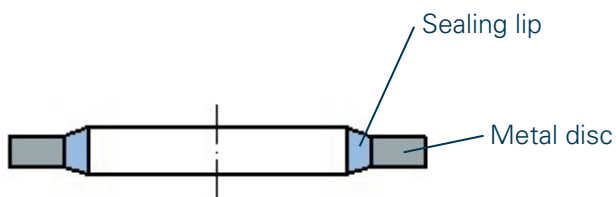
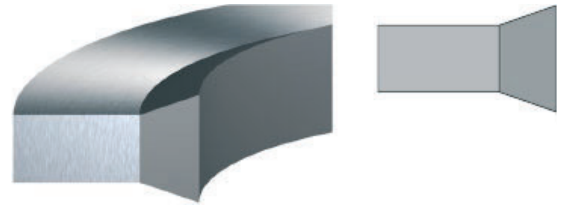


BS-10

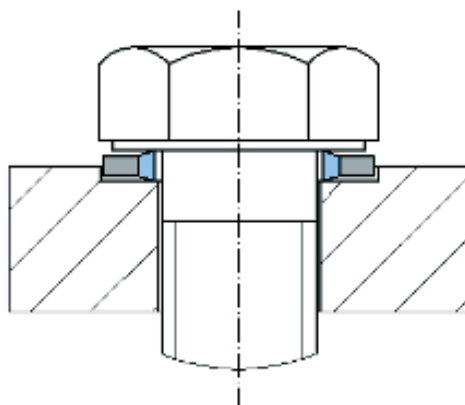
Description

Bonded seals or bolt seals are standard sealing elements for sealing off bolt connections. Bonded seals act like a washer with an additional sealing effect. This is achieved by a trapezoidal sealing lip made of elastomer, which is vulcanised onto the inner diameter of the metal disc.

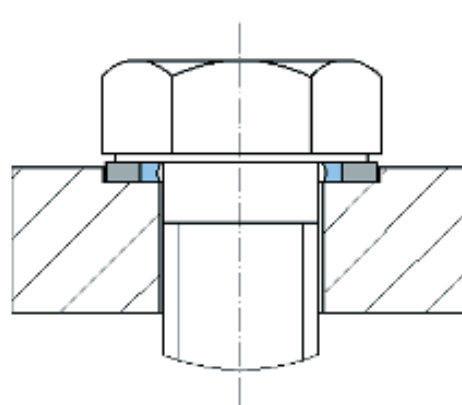


Function

When the bolt connection is tightened, the sealing bead is pressed in the axial direction. The maximum extent of the pressing is defined and limited by the thickness of the metal disc. As the internal pressure rises, the contact pressure of the resilient sealing material on the sealing surfaces increases even more.



Loose screw connection



Tightened screw connection

Advantages

- Simple, cost-effective sealing element
- Easy to assemble
- Automatic assembly possible
- Defined compression of the seal
- Wide range of uses with various tools
- Good sealing effect at low and high pressures
- Available for metric, imperial and BSP threads
- Suitable for many common bolt connections

Applications

Static sealing of screw connections, e.g.:

- machinery
 - tank and apparatus construction
 - screw connections
 - flange seals
 - engines
- and much more

