

BACK-UP RING STANDRD SIZE (AS)

4.65 mm			5.99 mm			Other dimensions (mm)			
Dimensions		(M)	Dimensions		(M)	No.	R(mm)	No.	T(mm)
Type	M	Tolerance	Type	M	Tolerance				
8-359	146.76		8-425	115.60		004-050	2.21	004-050	1.24
8-360	149.68	+/-0.78%	8-426	118.77		102-178	3.28	102-178	1.35
8-361	152.86		8-427	121.95		201-284	4.42	201-284	1.27
8-362	159.21		8-428	125.20		309-395	6.65	309-395	1.93
8-363	165.56		8-429	128.30		425-475	8.74	425-475	2.97
8-364	171.91		8-430	131.47					
8-365	178.26		8-431	134.65	+/-0.78%				
8-366	184.86		8-432	137.82					
8-367	191.21		8-433	141.00					
8-368	197.56		8-434	144.17					
8-369	203.91		8-435	147.35					
8-370	210.26		8-436	150.52					
8-371	216.61	+/-0.74%	8-437	153.70					
8-372	222.96		8-438	159.36					
8-373	229.31		8-439	165.71					
8-374	235.66		8-440	172.06					
8-375	242.01		8-441	178.41					
8-376	248.36		8-442	184.76					
8-377	254.71		8-443	191.11					
8-378	267.41		8-444	197.46					
8-379	280.11		8-445	203.81					
8-380	292.81		8-446	216.51					
8-381	305.51		8-447	229.21					
8-382	330.91		8-448	241.91					
8-383	356.31		8-449	254.61					
8-384	381.71		8-450	267.31					
8-385	406.60		8-451	280.01					
8-386	432.00		8-452	292.71					
8-387	457.4	+/-0.67%	8-453	305.41					
8-388	482.75		8-454	318.11					
8-389	508.15		8-455	330.81					
8-390	533.55		8-456	343.51					
8-391	558.95		8-457	356.21					
8-392	584.02		8-458	368.91					
8-393	609.42		8-459	381.61					
8-394	634.82		8-460	394.31					
8-395	660.22		8-461	406.50					
			8-462	419.20					
			8-463	431.90					
			8-464	444.60	+/-0.67%				
			8-465	457.30					
			8-466	470.00					
			8-467	482.70					
			8-468	495.40					
			8-469	508.10					
			8-470	533.50					
			8-471	558.90					
			8-472	584.30					
			8-473	609.70					
			8-474	635.10					
			8-475	660.50					

Bonded Seals

The Bonded Seal was originally designed to replace copper type washers in high-pressure systems.

Often used as bolt seals in hydraulic equipments, today bonded seals are finding usage in many and varied application throughout industries. The Bonded Seal comprises a metal washer and an elastomeric ring bonded inside the diameter. The metal washer prevents over-compression and limits deformation of the elastomeric ring.

Bonded Seals

Bonded Seals
(Centralising Lip)

Advantages

- Reliable low and high pressure sealing
- High and low temperature capabilities
- Bolt torque is reduced with no loss of tightening load

