BOQA® Fastening Elements product group 2350 for shaft diameter = 8.00 mm

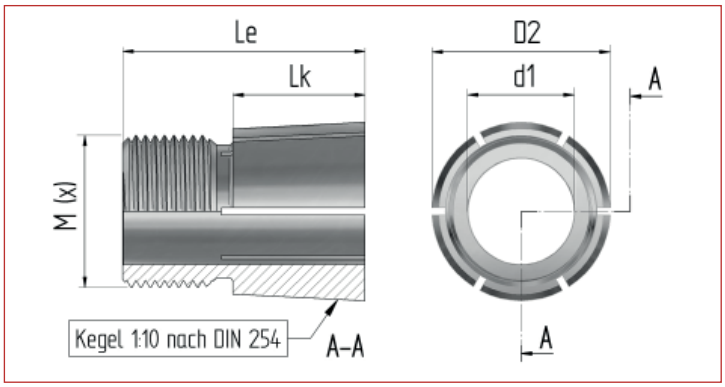
Technical Data (general)

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

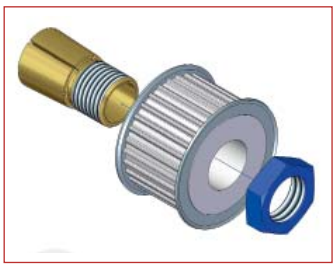
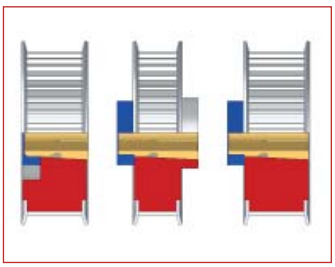
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly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

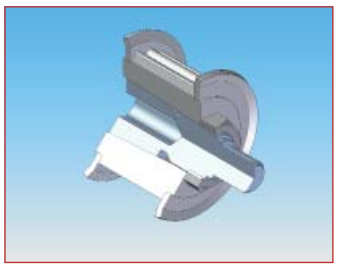
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated 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

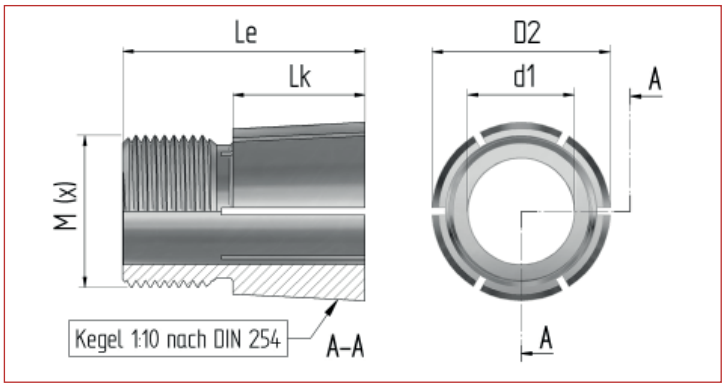
Technical Data (general)

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

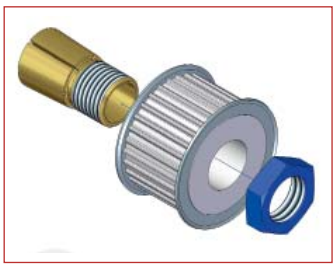
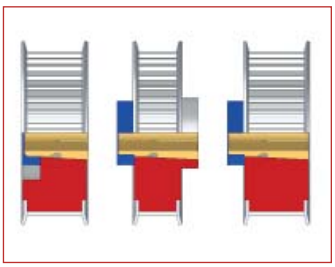
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly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

