

Back-up Rings

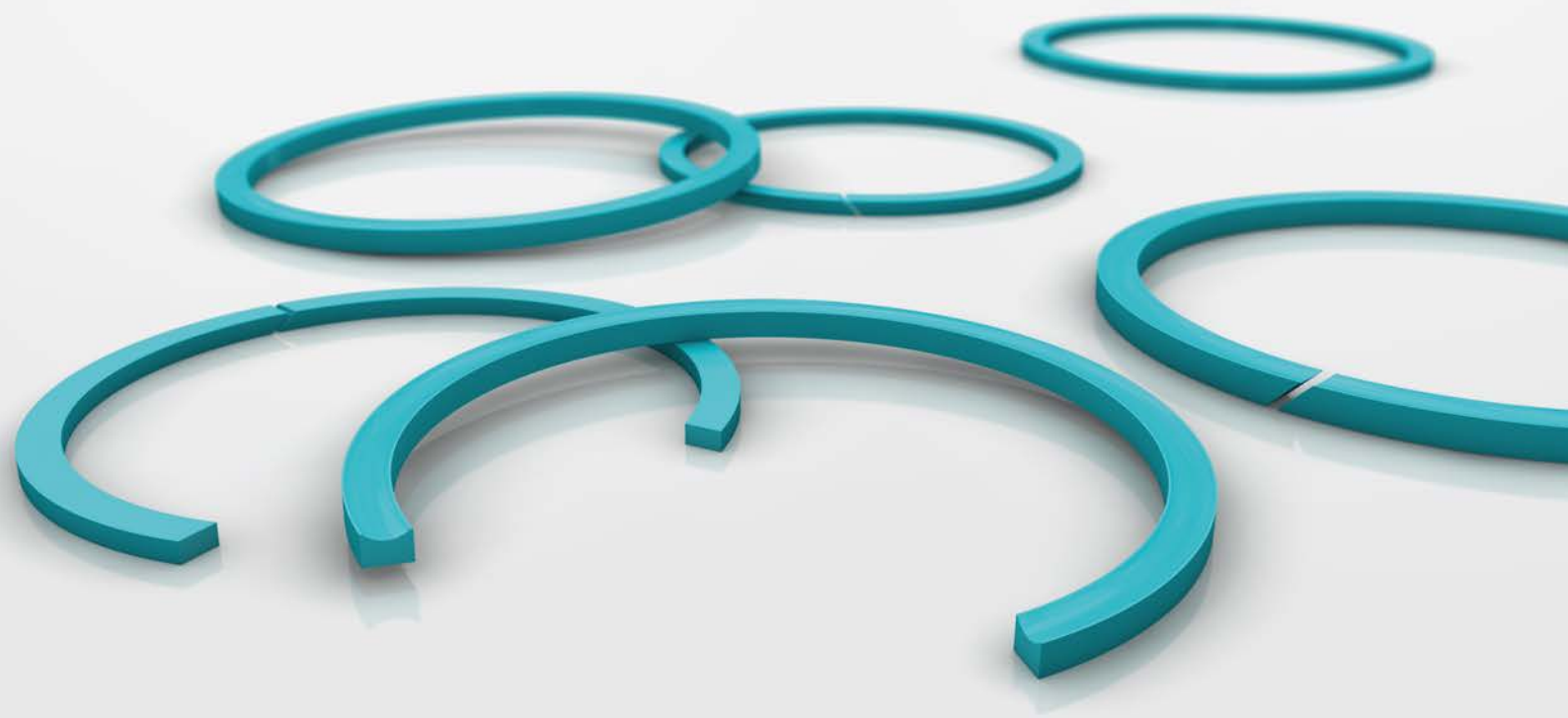


Protective and supporting
element

Static and dynamic applications, high pressure

Material:

PTFE, Elastomers and others



! This page is intentionally left blank.



■ E General Information

Back-up Rings have no intended sealing function. Instead, as their name indicates, they are protective and supporting elements made from extrusion-resistant materials which generally have a rectangular cross section. They are installed in a groove together with an elastomeric sealing element, preferably with a corresponding O-Ring in static applications.

Due to the tight fit of the Back-up Ring in the housing, they prevent extrusion of the pressurized elastomeric sealing element into the sealing gap.

APPLICATION EXAMPLES

- Injection molding machines
- Machine tools
- Presses
- Excavators
- Agricultural machines
- Valves for hydraulic circuits

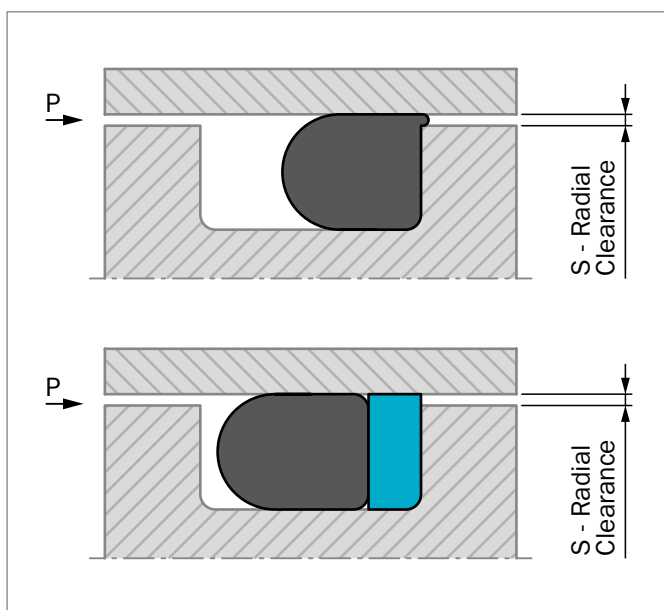


Figure 53: O-Ring installation with and without Back-up Ring

ADVANTAGES

- Use of O-Rings in high pressure applications
- Use of O-Ring materials with a low hardness
- Compensation of radial sealing gaps
- Use for internal and external sealing applications
- Reciprocating and rotating movements possible
- Compensation for large temperature fluctuations
- Static and dynamic applications



■ F Back-up Ring Types

■ F.1 Overview

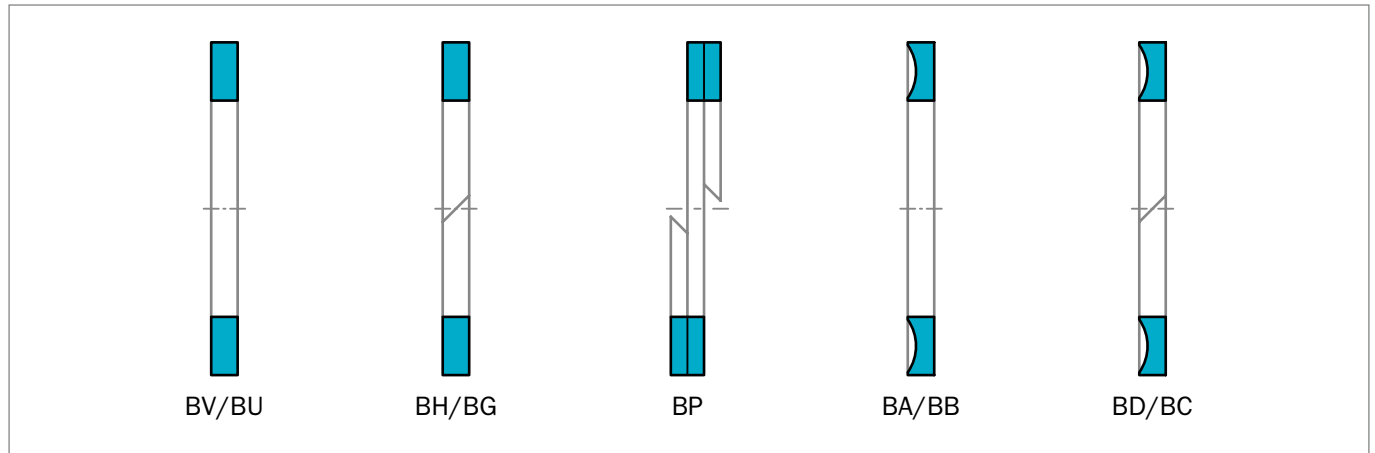


Figure 54: Back-up Ring types

External sealing (piston)

Type BV

- Rectangular, uncut, PTFE

Type BH

- Rectangular, cut, PTFE

Type BP

- Spiral, PTFE

Type BA

- Concave, uncut, PTFE

Type BB

- Concave, uncut, NBR + FKM

Type BD

- Concave, cut, PTFE

Internal sealing (rod)

Type BU

- Rectangular, uncut, PTFE

Type BG

- Rectangular, cut, PTFE

Type BP

- Spiral, PTFE

Type BB

- Concave, uncut, PTFE

Type BB

- Concave, uncut, NBR + FKM

Type BC

- Concave, cut, PTFE



■ F.2 Back-up Ring Types for External Sealing (Piston)

Back-up Ring types, uncut

Type BV

- Rectangular cross section
- Material: PTFE
- Static and dynamic use
- Reciprocating and rotating movements possible

Type BB

- Concave cross section
- Material: NBR, FKM
- The large contact surface protects the O-Ring against deformation in case of high pulsating pressures
- Dimensional stability of the O-Ring improves the sealing force and increases the service life
- Preferably for static use
- Reciprocating movements possible

Type BA

- Concave cross section
- Material: PTFE
- The large contact surface protects the O-Ring against deformation in case of high pulsating pressures
- Dimensional stability of the O-Ring improves the sealing force and increases the service life
- Static and dynamic use
- Reciprocating and rotating movements possible

Snap-back Back-up Ring, special Type

- Easy installation in closed grooves due to the snap-back effect of the material
- The dimensions are different compared to the standard Back-up Rings. Production only on request

Back-up Ring types, cut

Type BH

- Rectangular cross section
- Material: PTFE
- Cut angle of 30° or 45°
- Static and dynamic use
- Reciprocating and rotating movements possible
- Preferred for installations in a closed groove where uncut Back-up Rings are not suitable

Type BD

- Concave cross-section
- Material: PTFE
- Cut angle of 30° or 45°
- The large contact surface protects the O-Ring against deformation in case of high pulsating pressures
- Dimensional stability of the O-Ring improves the sealing force and increases the service life
- Static and dynamic use
- Reciprocating movements possible
- Preferred for installations in a closed groove where uncut Back-up Rings are not suitable

Back-up Ring types, spiral

Type BP

- Rectangular cross section
- Material: PTFE
- Cut angle of 30° or 45°
- Consists of standard two spiral windings which are cut at the ends at an angle
- Static and dynamic use
- For reciprocating movements only
- Preferred for installations in a closed groove where uncut Back-up Ring are not suitable
- Compensation of large temperature changes and tolerances through a screw-like elongation and contraction. Easy installation in closed grooves for external sealing applications
- The dimensions are different compared to standard Back-up Rings
- Recommended only if service diameter does not exceed 40 times the radial groove depth



■ F.3 Back-up Ring Types for Internal Sealing (Rod)

Back-up Ring types, uncut

Type BU

- Rectangular cross section
- Material: PTFE
- Static and dynamic use
- Reciprocating and rotating movements possible

Type BB

- Concave cross-section
- Material: PTFE, NBR, FKM
- The large contact surface protects the O-Ring against deformation in case of high pulsating pressures
- Dimensional stability of the O-Ring improves the sealing force and increases the service life
- Static and dynamic use
- Reciprocating movements possible

Back-up Ring types, cut

Type BG

- Rectangular cross section
- Material: PTFE
- Cut angle of 30° or 45°
- Static and dynamic use
- Reciprocating and rotating movement possible
- Preferred for installations in closed grooves where uncut Back-up Rings are not suitable

Type BC

- Concave cross-section
- Material: PTFE
- Cut angle of 30° or 45°
- The large contact surface protects the O-Ring against deformation in case of high pulsating pressures
- Dimensional stability of the O-Ring improves the sealing force and increases the service life
- Static and dynamic use
- Reciprocating movements possible
- Preferred for installations in a closed groove where uncut Back-up Rings are not suitable

Back-up Ring type, spiral

Type BP

- Rectangular cross section
- Material: PTFE
- Cut angle of 30° or 45°
- Consists of standard two spiral windings which are cut at the ends at an angle
- Static and dynamic use
- For reciprocating movements only
- Preferred for installations in a closed groove where uncut Back-up Rings are not suitable
- Compensation of large temperature changes and tolerances through a screw-like elongation and contraction
- Recommended only if service diameter does not exceed 40 times the radial groove depth



■ G Technical Information

■ G.1 Materials

Back-up Rings are manufactured from virgin PTFE as standard. In view of the unfavorable cold flow behavior of virgin PTFE, these Back-up Rings are only used for low to medium loads. For higher load requirements, filled PTFE materials (with glassfiber, bronze, carbon, etc.) have to be used. For sealing against high pressures, Back-up Rings made from specially modified thermoplastic materials are available.

