36	36	36	36
Nut height (m)	mm	10,00	10,00	10,00	10,00
Recommended tightening torque [1]	Nm	165,00	165,00	170,00	170,00
Transmission Values [2]					
Torque (M)	Nm	100,70	100,70	103,70	103,70
Thrust (F_e)	kN	4,13	4,13	4,29	4,29
Hub load ($_pF$)	N/mm²	21,38	21,38	18,85	18,85

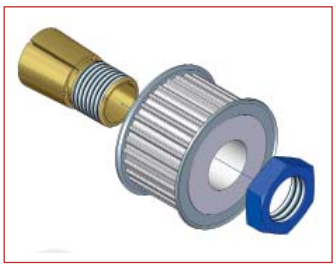
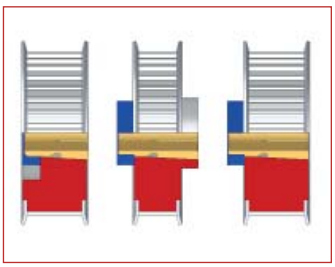
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10103** **10103-ISK** **10103L** **10103L-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

BOQA® Fastening Elements product group 3400 for shaft diameter = 24.00 mm

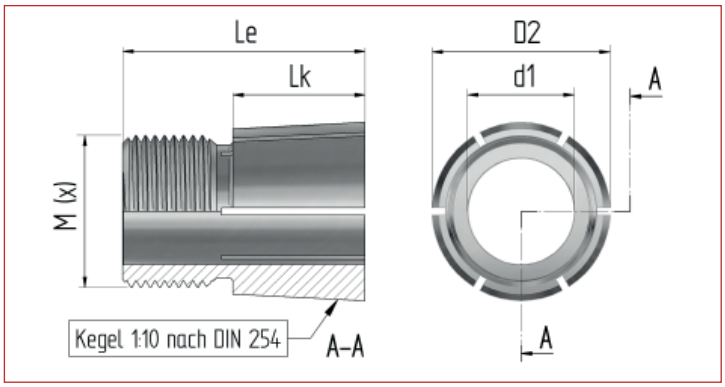
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10107k**	**10107k-ISK**	**10107**	**10107-ISK**	**10108**	**10108-ISK**
for shaft diameters (d1)	mm	24,00	24,00	24,00	24,00	24,00	24,00
Hub width (B) max.	mm	16,00	16,00	22,00	22,00	28,00	28,00
Taper diameter front (D2)	mm	34,00	34,00	34,00	34,00	34,00	34,00
Taper length (L_k)	mm	12,50	12,50	18,60	18,60	23,70	23,70
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (Le)	mm	26,00	26,00	33,30	33,30	38,40	38,40
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm
Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)							
Thread (metric DIN)	M (x)	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5
Key width (SW)	mm	36	36	36	36	36	36
Nut height (m)	mm	10,00	10,00	10,00	10,00	10,00	10,00
Recommended tightening torque [1]	Nm	155,00	155,00	160,00	160,00	165,00	165,00
Transmission Values [2]							
Torque (M)	Nm	94,60	94,60	97,60	97,60	100,70	100,70
Thrust (F_e)	kN	3,79	3,79	3,95	3,95	4,10	4,10
Hub load ($_pF$)	N/mm²	43,21	43,21	30,53	30,53	25,10	25,10

1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.:	**10107k**	**10107k-ISK**	**10107**	**10107-ISK**	**10108**	**10108-ISK**

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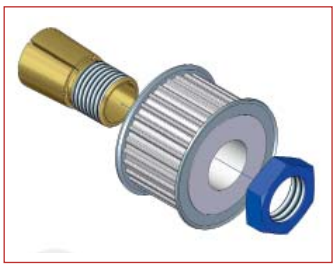
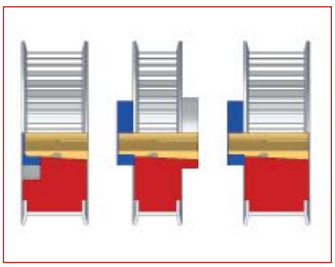



BOQA® Fastening Elements product group 3400 for shaft diameter = 24.00 mm

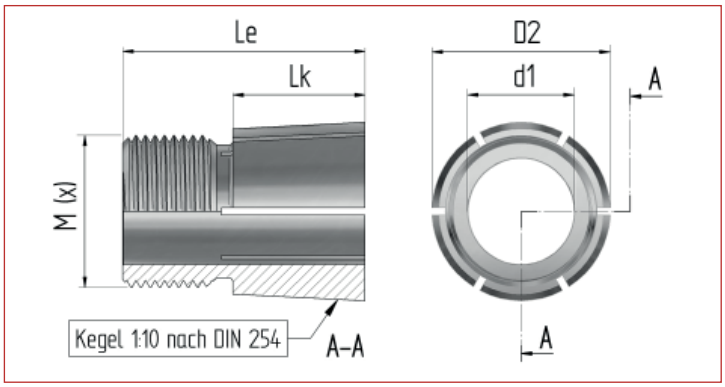
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10109**	**10109-ISK**	**10109L**	**10109L-ISK**
for shaft diameters (d1)	mm	24,00	24,00	24,00	24,00
Hub width (B) max.	mm	35,00	35,00	40,00	40,00
Taper diameter front (D2)	mm	34,00	34,00	34,00	34,00
Taper length (L_k)	mm	28,20	28,20	33,50	33,50
Counter bearing, length	mm	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-
Overall length (Le)	mm	46,00	46,00	51,50	51,50
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5
Hex socket key width (SW)	mm	-	10 mm	-	10 mm
Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)					
Thread (metric DIN)	M (x)	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5
Key width (SW)	mm	36	36	36	36
Nut height (m)	mm	10,00	10,00	10,00	10,00
Recommended tightening torque [1]	Nm	170,00	170,00	175,00	175,00
Transmission Values [2]					
Torque (M)	Nm	103,70	103,70	106,80	106,80
Thrust (F_e)	kN	4,26	4,26	4,42	4,42
Hub load ($_pF$)	N/mm²	22,03	22,03	19,41	19,41

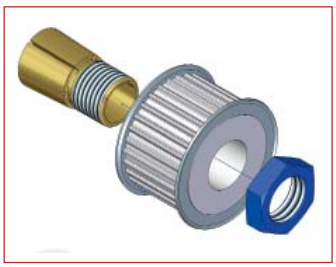
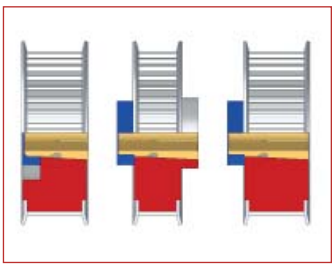
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