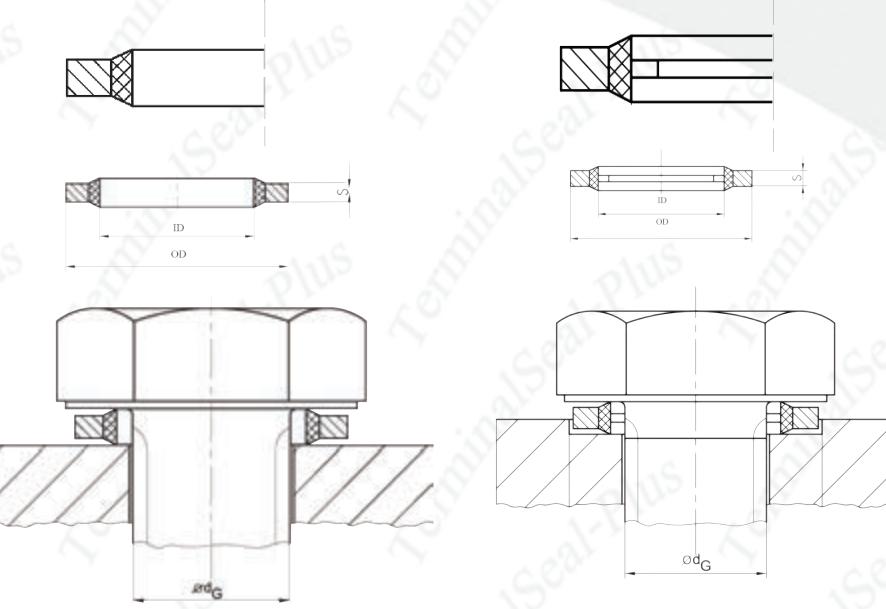


Materials

1. Elastomer component : available in NBR 70 (standard) and (special order materials)
NBR 90, FKM (viton ®) 70 & 75 Shore A, EPDM 75 Shore A , HNBR and FVMQ
2. Washer component : standard carbon steel, and (special on request)
stainless steel AISI 304, AISI 316 and AISI 316Ti
3. Surface Protection : Zinc Plated

Bonded Seals

Bonded Seals (Centralising Lip)

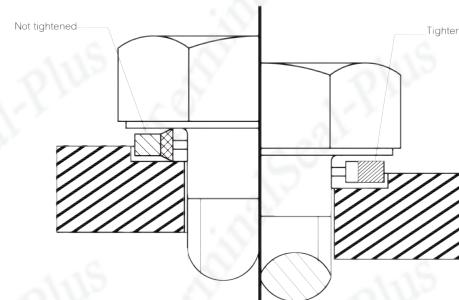


Bonded Seals

Height Tolerance (S)

1 \pm 0.1
1.2 \pm 0.1
1.5 \pm 0.1
2 \pm 0.1
2.3 \pm 0.15
2.5 \pm 0.15
3 \pm 0.15
3.2 \pm 0.15
3.5 \pm 0.15

Bonded Seals (Not Tightened vs Tightened)



Metric Thread Size	Inside Diameter	Outside Diameter	Metal thickness	Spot face diameter	Clearance hole diameter
	ID	OD	t	d3 H13	d4
M2.5	3,10	6,40	1,00	6,70	2,70
M2.5	3,10	6,40	1,30	6,70	2,70
M3	3,60	7,50	1,00	7,63	3,20
M3	4,10	7,00	1,00	7,30	3,20
M3 (M3.5)	4,10	7,20	1,00	7,50 (7,35)	3,20 (3,70)
M4	4,50	7,00	1,00	7,35 (7,15)	4,20
M4	4,60	9,00	1,00	9,30 (9,13)	4,30 (4,20)
M4	4,90	8,60	1,00	8,90	4,30
M5	5,60	10,00	1,00	10,13	5,20
M5	5,70	9,00	1,00	9,30 (9,15)	5,30 (5,20)
M5	5,70	9,20	1,00	9,50	5,30
M5	5,70	10,00	1,00	10,30 (10,15)	5,30 (5,20)
M5 (M5.5)	6,20	9,20	1,00	9,50 (9,35)	5,30 (5,70)
M6	6,60	11,00	1,00	11,13	6,20
M6	6,70	10,00	1,00	10,30 (10,15)	6,40 (6,20)
M6	6,70	11,00	1,00	11,30 (11,15)	6,40 (6,20)
M6	6,70	11,00	2,50	11,35 (11,15)	6,40 (6,20)
M6	6,85	13,27	1,30	13,40	6,20
M6	6,90	13,20	1,30	13,50	6,40
M6	7,00	11,40	1,00	11,53	6,20
M6	7,00	13,40	1,30	13,70	6,40
M6 (M6.5)	7,10	12,00	1,00	12,30 (12,15)	6,40 (6,70)
M6 (M6.7)	7,30	10,20	1,00	10,50 (10,35)	6,40 (6,90)
M6 (M8)	8,50	13,40	1,00	13,70 (13,55)	6,40 (8,20)