For the series production of larger quantities, injection molded Back-up Rings can be manufactured, e.g. NBR 90 Shore A, FKM 90 Shore A, or thermoplastic elastomers (TPE) on request.

Table 71: Back-up Ring materials

Base material	Material code	Type					Dynamic application	
		BU/BV	BG/BH	BP	BB/BA	BC/BD	Pressure	
							MPa	psi
PTFE (virgin) - standard	PT00	•	•	•	•	•	25	3,626
PTFE - glassfibre-filled	PTGB	•	•	•	•	•	40	5,801
PTFE, carbon-filled	PTKC	•	•	•	•	•	40	5,801
PTFE, bronze-filled	PTB4	•	•	•	•	•	40	5,801
TPE-E	PR	•	•	-	•	•	30	4,351
NBR, 90 Shore A	N962N	-	-	-	•	-	20	2,901
FKM, 90 Shore A	V96E1	-	-	-	•	-	20	2,901

■ G.2 Technical Data

Static applications:	Up to approximately 250 MPa (36,259 psi) depending on the Back-up Ring material and sealing gap
Dynamic applications:	Reciprocating up to approximately 40 MPa (5,801 psi) Oscillating/slowly rotating up to approximately 15 MPa (2,176 psi)
Speed:	Reciprocating or rotating up to approximately 2 m/s (4.474 mph) depending on the material
Operating temperature:	-200 °C (-328 °F) up to +260 °C (+500 °F) depending on the material

IMPORTANT NOTE

The application limits for pressure and temperature given in this catalog are maximum values. During practical applications it should be remembered that due to the interaction of operating parameters, the maximum values must be set correspondingly lower.



■ G.3 Design Recommendations

The recommendations for O-Rings are generally valid for the use of Back-up Rings. This applies to the groove design, surface roughness, lead-in chamfers, etc.

When the pressure is applied from one side only, it is sufficient to install a Back-up Ring on the downstream side of the O-Ring. When the seal is exposed to pressure from both sides, two Back-up Rings - one on each side of the O-Ring - have to be used.

Permissible sealing gap

The use of Back-up Rings allows the service pressure and/or permissible radial clearance specified in this catalog, Part I: O-Ring, chapter B.2.7 Housing design and dimensions, to be increased.

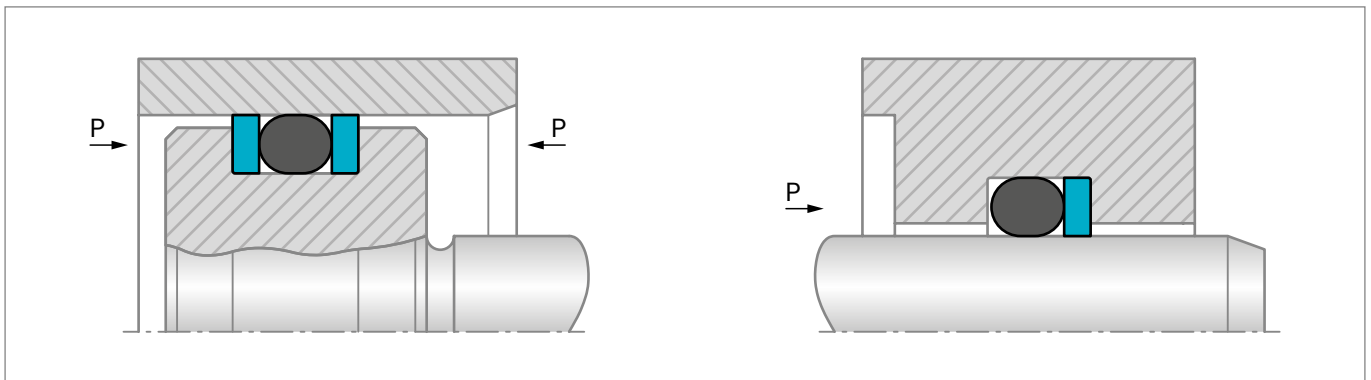


Figure 55: Back-up Ring installation, depending on the direction of the pressure



■ H Installation Recommendations and Back-up Ring Dimensions

■ H.1 External sealing (Piston), static and dynamic applications

H.1.1 RECTANGULAR BACK-UP RING TYPES, UNCUT (BV) AND CUT (BH), MATERIAL PTFE

The following figure and tables include installation recommendations and Back-up Ring dimensions for external sealing applications with the rectangular Back-up Ring types BV (uncut) and BH (cut).

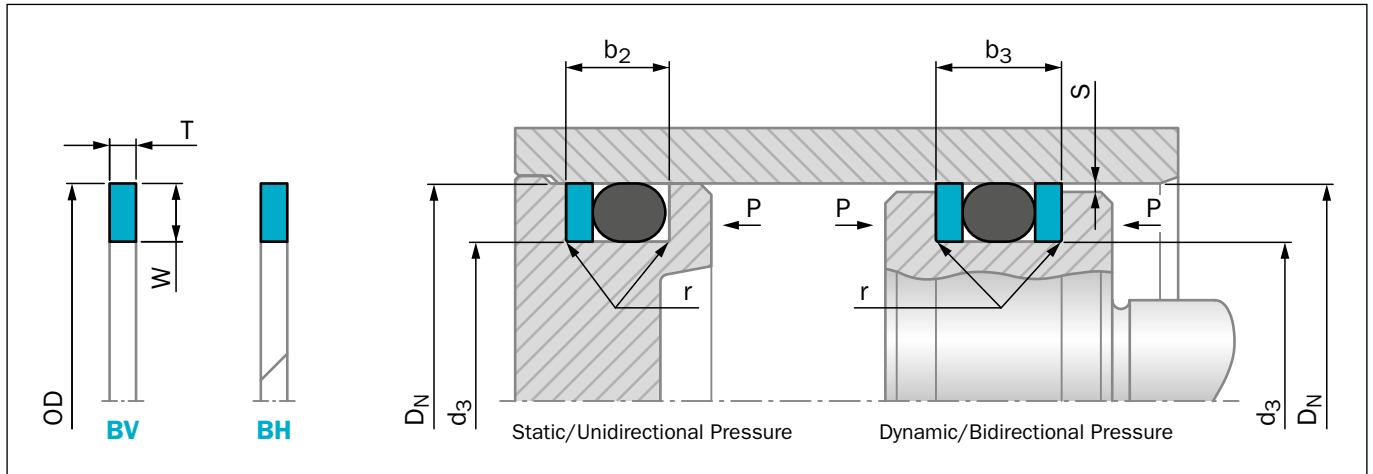


Figure 56: Installation drawing external sealing, rectangular Back-up Ring types

Table 72: Installation dimensions for rectangular Back-up Ring types, uncut and cut, External sealing, material PTFE – Metric

O-Ring Cross-Section- Ø d ₂	Back-up Ring Cross-Section			Groove dimensions				
	Radial height W		Thickness	Groove diameter d ₃ h9		Groove width		Radius
	Dynamic	Static	T	Dynamic	Static	b ₂ +0.25	b ₃ +0.25	r ±0.2
mm								
1.50	1.25	1.10	1.0	D _N - 2.5	D _N - 2.2	3.0	4.0	0.25
1.60	1.30	1.20	1.0	D _N - 2.6	D _N - 2.4	3.1	4.1	0.25
1.78	1.45	1.30	1.4	D _N - 2.9	D _N - 2.6	3.8	5.2	0.25
1.80	1.45	1.30	1.4	D _N - 2.9	D _N - 2.6	3.8	5.2	0.25
2.00	1.65	1.50	1.4	D _N - 3.3	D _N - 3.0	4.1	5.5	0.25
2.40	2.05	1.80	1.4	D _N - 4.1	D _N - 3.6	4.6	6.0	0.25
2.50	2.15	1.90	1.4	D _N - 4.3	D _N - 3.8	4.7	6.1	0.25
2.62	2.25	2.00	1.4	D _N - 4.5	D _N - 4.0	5.0	6.4	0.25
2.65	2.25	2.00	1.4	D _N - 4.5	D _N - 4.0	5.0	6.4	0.25
3.00	2.60	2.30	1.4	D _N - 5.2	D _N - 4.6	5.4	6.8	0.25
3.53	3.10	2.70	1.4	D _N - 6.2	D _N - 5.4	6.2	7.6	0.25
3.55	3.10	2.70	1.4	D _N - 6.2	D _N - 5.4	6.2	7.6	0.25
4.00	3.50	3.10	1.7	D _N - 7.0	D _N - 6.2	6.9	8.6	0.25
5.00	4.40	4.00	1.7	D _N - 8.8	D _N - 8.0	8.3	10.0	0.25
5.30	4.70	4.30	1.7	D _N - 9.4	D _N - 8.6	9.0	10.9	0.25
5.33	4.70	4.30	1.7	D _N - 9.4	D _N - 8.6	9.0	10.9	0.25



O-Ring Cross-Section- Ø d ₂	Back-up Ring Cross-Section			Groove dimensions				
	Radial height W		Thickness	Groove diameter d ₃ h9		Groove width		Radius
	Dynamic	Static	T	Dynamic	Static	b ₂ +0.25	b ₃ +0.25	r ±0.2
mm								
5.70	5.00	4.60	1.7	D _N - 10.0	D _N - 9.2	9.0	11.0	0.25
6.00	5.30	4.90	1.7	D _N - 10.6	D _N - 9.8	9.3	11.2	0.25
6.99	6.10	5.80	2.5	D _N - 12.2	D _N - 11.6	12.3	15.1	0.25
8.00	7.10	6.70	2.5	D _N - 14.2	D _N - 13.4	12.6	15.4	0.25
8.40	7.50	7.10	2.5	D _N - 15.0	D _N - 14.2	12.8	15.6	0.25

**Table 73: Installation dimensions for rectangular Back-up Ring types, uncut and cut,
External sealing, material PTFE – Inch**

O-Ring Cross-Section- Ø d ₂	Back-up Ring Cross-Section			Groove dimensions				
	Radial height W		Thickness	Groove diameter d ₃ h9		Groove width		Radius
	Dynamic	Static	T	Dynamic	Static	b ₂ +0.010	b ₃ +0.010	r ±0.008
inch								
0.059	0.049	0.043	0.039	D _N - 0.098	D _N - 0.087	0.118	0.157	0.010
0.063	0.051	0.047	0.039	D _N - 0.102	D _N - 0.094	0.122	0.161	0.010
0.070	0.057	0.051	0.055	D _N - 0.114	D _N - 0.102	0.150	0.205	0.010
0.071	0.057	0.051	0.055	D _N - 0.114	D _N - 0.102	0.150	0.205	0.010
0.079	0.065	0.059	0.055	D _N - 0.130	D _N - 0.118	0.161	0.217	0.010
0.094	0.081	0.071	0.055	D _N - 0.161	D _N - 0.142	0.181	0.236	0.010
0.098	0.085	0.075	0.055	D _N - 0.169	D _N - 0.150	0.185	0.240	0.010
0.103	0.089	0.079	0.055	D _N - 0.177	D _N - 0.157	0.197	0.252	0.010
0.104	0.089	0.079	0.055	D _N - 0.177	D _N - 0.157	0.197	0.252	0.010
0.118	0.102	0.091	0.055	D _N - 0.205	D _N - 0.181	0.213	0.268	0.010
0.139	0.122	0.106	0.055	D _N - 0.244	D _N - 0.213	0.244	0.299	0.010
0.140	0.122	0.106	0.055	D _N - 0.244	D _N - 0.213	0.244	0.299	0.010
0.157	0.138	0.122	0.067	D _N - 0.276	D _N - 0.244	0.272	0.339	0.010
0.197	0.173	0.157	0.067	D _N - 0.346	D _N - 0.315	0.327	0.394	0.010
0.209	0.185	0.169	0.067	D _N - 0.370	D _N - 0.339	0.354	0.429	0.010
0.210	0.185	0.169	0.067	D _N - 0.370	D _N - 0.339	0.354	0.429	0.010
0.224	0.197	0.181	0.067	D _N - 0.394	D _N - 0.362	0.354	0.433	0.010
0.236	0.209	0.193	0.067	D _N - 0.417	D _N - 0.386	0.366	0.441	0.010
0.275	0.240	0.228	0.098	D _N - 0.480	D _N - 0.457	0.484	0.594	0.010
0.315	0.280	0.264	0.098	D _N - 0.559	D _N - 0.528	0.496	0.606	0.010
0.331	0.295	0.280	0.098	D _N - 0.591	D _N - 0.559	0.504	0.614	0.010



ORDERING EXAMPLE

Back-up Ring:	Rectangular type BH (cut) for O-Ring seal
Application:	Static, external sealing
Bore diameter:	$D_N = 40.00$ mm (1.575 inch)
O-Ring Cross-Section:	$d_2 = 2.62$ mm (0.103 inch)
Back-up Ring material:	PTFE, glassfiber filled (25%)