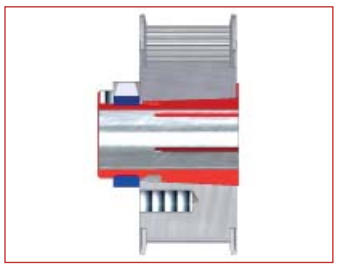
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10109** **10109-ISK** **10109L** **10109L-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 3400 for shaft diameter = 25.00 mm

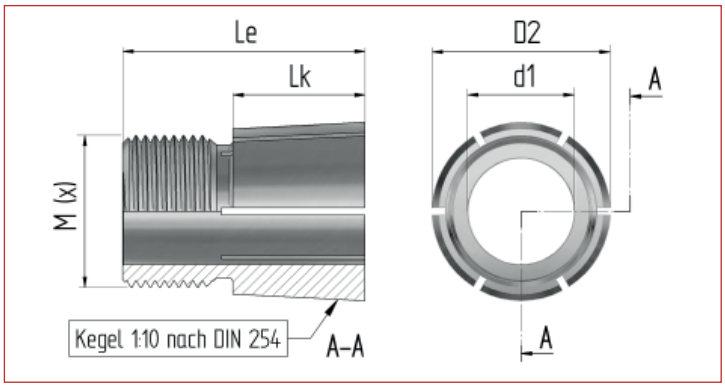
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10107k-25**	**10107k-25-ISK**	**10107-25**	**10107-25-ISK**	**10108-25**	**10108-25-ISK**
for shaft diameters (d1)	mm	25,00	25,00	25,00	25,00	25,00	25,00
Hub width (B) max.	mm	16,00	16,00	22,00	22,00	28,00	28,00
Taper diameter front (D2)	mm	34,00	34,00	34,00	34,00	34,00	34,00
Taper length (L_k)	mm	12,50	12,50	18,60	18,60	23,70	23,70
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (Le)	mm	26,00	26,00	33,30	33,30	38,40	38,40
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm

***Fastening Nut (stan**dard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)*

Thread (metric DIN)	M (x)	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5
Key width (SW)	mm	36	36	36	36	36	36
Nut height (m)	mm	10,00	10,00	10,00	10,00	10,00	10,00
Recommended tightening torque [1]	Nm	160,00	160,00	165,00	165,00	170,00	170,00

Transmission Values [2]

Torque (M)	Nm	97,60	97,60	100,70	100,70	103,70	103,70
Thrust (F_e)	kN	3,91	3,91	4,07	4,07	4,23	4,23
Hub load ($_pF$)	N/mm²	44,61	44,61	31,49	31,49	25,86	25,86

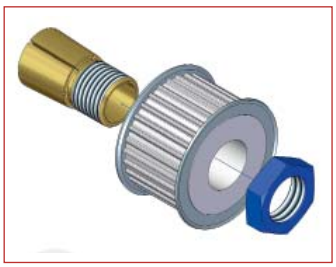
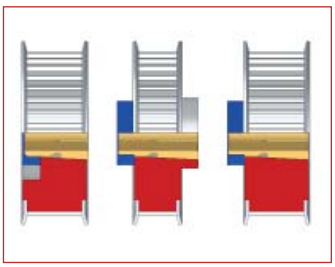
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10107k-25** **10107k-25-ISK** **10107-25** **10107-25-ISK** **10108-25** **10108-25-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

BOQA® Fastening Elements product group 3400 for shaft diameter = 25.00 mm

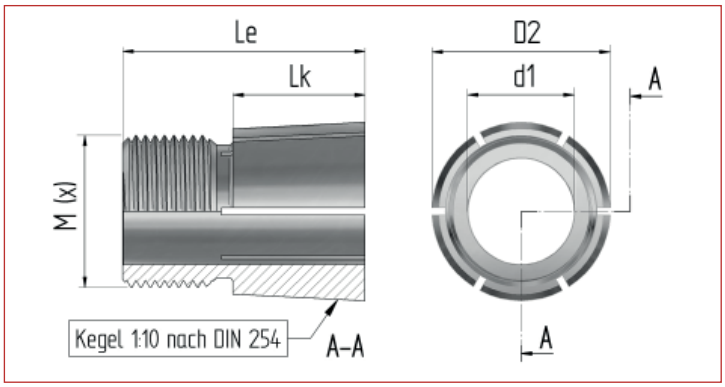
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10109-25**	**10109-25-ISK**	**10109-25L**	**10109-25L-ISK**
for shaft diameters (d1)	mm	25,00	25,00	25,00	25,00
Hub width (B) max.	mm	35,00	35,00	40,00	40,00
Taper diameter front (D2)	mm	34,00	34,00	34,00	34,00
Taper length (L_k)	mm	28,20	28,20	33,50	33,50
Counter bearing, length	mm	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-
Overall length (Le)	mm	46,00	46,00	51,50	51,50
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5
Hex socket key width (SW)	mm	-	10 mm	-	10 mm

***Fastening Nut (stan**dard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)*

Thread (metric DIN)	M (x)	M30 x 1,5	M30 x 1,5	M30 x 1,5	M30 x 1,5
Key width (SW)	mm	36	36	36	36
Nut height (m)	mm	10,00	10,00	10,00	10,00
Recommended tightening torque [1]	Nm	175,00	175,00	180,00	180,00

Transmission Values [2]

Torque (M)	Nm	106,80	106,80	109,80	109,80
Thrust (F_e)	kN	4,38	4,38	4,54	4,54
Hub load ($_pF$)	N/mm²	22,68	22,68	19,96	19,96

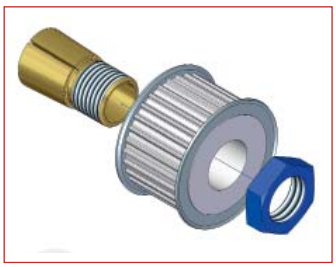
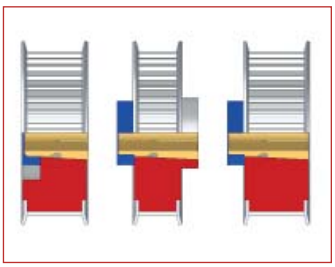
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10109-25** **10109-25-ISK** **10109-25L** **10109-25L-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