Materials / Operating parameters

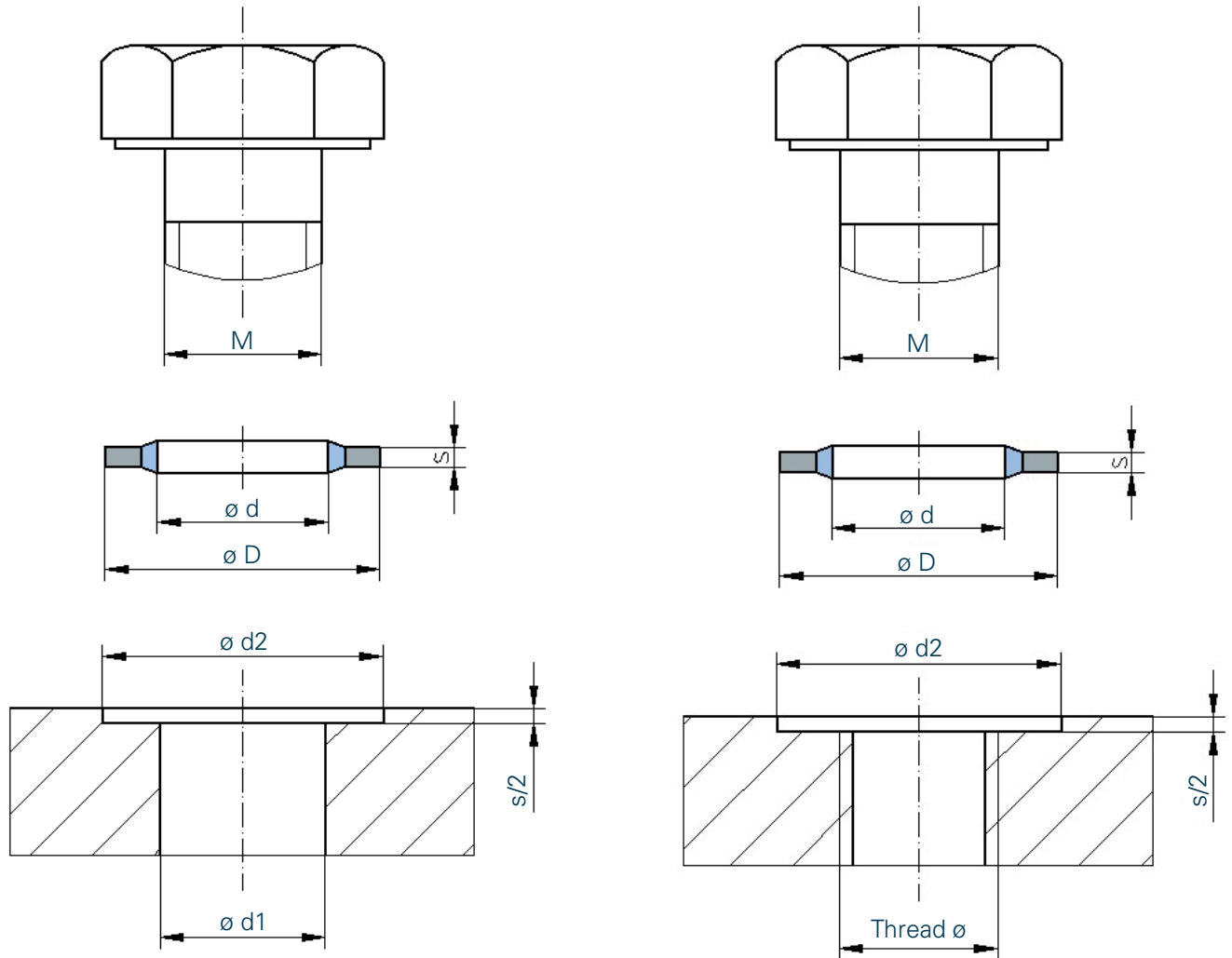
Standard elastomers:

NBR 70	Black	(-30 to +100°C)
FKM 70	Brown	(-15 to +200°C)

Standard steel material: JIS G3141 SPCC, zinc-chromated, (Cr(VI)-free)
Equivalent to 1.0330 (AISI 1008)

Other elastomer materials are available on request.

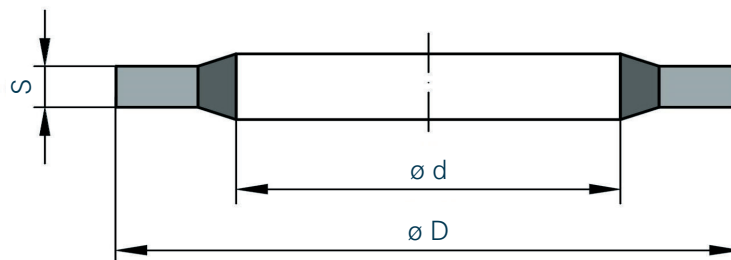
Installation space and design recommendations



The diameter $d1$ must be selected so that the sealing lip always rests securely on the flat surface outside of the bore.