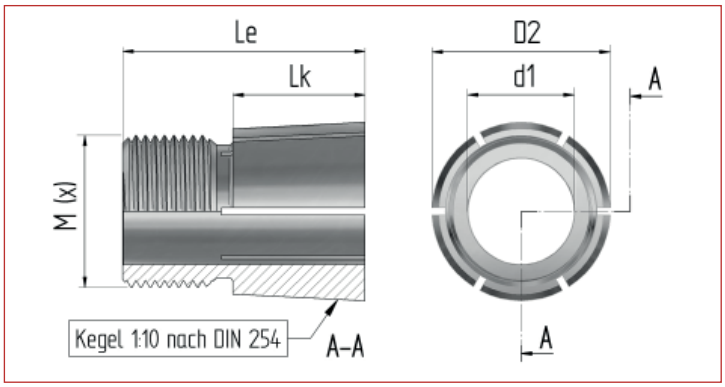
Technical Data (general)

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

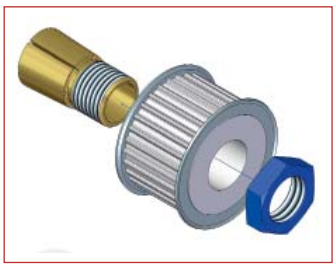
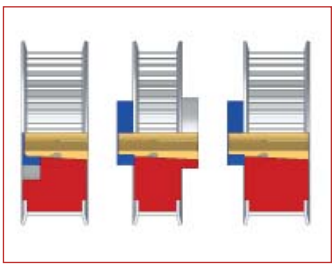
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly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

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

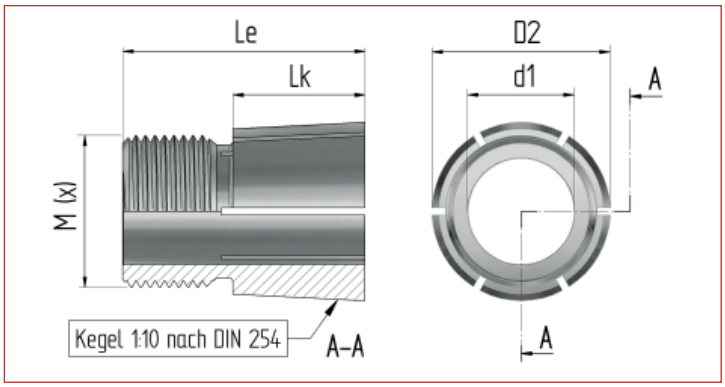
Technical Data (general)

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.:		**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

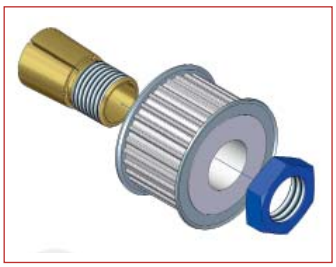
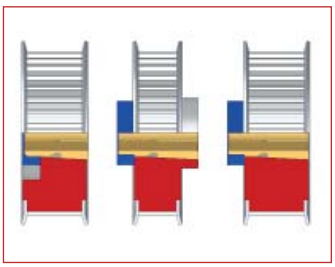
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly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

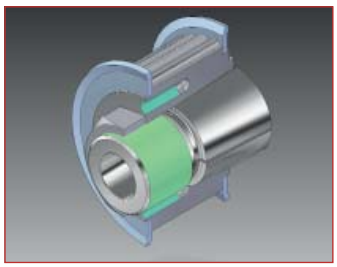
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated 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

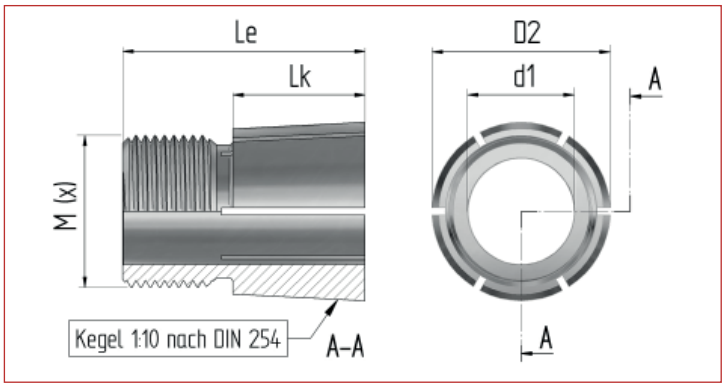
Technical Data (general)