For material code see page 151

TSS Article No. BH 20 0 0400 - PTGC

Back-Up Ring (Cut) ————
 Radial Height (mm) W x 10 ————
 T-dimension (Standard, mm) ————
 Bore-Ø (mm) D_N x 10 ————
 Quality Index (Standard) ————
 Material Code (Standard) ————

**Table 74: Preferred series for static applications, rectangular Back-up Ring
Types BV (uncut) and BH (cut), External sealing, material PTFE – Metric**

Bore Ø	Groove Ø	Groove width		Radius	Back-up Ring dimension	TSS Part No.		O-Ring TSS Part No.	O-Ring dimension
		$b_2 + 0.25$	$b_3 + 0.25$			Uncut (BV)	Cut (BH)		
D_N H8	d_3 h9			$r \pm 0.2$	OD x W x T				$d_1 \times d_2$
mm									
6.0	3.4	3.8	5.2	0.25	6.0 x 1.3 x 1.4	BV1300060	BH1300060	ORAR00006	2.90 x 1.78
6.0	3.8	3.0	4.0	0.25	6.0 x 1.1 x 1.0	BV1100060	BH1100060	OR1500350	3.50 x 1.50
8.0	5.8	3.0	4.0	0.25	8.0 x 1.1 x 1.0	BV1100080	BH1100080	OR1500550	5.50 x 1.50
10.0	7.8	3.0	4.0	0.25	10.0 x 1.1 x 1.0	BV1100100	BH1100100	OR1500750	7.50 x 1.50
12.0	9.0	4.1	5.5	0.25	12.0 x 1.5 x 1.4	BV1500120	BH1500120	OR2000850	8.50 x 2.00
12.0	9.4	3.8	5.2	0.25	12.0 x 1.3 x 1.4	BV1300120	BH1300120	ORAR00012	9.25 x 1.78
14.0	11.0	4.1	5.5	0.25	14.0 x 1.5 x 1.4	BV1500140	BH1500140	OR2001000	10.00 x 2.00
14.0	11.4	3.8	5.2	0.25	14.0 x 1.3 x 1.4	BV1300140	BH1300140	ORAR00013	10.82 x 1.78
15.0	12.0	4.1	5.5	0.25	15.0 x 1.5 x 1.4	BV1500150	BH1500150	OR2001100	11.00 x 2.00
15.0	12.4	3.8	5.2	0.25	15.0 x 1.3 x 1.4	BV1300150	BH1300150	ORAR00014	12.42 x 1.78
16.0	13.0	4.1	5.5	0.25	16.0 x 1.5 x 1.4	BV1500160	BH1500160	OR2001200	12.00 x 2.00
16.0	13.4	3.8	5.2	0.25	16.0 x 1.3 x 1.4	BV1300160	BH1300160	ORAR00015	14.00 x 1.78
18.0	15.0	4.1	5.5	0.25	18.0 x 1.5 x 1.4	BV1500180	BH1500180	OR2001400	14.00 x 2.00
18.0	15.4	3.8	5.2	0.25	18.0 x 1.3 x 1.4	BV1300180	BH1300180	ORAR00016	15.60 x 1.78
20.0	17.0	4.1	5.5	0.25	20.0 x 1.5 x 1.4	BV1500200	BH1500200	OR2001600	16.00 x 2.00
20.0	17.4	3.8	5.2	0.25	20.0 x 1.3 x 1.4	BV1300200	BH1300200	ORAR00017	17.17 x 1.78
22.0	19.0	4.1	5.5	0.25	22.0 x 1.5 x 1.4	BV1500220	BH1500220	OR2001800	18.00 x 2.00
22.0	19.4	3.8	5.2	0.25	22.0 x 1.3 x 1.4	BV1300220	BH1300220	ORAR00018	18.77 x 1.78
25.0	22.0	4.1	5.5	0.25	25.0 x 1.5 x 1.4	BV1500250	BH1500250	OR2002100	21.00 x 2.00
25.0	22.4	3.8	5.2	0.25	25.0 x 1.3 x 1.4	BV1300250	BH1300250	ORAR00020	21.95 x 1.78
28.0	23.4	5.4	6.8	0.25	28.0 x 2.3 x 1.4	BV2300280	BH2300280	OR3002200	22.00 x 3.00
28.0	24.0	5.0	6.4	0.25	28.0 x 2.0 x 1.4	BV2000280	BH2000280	ORAR00119	23.47 x 2.62
30.0	25.4	5.4	6.8	0.25	30.0 x 2.3 x 1.4	BV2300300	BH2300300	OR3002400	24.00 x 3.00
30.0	26.0	5.0	6.4	0.25	30.0 x 2.0 x 1.4	BV2000300	BH2000300	ORAR00120	25.07 x 2.62
32.0	27.4	5.4	6.8	0.25	32.0 x 2.3 x 1.4	BV2300320	BH2300320	OR3002600	26.00 x 3.00
32.0	28.0	5.0	6.4	0.25	32.0 x 2.0 x 1.4	BV2000320	BH2000320	ORAR00121	26.64 x 2.62
35.0	30.4	5.4	6.8	0.25	35.0 x 2.3 x 1.4	BV2300350	BH2300350	OR3002900	29.00 x 3.00
35.0	31.0	5.0	6.4	0.25	35.0 x 2.0 x 1.4	BV2000350	BH2000350	ORAR00123	29.82 x 2.62



Bore Ø	Groove Ø	Groove width		Radius	Back-up Ring dimension	TSS Part No.		O-Ring TSS Part No.	O-Ring dimension
		b ₂ +0.25	b ₃ +0.25			Uncut (BV)	Cut (BH)		
D _N H8	d ₃ h9			r ±0.2	OD x W x T				d ₁ x d ₂
mm									
40.0	35.4	5.4	6.8	0.25	40.0 x 2.3 x 1.4	BV2300400	BH2300400	OR3003400	34.00 x 3.00
40.0	36.0	5.0	6.4	0.25	40.0 x 2.0 x 1.4	BV2000400	BH2000400	ORAR00126	34.59 x 2.62
42.0	37.4	5.4	6.8	0.25	42.0 x 2.3 x 1.4	BV2300420	BH2300420	OR3003600	36.00 x 3.00
42.0	38.0	5.0	6.4	0.25	42.0 x 2.0 x 1.4	BV2000420	BH2000420	ORAR00127	36.17 x 2.62
45.0	40.0	5.4	6.8	0.25	45.0 x 2.25 x 1.4	BV22H00450	BH22H00450	OR3003900	39.00 x 3.00
45.0	41.0	5.0	6.4	0.25	45.0 x 2.0 x 1.4	BV2000450	BH2000450	ORAR00129	39.34 x 2.62
48.0	41.8	6.9	8.6	0.25	48.0 x 3.1 x 1.7	BV3100480	BH3100480	OR4004000	40.00 x 4.00
48.0	42.6	6.2	7.6	0.25	48.0 x 2.7 x 1.4	BV2700480	BH2700480	ORAR00223	40.87 x 3.53
50.0	43.8	6.9	8.6	0.25	50.0 x 3.1 x 1.7	BV3100500	BH3100500	OR4004200	42.00 x 4.00
50.0	44.6	6.2	7.6	0.25	50.0 x 2.7 x 1.4	BV2700500	BH2700500	ORAR00224	44.04 x 3.53
52.0	45.8	6.9	8.6	0.25	52.0 x 3.1 x 1.7	BV3100520	BH3100520	OR4004400	44.00 x 4.00
52.0	46.6	6.2	7.6	0.25	52.0 x 2.7 x 1.4	BV2700520	BH2700520	ORAR0022	44.04 x 3.53
55.0	48.8	6.9	8.6	0.25	55.0 x 3.1 x 1.7	BV3100550	BH3100550	OR4004700	47.00 x 4.00
55.0	49.6	6.2	7.6	0.25	55.0 x 2.7 x 1.4	BV2700550	BH2700550	ORAR00225	47.22 x 3.53
60.0	53.8	6.9	8.6	0.25	60.0 x 3.1 x 1.7	BV3100600	BH3100600	OR4005200	52.00 x 4.00
60.0	54.6	6.2	7.6	0.25	60.0 x 2.7 x 1.4	BV2700600	BH2700600	ORAR00227	53.57 x 3.53
63.0	56.8	6.9	8.6	0.25	63.0 x 3.1 x 1.7	BV3100630	BH3100630	OR4005500	55.00 x 4.00
63.0	57.6	6.2	7.6	0.25	63.0 x 2.7 x 1.4	BV2700630	BH2700630	ORAR00228	56.74 x 3.53
65.0	58.8	6.9	8.6	0.25	65.0 x 3.1 x 1.7	BV3100650	BH3100650	OR4005700	57.00 x 4.00
65.0	59.6	6.2	7.6	0.25	65.0 x 2.7 x 1.4	BV2700650	BH2700650	ORAR00228	56.74 x 3.53
70.0	63.8	6.9	8.6	0.25	70.0 x 3.1 x 1.7	BV3100700	BH3100700	OR4006200	62.00 x 4.00
70.0	64.6	6.2	7.6	0.25	70.0 x 2.7 x 1.4	BV2700700	BH2700700	ORAR00230	63.09 x 3.53
75.0	68.8	6.9	8.6	0.25	75.0 x 3.1 x 1.7	BV3100750	BH3100750	OR4006700	67.00 x 4.00
75.0	69.6	6.2	7.6	0.25	75.0 x 2.7 x 1.4	BV2700750	BH2700750	ORAR00231	66.27 x 3.53
80.0	73.8	6.9	8.6	0.25	80.0 x 3.1 x 1.7	BV3100800	BH3100800	OR4007200	72.00 x 4.00
80.0	74.6	6.2	7.6	0.25	80.0 x 2.7 x 1.4	BV2700800	BH2700800	ORAR00233	72.62 x 3.53
85.0	78.8	6.9	8.6	0.25	85.0 x 3.1 x 1.7	BV3100850	BH3100850	OR4007700	77.00 x 4.00
85.0	79.6	6.2	7.6	0.25	85.0 x 2.7 x 1.4	BV2700850	BH2700850	ORAR00235	78.97 x 3.53
90.0	81.4	9.0	10.9	0.25	90.0 x 4.3 x 1.7	BV4300900	BH4300900	ORAR00338	78.74 x 5.33
90.0	82.0	8.3	10.0	0.25	90.0 x 4.0 x 1.7	BV4000900	BH4000900	OR5008000	80.00 x 5.00
95.0	86.4	9.0	10.9	0.25	95.0 x 4.3 x 1.7	BV4300950	BH4300950	ORAR00340	85.09 x 5.33
95.0	87.0	8.3	10.0	0.25	95.0 x 4.0 x 1.7	BV4000950	BH4000950	OR5008000	80.00 x 5.00
100.0	91.4	9.0	10.9	0.25	100.0 x 4.3 x 1.7	BV4301000	BH4301000	ORAR0034	91.44 x 5.33
100.0	92.0	8.3	10.0	0.25	100.0 x 4.0 x 1.7	BV4001000	BH4001000	OR5009000	90.00 x 5.00
105.0	96.4	9.0	10.9	0.25	105.0 x 4.3 x 1.7	BV4301050	BH4301050	ORAR00343	94.62 x 5.33
105.0	97.0	8.3	10.0	0.25	105.0 x 4.0 x 1.7	BV4001050	BH4001050	OR5009500	95.00 x 5.00
110.0	101.4	9.0	10.9	0.25	110.0 x 4.3 x 1.7	BV4301100	BH4301100	ORAR00345	100.97 x 5.33
110.0	102.0	8.3	10.0	0.25	110.0 x 4.0 x 1.7	BV4001100	BH4001100	OR5010000	100.00 x 5.00
115.0	106.4	9.0	10.9	0.25	115.0 x 4.3 x 1.7	BV4301150	BH4301150	ORAR00346	104.14 x 5.33
115.0	107.0	8.3	10.0	0.25	115.0 x 4.0 x 1.7	BV4001150	BH4001150	OR5010500	105.00 x 5.00
120.0	111.4	9.0	10.9	0.25	120.0 x 4.3 x 1.7	BV4301200	BH4301200	ORAR00348	110.49 x 5.33
120.0	112.0	8.3	10.0	0.25	120.0 x 4.0 x 1.7	BV4001200	BH4001200	OR5011000	110.00 x 5.00