Surface properties of the mating surface:

Ra $\leq 3.2 \mu\text{m}$
 Rmax $\leq 15 \mu\text{m}$

BS-10


Metric thread	Inch thread	BSP	Ød	ØD	s	Type
	6BA		3.05	6.35	1.22	BS10
M2.5			3.1	6.4	1.3	BS10
M3			3.6	7.5	1	BS10
M3(M3.5)			4.1	7.2	1	BS10
	4BA		4.12	7.26	1.22	BS10
M4			4.5	7	1	BS10
M4			4.6	9	1	BS10
	2BA		5.21	8.38	1.22	BS10
M5			5.6	10	1	BS10
M5			5.7	10	1	BS10
M5			5.7	9	1	BS10
M5(M5.5)			6.2	9.2	1	BS10
M6			6.6	11	1	BS10
M6			6.7	11	1	BS10
M6			6.7	10	1	BS10
M6			6.7	11	2.5	BS10
M6			6.85	13.27	1.3	BS10
	¼		6.86	13.21	1.22	BS10
M6			6.9	13.2	1.3	BS10
	¼		6.99	13.34	1.22	BS10
M6			7	11.4	1	BS10
M6(M6.5)			7.1	12	1	BS10
M6(M6.7)			7.3	10.2	1	BS10
M6			8.3	12.7	1.25	BS10
	5/16		8.31	13.34	1.22	BS10
M6(M8)			8.5	13.4	1	BS10
M8			8.6	13	1	BS10
	5/16		8.64	14.22	1.22	BS10
M8			8.7	13	1	BS10
M8			8.7	14	1	BS10
M8			8.7	16	1	BS10
M8			8.7	14.2	1.3	BS10
M8(M8.5)			9.3	13.3	1	BS10

Metric thread	Inch thread	BSP	Ød	ØD	s	Type
M10			10.35	16	2	BS10
	3/8	1/8	10.37	15.88	2.03	BS10
	3/8	1/8	10.37	15.88	2	BS10
M10			10.4	14.7	1.25	BS10
M8(M10)			10.7	18	1.5	BS10
M10			10.7	17	1.5	BS10
M8(M10)			10.7	16	1.5	BS10
	40		11.26	18.36	2.03	BS10
M10			11.26	18.36	2	BS10
M10(M11)			11.4	16.3	1.5	BS10
	7/16		11.69	19.05	2.03	BS10
	7/16		11.69	19.05	2	BS10
M10(M11)			11.8	18.5	1.5	BS10
M10(M11)			11.8	19.1	1.5	BS10
M11			11.8	18.1	1.5	BS10
M10(M12)			12.7	18	1.5	BS10
M10(M12)			12.7	20	1.5	BS10
M12			12.7	19	1.5	BS10
M12(M13)			13.7	20	1.5	BS10
	1/2		13.7	22	1.5	BS10
M12			13.7	20.6	2.1	BS10
	1/2	1/4	13.74	20.57	2.03	BS10
	1/2	1/4	13.74	20.57	2	BS10
M13			13.8	20.1	1.5	BS10
M12(M13.5)			13.85	18.7	1.25	BS10
M12(M13.5)			13.9	18.7	1.25	BS10
M12(M13.5)			14	18.7	1.5	BS10
M12(M14)			14.7	22	1.5	BS10
M12(M14)			14.7	21	1.5	BS10
	9/16		14.86	22.23	2.03	BS10
	9/16		14.86	22.23	2	BS10
	60		15.83	22.23	2.03	BS10
	60		15.83	22.23	2	BS10
M14			16	22.7	1.5	BS10
	5/8		16.51	25.4	2.03	BS10
	5/8		16.52	25.4	2	BS10
M14(M16)			16.7	24	1.5	BS10
M16			16.7	23	1.5	BS10
M16.5			17.2	23.9	2.1	BS10
		3/8	17.28	23.8	2.03	BS10
		3/8	17.28	23.8	2	BS10