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

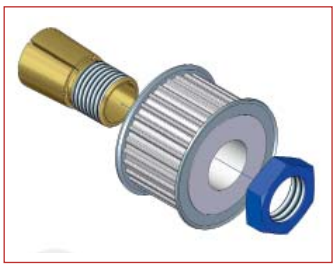
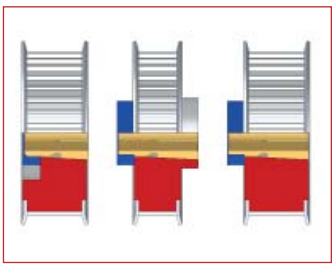
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly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

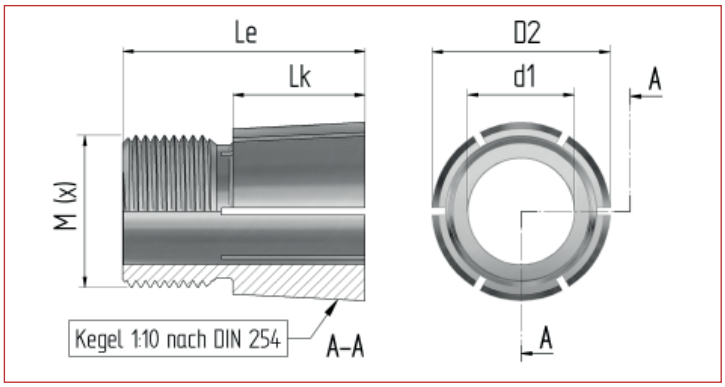
Technical Data (general)

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

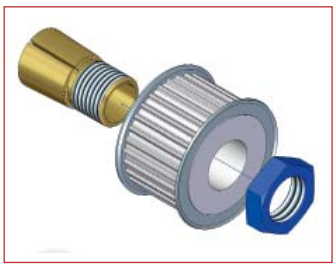
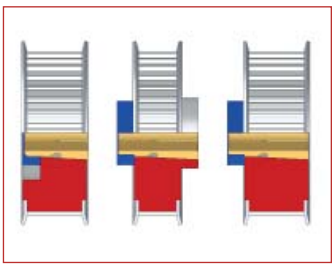
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly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

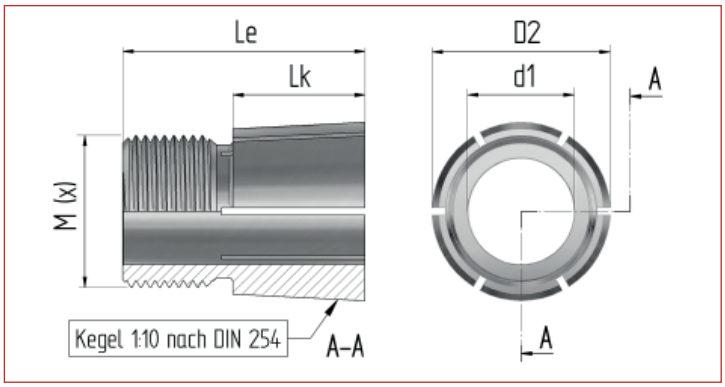
Technical Data (general)

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

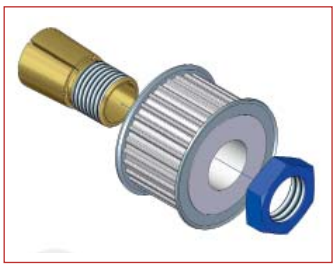
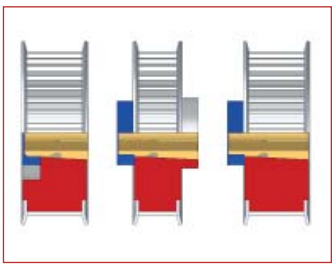
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly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

