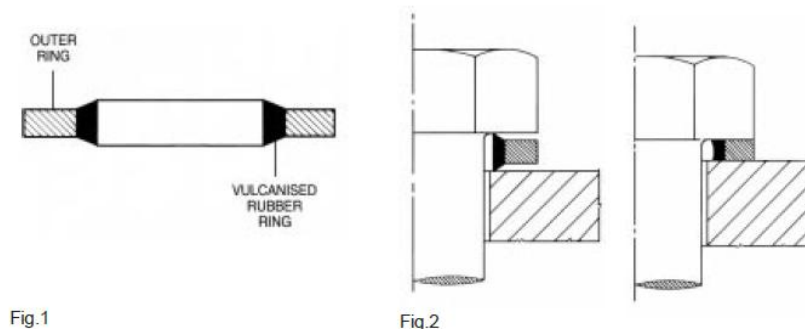


A bonded seal consists of a metal washer with a vulcanized elastomer sealing element bonded to its inner diameter. The metal washer provides mechanical support and limits deformation of the elastomer under compression and pressure. Both the washer material and the elastomer compound can be selected to suit a given application. (Fig.1)



Function

When the joint is tightened, the elastomer sealing element is compressed between the metal washer and the mating surfaces, creating a reliable static seal. The metal washer controls elastomer deformation and provides mechanical support under pressure.

Design Variants

0xx Series - Standard Bonded Seal: Standard bonded seal with a vulcanized elastomer sealing element.

8xx Series - Self-Centring Bonded Seal: Incorporates an additional elastomer centring membrane to assist positioning during assembly.

Material

Component	Material / specification
Metal washer	Zinc-plated carbon steel
Metal washer	Stainless steel
Elastomer	NBR
Elastomer	FKM
Elastomer	HNBR
Elastomer	EPDM

Material combinations and compound specifications depend on product type, size and application. Compound-specific material data and test documentation are available on request.

Burst Pressures

Burst pressure values shown in the dimensional tables are reference values associated with the specified seal design and material configuration. Actual pressure capability depends on the complete joint design, materials, dimensions, mating surfaces and installation conditions.

Dimensions

Dimensions and tolerances are shown in the relevant product tables. Please contact STEMA for confirmation of dimensions and tolerances for critical applications.

Recommended Counter Surface

$R_a \leq 3.2 \mu\text{m}$ | $R_{\text{max}} \leq 15 \mu\text{m}$

Specials

Additional sizes, materials and special configurations may be available on request. Please contact STEMA with your application requirements.

NITRILE RUBBER (NBR)

Compound Ref.: NB01987A

Hardness Range: 85 $\pm$ 5 Shore A

Specification: ASTM D2000 M6BG910A14B14EO14EO34Z

NB01987A is a nitrile rubber compound with documented fluid-resistance testing including IRM 901, IRM 903, distilled water and reference fuels.

PHYSICAL PROPERTIES

Hardness: 86 Shore A

Tensile Strength: 2360 psi

Elongation at Break: 198%

Tear Resistance: 47.2 kgf/cm

Modulus at 100%: 1422 psi

Specific Gravity: 1.317

Compression Set: 11% after 22 h at 100°C

Fluid resistance testing has been performed according to ASTM D471 using IRM 901, IRM 903, distilled water, Reference Fuel A and Reference Fuel B.

FLUOROCARBON RUBBER (FKM)

Compound Ref.: KF16973A

Hardness Range: 75 $\pm$ 5 Shore A

Specification: ASTM D2000 M2HK710A1-10B37B38EF31EO78Z

KF16973A is a fluorocarbon rubber compound with documented high-temperature, compression set and fluid resistance properties.

PHYSICAL PROPERTIES

Hardness: 76 Shore A

Tensile Strength: 1942 psi

Elongation at Break: 248%

Tear Resistance: 32 kgf/cm

Modulus at 100%: 872 psi

Modulus at 200%: 1701 psi

Specific Gravity: 2.168

Compression Set: 15% after 22 h at 175°C

Compression Set: 17% after 22 h at 200°C

Heat resistance has been tested according to ASTM D573 for 70 h at 250°C. Fluid resistance testing has been performed according to ASTM D471.