Bore Ø	Groove Ø	Groove width		Radius	Back-up Ring dimension	TSS Part No.		O-Ring TSS Part No.	O-Ring dimension d ₁ x d ₂
		b ₂ +0.25	b ₃ +0.25			Uncut (BV)	Cut (BH)		
D _N H8	d ₃ h9			r ±0.2	OD x W x T				
mm									
125.0	116.4	9.0	10.9	0.25	125.0 x 4.3 x 1.7	BV4301250	BH4301250	ORAR00349	113.67 x 5.33
125.0	117.0	8.3	10.0	0.25	125.0 x 4.0 x 1.7	BV4001250	BH4001250	OR5011500	115.00 x 5.00
130.0	121.4	9.0	10.9	0.25	130.0 x 4.3 x 1.7	BV4301300	BH4301300	ORAR00351	120.02 x 5.33
130.0	122.0	8.3	10.0	0.25	130.0 x 4.0 x 1.7	BV4001300	BH4001300	OR5012000	120.00 x 5.00
135.0	123.4	12.3	15.1	0.25	135.0 x 5.8 x 2.5	BV5801350	BH5801350	ORAR00427	120.02 x 6.99
140.0	128.4	12.3	15.1	0.25	140.0 x 5.8 x 2.5	BV5801400	BH5801400	ORAR00429	126.37 x 6.99
150.0	138.4	12.3	15.1	0.25	150.0 x 5.8 x 2.5	BV5801500	BH5801500	ORAR00432	135.89 x 6.99
160.0	148.4	12.3	15.1	0.25	160.0 x 5.8 x 2.5	BV5801600	BH5801600	ORAR00435	145.42 x 6.99
170.0	158.4	12.3	15.1	0.25	170.0 x 5.8 x 2.5	BV5801700	BH5801700	ORAR00438	158.12 x 6.99
180.0	168.4	12.3	15.1	0.25	180.0 x 5.8 x 2.5	BV5801800	BH5801800	ORAR00439	164.47 x 6.99
190.0	178.4	12.3	15.1	0.25	190.0 x 5.8 x 2.5	BV5801900	BH5801900	ORAR00441	177.17 x 6.99
200.0	188.4	12.3	15.1	0.25	200.0 x 5.8 x 2.5	BV5802000	BH5802000	ORAR00442	183.52 x 6.99
210.0	198.4	12.3	15.1	0.25	210.0 x 5.8 x 2.5	BV5802100	BH5802100	ORAR00444	196.22 x 6.99
220.0	208.4	12.3	15.1	0.25	220.0 x 5.8 x 2.5	BV5802200	BH5802200	ORAR00445	202.57 x 6.99
230.0	218.4	12.3	15.1	0.25	230.0 x 5.8 x 2.5	BV5802300	BH5802300	ORAR00446	215.27 x 6.99
240.0	228.4	12.3	15.1	0.25	240.0 x 5.8 x 2.5	BV5802400	BH5802400	ORAR00447	227.97 x 6.99
250.0	238.4	12.3	15.1	0.25	250.0 x 5.8 x 2.5	BV5802500	BH5802500	ORAR00448	240.67 x 6.99
280.0	268.4	12.3	15.1	0.25	280.0 x 5.8 x 2.5	BV5802800	BH5802800	ORAR00450	266.07 x 6.99
300.0	288.4	12.3	15.1	0.25	300.0 x 5.8 x 2.5	BV5803000	BH5803000	ORAR00451	278.77 x 6.99
320.0	308.4	12.3	15.1	0.25	320.0 x 5.8 x 2.5	BV5803200	BH5803200	ORAR00453	304.17 x 6.99
350.0	338.4	12.3	15.1	0.25	350.0 x 5.8 x 2.5	BV5803500	-	ORAR00455	329.57 x 6.99
400.0	388.4	12.3	15.1	0.25	400.0 x 5.8 x 2.5	BV5804000	-	ORAR00459	380.37 x 6.99
420.0	408.4	12.3	15.1	0.25	420.0 x 5.8 x 2.5	BV5804200	-	ORAR00461	405.26 x 6.99
450.0	438.4	12.3	15.1	0.25	450.0 x 5.8 x 2.5	BV5804500	-	ORAR00463	430.66 x 6.99
480.0	468.4	12.3	15.1	0.25	480.0 x 5.8 x 2.5	BV5804800	-	ORAR00465	456.06 x 6.99
500.0	488.4	12.3	15.1	0.25	500.0 x 5.8 x 2.5	BV5805000	-	ORAR00467	481.46 x 6.99

Further sizes available on request.

This table shows the possible range of available dimensions (Back-up Rings). However, these dimensions are not always stock items.



**Table 75: Preferred series for static applications, rectangular Back-up Ring
Types BV (uncut) and BH (cut), External sealing, material PTFE – Inch**

Bore Ø	Groove Ø	Groove width		Radius	Back-up Ring dimension	TSS Part No.		O-Ring TSS Part No.	O-Ring dimension
D _N H8	d ₃ h9	b ₂ +0.010	b ₃ +0.010	r ±0.008	OD x W x T	Uncut (BV)	Cut (BH)		d ₁ x d ₂
inch									
0.236	0.134	0.150	0.205	0.010	0.236 x 0.051 x 0.055	BV1300060	BH1300060	ORAR00006	0.114 x 0.070
0.236	0.150	0.118	0.157	0.010	0.236 x 0.043 x 0.039	BV1100060	BH1100060	OR1500350	0.138 x 0.059
0.315	0.228	0.118	0.157	0.010	0.315 x 0.043 x 0.039	BV1100080	BH1100080	OR1500550	0.217 x 0.059
0.394	0.307	0.118	0.157	0.010	0.394 x 0.043 x 0.039	BV1100100	BH1100100	OR1500750	0.295 x 0.059
0.472	0.354	0.161	0.217	0.010	0.472 x 0.059 x 0.055	BV1500120	BH1500120	OR2000850	0.335 x 0.079
0.472	0.370	0.150	0.205	0.010	0.472 x 0.051 x 0.055	BV1300120	BH1300120	ORAR00012	0.364 x 0.070
0.551	0.433	0.161	0.217	0.010	0.551 x 0.059 x 0.055	BV1500140	BH1500140	OR2001000	0.394 x 0.079
0.551	0.449	0.150	0.205	0.010	0.551 x 0.051 x 0.055	BV1300140	BH1300140	ORAR00013	0.426 x 0.070
0.591	0.472	0.161	0.217	0.010	0.591 x 0.059 x 0.055	BV1500150	BH1500150	OR2001100	0.433 x 0.079
0.591	0.488	0.150	0.205	0.010	0.591 x 0.051 x 0.055	BV1300150	BH1300150	ORAR00014	0.489 x 0.070
0.630	0.512	0.161	0.217	0.010	0.630 x 0.059 x 0.055	BV1500160	BH1500160	OR2001200	0.472 x 0.079
0.630	0.528	0.150	0.205	0.010	0.630 x 0.051 x 0.055	BV1300160	BH1300160	ORAR00015	0.551 x 0.070
0.709	0.591	0.161	0.217	0.010	0.709 x 0.059 x 0.055	BV1500180	BH1500180	OR2001400	0.551 x 0.079
0.709	0.606	0.150	0.205	0.010	0.709 x 0.051 x 0.055	BV1300180	BH1300180	ORAR00016	0.614 x 0.070
0.787	0.669	0.161	0.217	0.010	0.787 x 0.059 x 0.055	BV1500200	BH1500200	OR2001600	0.630 x 0.079
0.787	0.685	0.150	0.205	0.010	0.787 x 0.051 x 0.055	BV1300200	BH1300200	ORAR00017	0.676 x 0.070
0.866	0.748	0.161	0.217	0.010	0.866 x 0.059 x 0.055	BV1500220	BH1500220	OR2001800	0.709 x 0.079
0.866	0.764	0.150	0.205	0.010	0.866 x 0.051 x 0.055	BV1300220	BH1300220	ORAR00018	0.739 x 0.070
0.984	0.866	0.161	0.217	0.010	0.984 x 0.059 x 0.055	BV1500250	BH1500250	OR2002100	0.827 x 0.079
0.984	0.882	0.150	0.205	0.010	0.984 x 0.051 x 0.055	BV1300250	BH1300250	ORAR00020	0.864 x 0.070
1.102	0.921	0.213	0.268	0.010	1.102 x 0.091 x 0.055	BV2300280	BH2300280	OR3002200	0.866 x 0.118
1.102	0.945	0.197	0.252	0.010	1.102 x 0.079 x 0.055	BV2000280	BH2000280	ORAR00119	0.924 x 0.103
1.181	1.000	0.213	0.268	0.010	1.181 x 0.091 x 0.055	BV2300300	BH2300300	OR3002400	0.945 x 0.079
1.181	1.024	0.197	0.252	0.010	1.102 x 0.079 x 0.055	BV2000280	BH2000280	ORAR00119	0.924 x 0.103
1.260	1.079	0.213	0.268	0.010	1.260 x 0.091 x 0.055	BV2300320	BH2300320	OR3002600	1.024 x 0.118
1.260	1.102	0.197	0.252	0.010	1.260 x 0.079 x 0.055	BV2000320	BH2000320	ORAR00121	1.049 x 0.103
1.378	1.197	0.213	0.268	0.010	1.378 x 0.091 x 0.055	BV2300350	BH2300350	OR3002900	1.154 x 0.118
1.378	1.220	0.197	0.252	0.010	1.378 x 0.079 x 0.055	BV2000350	BH2000350	ORAR00123	1.174 x 0.103
1.575	1.394	0.213	0.268	0.010	1.575 x 0.091 x 0.055	BV2300400	BH2300400	OR3003400	1.339 x 0.118
1.575	1.417	0.197	0.252	0.010	1.575 x 0.079 x 0.055	BV2000400	BH2000400	ORAR00126	1.362 x 0.103
1.654	1.472	0.213	0.268	0.010	1.654 x 0.091 x 0.055	BV2300420	BH2300420	OR3003600	1.417 x 0.118
1.654	1.496	0.197	0.252	0.010	1.654 x 0.079 x 0.055	BV2000420	BH2000420	ORAR00127	1.424 x 0.103
1.772	1.575	0.213	0.268	0.010	1.772 x 0.091 x 0.055	BV2300450	BH2300450	OR3003900	1.535 x 0.118
1.772	1.614	0.197	0.252	0.010	1.772 x 0.079 x 0.055	BV2000450	BH2000450	ORAR00129	1.549 x 0.103
1.890	1.646	0.272	0.339	0.010	1.890 x 0.122 x 0.067	BV3100480	BH3100480	OR4004000	1.575 x 0.157
1.890	1.677	0.244	0.299	0.010	1.890 x 0.106 x 0.055	BV2700480	BH2700480	ORAR00223	1.609 x 0.139
1.969	1.724	0.272	0.339	0.010	1.969 x 0.122 x 0.067	BV3100500	BH3100500	OR4004200	1.654 x 0.157
1.969	1.756	0.244	0.299	0.010	1.969 x 0.106 x 0.055	BV2700500	BH2700500	ORAR00224	1.734 x 0.139
2.047	1.803	0.272	0.339	0.010	2.047 x 0.122 x 0.067	BV3100520	BH3100520	OR4004400	1.732 x 0.157
2.047	1.835	0.244	0.299	0.010	2.047 x 0.106 x 0.055	BV2700520	BH2700520	ORAR00224	1.734 x 0.139