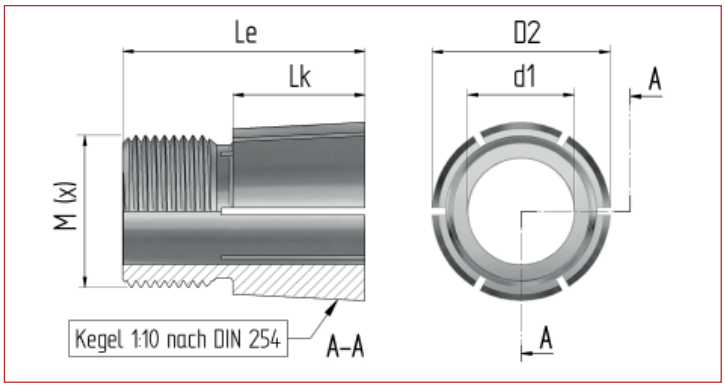
Technical Data (general)

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

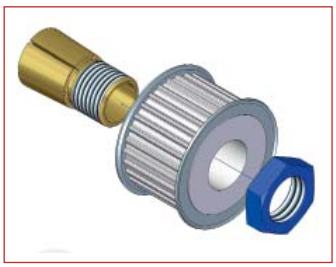
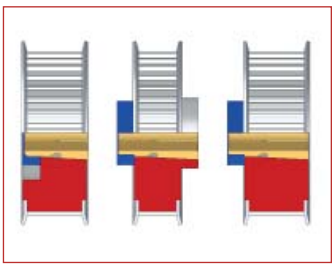
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly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

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

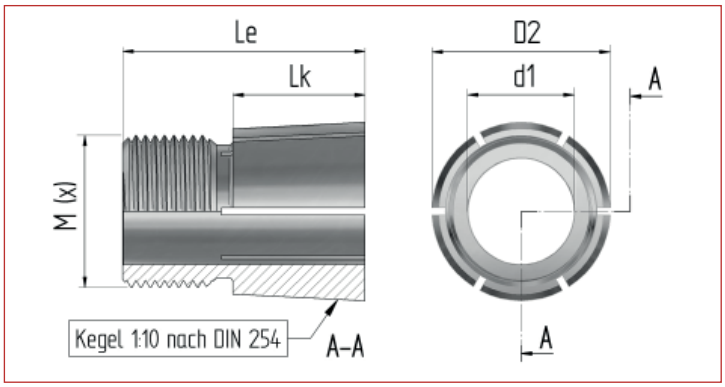
Technical Data (general)

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.:		**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

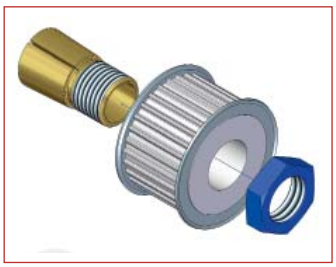
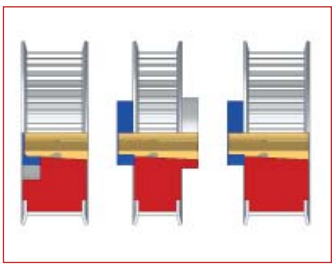
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly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

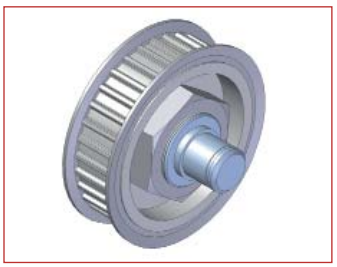
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated 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