HYDROGENATED NITRILE RUBBER (HNBR)

Compound Ref.: CHR-HN-002

CHR-HN-002 is a hydrogenated nitrile rubber compound with documented mechanical, high-temperature and Rapid Gas Decompression (RGD) performance.

PHYSICAL PROPERTIES

Hardness: 88.9 Shore A
Tensile Strength: 4748 psi
Elongation at Break: 171%
Tear Resistance: 59.0 kgf/cm
Specific Gravity: 1.280
Compression Set: 14% after 22 h at 150°C
Low-Temperature Resistance: Tested at -40°C

The compound has been independently tested for Rapid Gas Decompression resistance according to ISO 23936-2:2011 Annex B.

RGD test conditions: 90 mol% CH₄ / 10 mol% CO₂, 150 bar, 100°C and eight decompression cycles. The tested CHR-HN-002 specimens achieved PASS with ISO section ratings of 0000.

Note: The RGD test was performed on CHR-HN-002 O-ring specimens. The result therefore demonstrates the RGD resistance of the elastomer compound under the stated test conditions and should not be interpreted as qualification of every complete bonded seal assembly.

ETHYLENE PROPYLENE DIENE RUBBER (EPDM)

Compound Ref.: EP00172A
Hardness Range: 65–75 Shore A
Specification: ASTM D2000 M2AA708A13B13C12EA14F17

EP00172A is an EPDM compound with documented heat ageing, water resistance, compression set, ozone resistance and low-temperature performance.

PHYSICAL PROPERTIES

Hardness: 72.4 Shore A
Tensile Strength: 1634 psi
Elongation at Break: 258%
Tear Resistance: 33.7 kgf/cm
Specific Gravity: 1.177
Compression Set: 10% after 22 h at 70°C
Ozone Resistance: PASS according to ASTM D1149
Low-Temperature Resistance: PASS at -40°C according to ASTM D2137

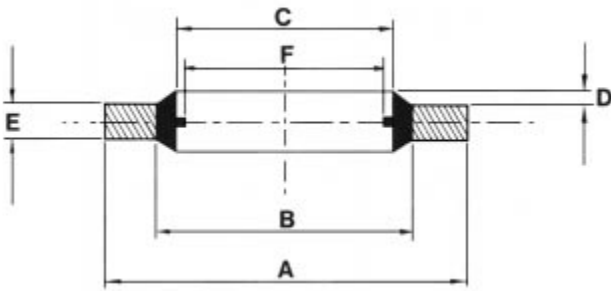
Heat resistance has been tested according to ASTM D573 at 70°C, 100°C and 125°C. Water resistance has been tested using distilled water according to ASTM D471.

TECHNICAL NOTE

The properties stated above apply to the specific compounds referenced. Material performance may vary depending on the actual compound, medium, temperature, pressure and application conditions. Compound-specific test reports and material documentation are available on request.

Self-Centring Bonded Seals

BSP Series



Advantages

- Improved seal positioning
- Reduced risk of seal offset
- Easier installation
- Reduced assembly time
- Captive positioning during assembly



The self-centring design incorporates an elastomer centring membrane that locates the seal concentrically within the thread undercut. This helps maintain correct seal position during assembly and reduces the risk of misalignment.

Designed for applications where a thread undercut is present.