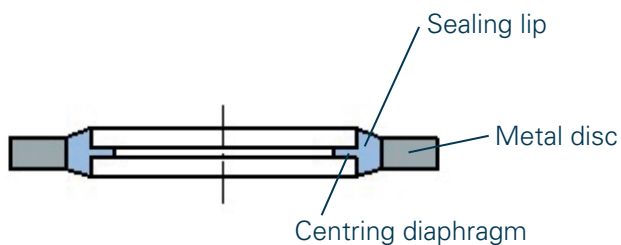
Metric thread	Inch thread	BSP	Ød	ØD	s	Type
		3/8	17.3	22.7	1.25	BS10
		3/8	17.35	22.7	1.25	BS10
M14(M17)			17.4	24	1.5	BS10
M16(M17.5)			18	24.7	1.5	BS10
	1 1/16		18.16	25.4	2.34	BS10
M16(M18)			18.7	26	1.5	BS10
M18			18.7	27	2	BS10
	3/4		19.69	26.92	2.34	BS10
M20			20.7	29	2	BS10
M18(M20)			20.7	28	1.5	BS10
	1 3/16		21.5	28.7	2.5	BS10
	1 3/16	1/2	21.54	28.58	2.34	BS10
	1 3/16		21.65	26.7	1.25	BS10
	M21		21.7	30	2	BS10
	1 3/16		21.7	26.7	1.25	BS10
M20(M22)			22.5	28	1.5	BS10
M20(M22)			22.7	30	2	BS10
M20(M22)			22.7	30	3	BS10
M22			22.7	31	2	BS10
	7/8	5/8	23.49	31.75	2.34	BS10
M23			23.7	32	2	BS10
	1 5/16		24.26	33.27	2.34	BS10
M20(M24)			24.7	32	2	BS10
M24			24.7	33	2	BS10
M22			26.7	35	2	BS10
M26			27	35.3	2	BS10
	1	3/4	27.05	34.93	2.34	BS10
M24(M27)			27.2	36	2	BS10
M26			27.3	32.6	1.25	BS10
M26			27.3	32.6	2	BS10
M26			27.3	32.5	1.25	BS10
M27			27.7	36	2	BS10
	1 1/16		27.82	38.61	2.34	BS10
M28			28.6	36	2	BS10
M24			28.7	37	2	BS10
M28.5			29.2	37.5	2	BS10
	1 1/8		29.33	36.58	2.34	BS10
M30			30.7	39	2	BS10
	1 3/16	7/8	30.81	38.1	2.34	BS10
M27(M30)			31	39	2	BS10
	1 1/4		32.64	41.4	3.25	BS10

Metric thread	Inch thread	BSP	Ød	ØD	s	Type
	1 5/16	1	33.89	42.8	3.25	BS10
	1 5/16	1	33.89	42.8	2.34	BS10
M27			33.9	42.8	3.25	BS10
M27			34.2	39.5	2	BS10
M30(M33)			34.3	43	2	BS10
	1 3/8		35.94	44.45	3.25	BS10
M30(M36)			36.7	46	2	BS10
M36			37	48	2.5	BS10
	1 1/2		38.96	47.75	3.25	BS10
M36(M42)			42.7	53	3	BS10
M36(M42)			42.8	49.5	2	BS10
	1 5/8	1 1/4	42.93	52.38	3.25	BS10
M42			43	54	2.5	BS10
	1 3/4		45.34	57.15	3.25	BS10
M45			46	57	2.5	BS10
	1 7/8	1 1/2	48.44	58.6	3.25	BS10
M36(M48)			48.7	59	3	BS10
M36(M48)			48.7	55.5	2	BS10
M48			49	60	2.5	BS10
	2		51.69	63.5	3.25	BS10
M42			51.7	63.5	3.25	BS10
M42(M51)			52	60	3	BS10
M48(M52)			53.3	64.5	3	BS10
	2 1/8	1 3/4	54.89	69.85	3.25	BS10
	2 1/4		58.04	70.36	3.25	BS10
M48			60.5	68.5	2	BS10
		2	60.58	73.03	3.25	BS10
M48(M60)			60.7	73	3	BS10
	2 1/2		64.39	77.22	3.25	BS10
		2 1/4	66.68	79.5	3.25	BS10
M68			68.6	79.5	3.5	BS10
		2 1/2	76.08	90.17	3.25	BS10
		2 1/2	76.08	90.3	3.38	BS10
M75			76.1	90.3	3.38	BS10
M88			89.09	101.35	3.25	BS10
M88			89.09	101.48	3.25	BS10