Metric Thread Size	Inside Diameter	Outside Diameter	Metal thickness	Spot face diameter	Clearance hole diameter
M8	8,60	13,00	1,00	13,13	8,20
M8	8,70	13,00	1,00	13,30 (13,15)	8,40 (8,20)
M8	8,70	14,00	1,00	14,30 (14,15)	8,40 (8,20)
M8	8,70	14,20	1,30	14,50	8,40
M8	8,70	16,00	1,00	16,30 (16,15)	8,40 (8,20)
M8 (M8.5)	9,30	13,30	1,00	13,60 (13,45)	8,40 (8,70)
M10	10,35	16,00	2,00	16,17	9,95
M8 (M10)	10,70	16,00	1,50	16,30 (16,15)	8,40 (10,20)
M10	10,70	17,00	1,50	17,13	10,20
M8 (M10)	10,70	18,00	1,50	18,30 (18,15)	8,40 (10,20)
M10 (M11)	11,40	16,30	1,50	16,60 (16,45)	10,50 (11,20)
M11	11,80	18,10	1,50	18,23	11,20
M10 (M11)	11,80	18,50	1,50	18,80 (18,65)	10,50 (11,20)
M10 (M11)	11,80	19,10	1,50	19,40 (19,25)	10,50 (11,20)
M10 (M12)	12,70	18,00	1,50	18,30 (18,15)	10,50 (12,20)
M12	12,70	19,00	1,50	19,13	12,20
M10 (M12)	12,70	20,00	1,50	20,30 (20,15)	10,50 (12,20)
M12 (M13)	13,70	20,00	1,50	20,30 (20,15)	13,00 (13,20)
M12	13,70	20,60	2,10	20,90	13,00
M12 (M13)	13,70	22,00	1,50	22,30 (22,15)	13,00 (13,20)
M12	13,70	22,20	1,59	22,50	13,00
M13	13,80	20,10	1,50	20,23	13,20
M12 (M13.5)	14,00	18,70	1,50	19,00 (18,85)	13,00 (13,70)
M14	14,70	21,00	1,50	21,13	14,20
M12 (M14)	14,70	22,00	1,50	22,30 (22,15)	13,00 (14,20)
M12	14,90	22,30	2,10	22,60	13,00
M14 (M15)	16,00	22,70	1,50	23,00 (22,85)	15,00 (15,20)
M14	16,50	25,50	2,10	25,80	15,00
M16	16,70	23,00	1,50	23,13	16,20
M14 (M16)	16,70	24,00	1,50	24,30 (24,15)	15,00 (16,20)

Metric Thread Size	Inside Diameter	Outside Diameter	Metal thickness	Spot face diameter	Clearance hole diameter
M16.5	17,20	23,90	2,10	24,03	16,70
M17	17,40	23,70	1,50	23,83	17,20
M14 (M17)	17,40	24,00	1,50	24,30 (24,15)	15,00 (17,20)
M14	17,40	24,00	2,00	24,30	15,00
M16 (M17.5)	18,00	24,70	1,50	25,00 (24,85)	17,00 (17,70)
M16	18,20	25,40	2,50	25,70	17,00
M16 (M18)	18,70	26,00	1,50	26,30 (26,15)	17,00 (18,20)
M18	18,70	27,00	2,00	27,13	18,20
M18 (M20)	20,70	28,00	1,50	28,30 (28,15)	19,00 (20,20)
M20	20,70	29,00	2,00	29,13	20,20
M18 (M21)	21,50	28,70	2,50	29,00 (28,85)	19,00 (21,20)
M21	21,70	30,00	2,00	30,13	21,20
M20 (M22)	22,50	28,00	1,50	28,30 (28,15)	21,00 (22,20)
M20 (M22)	22,70	30,00	2,00	30,30 (30,15)	21,00 (22,20)
M20 (M22)	22,70	30,00	3,00	30,30 (30,15)	21,00 (22,20)
M20 (M22)	22,70	31,00	2,00	31,13	22,20
M23	23,70	32,00	2,00	32,13	23,20
M20 (M24)	24,70	32,00	2,00	32,30 (32,15)	21,00 (24,20)
M24	24,70	33,00	2,00	33,13	24,20
M22	26,70	35,00	2,00	35,30	23,00
M24	27,00	35,00	2,50	35,30	25,00
M26	27,00	35,30	2,00	35,43	26,20
M24 (M27)	27,20	36,00	2,00	36,30 (36,15)	25,00 (27,20)
M27	27,70	36,00	2,00	36,13	27,20
M28	28,60	36,00	2,00	36,13	28,20
M24	28,70	37,00	2,00	37,30	25,00
M28.5	29,20	37,50	2,00	37,63	28,70
M30	30,70	39,00	2,00	39,13	30,20
M27 (M30)	31,00	39,00	2,00	39,30 (39,15)	28,00 (30,20)
M27 (M33)	33,70	42,00	2,00	42,30 (42,15; 42,13)	28,00 (33,20)
M27 (M33)	33,70	42,00	2,00	42,30 (42,15; 42,13)	28,00 (33,20)
M27	33,90	42,80	3,25	43,10	28,00
M27	33,90	42,90	3,40	43,20	28,00
M30 (M33)	34,30	43,00	2,00	43,30 (43,15)	31,00 (33,20)
M30 (M36)	36,70	46,00	2,00	46,30 (46,15)	31,00 (36,20)
M36	37,00	48,00	2,50	48,13	36,20
M36 (M39)	40,00	51,00	2,50	51,30 (51,15)	37,00 (39,20)
M39	40,00	51,00	2,50	51,13	39,20
M36 (M42)	42,70	53,00	3,00	53,30 (53,15)	37,00 (42,20)
M42	43,00	54,00	2,50	54,13	42,20
M45	46,00	57,00	2,50	57,13	45,20
M36 (M48)	48,70	59,00	3,00	59,30 (59,15)	37,00 (48,20)
M48	49,00	60,00	2,50	60,13	48,20
M42	51,70	63,50	3,25	63,80	43,00
M42 (M51)	52,00	60,00	3,00	60,30 (60,15)	43,00 (51,20)
M48 (M52)	53,30	64,50	3,00	64,80 (64,65)	50,00 (52,20)
M48 (M60)	60,70	73,00	3,00	73,30 (73,15)	50,00 (60,20)
M68	68,60	79,50	3,50	79,65	68,20
M75	76,10	90,30	3,38	90,45	75,20
M64	76,10	90,30	3,40	90,60	66,00
M88	89,09	101,48	3,25	101,63	88,20
M125	127,00	143,67	5,00	143,82	125,20