Bore Ø	Groove Ø	Groove width		Radius	Back-up Ring dimension	TSS Part No.		O-Ring TSS Part No.	O-Ring dimension
D _N H8	d ₃ h9	b ₂ +0.010	b ₃ +0.010	r ±0.008	OD x W x T	Uncut (BV)	Cut (BH)		d ₁ x d ₂
inch									
2.165	1.921	0.272	0.339	0.010	2.165 x 0.122 x 0.067	BV3100550	BH3100550	OR4004700	1.850 x 0.157
2.165	1.953	0.244	0.299	0.010	2.165 x 0.106 x 0.055	BV2700550	BH2700550	ORAR00225	1.859 x 0.139
2.362	2.118	0.272	0.339	0.010	2.362 x 0.122 x 0.067	BV3100600	BH3100600	OR4005200	2.047 x 0.157
2.362	2.150	0.244	0.299	0.010	2.362 x 0.106 x 0.055	BV2700600	BH2700600	ORAR00227	2.109 x 0.139
2.480	2.236	0.272	0.339	0.010	2.480 x 0.122 x 0.067	BV3100630	BH3100630	OR4005500	2.165 x 0.157
2.480	2.268	0.244	0.299	0.010	2.480 x 0.106 x 0.055	BV2700630	BH2700630	ORAR00228	2.234 x 0.139
2.559	2.315	0.272	0.339	0.010	2.559 x 0.122 x 0.067	BV3100650	BH3100650	OR4005700	2.244 x 0.157
2.559	2.346	0.244	0.299	0.010	2.559 x 0.106 x 0.055	BV2700650	BH2700650	ORAR00228	2.234 x 0.139
2.756	2.512	0.272	0.339	0.010	2.756 x 0.122 x 0.067	BV3100700	BH3100700	OR4006200	2.441 x 0.157
2.756	2.543	0.244	0.299	0.010	2.756 x 0.106 x 0.055	BV2700700	BH2700700	ORAR00230	2.484 x 0.139
2.953	2.709	0.272	0.339	0.010	2.953 x 0.122 x 0.067	BV3100750	BH3100750	OR4006700	2.638 x 0.157
2.953	2.740	0.244	0.299	0.010	2.953 x 0.106 x 0.055	BV2700750	BH2700750	ORAR00231	2.609 x 0.139
3.150	2.906	0.272	0.339	0.010	3.150 x 0.122 x 0.067	BV3100800	BH3100800	OR4007200	2.835 x 0.157
3.150	2.937	0.244	0.299	0.010	3.150 x 0.106 x 0.055	BV2700800	BH2700800	ORAR00233	2.859 x 0.139
3.346	3.102	0.272	0.339	0.010	3.346 x 0.122 x 0.067	BV3100850	BH3100850	OR4007700	3.031 x 0.157
3.346	3.134	0.244	0.299	0.010	3.346 x 0.106 x 0.055	BV2700850	BH2700850	ORAR00235	3.109 x 0.139
3.543	3.205	0.354	0.429	0.010	3.543 x 0.169 x 0.067	BV4300900	BH4300900	ORAR00338	3.100 x 0.210
3.543	3.228	0.327	0.394	0.010	3.543 x 0.157 x 0.067	BV4000900	BH4000900	OR5008000	3.150 x 0.197
3.740	3.402	0.354	0.429	0.010	3.740 x 0.169 x 0.067	BV4300950	BH4300950	ORAR00340	3.350 x 0.210
3.740	3.425	0.327	0.394	0.010	3.740 x 0.157 x 0.067	BV4000950	BH4000950	OR5008000	3.150 x 0.197
3.937	3.598	0.354	0.429	0.010	3.937 x 0.169 x 0.067	BV4301000	BH4301000	ORAR00342	3.600 x 0.210
3.937	3.622	0.327	0.394	0.010	3.937 x 0.157 x 0.067	BV4001000	BH4001000	OR5009000	3.543 x 0.197
4.134	3.795	0.354	0.429	0.010	4.134 x 0.169 x 0.067	BV4301050	BH4301050	ORAR00343	3.725 x 0.210
4.134	3.819	0.327	0.394	0.010	4.134 x 0.157 x 0.067	BV4001050	BH4001050	OR5009500	3.740 x 0.197
4.331	3.992	0.354	0.429	0.010	4.331 x 0.169 x 0.067	BV4301100	BH4301100	ORAR00345	3.975 x 0.210
4.331	4.016	0.327	0.394	0.010	4.331 x 0.157 x 0.067	BV4001100	BH4001100	OR5010000	3.937 x 0.197
4.528	4.189	0.354	0.429	0.010	4.528 x 0.169 x 0.067	BV4301150	BH4301150	ORAR00346	4.100 x 0.210
4.528	4.213	0.327	0.394	0.010	4.528 x 0.157 x 0.067	BV4001150	BH4001150	OR5010500	4.134 x 0.197
4.724	4.386	0.354	0.429	0.010	4.724 x 0.169 x 0.067	BV4301200	BH4301200	ORAR00348	4.350 x 0.210
4.724	4.409	0.327	0.394	0.010	4.724 x 0.157 x 0.067	BV4001200	BH4001200	OR5011000	4.331 x 0.197
4.921	4.583	0.354	0.429	0.010	4.921 x 0.169 x 0.067	BV4301250	BH4301250	ORAR00349	4.475 x 0.210
4.921	4.606	0.327	0.394	0.010	4.921 x 0.157 x 0.067	BV4001250	BH4001250	OR5011500	4.528 x 0.197
5.118	4.780	0.354	0.429	0.010	5.118 x 0.169 x 0.067	BV4301300	BH4301300	ORAR00351	4.725 x 0.210
5.118	4.803	0.327	0.394	0.010	5.118 x 0.157 x 0.067	BV4001300	BH4001300	OR5012000	4.724 x 0.197
5.315	4.858	0.484	0.594	0.010	5.315 x 0.228 x 0.098	BV5801350	BH5801350	ORAR00427	4.725 x 0.275
5.512	5.055	0.484	0.594	0.010	5.512 x 0.228 x 0.098	BV5801400	BH5801400	ORAR00429	4.975 x 0.275
5.906	5.449	0.484	0.594	0.010	5.906 x 0.228 x 0.098	BV5801500	BH5801500	ORAR00432	5.350 x 0.275
6.299	5.843	0.484	0.594	0.010	6.299 x 0.228 x 0.098	BV5801600	BH5801600	ORAR00435	5.725 x 0.275
6.693	6.236	0.484	0.594	0.010	6.693 x 0.228 x 0.098	BV5801700	BH5801700	ORAR00438	6.225 x 0.275
7.087	6.630	0.484	0.594	0.010	7.087 x 0.228 x 0.098	BV5801800	BH5801800	ORAR00439	6.475 x 0.275



Bore Ø	Groove Ø	Groove width		Radius	Back-up Ring dimension	TSS Part No.		O-Ring TSS Part No.	O-Ring dimension
D _N H8	d ₃ h9	b ₂ +0.010	b ₃ +0.010	r ±0.008	OD x W x T	Uncut (BV)	Cut (BH)		d ₁ x d ₂
inch									
7.480	7.024	0.484	0.594	0.010	7.480 x 0.228 x 0.098	BV5801900	BH5801900	ORAR00441	6.975 x 0.275
7.874	7.417	0.484	0.594	0.010	7.874 x 0.228 x 0.098	BV5802000	BH5802000	ORAR00442	7.225 x 0.275
8.268	7.811	0.484	0.594	0.010	8.268 x 0.228 x 0.098	BV5802100	BH5802100	ORAR00444	7.725 x 0.275
8.661	8.205	0.484	0.594	0.010	8.661 x 0.228 x 0.098	BV5802200	BH5802200	ORAR00445	7.975 x 0.275
9.055	8.598	0.484	0.594	0.010	9.055 x 0.228 x 0.098	BV5802300	BH5802300	ORAR00446	8.475 x 0.275
9.449	8.992	0.484	0.594	0.010	9.449 x 0.228 x 0.098	BV5802400	BH5802400	ORAR00447	8.975 x 0.275
9.843	9.386	0.484	0.594	0.010	9.843 x 0.228 x 0.098	BV5802500	BH5802500	ORAR00448	9.475 x 0.275
11.024	10.567	0.484	0.594	0.010	11.024 x 0.228 x 0.098	BV5802800	BH5802800	ORAR00450	10.475 x 0.275
11.811	11.354	0.484	0.594	0.010	11.811 x 0.228 x 0.098	BV5803000	BH5803000	ORAR00451	10.975 x 0.275
12.598	12.142	0.484	0.594	0.010	12.598 x 0.228 x 0.098	BV5803200	BH5803200	ORAR00453	11.975 x 0.275
13.780	13.323	0.484	0.594	0.010	13.780 x 0.228 x 0.098	BV5803500	-	ORAR00455	12.975 x 0.275
15.748	15.291	0.484	0.594	0.010	15.748 x 0.228 x 0.098	BV5804000	-	ORAR00459	14.975 x 0.275
16.535	16.079	0.484	0.594	0.010	16.535 x 0.228 x 0.098	BV5804200	-	ORAR00461	15.955 x 0.275
17.717	17.260	0.484	0.594	0.010	17.717 x 0.228 x 0.098	BV5804500	-	ORAR00463	16.955 x 0.275
18.898	18.441	0.484	0.594	0.010	18.898 x 0.228 x 0.098	BV5804800	-	ORAR00465	17.955 x 0.275
19.685	19.228	0.484	0.594	0.010	19.685 x 0.228 x 0.098	BV5805000	-	ORAR00467	18.955 x 0.275

Further sizes available on request.

This table shows the possible range of available dimensions (Back-up Rings). However, these dimensions are not always stock items.



H.1.2 CONCAVE BACK-UP RING TYPES, UNCUT (BA) AND CUT (BD), MATERIAL PTFE

The following figure and tables include installation recommendations and Back-up Ring dimensions for external sealing applications with the concave Back-up Ring types BA (uncut) and BD (cut).

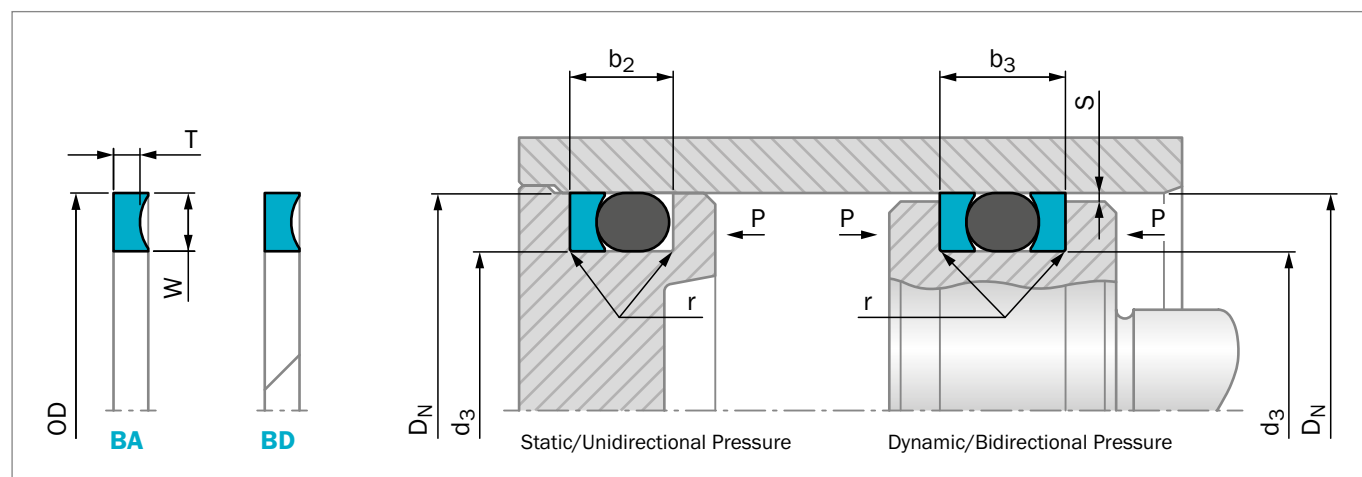


Figure 57: Installation drawing external sealing, concave Back-up Ring types

Table 76: Installation dimensions for concave Back-up Ring types, uncut and cut, External sealing, material PTFE – Metric

O-Ring Cross-Section-Ø d_2	Back-up Ring Cross-Section			Groove dimensions				
	Radial height W		Thickness	Groove diameter d_3 h9		Groove width		Radius
	Dynamic	Static	T	Dynamic	Static	$b_2 + 0.25$	$b_3 + 0.25$	$r \pm 0.2$
mm								
1.50	1.25	1.10	1.00	$D_N - 2.5$	$D_N - 2.2$	3.00	4.00	0.25
1.60	1.30	1.20	1.00	$D_N - 2.6$	$D_N - 2.4$	3.10	4.10	0.25
1.78	1.45	1.30	1.40	$D_N - 2.9$	$D_N - 2.6$	3.80	5.20	0.25
1.80	1.45	1.30	1.40	$D_N - 2.9$	$D_N - 2.6$	3.80	5.20	0.25
2.00	1.65	1.50	1.40	$D_N - 3.3$	$D_N - 3.0$	4.10	5.50	0.25
2.40	2.05	1.80	1.40	$D_N - 4.1$	$D_N - 3.6$	4.60	6.00	0.25
2.50	2.15	1.90	1.40	$D_N - 4.3$	$D_N - 3.8$	4.70	6.10	0.25
2.62	2.25	2.00	1.40	$D_N - 4.5$	$D_N - 4.0$	5.00	6.40	0.25
2.65	2.25	2.00	1.40	$D_N - 4.5$	$D_N - 4.0$	5.00	6.40	0.25
3.00	2.60	2.30	1.40	$D_N - 5.2$	$D_N - 4.6$	5.40	6.80	0.25
3.53	3.10	2.70	1.40	$D_N - 6.2$	$D_N - 5.4$	6.20	7.60	0.25
3.55	3.10	2.70	1.40	$D_N - 6.2$	$D_N - 5.4$	6.20	7.60	0.25
4.00	3.50	3.10	1.70	$D_N - 7.0$	$D_N - 6.2$	6.90	8.60	0.25
5.00	4.40	4.00	1.70	$D_N - 8.8$	$D_N - 8.0$	8.30	10.00	0.25
5.30	4.70	4.30	1.70	$D_N - 9.4$	$D_N - 8.6$	9.00	10.90	0.25
5.33	4.70	4.30	1.70	$D_N - 9.4$	$D_N - 8.6$	9.00	10.90	0.25
5.70	5.00	4.60	1.70	$D_N - 10.0$	$D_N - 9.2$	9.00	11.00	0.25
6.00	5.30	4.90	1.70	$D_N - 10.6$	$D_N - 9.8$	9.30	11.20	0.25
6.99	6.10	5.80	2.50	$D_N - 12.2$	$D_N - 11.6$	12.30	15.10	0.25
8.00	7.10	6.70	2.50	$D_N - 14.2$	$D_N - 13.4$	12.60	15.40	0.25
8.40	7.50	7.10	2.50	$D_N - 15.0$	$D_N - 14.2$	12.80	15.60	0.25