BOQA® Fastening Elements product group 3980 for shaft diameter = 19.00 mm

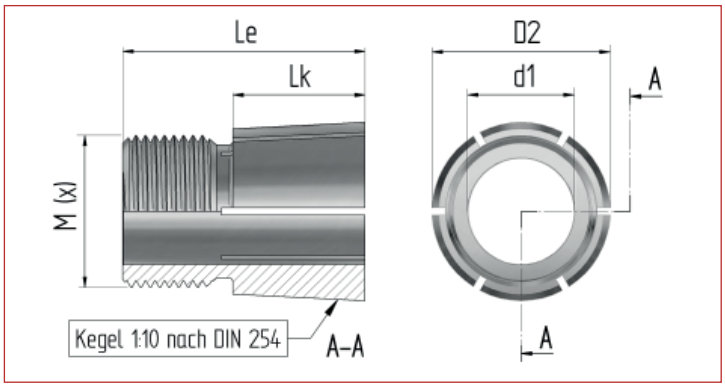
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10093-19**	**10093-19-ISK**	**10094-19**	**10094-19-ISK**
for shaft diameters (d1)	mm	19,00	19,00	19,00	19,00
Hub width (B) max.	mm	25,00	25,00	35,00	35,00
Taper diameter front (D2)	mm	39,80	39,80	39,80	39,80
Taper length (L_k)	mm	18,50	18,50	27,00	27,00
Counter bearing, length	mm	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-
Overall length (Le)	mm	40,00	40,00	48,50	48,50
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5
Hex socket key width (SW)	mm	-	10 mm	-	10 mm

***Fastening Nut (stan**dard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)*

Thread (metric DIN)	M (x)	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5
Key width (SW)	mm	55	55	55	55
Nut height (m)	mm	14,00	14,00	14,00	14,00
Recommended tightening torque [1]	Nm	120,00	120,00	130,00	130,00

Transmission Values [2]

Torque (M)	Nm	91,00	91,00	98,50	98,50
Thrust (F_e)	kN	3,13	3,13	3,43	3,43
Hub load ($_pF$)	N/mm²	20,70	20,70	15,70	15,70

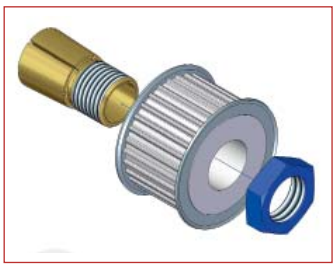
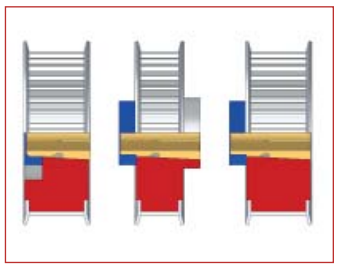
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10093-19** **10093-19-ISK** **10094-19** **10094-19-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

BOQA® Fastening Elements product group 3980 for shaft diameter = 20.00 mm

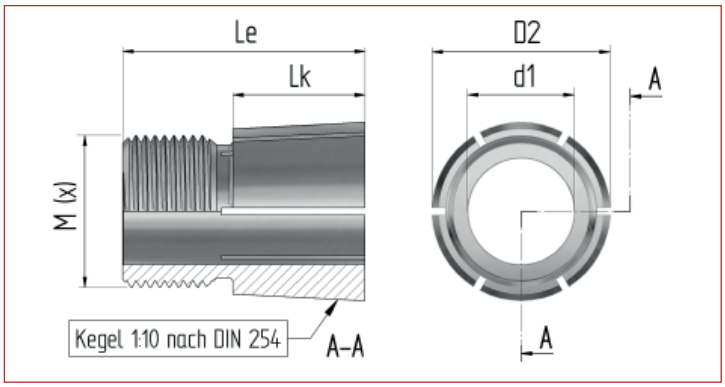
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10093**	**10093-ISK**	**10094**	**10094-ISK**	**11095**	**11095-ISK**
for shaft diameters (d1)	mm	20,00	20,00	20,00	20,00	20,00	20,00
Hub width (B) max.	mm	25,00	25,00	35,00	35,00	45,00	45,00
Taper diameter front (D2)	mm	39,80	39,80	39,80	39,80	39,80	39,80
Taper length (L_k)	mm	18,50	18,50	27,00	27,00	35,00	35,00
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (Le)	mm	40,00	40,00	48,50	48,50	64,50	64,50
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm
Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)							
Thread (metric DIN)	M (x)	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5
Key width (SW)	mm	55	55	55	55	55	55
Nut height (m)	mm	14,00	14,00	14,00	14,00	14,00	14,00
Recommended tightening torque [1]	Nm	130,00	130,00	140,00	140,00	150,00	150,00
Transmission Values [2]							
Torque (M)	Nm	98,50	98,50	106,10	106,10	113,70	113,70
Thrust (F_e)	kN	3,39	3,39	3,69	3,69	4,00	4,00
Hub load ($_pF$)	N/mm²	22,42	22,42	16,91	16,91	14,27	14,27

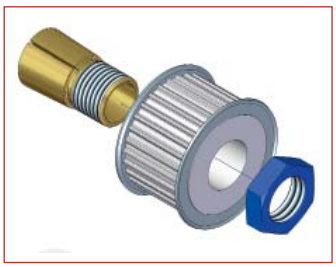
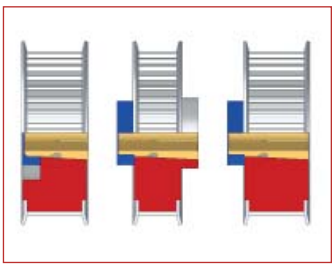
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

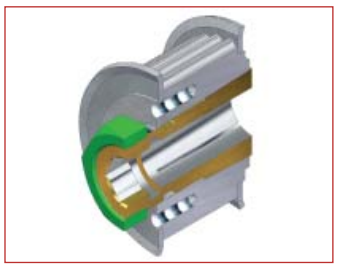
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.:	**10093**	**10093-ISK**	**10094**	**10094-ISK**	**11095**	**11095-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 3980 for shaft diameter = 21.00 mm

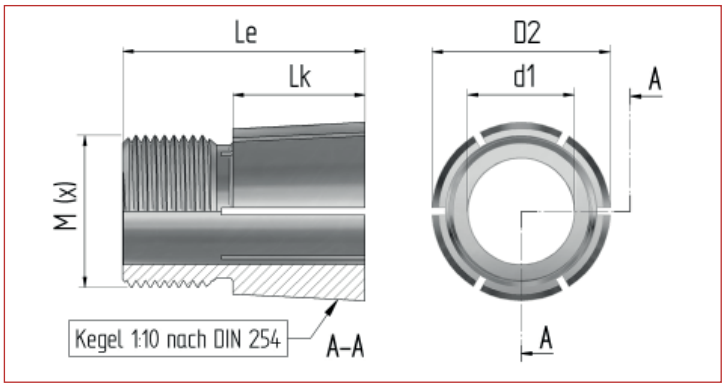
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10099**	**10099-ISK**	**10100**	**10100-ISK**	**11101**	**11101-ISK**
for shaft diameters (d1)	mm	21,00	21,00	21,00	21,00	21,00	21,00
Hub width (B) max.	mm	25,00	25,00	35,00	35,00	45,00	45,00
Taper diameter front (D2)	mm	39,80	39,80	39,80	39,80	39,80	39,80
Taper length (L_k)	mm	18,50	18,50	27,00	27,00	35,00	35,00
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (Le)	mm	40,00	40,00	48,50	48,50	64,50	64,50
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm

***Fastening Nut (stan**dard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)*

Thread (metric DIN)	M (x)	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5
Key width (SW)	mm	55	55	55	55	55	55
Nut height (m)	mm	14,00	14,00	14,00	14,00	14,00	14,00
Recommended tightening torque [1]	Nm	140,00	140,00	150,00	150,00	160,00	160,00

Transmission Values [2]

Torque (M)	Nm	106,10	106,10	113,70	113,70	121,30	121,30
Thrust (F_e)	kN	3,65	3,65	3,96	3,96	4,26	4,26
Hub load ($_pF$)	N/mm²	24,14	24,14	18,12	18,12	15,22	15,22

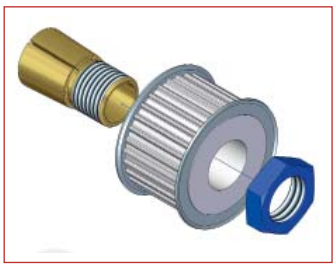
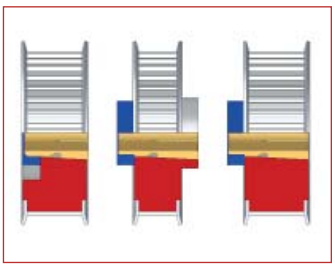
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

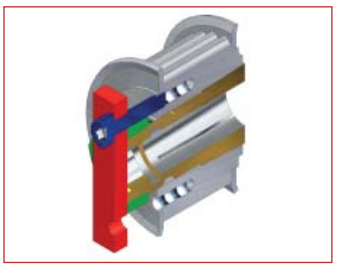
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10099** **10099-ISK** **10100** **10100-ISK** **11101** **11101-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 3980 for shaft diameter = 22.00 mm

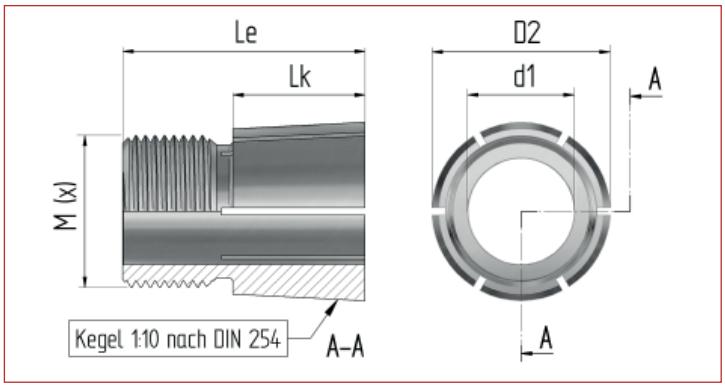
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10105**	**10105-ISK**	**10106**	**10106-ISK**	**11107**	**11107-ISK**
for shaft diameters (d1)	mm	22,00	22,00	22,00	22,00	22,00	22,00
Hub width (B) max.	mm	25,00	25,00	35,00	35,00	45,00	45,00
Taper diameter front (D2)	mm	39,80	39,80	39,80	39,80	39,80	39,80
Taper length (L_k)	mm	18,50	18,50	27,00	27,00	35,00	35,00
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (Le)	mm	40,00	40,00	48,50	48,50	64,50	64,50
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm

***Fastening Nut (stan**dard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)*

Thread (metric DIN)	M (x)	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5
Schlüsselweite (SW)	mm	55	55	55	55	55	55
Nut height (m)	mm	14,00	14,00	14,00	14,00	14,00	14,00
Recommended tightening torque [1]	Nm	150,00	150,00	160,00	160,00	170,00	170,00

Transmission Values [2]

Torque (M)	Nm	113,70	113,70	121,30	121,30	128,90	128,90
Thrust (F_e)	kN	3,91	3,91	4,22	4,22	4,53	4,53
Hub load ($_pF$)	N/mm²	25,87	25,87	19,33	19,33	16,18	16,18

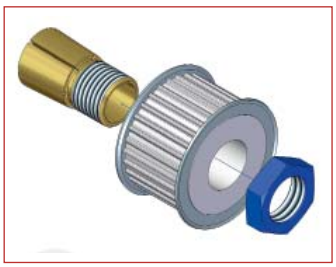
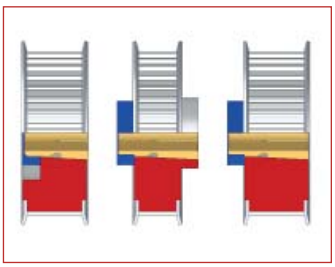
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

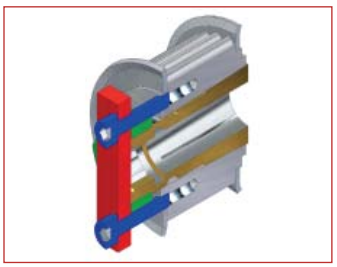
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10105** **10105-ISK** **10106** **10106-ISK** **11107** **11107-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 3980 for shaft diameter = 24.00 mm

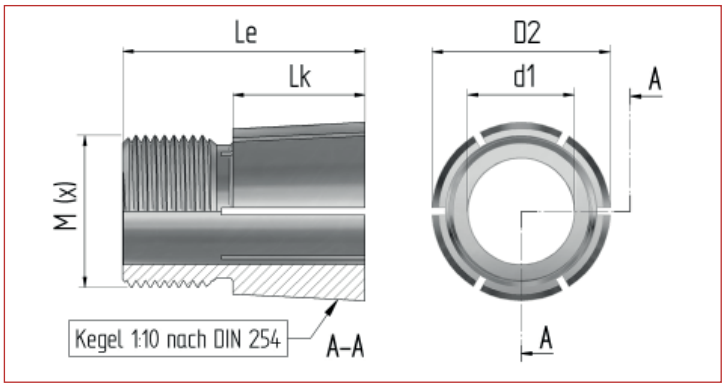
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10111**	**10111-ISK**	**10112**	**10112-ISK**	**11113**	**11113-ISK**
for shaft diameters (d1)	mm	24,00	24,00	24,00	24,00	24,00	24,00
Hub width (B) max.	mm	25,00	25,00	35,00	35,00	45,00	45,00
Taper diameter front (D2)	mm	39,80	39,80	39,80	39,80	39,80	39,80
Taper length (L_k)	mm	18,50	18,50	27,00	27,00	35,00	35,00
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (Le)	mm	40,00	40,00	48,50	48,50	64,50	64,50
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm

***Fastening Nut (stan**dard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)*

Thread (metric DIN)	M (x)	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5
Schlüsselweite (SW)	mm	55	55	55	55	55	55
Nut height (m)	mm	14,00	14,00	14,00	14,00	14,00	14,00
Recommended tightening torque [1]	Nm	160,00	160,00	170,00	170,00	180,00	180,00

Transmission Values [2]

Torque (M)	Nm	121,30	121,30	128,90	128,90	136,40	136,40
Thrust (F_e)	kN	4,17	4,17	4,48	4,48	4,80	4,80
Hub load ($_pF$)	N/mm²	27,59	27,59	20,54	20,54	17,13	17,13

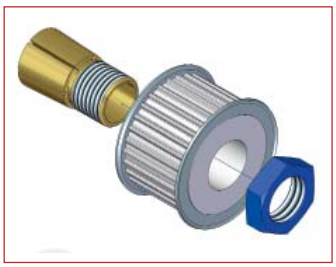
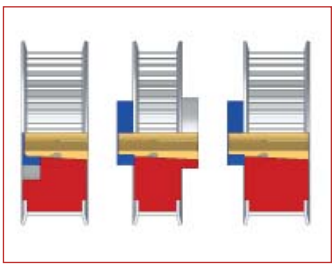
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

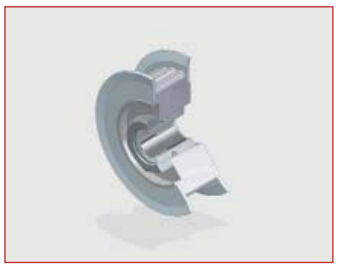
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.:	**10111**	**10111-ISK**	**10112**	**10112-ISK**	**11113**	**11113-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 3980 for shaft diameter = 25.00 mm

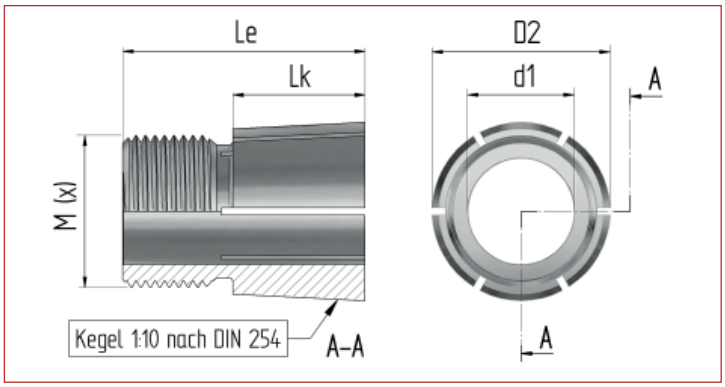
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10114-25**	**10114-25-ISK**	**10115-25**	**10115-25-ISK**	**11115-25**	**11115-25-ISK**
for shaft diameters (d1)	mm	25,00	25,00	25,00	25,00	25,00	25,00
Hub width (B) max.	mm	25,00	25,00	35,00	35,00	45,00	45,00
Taper diameter front (D2)	mm	39,80	39,80	39,80	39,80	39,80	39,80
Taper length (L_k)	mm	18,50	18,50	27,00	27,00	35,00	35,00
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (Le)	mm	40,00	40,00	48,50	48,50	64,50	64,50
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm
Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)							
Thread (metric DIN)	M (x)	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5
Key width (SW)	mm	55	55	55	55	55	55
Nut height (m)	mm	14,00	14,00	14,00	14,00	14,00	14,00
Recommended tightening torque [1]	Nm	170,00	170,00	180,00	180,00	190,00	190,00
Transmission Values [2]							
Torque (M)	Nm	128,90	128,90	136,40	136,40	144,00	144,00
Thrust (F_e)	kN	4,43	4,43	4,75	4,75	5,06	5,06
Hub load ($_pF$)	N/mm²	29,32	29,32	21,74	21,74	18,08	18,08

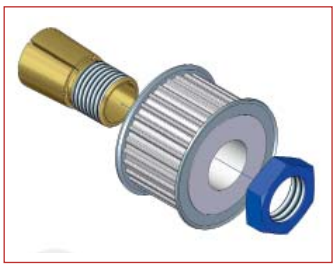
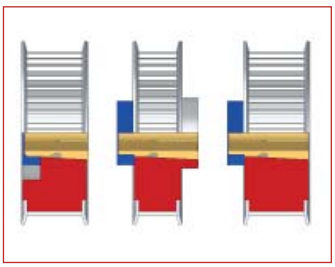
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

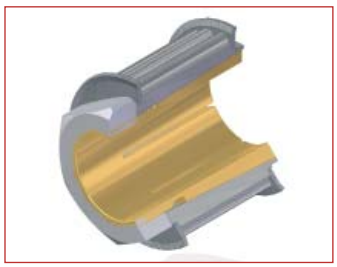
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10114-25** **10114-25-ISK** **10115-25** **10115-25-ISK** **11115-25** **11115-25-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 3980 for shaft diameter = 26.00 mm

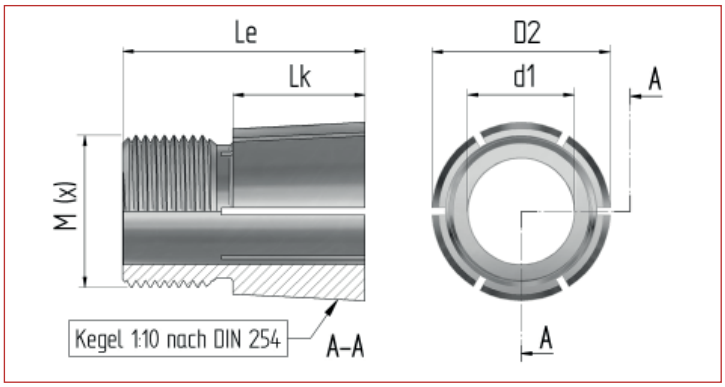
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10114-26**	**10114-26-ISK**	**10115-26**	**10115-26-ISK**	**11115-26**	**11115-26-ISK**
for shaft diameters (d1)	mm	26,00	26,00	26,00	26,00	26,00	26,00
Hub width (B) max.	mm	25,00	25,00	35,00	35,00	45,00	45,00
Taper diameter front (D2)	mm	39,80	39,80	39,80	39,80	39,80	39,80
Taper length (L_k)	mm	18,50	18,50	27,00	27,00	35,00	35,00
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (Le)	mm	40,00	40,00	48,50	48,50	64,50	64,50
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm

***Fastening Nut (stan**dard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)*

Thread (metric DIN)	M (x)	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5
Key width (SW)	mm	55	55	55	55	55	55
Nut height (m)	mm	14,00	14,00	14,00	14,00	14,00	14,00
Recommended tightening torque [1]	Nm	180,00	180,00	190,00	190,00	200,00	200,00

Transmission Values [2]

Torque (M)	Nm	136,40	136,40	144,40	144,40	151,60	151,60
Thrust (F_e)	kN	4,69	4,69	5,01	5,01	5,33	5,33
Hub load ($_pF$)	N/mm²	31,04	31,04	22,91	22,91	19,03	19,03

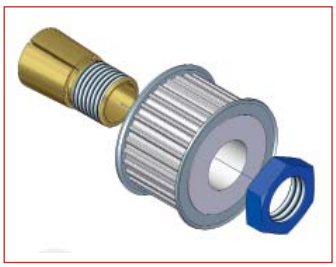
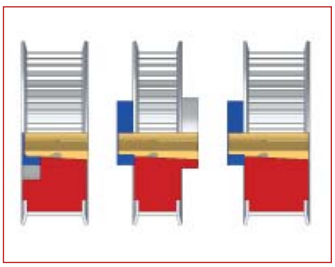
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

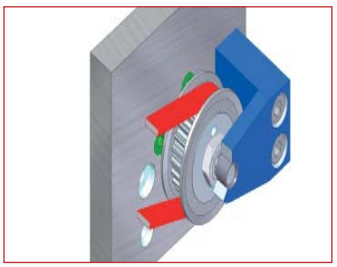
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10114-26** **10114-26-ISK** **10115-26** **10115-26-ISK** **11115-26** **11115-26-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 3980 for shaft diameter = 28.00 mm

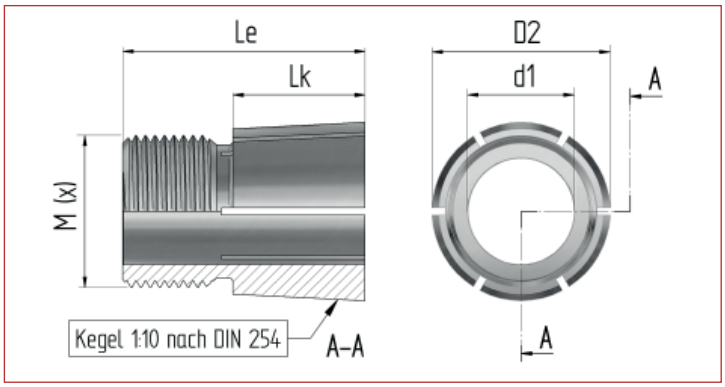
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10117**	**10117-ISK**	**10118**	**10118-ISK**	**11118**	**11118-ISK**
for shaft diameters (d1)	mm	28,00	28,00	28,00	28,00	28,00	28,00
Hub width (B) max.	mm	25,00	25,00	35,00	35,00	45,00	45,00
Taper diameter front (D2)	mm	39,80	39,80	39,80	39,80	39,80	39,80
Taper length (L_k)	mm	18,50	18,50	27,00	27,00	35,00	35,00
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	
Overall length (Le)	mm	40,00	40,00	48,50	48,50	64,50	64,50
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm

***Fastening Nut (stan**dard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)*

Thread (metric DIN)	M (x)	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5
Key width (SW)	mm	55	55	55	55	55	55
Nut height (m)	mm	14,00	14,00	14,00	14,00	14,00	14,00
Recommended tightening torque [1]	Nm	190,00	190,00	200,00	200,00	210,00	210,00

Transmission Values [2]

Torque (M)	Nm	144,00	144,00	151,60	151,60	159,20	159,20
Thrust (F_e)	kN	4,95	4,95	5,27	5,27	5,60	5,60
Hub load ($_pF$)	N/mm²	32,77	32,77	24,16	24,16	19,98	19,98

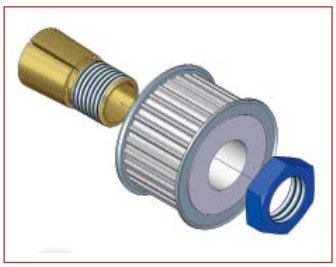
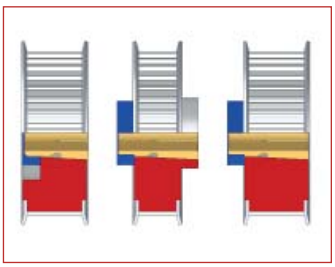
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

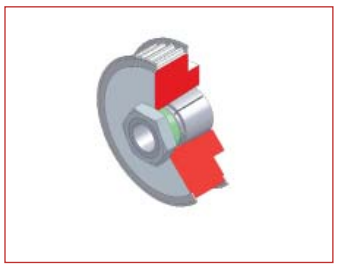
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.:	**10117**	**10117-ISK**	**10118**	**10118-ISK**	**11118**	**11118-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 3980 for shaft diameter = 30.00 mm

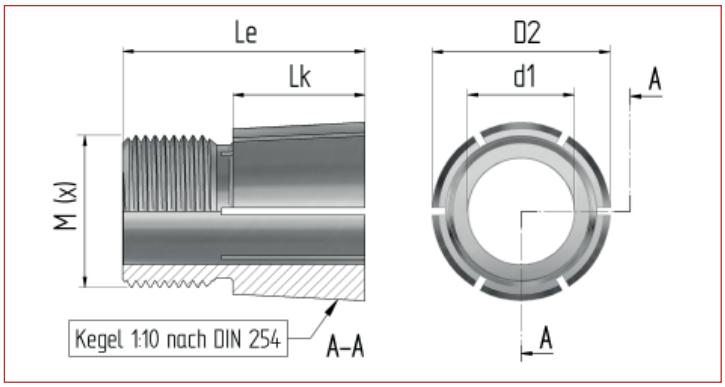
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.:		**10119**	**10119-ISK**	**10120**	**10120-ISK**	**11121**	**11121-ISK**
for shaft diameters (d1)	mm	30,00	30,00	30,00	30,00	30,00	30,00
Hub width (B) max.	mm	25,00	25,00	35,00	35,00	45,00	45,00
Taper diameter front (D2)	mm	39,80	39,80	39,80	39,80	39,80	39,80
Taper length (L_k)	mm	18,50	18,50	27,00	27,00	35,00	35,00
Counter bearing, length	mm	-	-	-	-	-	-
Counter bearing, diameter	mm	-	-	-	-	-	-
Bore depth for shaft journal	mm	-	-	-	-	-	-
Overall length (Le)	mm	40,00	40,00	48,50	48,50	64,50	64,50
Taper ratio (C)	C=1:x	1:10	1:10	1:10	1:10	1:10	1:10
Taper angle (α)	°	5,725	5,725	5,725	5,725	5,725	5,725
Thread (metric DIN)	M (x)	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5
Hex socket key width (SW)	mm	-	10 mm	-	10 mm	-	10 mm
Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)							
Thread (metric DIN)	M (x)	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5	M36 x 1,5
Key width (SW)	mm	55	55	55	55	55	55
Nut height (m)	mm	14,00	14,00	14,00	14,00	14,00	14,00
Recommended tightening torque [1]	Nm	200,00	200,00	210,00	210,00	220,00	220,00
Transmission Values [2]							
Torque (M)	Nm	151,60	151,60	159,20	159,20	166,80	166,80
Thrust (F_e)	kN	5,22	5,22	5,54	5,54	5,86	5,86
Hub load ($_pF$)	N/mm²	34,49	34,49	25,37	25,37	20,93	20,93