BS-11 self-centring

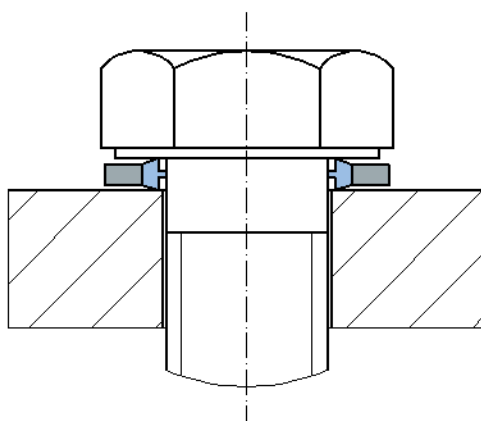
Description

Bonded seals or bolt seals are standard sealing elements for sealing off bolt connections. Bonded seals act like a washer with an additional sealing effect. This is achieved by a trapezoidal sealing lip made of elastomer, which is vulcanised onto the inner diameter of the metal disc. The BS-11 self-centring version has an additional centring diaphragm on the inner diameter. This makes it possible to pre-assemble the seal on the bolts.

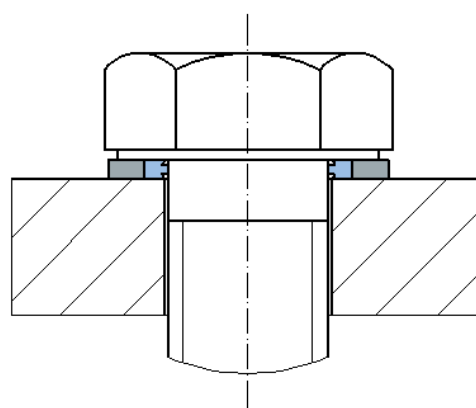


Function

When the bolt connection is tightened, the sealing bead is pressed in the axial direction. The maximum extent of the pressing is defined and limited by the thickness of the metal disc. As the internal pressure rises, the contact pressure of the resilient sealing material on the sealing surfaces increases even more. The centring diaphragm on the inner diameter ensures that the seal is centred in relation to the screw.



Loose screw connection



Tightened screw connection

Advantages

- Self-centring version
- Captive component pre-assembly possible
- Simple, cost-effective sealing element
- Easy to assemble
- Automatic assembly possible
- Defined compression of the seal
- Wide range of uses with various tools
- Good sealing effect at low and high pressures
- Available for metric and BSP threads
- Suitable for many common bolt connections
- Captive pre-assembly

Applications

Static sealing of screw connections, e.g.:

- machinery
 - tank and apparatus construction
 - screw connections
 - flange seals
 - engines
- and much more

Materials / Operating parameters

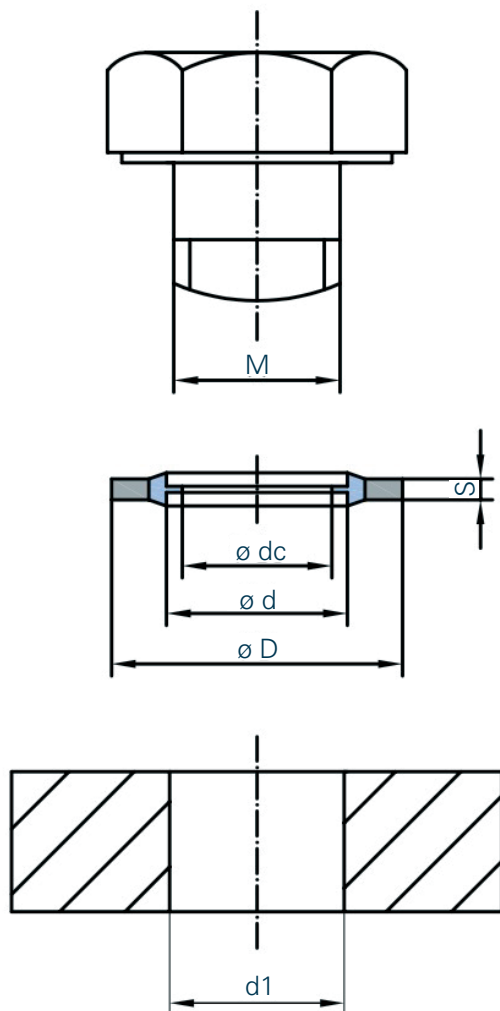
Standard elastomers:

NBR 70	Black	(-30 to +100°C)
FKM 70	Brown	(-15 to +200°C)

Standard steel material: JIS G3141 SPCC, zinc-chromated
Equivalent to 1.0330 (AISI 1008)

Other elastomer materials or stainless steel (1.4301 / AISI 304) variants are available on request.

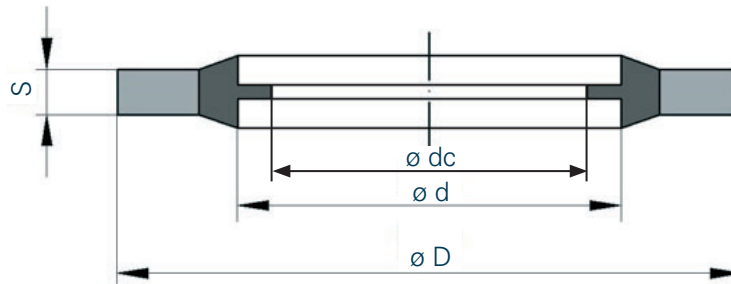
Installation space and design recommendations



Surface properties of the mating surface:

Ra $\leq 3.2 \mu\text{m}$
Rmax $\leq 15 \mu\text{m}$

BS-11



Metric thread	BSP	ØD	Ød	Ødc ID with centring	s
		9	5.7		1
M5		10	5.7	4.45	1
M6		10	6.7	5.6	1
M8		14	8.7	6.4	1
M8		13	8.7	6.4	1
	1/8	15.88	10.37	8.26	2.03
	1/8	15.88	10.37	8.26	2
M10		16	10.7	8.05	1.5
M10		18	10.7	8.05	1.5
		19	12.7	9.73	1.5
M12		18	12.7	9.73	1.5
M12		20	12.7	9.73	1.5
	1/4	20.57	13.74	11.18	2.03
	1/4	20.57	13.74	11.18	2
M14		22	14.7	11.38	1.5
	5/8	25.4	16.51	12.9	2.03
	5/8	25.4	16.51	12.9	2
M16		24	16.7	13.41	1.5
	3/8	23.8	17.28	14.76	2.03
	3/8	23.8	17.28	14.76	2
	1 1/16	25.4	18.16	14.5	2.34
	1 1/16	25.4	18.16	14.5	2.4
M18		26	18.7	14.76	1.5
		28	20.7		1.5
	1/2	28.58	21.54	18.24	2.34
	1/2	28.58	21.54	18.24	2.47
M22		30	22.7	18.74	2
	5/8	31.75	23.49	20.27	2.34
	5/8	31.75	23.49	20.27	2.47
M24		32	24.7	20.11	2
		35	26.7		2
	3/4	34.93	27.05	23.83	2.34
	3/4	34.93	27.05	23.83	2.47

Metric thread	BSP	ØD	Ød	Ødc ID with centring	s
		36	27.7		2
		39	30.7		2
	7/8	38.1	30.81	27.51	2.34
	7/8	38.1	30.81	27.51	2.47
		42	33.7		2
	1	42.8	33.89	29.92	3.25
	1	42.8	33.89	29.92	3.4
		46	36.7		2
	1 ¼	52.38	42.93	38.45	3.25
	1 ¼	52.38	42.93	38.45	3.4
	1 ½	58.6	48.44	44.45	3.2
	1 ½	58.6	48.44	44.45	3.4
	1 ¾	69.85	54.89	50.42	3.25
	1 ¾	69.85	54.89	50.42	3.4
	2	73.03	60.58	56.26	3.25
	2 ¼	79.5	66.68	62.36	3.25
	2 ½	90.17	76.08	71.5	3.25