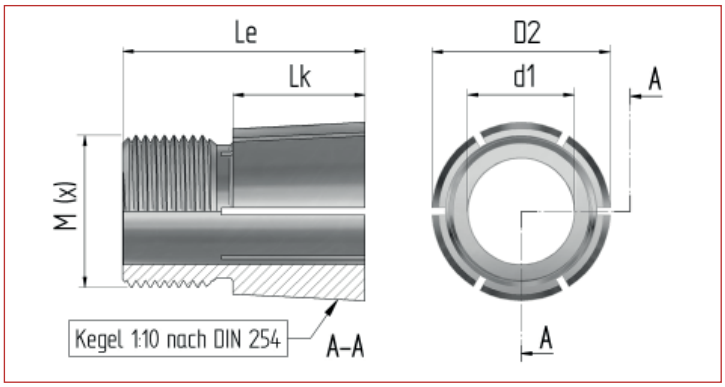
Technical Data (general)

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

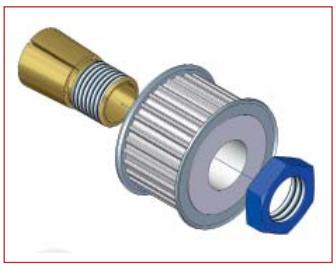
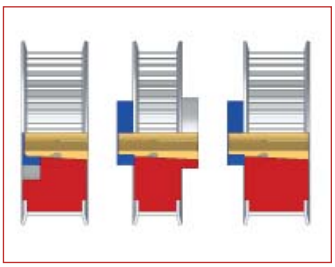
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly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

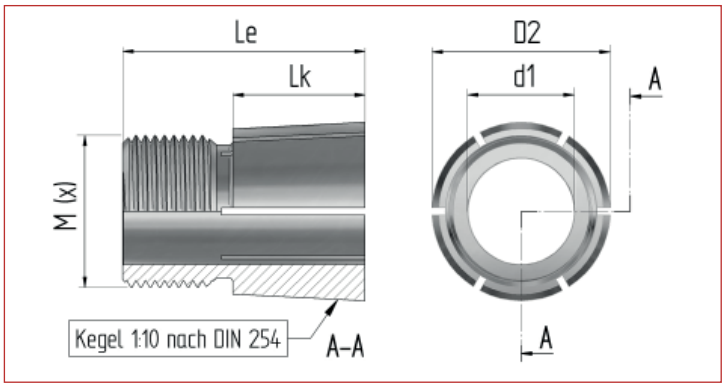
Technical Data (general)

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

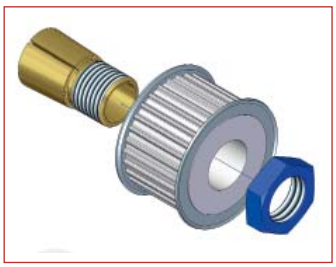
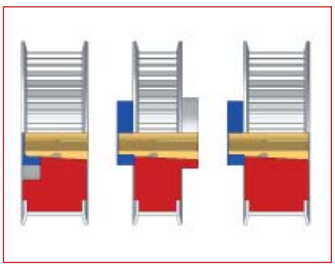
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly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

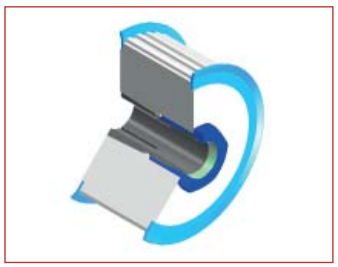
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated 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