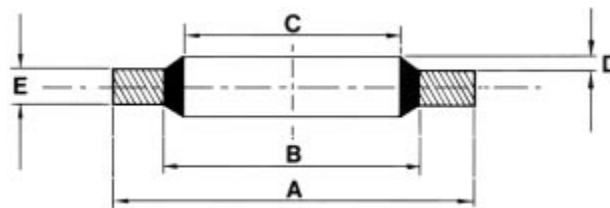
Ref.	BSP	Bolt	A +0.13 -0.00	B ±0.10	C +0.10 -0.00	D	E	F +0.00 -0.20	Minimum Burst Pressure (bar)
820	1/8	3/8	15.88	11.84	10.37			8.56	1500
821	1/4	1/2	20.57	15.21	13.74		2.03	11.45	1550
823	3/8	-	23.80	18.75	17.28		2.18	14.96	1260
825	1/2	13/16	28.58	23.01	21.54	0.35		18.64	1150
826	5/8	7/8	31.75	24.97	23.49	0.51	2.34	20.60	1250
827	3/4	1	34.93	28.53	27.05		2.60	24.13	1060
829	7/8	1 3/16	38.10	32.29	30.81			27.89	900
830	1	1 5/16	42.80	36.88	33.89			30.30	790
832	1 1/4	1 5/8	52.38	45.93	42.93		3.25	38.96	690
833	1 1/2	1 7/8	58.60	51.39	48.44		3.51	44.86	690
836	2	-	73.03	63.63	60.58			56.67	700

All dimensions in mm.

Note: A permitted moulding flash line may be present on inner diameter 'C' in accordance with AGS 1186.

Imperial Bonded Seals

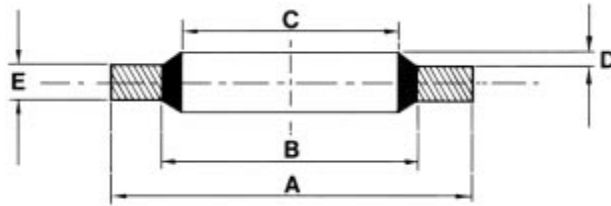
Dimensions



Ref.	BSP	Bolt	A +0.13 -0.00	B ±0.13	C ±0.13	D	E	Minimum Burst Pressure (bar)
001		6BA	6.35	4.09	3.05			2150
002		4BA	7.26	5.26	4.12			1570
003		2BA	8.38	6.35	5.21			1375
004		1/4	13.21	8.00	6.86	0.2/0.38	1.22/1.37	2450
005		1/4	13.34	9.53	6.99			1700
006		5/16	13.34	9.53	8.31			1700
007		5/16	14.22	10.04	8.64			1750
020	1/8	3/8	15.88	11.84	10.37			1500
008		0.4	18.36	12.45	11.26			1950
009		7/16	19.05	13.08	11.69			1900
021	1/4	1/2	20.57	15.21	13.74		2.03/2.18	1550
010		9/16	22.23	16.39	14.86			1575
022		0.6	22.23	17.30	15.83			1310
011		5/8	25.40	18.75	16.51			1550
023	3/8		23.80	18.75	17.28			1260
012		11/16	25.40	19.69	18.16			1320
024		3/4	26.92	21.21	19.69			1260
025	1/2	13/16	28.58	23.01	21.54			1150
026	5/8	7/8	31.75	24.97	23.49			1250
013		15/16	33.27	26.04	24.26	0.25/0.51	2.34/2.60	1275
027	3/4	1	34.93	28.53	27.05			1060
028		1 1/16	38.61	30.61	27.82			1250
014		1 1/8	36.58	30.86	29.33			900
029	7/8	1 3/16	38.10	32.29	30.81			900
015		1 1/4	41.40	35.69	32.64			810
030	1	1 5/16	42.80	36.88	33.89			790
031	1	1 5/16	42.80	36.88	33.89			810
016		1 3/8	44.45	38.99	35.94			700
017		1 1/2	47.75	42.04	38.96			700
032	1 1/4	1 5/8	52.38	45.93	42.93			690
018		1 3/4	57.15	48.39	45.34			875
033	1 1/2	1 7/8	58.60	51.39	48.44		3.25/3.51	690
019		2.0	63.50	54.74	51.69			780
034	1 3/4	2 1/8	69.85	58.30	54.89			950
035		2 1/4	70.36	61.09	58.04			760
036	2		73.03	63.63	60.58			700
037		2 1/2	77.72	67.44	64.39			770
038	2 1/4		79.50	69.98	66.68			690
039	2 1/2		90.17	79.38	76.08			700
079	3		101.47	92.84	89.09			530

All dimensions in mm.

Note: A permitted moulding flash line may be present on inner diameter 'C' in accordance with AGS 1186.