**Table 77: Installation dimensions for concave Back-up Ring types, uncut and cut, External sealing , material PTFE – Inch**

O-Ring Cross-Section-Ø d_2	Back-up Ring Cross-Section			Groove dimensions				
	Radial height W		Thickness	Groove diameter d_3 h9		Groove width		Radius
	Dynamic	Static	T	Dynamic	Static	$b_2 + 0.010$	$b_3 + 0.010$	$r \pm 0.008$
inch								
0.059	0.049	0.043	0.039	$D_N - 0.098$	$D_N - 0.087$	0.118	0.157	0.010
0.063	0.051	0.047	0.039	$D_N - 0.102$	$D_N - 0.094$	0.122	0.161	0.010
0.070	0.057	0.051	0.055	$D_N - 0.114$	$D_N - 0.102$	0.150	0.205	0.010
0.071	0.057	0.051	0.055	$D_N - 0.130$	$D_N - 0.102$	0.150	0.205	0.010
0.079	0.065	0.059	0.055	$D_N - 0.130$	$D_N - 0.118$	0.161	0.217	0.010
0.094	0.081	0.071	0.055	$D_N - 0.161$	$D_N - 0.142$	0.181	0.236	0.010
0.098	0.085	0.075	0.055	$D_N - 0.169$	$D_N - 0.150$	0.185	0.240	0.010
0.103	0.089	0.079	0.055	$D_N - 0.177$	$D_N - 0.157$	0.197	0.252	0.010
0.104	0.089	0.079	0.055	$D_N - 0.177$	$D_N - 0.157$	0.197	0.252	0.010
0.118	0.102	0.091	0.055	$D_N - 0.205$	$D_N - 0.181$	0.213	0.268	0.010
0.139	0.122	0.106	0.055	$D_N - 0.244$	$D_N - 0.213$	0.244	0.299	0.010
0.140	0.122	0.106	0.055	$D_N - 0.244$	$D_N - 0.213$	0.244	0.299	0.010
0.157	0.138	0.122	0.067	$D_N - 0.276$	$D_N - 0.244$	0.272	0.339	0.010
0.197	0.173	0.157	0.067	$D_N - 0.346$	$D_N - 0.315$	0.327	0.394	0.010
0.209	0.185	0.169	0.067	$D_N - 0.370$	$D_N - 0.339$	0.354	0.429	0.010
0.210	0.185	0.169	0.067	$D_N - 0.370$	$D_N - 0.339$	0.354	0.429	0.010
0.224	0.197	0.181	0.067	$D_N - 0.394$	$D_N - 0.362$	0.354	0.433	0.010
0.236	0.209	0.193	0.067	$D_N - 0.417$	$D_N - 0.386$	0.366	0.441	0.010
0.275	0.240	0.228	0.098	$D_N - 0.480$	$D_N - 0.457$	0.484	0.594	0.010
0.315	0.280	0.264	0.098	$D_N - 0.559$	$D_N - 0.528$	0.496	0.606	0.010
0.331	0.295	0.280	0.098	$D_N - 0.591$	$D_N - 0.559$	0.504	0.614	0.010

ORDERING EXAMPLE

Back-up Ring:	Concave, type BD (cut) for O-Ring seal
Application:	Static, external sealing
Bore diameter:	$D_N = 40.00$ mm (1.575 inch)
O-Ring Cross-Section:	$d_2 = 2.62$ mm (0.103 inch)
Back-up Ring material:	PTFE, bronze filled (40%)

For material code see page 151

TSS Article No. **BD 20 0 0400 - PTB4**

Back-Up Ring (Cut) ———

Radial Height (mm) W x 10 ———

T-dimension (Standard, mm) ———

Bore-Ø (mm) D_N x 10 ———

Quality Index (Standard) ———

Material Code (Standard) ———



**Table 78: Preferred series for static applications, concave Back-up Ring
Type BD (cut), External sealing, material PTFE – Metric**

Bore Ø	Groove Ø	Groove width		Radius	Back-up Ring dimension	TSS Part No.	O-Ring TSS Part No.	O-Ring dimension
D _N H8	d ₃ h9	b ₂ +0.25	b ₃ +0.25	r ±0.2	OD x W x T			d ₁ x d ₂
mm								
6.0	3.4	3.8	5.2	0.25	6.0 x 1.3 x 1.4	BD1300060	ORAR00006	2.90 x 1.78
6.0	3.8	3.0	4.0	0.25	6.0 x 1.1 x 1.0	BD1100060	OR1500350	3.50 x 1.50
8.0	5.8	3.0	4.0	0.25	8.0 x 1.1 x 1.0	BD1100080	OR1500550	5.50 x 1.50
10.0	7.8	3.0	4.0	0.25	10.0 x 1.1 x 1.0	BD1100100	OR1500750	7.50 x 1.50
12.0	9.0	4.1	5.5	0.25	12.0 x 1.5 x 1.4	BD1500120	OR2000850	8.50 x 2.00
12.0	9.4	3.8	5.2	0.25	12.0 x 1.3 x 1.4	BD1300120	ORAR00012	9.25 x 1.78
14.0	11.0	4.1	5.5	0.25	14.0 x 1.5 x 1.4	BD1500140	OR2001000	10.00 x 2.00
14.0	11.4	3.8	5.2	0.25	14.0 x 1.3 x 1.4	BD1300140	ORAR00013	10.82 x 1.78
15.0	12.0	4.1	5.5	0.25	15.0 x 1.5 x 1.4	BD1500150	OR2001100	11.00 x 2.00
15.0	12.4	3.8	5.2	0.25	15.0 x 1.3 x 1.4	BD1300150	ORAR00014	12.42 x 1.78
16.0	13.0	4.1	5.5	0.25	16.0 x 1.5 x 1.4	BD1500160	OR2001200	12.00 x 2.00
16.0	13.4	3.8	5.2	0.25	16.0 x 1.3 x 1.4	BD1300160	ORAR00015	14.00 x 1.78
18.0	15.0	4.1	5.5	0.25	18.0 x 1.5 x 1.4	BD1500180	OR2001400	14.00 x 2.00
18.0	15.4	3.8	5.2	0.25	18.0 x 1.3 x 1.4	BD1300180	ORAR00016	15.60 x 1.78
20.0	17.0	4.1	5.5	0.25	20.0 x 1.5 x 1.4	BD1500200	OR2001600	16.00 x 2.00
20.0	17.4	3.8	5.2	0.25	20.0 x 1.3 x 1.4	BD1300200	ORAR00017	17.17 x 1.78
22.0	19.0	4.1	5.5	0.25	22.0 x 1.5 x 1.4	BD1500220	OR2001600	16.00 x 2.00
22.0	19.4	3.8	5.2	0.25	22.0 x 1.3 x 1.4	BD1300220	ORAR00018	18.77 x 1.78
25.0	22.0	4.1	5.5	0.25	25.0 x 1.5 x 1.4	BD1500250	OR2002100	21.00 x 2.00
25.0	22.4	3.8	5.2	0.25	25.0 x 1.3 x 1.4	BD1300250	ORAR00020	21.95 x 1.78
28.0	23.4	5.4	6.8	0.25	28.0 x 2.3 x 1.4	BD2300280	OR3002200	22.00 x 3.00
28.0	24.0	5.0	6.4	0.25	28.0 x 2.0 x 1.4	BD2000280	ORAR00119	23.47 x 2.62
30.0	25.4	5.4	6.8	0.25	30.0 x 2.3 x 1.4	BD2300300	OR3002400	24.00 x 3.00
30.0	26.0	5.0	6.4	0.25	30.0 x 2.0 x 1.4	BD2000300	ORAR00120	25.07 x 2.62
32.0	27.4	5.4	6.8	0.25	32.0 x 2.3 x 1.4	BD2300320	OR3002600	26.00 x 3.00
32.0	28.0	5.0	6.4	0.25	32.0 x 2.0 x 1.4	BD2000320	ORAR00121	26.64 x 2.62
35.0	30.4	5.4	6.8	0.25	35.0 x 2.3 x 1.4	BD2300350	OR3002900	29.00 x 3.00
35.0	31.0	5.0	6.4	0.25	35.0 x 2.0 x 1.4	BD2000350	ORAR00123	29.82 x 2.62
40.0	35.4	5.4	6.8	0.25	40.0 x 2.3 x 1.4	BD2300400	OR3003400	34.00 x 3.00
40.0	36.0	5.0	6.4	0.25	40.0 x 2.0 x 1.4	BD2000400	ORAR00126	34.59 x 2.62
42.0	37.4	5.4	6.8	0.25	42.0 x 2.3 x 1.4	BD2300420	OR3003600	36.00 x 3.00
42.0	38.0	5.0	6.4	0.25	42.0 x 2.0 x 1.4	BD2000420	ORAR00127	36.17 x 2.62
45.0	40.0	5.4	6.8	0.25	45.0 x 2.25 x 1.4	BD22H00450	OR3003900	39.00 x 3.00
45.0	41.0	5.0	6.4	0.25	45.0 x 2.0 x 1.4	BD2000450	ORAR00129	39.34 x 2.62
48.0	41.8	6.9	8.6	0.25	48.0 x 3.1 x 1.7	BD3100480	OR4004000	40.00 x 4.00
48.0	42.6	6.2	7.6	0.25	48.0 x 2.7 x 1.4	BD2700480	ORAR00223	40.87 x 3.53
50.0	43.8	6.9	8.6	0.25	50.0 x 3.1 x 1.7	BD3100500	OR4004200	42.00 x 4.00
50.0	44.6	6.2	7.6	0.25	50.0 x 2.7 x 1.4	BD2700500	ORAR00224	44.04 x 3.53
52.0	45.8	6.9	8.6	0.25	52.0 x 3.1 x 1.7	BD3100520	OR4004400	44.00 x 4.00
52.0	46.6	6.2	7.6	0.25	52.0 x 2.7 x 1.4	BD2700520	ORAR00224	44.04 x 3.53