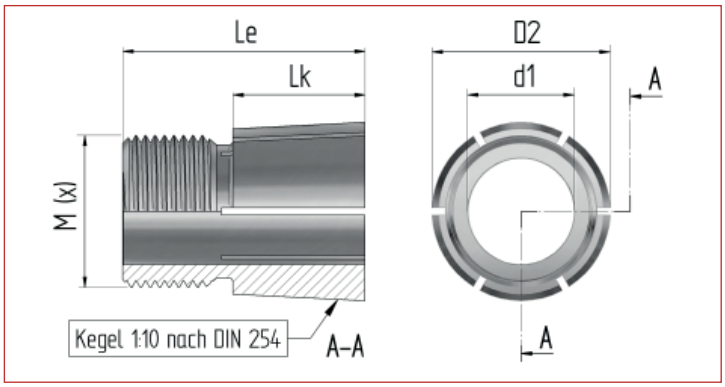
Technical Data (general)

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

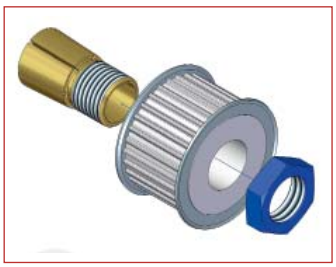
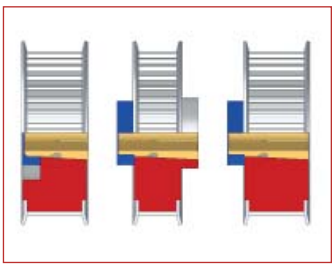
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly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

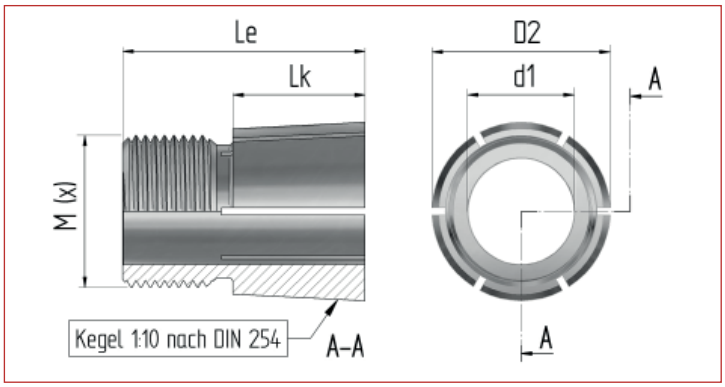
Technical Data (general)

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

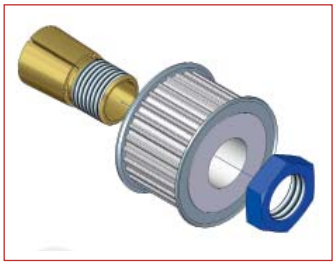
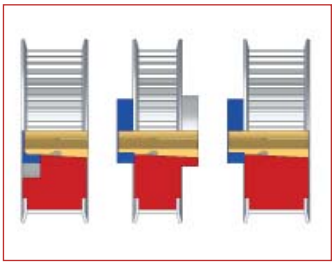
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly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

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 = 15.00 mm

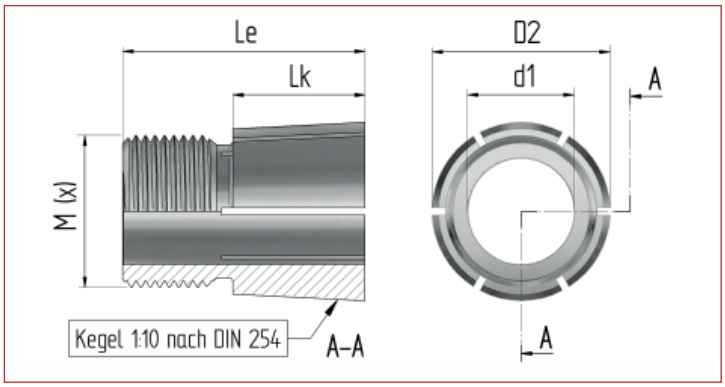
Technical Data (general)