Thread Ref.	Size Ref.	A +0.13/-0.00	B ±0.13	C +0.10	D +0.25/-0.00	E	Minimum Burst Pressure (bar)
M4	202	7.00	5.40	4.5			1270
M5	203	9.00	6.80	5.70			1400
M5.5	205	9.2	7.20	6.20			1220
M6	206	10.00	8.00	6.70	0.30	0.90	1130
M6	207	11.00	8.20	6.70		1.10	1510
M8	212	13.00	10.00	8.70			1330
M8	213	14.00	10.40	8.70			1550
M10	217	16.00	12.40	10.70			1350
M10	218	18.00	12.40	10.70			1880
M11	221	19.10	13.50	11.80			1770
M12	222	18.00	14.40	12.70			1250
M12	223	20.00	14.00	12.70			1680
M13	225	22.00	15.40	13.70		1.40	1810
M14	227	22.00	16.40	14.70		1.60	1510
M16	229	24.00	18.40	16.70			1400
M17	230	24.00	19.20	17.40	0.40		1150
M17.5	231	24.70	20.10	18.00			1070
M18	232	26.00	20.40	18.70			1275
M20	233	28.00	22.50	20.70			1150
M21	234	28.70	23.30	21.50		2.35/2.65	1080
M22	236	30.00	24.40	22.70		1.90/2.10	1100
M24	238	32.00	26.40	24.70			1050
M26	239	35.00	28.40	26.70		1.90	1050
M27	240	36.00	29.00	27.20		2.10	1130
M33	243	42.00	35.80	33.70			900
M33	244	43.00	36.40	34.30			880
M42	247	53.00	44.00	42.70		2.85	940
M48	248	59.00	50.80	48.70		3.15	800

All dimensions in mm.

Note: A permitted moulding flash line may be present on inner diameter 'C' in accordance with AGS 1186.

French Metric Bonded Seals

Dimensions



Thread Ref.	Size Ref.	A +0.13/-0.00	B ±0.10	C +0.10	D +0.25/-0.00	E	Minimum Burst Pressure (bar)
M4	302	9	6.00	4.60			2000
M5	303	10	7.00	5.60		0.90	1780
M6	304	11	8.00	6.60		1.10	1680
M6	306	11.4	8.40	7.00	0.30		1540
M8	307	13	10.00	8.60			1330
M10	310	17	12.10	10.70			1730
M12	313	19	14.10	12.70		1.40	1530
M13	315	20.10	15.20	13.80	0.40	1.60	1440
M14	316	21	16.10	14.70			1370
M16	317	23	18.10	16.70	0.30		1240
M18	320	27	20.40	18.70			1450
M20	321	29	22.40	20.70			1340
M21	323	30	23.40	21.70			1290
M22	324	31	24.40	22.70		1.90	1240
M24	326	33	26.40	24.70		2.10	1160
M26	327	35.30	28.70	27.00			870
M27	328	36	29.40	27.70			1060
M28	329	36	30.30	28.60	0.40		730
M30	331	39	32.40	30.70			970
M33	332	42	35.40	33.70			900
M36	333	48	39.60	37.00			1010
M39	334	51	42.60	40.00			950
M42	335	54	45.60	43.00		2.40	890
M45	336	57	48.60	46.00		2.60	860
M48	337	60	51.60	49.00			790

Bonded Seals to Suit Pipe Connections and Couplings

BSPF Thread	Size Ref.	A -0.2	B +0.2	C +0.2	D +0.25/-0.00	E ±0.15	Minimum Burst Pressure (bar)
1/16	519	12.7	9.9	8.3			1100
1/8	510	14.7	12	10.4			930
1/4	511	18.7	15.75	13.85		1.25	793
3/8	512	22.7	19.25	17.35			775
1/2	513	26.7	23.55	21.65	0.25		586
3/4	514	32.5	29.2	27.3			500
1	515	39.5	36.1	34.2			414
1 1/4	516	49.5	44.7	42.8		2	500
1 1/2	517	55.5	50.6	48.7			434
2	518	68.5	62.4	60.5			448

All dimensions in mm.

Note: A permitted moulding flash line may be present on inner diameter 'C' in accordance with AGS 1186.