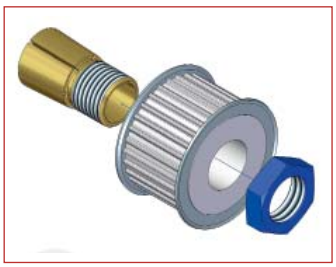
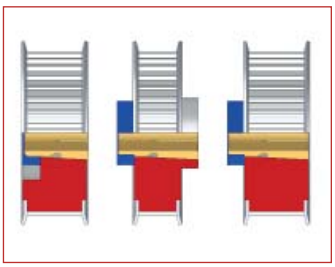
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

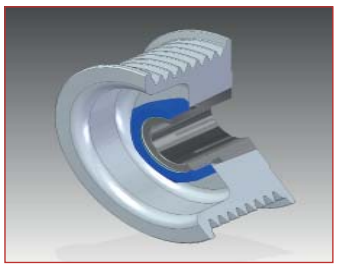
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: **10119** **10119-ISK** **10120** **10120-ISK** **11121** **11121-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.



BOQA® Fastening Elements product group 3980 for shaft diameter = 32.00 mm

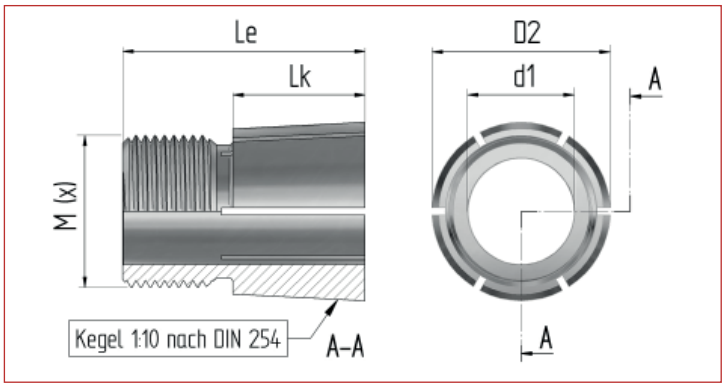
Technical Data (general)

Material : Preferably stainless steel 1.4104 (X12CrMoS17) or 1.4305 (X10CrNiS18 9) according to DIN 17 440 (other suitable materials upon request)

Cocentricity : Concentricity tolerance approx. 0,01 mm

Surface quality : Ra = 3,2 µm (shaft)
Ra = 1,6 µm (taper)

Seat (bore) : d1 = H7 (at the unslotted part)



Technical Data (individual)

Fastening Element BOQA® Article-No.: ..... **10120-32** **10120-32-ISK**

for shaft diameters (d1)	mm	32,00	32,00
Hub width (B) max.	mm	35,00	35,00
Taper diameter front (D2)	mm	39,80	39,80
Taper length (L_k)	mm	27,00	27,00
Counter bearing, length	mm	-	-
Counter bearing, diameter	mm	-	-
Bore depth for shaft journal	mm	-	-
Overall length (Le)	mm	48,50	48,50
Taper ratio (C)	C=1:x	1:10	1:10
Taper angle (α)	°	5,725	5,725
Thread (metric DIN)	M (x)	M36 x 1,5	M36 x 1,5
Hex socket key width (SW)	mm	-	10 mm

Fastening Nut (standard similar to DIN 439 or DIN 936, galvanised steel / stainless steel for an additional charge)

Thread (metric DIN)	M (x)	M36 x 1,5	M36 x 1,5
Key width (SW)	mm	55	55
Nut height (m)	mm	14,00	14,00
Recommended tightening torque [1]	Nm	220,00	220,00

Transmission Values [2]

Torque (M)	Nm	166,80	166,80
Thrust (F_e)	kN	5,80	5,80
Hub load ($_pF$)	N/mm²	26,58	26,58

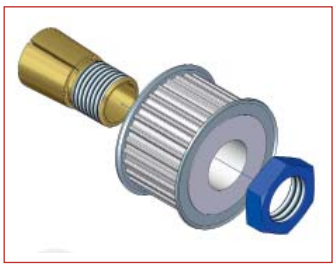
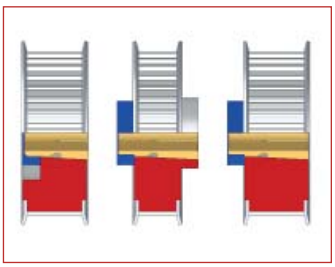
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly instructions.

2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated for increasing loads. All stated values are approximate reference values. Actual performance data are determined by factors not within our control, such as shaft/hub material properties, surface quality of the shaft and bore inside the hub, permitted manufacturing tolerances, hub length, the actual tightening torque of the **BOQA®** fastening element fastening nut, etc..

BOQA® fastening elements are available in various lengths based on commercially available belt pulley widths and customised designs.

Article-No.: ..... **10120-32** **10120-32-ISK**

The use of **BOQA®** fastening elements offers a series of alternatives for complex shaft-to-hub connections with a significant impact on easier assembly/disassembly, reliability and longevity of drive components.

Important Information:

Important Information:

Please note that, for reasons of clarity, we are unable to include all of the fastening solutions which we have been able to implement together with our customers to date using **BOQA®** fastening elements in this product information.

If you do not find the solution variant you are looking for on these pages, please get in touch with one of our distribution partners near you or contact us directly.

We are certain that together with you we will be able to find the fastening solution you are looking for and the help you need.