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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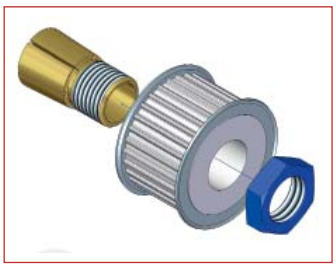
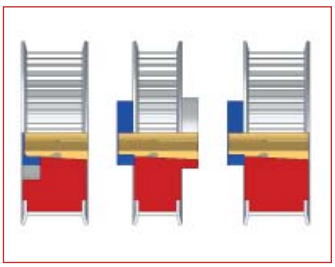



BOQA® Fastening Elements product group 2350 for shaft diameter = 15.00 mm

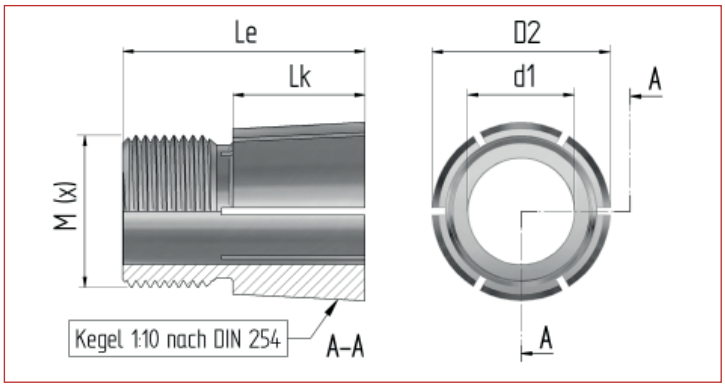
Technical Data (general)

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**

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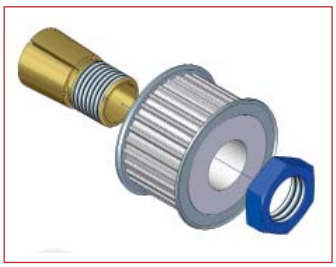
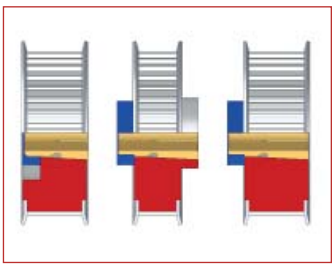
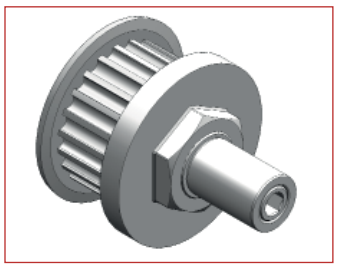





BOQA® Fastening Elements product group 2350 for shaft diameter = 16.00 mm

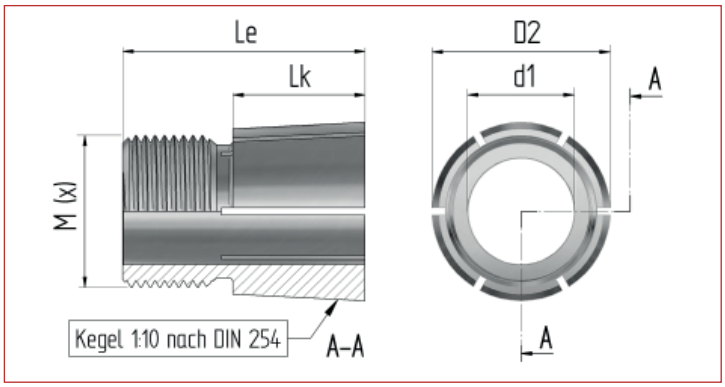
Technical Data (general)

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

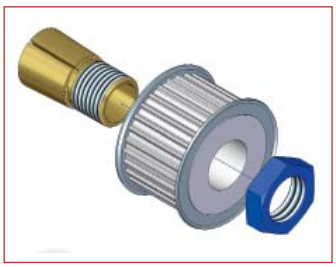
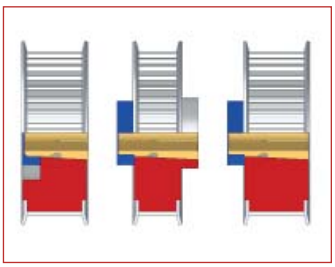
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly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