Bore Ø	Groove Ø	Groove width		Radius	Back-up Ring dimension	TSS Part No.	O-Ring TSS Part No.	O-Ring dimension
D _N H8	d ₃ h9	b ₂ +0.25	b ₃ +0.25	r ±0.2	OD x W x T			d ₁ x d ₂
mm								
55.0	48.8	6.9	8.6	0.25	55.0 x 3.1 x 1.7	BD3100550	OR4004700	47.00 x 4.00
55.0	49.6	6.2	7.6	0.25	55.0 x 2.7 x 1.4	BD2700550	ORAR00225	47.22 x 3.53
60.0	53.8	6.9	8.6	0.25	60.0 x 3.1 x 1.7	BD3100600	OR4005200	52.00 x 4.00
60.0	54.6	6.2	7.6	0.25	60.0 x 2.7 x 1.4	BD2700600	ORAR00227	53.57 x 3.53
63.0	56.8	6.9	8.6	0.25	63.0 x 3.1 x 1.7	BD3100630	OR4005500	55.00 x 4.00
63.0	57.6	6.2	7.6	0.25	63.0 x 2.7 x 1.4	BD2700630	ORAR00228	56.74 x 3.53
65.0	58.8	6.9	8.6	0.25	65.0 x 3.1 x 1.7	BD3100650	OR4005700	57.00 x 4.00
65.0	59.6	6.2	7.6	0.25	65.0 x 2.7 x 1.4	BD2700650	ORAR00228	56.74 x 3.53
70.0	63.8	6.9	8.6	0.25	70.0 x 3.1 x 1.7	BD3100700	OR4006200	62.00 x 4.00
70.0	64.6	6.2	7.6	0.25	70.0 x 2.7 x 1.4	BD2700700	ORAR00230	63.09 x 3.53
75.0	68.8	6.9	8.6	0.25	75.0 x 3.1 x 1.7	BD3100750	OR4006700	67.00 x 4.00
75.0	69.6	6.2	7.6	0.25	75.0 x 2.7 x 1.4	BD2700750	ORAR00231	66.27 x 3.53
80.0	73.8	6.9	8.6	0.25	80.0 x 3.1 x 1.7	BD3100800	OR4007200	72.00 x 4.00
80.0	74.6	6.2	7.6	0.25	80.0 x 2.7 x 1.4	BD2700800	ORAR00233	72.62 x 3.53
85.0	78.8	6.9	8.6	0.25	85.0 x 3.1 x 1.7	BD3100850	OR4007700	77.00 x 4.00
85.0	79.6	5.2	7.6	0.25	85.0 x 2.7 x 1.4	BD2700850	ORAR00235	78.97 x 3.53
90.0	81.4	9.0	10.9	0.25	90.0 x 4.3 x 1.7	BD4300900	ORAR00338	78.74 x 5.33
90.0	82.0	8.3	10.0	0.25	90.0 x 4.0 x 1.7	BD4000900	OR5008000	80.00 x 5.00
95.0	86.4	9.0	10.9	0.25	95.0 x 4.3 x 1.7	BD4300950	ORAR00340	85.09 x 5.33
95.0	87.0	8.3	10.0	0.25	95.0 x 4.0 x 1.7	BD4000950	OR5008000	80.00 x 5.00
100.0	91.4	9.0	10.9	0.25	100.0 x 4.3 x 1.7	BD4301000	ORAR00342	91.44 x 5.33
100.0	92.0	8.3	10.0	0.25	100.0 x 4.0 x 1.7	BD4001000	OR5009000	90.00 x 5.00
105.0	96.4	9.0	10.9	0.25	105.0 x 4.3 x 1.7	BD4301050	ORAR00343	94.62 x 5.33
105.0	97.0	8.3	10.0	0.25	105.0 x 4.0 x 1.7	BD4001050	OR5009500	95.00 x 5.00
110.0	101.4	9.0	10.9	0.25	110.0 x 4.3 x 1.7	BD4301100	ORAR00345	100.97 x 5.33
110.0	102.0	8.3	10.0	0.25	110.0 x 4.0 x 1.7	BD4001100	OR5010000	100.00 x 5.00
115.0	106.4	9.0	10.9	0.25	115.0 x 4.3 x 1.7	BD4301150	ORAR00346	104.14 x 5.33
115.0	107.0	8.3	10.0	0.25	115.0 x 4.0 x 1.7	BD4001150	OR5010500	105.00 x 5.00
120.0	111.4	9.0	10.9	0.25	120.0 x 4.3 x 1.7	BD4301200	ORAR00348	110.49 x 5.33
120.0	112.0	8.3	10.0	0.25	120.0 x 4.0 x 1.7	BD4001200	OR5011000	110.00 x 5.00
125.0	116.4	9.0	10.9	0.25	125.0 x 4.3 x 1.7	BD4301250	ORAR00349	113.67 x 5.33
125.0	117.0	8.3	10.0	0.25	125.0 x 4.0 x 1.7	BD4001250	OR5011500	115.00 x 5.00
130.0	121.4	9.0	10.9	0.25	130.0 x 4.3 x 1.7	BD4301300	ORAR00351	120.02 x 5.33
130.0	122.0	8.3	10.0	0.25	130.0 x 4.0 x 1.7	BD4001300	OR5012000	120.00 x 5.00
135.0	123.4	12.3	15.1	0.25	135.0 x 5.8 x 2.5	BD5801350	ORAR00427	120.02 x 6.99
140.0	128.4	12.3	15.1	0.25	140.0 x 5.8 x 2.5	BD5801400	ORAR00429	126.37 x 6.99
150.0	138.4	12.3	15.1	0.25	150.0 x 5.8 x 2.5	BD5801500	ORAR00432	135.89 x 6.99
160.0	148.4	12.3	15.1	0.25	160.0 x 5.8 x 2.5	BD5801600	ORAR00435	145.42 x 6.99
170.0	158.4	12.3	15.1	0.25	170.0 x 5.8 x 2.5	BD5801700	ORAR00438	158.12 x 6.99
180.0	168.4	12.3	15.1	0.25	180.0 x 5.8 x 2.5	BD5801800	ORAR00439	164.47 x 6.99
190.0	178.4	12.3	15.1	0.25	190.0 x 5.8 x 2.5	BD5801900	ORAR00441	177.17 x 6.99
200.0	188.4	12.3	15.1	0.25	200.0 x 5.8 x 2.5	BD5802000	ORAR00442	183.52 x 6.99



Bore Ø	Groove Ø	Groove width		Radius	Back-up Ring dimension	TSS Part No.	O-Ring TSS Part No.	O-Ring dimension
D _N H8	d ₃ h9	b ₂ +0.25	b ₃ +0.25	r ±0.2	OD x W x T			d ₁ x d ₂
mm								
210.0	198.4	12.3	15.1	0.25	210.0 x 5.8 x 2.5	BD5802100	ORAR00444	196.22 x 6.99
220.0	208.4	12.3	15.1	0.25	220.0 x 5.8 x 2.5	BD5802200	ORAR00445	202.57 x 6.99
230.0	218.4	12.3	15.1	0.25	230.0 x 5.8 x 2.5	BD5802300	ORAR00446	215.27 x 6.99
240.0	228.4	12.3	15.1	0.25	240.0 x 5.8 x 2.5	BD5802400	ORAR00447	227.97 x 6.99
250.0	238.4	12.3	15.1	0.25	250.0 x 5.8 x 2.5	BD5802500	ORAR00448	240.67 x 6.99
280.0	268.4	12.3	15.1	0.25	280.0 x 5.8 x 2.5	BD5802800	ORAR00450	266.07 x 6.99
300.0	288.4	12.3	15.1	0.25	300.0 x 5.8 x 2.5	BD5803000	ORAR00451	278.77 x 6.99
320.0	308.4	12.3	15.1	0.25	320.0 x 5.8 x 2.5	BD5803200	ORAR00453	304.17 x 6.99
350.0	338.4	12.3	15.1	0.25	350.0 x 5.8 x 2.5	BD5803500	ORAR00455	329.57 x 6.99
400.0	388.4	12.3	15.1	0.25	400.0 x 5.8 x 2.5	BD5804000	ORAR00459	380.37 x 6.99
420.0	408.4	12.3	15.1	0.25	420.0 x 5.8 x 2.5	BD5804200	ORAR00461	405.26 x 6.99
450.0	438.4	12.3	15.1	0.25	450.0 x 5.8 x 2.5	BD5804500	ORAR00463	430.66 x 6.99
480.0	468.4	12.3	15.1	0.25	480.0 x 5.8 x 2.5	BD5804800	ORAR00465	456.06 x 6.99
500.0	488.4	12.3	15.1	0.25	500.0 x 5.8 x 2.5	BD5805000	ORAR00467	481.46 x 6.99

Further sizes available on request.

This table shows the possible range of available dimensions (Back-up Rings). However, these dimensions are not always stock items.



**Table 79: Preferred series for static applications, concave Back-up Ring
Type BD (cut), External sealing, material PTFE – Inch**

Bore Ø	Groove Ø	Groove width		Radius	Back-up Ring dimension	TSS Part No.	O-Ring TSS Part No.	O-Ring dimension
D _N H8	d ₃ h9	b ₂ +0.010	b ₃ +0.010	r ±0.008	OD x W x T			d ₁ x d ₂
inch								
0.236	0.134	0.150	0.205	0.010	0.24 x 0.05 x 0.06	BD1300060	ORAR00006	0.114 x 0.070
0.236	0.150	0.118	0.157	0.010	0.24 x 0.04 x 0.04	BD1100060	OR1500350	0.138 x 0.059
0.315	0.228	0.118	0.157	0.010	0.31 x 0.04 x 0.04	BD1100080	OR1500550	0.217 x 0.059
0.394	0.307	0.118	0.157	0.010	0.39 x 0.04 x 0.04	BD1100100	OR1500750	0.295 x 0.059
0.472	0.354	0.161	0.217	0.010	0.47 x 0.06 x 0.06	BD1500120	OR2000850	0.335 x 0.079
0.472	0.370	0.150	0.205	0.010	0.47 x 0.05 x 0.06	BD1300120	ORAR00012	0.364 x 0.070
0.551	0.433	0.161	0.217	0.010	0.55 x 0.06 x 0.06	BD1500140	OR2001000	0.394 x 0.079
0.551	0.449	0.150	0.205	0.010	0.55 x 0.05 x 0.06	BD1300140	ORAR00013	0.426 x 0.070
0.591	0.472	0.161	0.217	0.010	0.59 x 0.06 x 0.06	BD1500150	OR2001100	0.433 x 0.079
0.591	0.488	0.150	0.205	0.010	0.59 x 0.05 x 0.06	BD1300150	ORAR00014	0.489 x 0.070
0.630	0.512	0.161	0.217	0.010	0.63 x 0.06 x 0.06	BD1500160	OR2001200	0.472 x 0.079
0.630	0.528	0.150	0.205	0.010	0.63 x 0.05 x 0.06	BD1300160	ORAR00015	0.551 x 0.070
0.709	0.591	0.161	0.217	0.010	0.71 x 0.06 x 0.06	BD1500180	OR2001400	0.551 x 0.079
0.709	0.606	0.150	0.205	0.010	0.71 x 0.05 x 0.06	BD1300180	ORAR00016	0.614 x 0.070
0.787	0.669	0.161	0.217	0.010	0.79 x 0.06 x 0.06	BD1500200	OR2001600	0.630 x 0.079
0.787	0.685	0.150	0.205	0.010	0.79 x 0.05 x 0.06	BD1300200	ORAR00017	0.676 x 0.070
0.866	0.748	0.161	0.217	0.010	0.87 x 0.06 x 0.06	BD1500220	OR2001600	0.630 x 0.079
0.866	0.764	0.150	0.205	0.010	0.87 x 0.05 x 0.06	BD1300220	ORAR00018	0.739 x 0.070
0.984	0.866	0.161	0.217	0.010	0.98 x 0.06 x 0.06	BD1500250	OR2002100	0.827 x 0.079
0.984	0.882	0.150	0.205	0.010	0.98 x 0.05 x 0.06	BD1300250	ORAR00020	0.864 x 0.070
1.102	0.921	0.213	0.268	0.010	1.10 x 0.09 x 0.06	BD2300280	OR3002200	0.866 x 0.118
1.102	0.945	0.197	0.252	0.010	1.10 x 0.08 x 0.06	BD2000280	ORAR00119	0.924 x 0.103
1.181	1.000	0.213	0.268	0.010	1.18 x 0.09 x 0.06	BD2300300	OR3002400	0.945 x 0.079
1.181	1.024	0.197	0.252	0.010	1.18 x 0.08 x 0.06	BD2000300	ORAR00120	0.987 x 0.103
1.260	1.079	0.213	0.268	0.010	1.26 x 0.09 x 0.06	BD2300320	OR3002600	1.024 x 0.118
1.260	1.102	0.197	0.252	0.010	1.26 x 0.08 x 0.06	BD2000320	ORAR00121	1.049 x 0.103
1.378	1.197	0.213	0.268	0.010	1.38 x 0.09 x 0.06	BD2300350	OR3002900	1.154 x 0.118
1.378	1.220	0.197	0.252	0.010	1.38 x 0.08 x 0.06	BD2000350	ORAR00123	1.174 x 0.103
1.575	1.394	0.213	0.268	0.010	1.57 x 0.09 x 0.06	BD2300400	OR3003400	1.339 x 0.118
1.575	1.417	0.197	0.252	0.010	1.57 x 0.08 x 0.06	BD2000400	ORAR00126	1.362 x 0.103
1.654	1.472	0.213	0.268	0.010	1.65 x 0.09 x 0.06	BD2300420	OR3003600	1.417 x 0.118
1.654	1.496	0.197	0.252	0.010	1.65 x 0.08 x 0.06	BD2000420	ORAR00127	1.424 x 0.103
1.772	1.575	0.213	0.268	0.010	1.77 x 0.09 x 0.06	BD2300450	OR3003900	1.535 x 0.118
1.772	1.614	0.197	0.252	0.010	1.77 x 0.08 x 0.06	BD2000450	ORAR00129	1.549 x 0.103
1.890	1.646	0.272	0.339	0.010	1.89 x 0.12 x 0.07	BD3100480	OR4004000	1.575 x 0.157
1.890	1.677	0.244	0.299	0.010	1.89 x 0.11 x 0.06	BD2700480	ORAR00223	1.609 x 0.139
1.969	1.724	0.272	0.339	0.010	1.97 x 0.12 x 0.07	BD3100500	OR4004200	1.654 x 0.157
1.969	1.756	0.244	0.299	0.010	1.97 x 0.11 x 0.06	BD2700500	ORAR00224	1.734 x 0.139
2.047	1.803	0.272	0.339	0.010	2.05 x 0.12 x 0.07	BD3100520	OR4004400	1.732 x 0.157
2.047	1.835	0.244	0.299	0.010	2.05 x 0.11 x 0.06	BD2700520	ORAR00224	1.734 x 0.139