for BA/BS..../UN.. Inch thread size	BSP thread	Inside Diameter	Outside Diameter	Metal thick- ness	Spot face diameter	Clearance hole diameter
		ID	OD	t	d3 H13	d4
6BA		3,05	6,35	1,22	6,48	2,79
1/8		3,70	8,05	1,04	8,30	3,50
9/64		4,00	8,38	1,04	8,70	3,90
4BA		4,12	7,26	1,22	7,39	3,60
5/32		4,70	9,29	1,04	9,60	4,50
2BA		5,21	8,38	1,22	8,51	4,69
3/16		5,60	10,79	1,37	11,10	5,40
7/32		6,20	11,55	1,37	11,90	6,00
1/4		6,86	13,21	1,22	13,34	6,34
1/4		6,99	13,34	1,22	13,47	6,35
1/4		7,10	13,18	1,37	13,50	7,00
5/16		8,31	13,34	1,22	13,47	7,93
5/16		8,64	14,22	1,22	14,35	7,94
5/16		8,70	15,16	1,37	15,50	8,50
3/8		10,30	17,52	1,37	17,80	10,20
3/8	1/8	10,37	15,88	2,00	16,01	9,53
40		11,26	18,36	2,00	18,49	10,16
7/16		11,69	19,05	2,00	19,18	11,11
7/16		11,90	19,53	1,90	19,80	11,70
1/2		13,70	22,30	1,90	22,50	13,50
1/2	1/4	13,74	20,57	2,00	20,70	12,70
9/16		14,86	22,23	2,00	22,36	14,28
9/16		15,30	24,68	1,90	25,00	15,00
60		15,83	22,23	2,00	22,36	15,23
5/8		16,52	25,40	2,00	25,53	15,88
5/8		16,90	27,05	1,90	27,30	16,80
	3/8	17,28	23,80	2,00	23,93	16,64
11/16		18,16	25,40	2,34	25,53	17,46
11/16		18,50	29,43	2,28	29,70	18,20
3/4		19,69	26,92	2,34	27,05	19,05
3/4		20,30	32,23	2,28	32,50	20,00
13/16	1/2	21,54	28,58	2,34	28,71	20,64
13/16		21,90	34,59	2,28	34,90	21,50
7/8	5/8	23,49	31,75	2,34	31,88	22,23
7/8		23,50	36,98	2,28	37,30	23,20
15/16		24,26	33,27	2,34	33,40	23,80
15/16		25,10	38,96	2,28	39,30	24,80
1		26,70	42,13	2,28	42,40	26,50
1	3/4	27,05	34,93	2,34	35,06	25,41
1 1/16		27,82	38,61	2,34	38,74	27,00
1 1/8		29,33	36,58	2,34	36,71	28,57
1 1/8		29,80	46,91	2,28	47,30	29,50
1 3/16	7/8	30,81	38,10	2,34	38,23	30,15
1 1/4		32,64	41,40	3,25	41,53	31,74
1 1/4		33,00	51,28	3,40	51,40	32,80
15/16	1	33,89	42,80	2,34	42,93	33,33
15/16	1	33,89	42,80	3,25	42,93	33,33
1 3/8		35,94	44,45	3,25	44,58	34,92
1 1/2		38,96	47,75	3,25	47,88	38,10
1 1/2		39,50	58,93	3,40	58,30	39,00
1 5/8	1 1/4	42,93	52,38	3,25	52,51	41,29