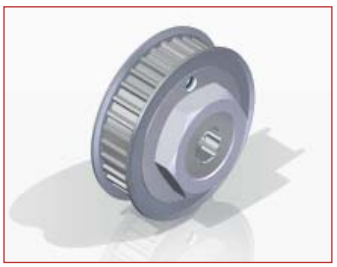
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated 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

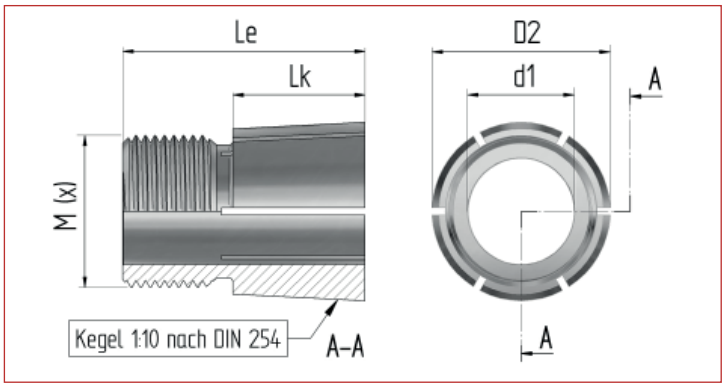
Technical Data (general)

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

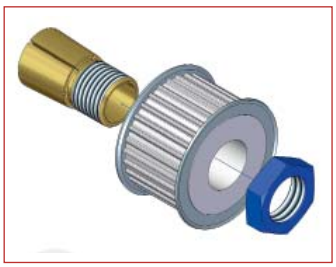
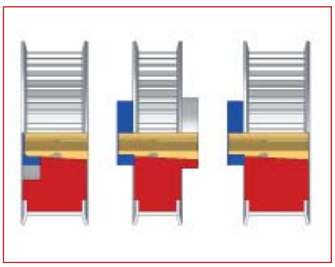
1) Values provided for the tightening torque of the nut for **BOQA®** fastening elements are recommended values only and lie within the lower third of the permissible range. Optimal tightening torque values for each case should be determined empirically, and should be stated explicitly in the assembly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

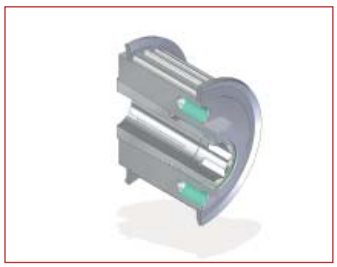
2) The table values for the individual performance statistics are derived from the standard combination of steel shaft and aluminium hub (e.g., belt pulley) and therefore take the lower yield strength (Re) of the hub material into account. Values for the permissible surface pressure are based upon estimated 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)

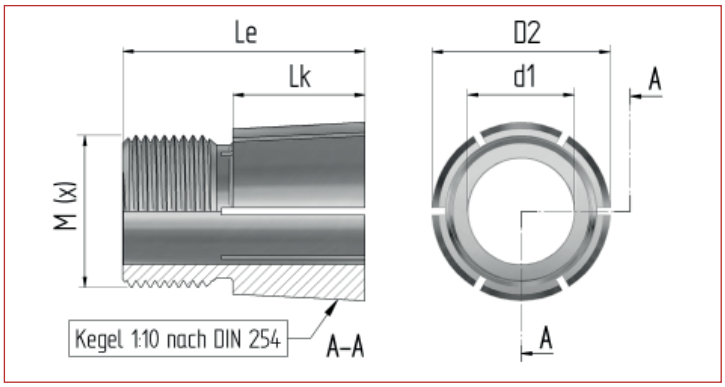
Technical Data (general)

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.