Contact Data:

If you have any questions or ideas, we are available under the following address any time:

Postal address:	bodaTec® GmbH Postbox 12 51 72646 Wolfschlugen
Delivery address:	bodaTec® GmbH Esslinger Strasse 15 72649 Wolfschlugen
Phone:	+49 (0)7022-97941-0
Fax:	+49 (0)7022-97941-20
Email:	bodaTec.GmbH@t-online.de
Internet:	www.boda-online.com
Contact partner:	Georg F. Boda Managing Director bodaTec® GmbH

General Terms and Conditions

General Terms and Conditions:

1. *Applicable terms and conditions*:

   These General Terms and Conditions – hereinafter referred to as Terms and Conditions – are applicable for the all business conducted by **bodaTec®** GmbH, Wolfschlugen – hereinafter referred to as **bodaTec®** – with the purchaser or other ordering parties, even if they are not specified within the scope of subsequent agreements.

   They also apply in the case that the purchaser refers to the purchaser's own terms and conditions in the purchaser's purchase order or order confirmation in particular, unless these have been expressly agreed to on the part of **bodaTec®**.

2. *Quotation/Purchase order*:

   Quotations from **bodaTec®** are subject to change without notice. Purchase orders are only binding for **bodaTec®** if confirmed in writing by **bodaTec®** or if **bodaTec®** responds by delivering the goods, additional oral agreements only if such are confirmed in writing by **bodaTec®**.

3. *Delivery time*:

   The delivery period begins with the sending of the order confirmation, however not before the purchaser has furnished all of the documents, approvals, etc. to be procured, and not before receipt of a deposit which has been agreed upon.

   The delivery deadline is met if, by expiration of the delivery period, the item to be delivered has left **bodaTec®** or notification has been sent that it is ready for shipment.

   The delivery period shall be extended accordingly in the case of action within the scope of labour disputes, especially strikes and lock-outs, as well as in the event of unforeseen obstacles which are beyond the will of **bodaTec®**, inasmuch as such obstacles can be proven to have an impact on the provision or shipment of the delivery item. This also applies if the circumstances arise with subcontractors.

   The supplier is not responsible for the above-mentioned circumstances if they arise in the course of an existing delay. In important cases, **bodaTec®** shall inform the purchaser as soon as possible as to the beginning and ending or such obstacles.

   In the case an agreed upon delivery deadline is negligently exceeded, the delivery is not considered to be delayed until an appropriate grace period has been set.

   The risk is transferred to the purchaser at the latest when the goods are shipped, and this also applies in the case of partial deliveries. Partial deliveries are possible.

4. *Price and payment*:

   All prices are quoted in euros (€) and do not include the currently applicable value-added tax.

   If invoices are paid and the payment received by **bodaTec®** within 14 days after receipt of the invoice, the customer is entitled to deduct a 2% cash discount.

5. *Reservation of title*:

   bodaTec® retains the title to the delivery item until receipt of all payments arising from the delivery contract.

   In the case of violations of the contract by the purchaser, in particular in the case of default, **bodaTec®** has, after the issue of a reminder notice, the right to repossess the goods and the purchaser is obliged to release these goods. The assertion of the reservation of title and the execution levied on the delivery item by **bodaTec®** do not constitute withdrawal from the agreement.

   The purchaser has the right to sell the delivery items within the limits of ordinary business transactions; the purchaser shall, however, assign to **bodaTec®** all claims to the amount of the purchase price (including value added tax) agreed upon between **bodaTec®** and the purchaser which arise from the resale, irrespective of whether or not the delivery items have been further processed prior to the resale. The purchaser shall remain entitled to collect this claim after its assignment. This does not affect **bodaTec®**'s authority to collect the claims itself; **bodaTec®** is, however, shall not undertake to collect the claim as long as the purchaser duly fulfils its payment obligations and does not default.

   If this should be the case, **bodaTec®** shall be entitled to request that the purchaser disclose the assigned claims and their debtors, provide all information necessary to collect the claim, deliver all corresponding documents and advise the debtors (third parties) of the

assignment.

Any further processing or modification of the goods by the purchaser is always done on behalf of **bodaTec®**. If the delivery items are processed with other items which do not belong to **bodaTec®**, **bodaTec®** shall acquire a proportional title to the new object that corresponds to the proportion of the value of the delivery items to the other mixed items.

The purchaser shall keep this proportional title for **bodaTec®**.

The purchaser is not permitted to pledge the delivery items or assign them as collateral. In the case of attachments or distraint or other disposals by third parties, the purchaser must inform **bodaTec®** of such without delay, or make all information and documents available which are necessary to protect the rights of **bodaTec®**.

bodaTec®'s ownership is to be indicated to any executory officer or third party.

bodaTec® undertakes to release, upon request of the purchaser, the securities to which **bodaTec®** is entitled, if the value of our securities exceeds the claims to be secured by more than 20%.

6. *Liability for defects*:

bodaTec® assumes liability for defects, including the lack of expressly assured quality and excluding further claims, as follows:

a) At the discretion of and according to **bodaTec®**, all such parts are to be improved or new parts shipped free of charge which, within 6 months following their delivery, prove to be unusable or not insignificantly limited in terms of their usability as a result of a circumstance occurring prior to the transfer of risk – in particular, as a result of defective construction, poor materials or poor workmanship. **bodaTec®** is to be informed in writing of detection of such defects without delay.

   For items comprising third-party products to a large degree, **bodaTec®**'s liability is limited to the transfer of liability claims to which **bodaTec®** is entitled vis-à-vis the supplier of the third-party products.

b) No liability is assumed for damages which arise as a result of the following:

   Unsuitable or improper usage, faulty installation and/or commissioning by the purchaser or third parties, natural wear and tear, faulty or negligent handling, unsuitable working materials, etc., inasmuch as these are not the fault of the supplier.

c) For the undertaking of all replacement deliveries which appear necessary at the discretion of **bodaTec®**, the purchaser is to grant **bodaTec®** the required time and opportunity in coordination with **bodaTec®**, otherwise **bodaTec®** is released from the liability for defects.

d) Further claims of the purchaser, in particular the claim to compensation for damages not directly incurred by the delivery item, are excluded.

   Neither does the exclusion of liability apply in cases in which according to the German Product Liability Act ("Produkthaftungsgesetz") there is liability for defects in the delivery item for damage to persons or property to privately used items. Neither does it apply in case of lack of qualities which are expressly assured, if the assurance is specifically intended to protect the purchaser against damages which are directly incurred by the delivery item.

e) Tort claims are excluded unless the damage was caused intentionally or as a result of gross negligence.

7. *Place of jurisdiction*:

In the case of all disputes arising from the contractual relationship, if the purchaser is a merchant entered in the commercial register, a body corporate organised under public law or a public separate estate, the claim is to be filed before the court in whose jurisdiction **bodaTec®** lies.

Wolfschlugen, July 2016