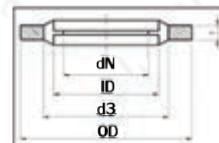
Bonded Seals (Not Tightened vs Tightened)

for BA/BS./UN.. Inch thread size	BSP thread	Inside Diameter	Outside Diameter	Metal thick- ness	Spot face diameter	Clearance hole diameter
1 3/4		45,34	57,15	3,25	57,28	44,44
1 7/8	1 1/2	48,44	58,60	3,25	58,73	47,64
2		51,69	63,50	3,25	63,63	50,79
2 1/8	1 3/4	54,89	69,85	3,25	69,98	53,99
2 1/4		58,04	70,36	3,25	70,49	57,14
	2	60,58	73,03	3,25	73,16	59,62
2 1/2		64,39	77,72	3,25	77,85	63,49
	2 1/4	66,68	79,50	3,25	79,63	65,50
	2 1/2	76,08	90,17	3,25	90,30	75,18

GM500 Deliverable Dimensions for pipe joints and couplings to ISO 1179 (CETOP RP.CH)

for BSP thread size	Inside Diameter	Outside Diameter	Metal thick- ness	Spot face diameter
	ID +0,2	OD -0,2	t ± 0,15	d3 +0,4
1/16	8,30	12,70	1,25	13
1/8	10,40	14,70	1,25	15
1/4	13,85	18,70	1,25	19
3/8	17,35	22,70	1,25	23
1/2	21,65	26,70	1,25	27
3/4	27,30	32,50	1,25	33
1	34,20	39,50	2,00	40
1 1/4	42,80	49,50	2,00	50
1 1/2	48,70	55,50	2,00	56
2	60,50	68,50	2,00	69

Bonded Seals (Self Centralising Lip)



GM 500 Dimensional series: metric series, self Centralizing Lip

for Metric Thread size	Inside Diameter	Outer Diameter	Metal thickness	Metal washer ID	ID between self centering seal
	ID	OD	t	d3	dN
M4	4,50	7,00	1,00	5,40	3,30
M5	5,70	10,00	1,00	7,40	4,45
M6	6,70	10,00	1,00	8,00	5,60
M8	8,70	14,00	1,00	10,40	6,40
M10	10,70	16,00	1,50	12,40	8,05
M12	12,70	19,00	1,50	14,10	9,73
M14	14,70	22,00	1,50	16,40	11,38
M16	16,70	24,00	1,50	18,40	13,41
M18	18,70	26,00	1,50	20,40	14,76
M20	20,70	28,00	1,50	22,50	16,76
M22	22,70	30,00	2,00	24,40	18,74
M24	24,70	32,00	2,00	26,40	20,11

Dimensional series: BSP, self Centralizing Lip

for BSP thread size	Inside Diameter	Outer Diameter	Metal thickness	Metal washer ID	ID between self centering seal
	ID	OD	t	d3	dN
BSP 1/8	10,37	15,88	2,00	11,84	8,26
BSP 1/4	13,74	20,57	2,00	15,21	11,18
BSP 5/8	16,51	25,40	2,00	18,75	12,90
BSP 3/8	17,28	23,80	2,00	18,75	14,76
BSP 11/16	18,16	25,40	2,40	19,69	14,50
BSP 1/2	21,54	28,58	2,47	23,01	18,24
BSP 5/8	27,05	34,93	2,47	28,53	23,83
BSP 3/4	27,05	34,93	2,47	28,53	23,83
BSP 7/8	30,81	38,10	2,47	32,29	27,51
BSP 1	33,89	42,80	3,40	36,88	29,92
BSP 1 1/4	42,93	52,38	3,40	45,93	38,45
BSP 1 1/2	48,44	58,60	3,40	51,39	44,45
BSP 1 3/4	54,89	69,85	3,40	58,30	50,42
BSP 2	60,58	73,03	3,40	63,63	56,26
BSP 2 1/4	66,68	79,50	3,40	69,98	62,36
BSP 2 1/2	76,08	90,17	3,40	79,38	71,50