Bore Ø	Groove Ø	Groove width		Radius	Back-up Ring dimension	TSS Part No.	O-Ring TSS Part No.	O-Ring dimension
D _N H8	d ₃ h9	b ₂ +0.010	b ₃ +0.010	r ±0.008	OD x W x T			d ₁ x d ₂
inch								
2.165	1.921	0.272	0.339	0.010	2.17 x 0.12 x 0.07	BD3100550	OR4004700	1.850 x 0.157
2.165	1.953	0.244	0.299	0.010	2.17 x 0.11 x 0.06	BD2700550	ORAR00225	1.859 x 0.139
2.362	2.118	0.272	0.339	0.010	2.36 x 0.12 x 0.07	BD3100600	OR4005200	2.047 x 0.157
2.362	2.150	0.244	0.299	0.010	2.36 x 0.11 x 0.06	BD2700600	ORAR00227	2.109 x 0.139
2.480	2.236	0.272	0.339	0.010	2.48 x 0.12 x 0.07	BD3100630	OR4005500	2.165 x 0.157
2.480	2.268	0.244	0.299	0.010	2.48 x 0.11 x 0.06	BD2700630	ORAR00228	2.234 x 0.139
2.559	2.315	0.272	0.339	0.010	2.56 x 0.12 x 0.07	BD3100650	OR4005700	2.244 x 0.157
2.559	2.346	0.244	0.299	0.010	2.56 x 0.11 x 0.06	BD2700650	ORAR00228	2.234 x 0.139
2.756	2.512	0.272	0.339	0.010	2.76 x 0.12 x 0.07	BD3100700	OR4006200	2.441 x 0.157
2.756	2.543	0.244	0.299	0.010	2.76 x 0.11 x 0.06	BD2700700	ORAR00230	2.484 x 0.139
2.953	2.709	0.272	0.339	0.010	2.95 x 0.12 x 0.07	BD3100750	OR4006700	2.638 x 0.157
2.953	2.740	0.244	0.299	0.010	2.95 x 0.11 x 0.06	BD2700750	ORAR00231	2.609 x 0.139
3.150	2.906	0.272	0.339	0.010	3.15 x 0.12 x 0.07	BD3100800	OR4007200	2.835 x 0.157
3.150	2.937	0.244	0.299	0.010	3.15 x 0.11 x 0.06	BD2700800	ORAR00233	2.859 x 0.139
3.346	3.102	0.272	0.339	0.010	3.35 x 0.12 x 0.07	BD3100850	OR4007700	3.031 x 0.157
3.346	3.134	0.205	0.299	0.010	3.35 x 0.11 x 0.06	BD2700850	ORAR00235	3.109 x 0.139
3.543	3.205	0.354	0.429	0.010	3.54 x 0.17 x 0.07	BD4300900	ORAR00338	3.100 x 0.210
3.543	3.228	0.327	0.394	0.010	3.54 x 0.16 x 0.07	BD4000900	OR5008000	3.150 x 0.197
3.740	3.402	0.354	0.429	0.010	3.74 x 0.17 x 0.07	BD4300950	ORAR00340	3.350 x 0.210
3.740	3.425	0.327	0.394	0.010	3.74 x 0.16 x 0.07	BD4000950	OR5008000	3.150 x 0.197
3.937	3.598	0.354	0.429	0.010	3.94 x 0.17 x 0.07	BD4301000	ORAR00342	3.600 x 0.210
3.937	3.622	0.327	0.394	0.010	3.94 x 0.16 x 0.07	BD4001000	OR5009000	3.543 x 0.197
4.134	3.795	0.354	0.429	0.010	4.13 x 0.17 x 0.07	BD4301050	ORAR00343	3.725 x 0.210
4.134	3.819	0.327	0.394	0.010	4.13 x 0.16 x 0.07	BD4001050	OR5009500	3.740 x 0.197
4.331	3.992	0.354	0.429	0.010	4.33 x 0.17 x 0.07	BD4301100	ORAR00345	3.975 x 0.210
4.331	4.016	0.327	0.394	0.010	4.33 x 0.16 x 0.07	BD4001100	OR5010000	3.937 x 0.197
4.528	4.189	0.354	0.429	0.010	4.53 x 0.17 x 0.07	BD4301150	ORAR00346	4.100 x 0.210
4.528	4.213	0.327	0.394	0.010	4.53 x 0.16 x 0.07	BD4001150	OR5010500	4.134 x 0.197
4.724	4.386	0.354	0.429	0.010	4.72 x 0.17 x 0.07	BD4301200	ORAR00348	4.350 x 0.210
4.724	4.409	0.327	0.394	0.010	4.72 x 0.16 x 0.07	BD4001200	OR5011000	4.331 x 0.197
4.921	4.583	0.354	0.429	0.010	4.92 x 0.17 x 0.07	BD4301250	ORAR00349	4.475 x 0.210
4.921	4.606	0.327	0.394	0.010	4.92 x 0.16 x 0.07	BD4001250	OR5011500	4.528 x 0.197
5.118	4.780	0.354	0.429	0.010	5.12 x 0.17 x 0.07	BD4301300	ORAR00351	4.725 x 0.210
5.118	4.803	0.327	0.394	0.010	5.12 x 0.16 x 0.07	BD4001300	OR5012000	4.724 x 0.197
5.315	4.858	0.484	0.594	0.010	5.31 x 0.23 x 0.10	BD5801350	ORAR00427	4.725 x 0.275
5.512	5.055	0.484	0.594	0.010	5.51 x 0.23 x 0.10	BD5801400	ORAR00429	4.975 x 0.275
5.906	5.449	0.484	0.594	0.010	5.91 x 0.23 x 0.10	BD5801500	ORAR00432	5.350 x 0.275
6.299	5.843	0.484	0.594	0.010	6.30 x 0.23 x 0.10	BD5801600	ORAR00435	5.725 x 0.275
6.693	6.236	0.484	0.594	0.010	6.69 x 0.23 x 0.10	BD5801700	ORAR00438	6.225 x 0.275
7.087	6.630	0.484	0.594	0.010	7.09 x 0.23 x 0.10	BD5801800	ORAR00439	6.475 x 0.275



Bore Ø	Groove Ø	Groove width		Radius	Back-up Ring dimension	TSS Part No.	O-Ring TSS Part No.	O-Ring dimension
D _N H8	d ₃ h9	b ₂ +0.010	b ₃ +0.010	r ±0.008	OD x W x T			d ₁ x d ₂
inch								
7.480	7.024	0.484	0.594	0.010	7.48 x 0.23 x 0.10	BD5801900	ORAR00441	6.975 x 0.275
7.874	7.417	0.484	0.594	0.010	7.87 x 0.23 x 0.10	BD5802000	ORAR00442	7.225 x 0.275
8.268	7.811	0.484	0.594	0.010	8.27 x 0.23 x 0.10	BD5802100	ORAR00444	7.725 x 0.275
8.661	8.205	0.484	0.594	0.010	8.66 x 0.23 x 0.10	BD5802200	ORAR00445	7.975 x 0.275
9.055	8.598	0.484	0.594	0.010	9.06 x 0.23 x 0.10	BD5802300	ORAR00446	8.475 x 0.275
9.449	8.992	0.484	0.594	0.010	9.45 x 0.23 x 0.10	BD5802400	ORAR00447	8.975 x 0.275
9.843	9.386	0.484	0.594	0.010	9.84 x 0.23 x 0.10	BD5802500	ORAR00448	9.475 x 0.275
11.024	10.567	0.484	0.594	0.010	11.02 x 0.23 x 0.10	BD5802800	ORAR00450	10.475 x 0.275
11.811	11.354	0.484	0.594	0.010	11.81 x 0.23 x 0.10	BD5803000	ORAR00451	10.975 x 0.275
12.598	12.142	0.484	0.594	0.010	12.60 x 0.23 x 0.10	BD5803200	ORAR00453	11.975 x 0.275
13.780	13.323	0.484	0.594	0.010	13.78 x 0.23 x 0.10	BD5803500	ORAR00455	12.975 x 0.275
15.748	15.291	0.484	0.594	0.010	15.75 x 0.23 x 0.10	BD5804000	ORAR00459	14.975 x 0.275
16.535	16.079	0.484	0.594	0.010	16.54 x 0.23 x 0.10	BD5804200	ORAR00461	15.955 x 0.275
17.717	17.260	0.484	0.594	0.010	17.72 x 0.23 x 0.10	BD5804500	ORAR00463	16.955 x 0.275
18.898	18.441	0.484	0.594	0.010	18.90 x 0.23 x 0.10	BD5804800	ORAR00465	17.955 x 0.275
19.685	19.228	0.484	0.594	0.010	19.69 x 0.23 x 0.10	BD5805000	ORAR00467	18.955 x 0.275

Further sizes available on request.

This table shows the possible range of available dimensions (Back-up Rings). However, these dimensions are not always stock items.



H.1.3 SPIRAL BACK-UP RING TYPES (BP), MATERIAL PTFE

The following figure and tables include installation recommendations and Back-up Ring dimensions for external sealing applications with the spiral Back-up Ring types BP.

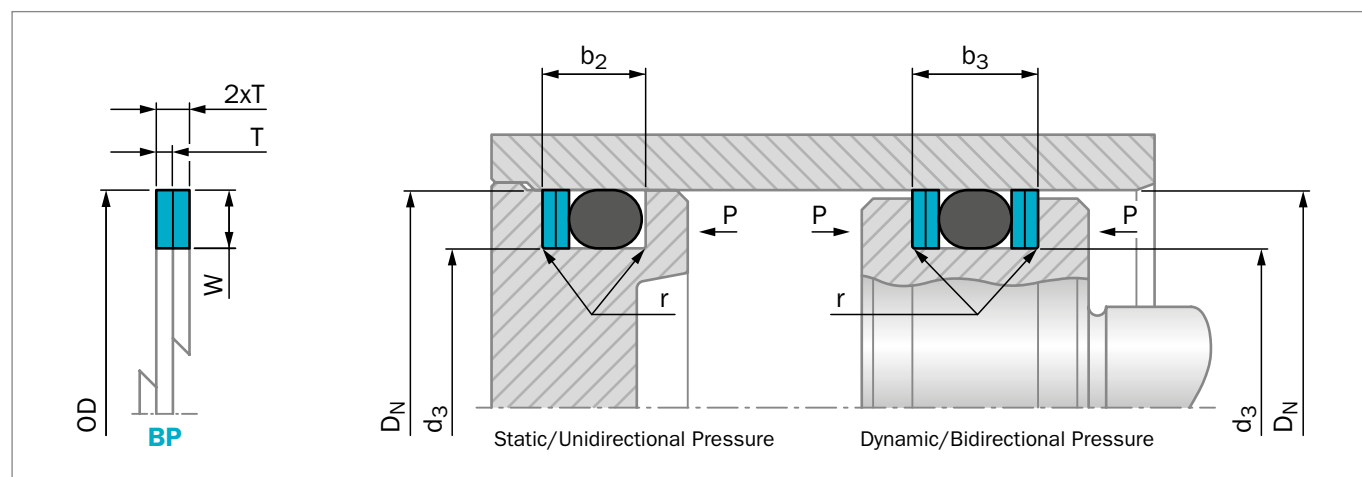


Figure 58: Installation drawing external sealing, spiral Back-up Ring type

**Table 80: Installation dimensions for the spiral Back-up Ring type,
External sealing, material PTFE – Metric**

O-Ring Cross-Section-Ø d_2	Back-up Ring Cross-Section			Groove dimensions				
	Radial height W		Thickness T	Groove diameter d_3 h9		Groove width		Radius
	Dynamic	Static	T	Dynamic	Static	$b_2 + 0.25$	$b_3 + 0.25$	$r \pm 0.2$
mm								
1.50	1.25	1.10	0.50	$D_N - 2.5$	$D_N - 2.2$	3.0	4.0	0.25
1.60	1.30	1.20	0.50	$D_N - 2.6$	$D_N - 2.4$	3.1	4.1	0.25
1.78	1.45	1.30	0.70	$D_N - 2.9$	$D_N - 2.6$	3.8	5.2	0.25
1.80	1.45	1.30	0.70	$D_N - 2.9$	$D_N - 2.6$	3.8	5.2	0.25
2.00	1.65	1.50	0.70	$D_N - 3.3$	$D_N - 3.0$	4.1	5.5	0.25
2.40	2.05	1.80	0.70	$D_N - 4.1$	$D_N - 3.6$	4.6	6.0	0.25
2.50	2.15	1.90	0.70	$D_N - 4.3$	$D_N - 3.8$	4.7	6.1	0.25
2.62	2.25	2.00	0.70	$D_N - 4.5$	$D_N - 4.0$	5.0	6.4	0.25
2.65	2.25	2.00	0.70	$D_N - 4.5$	$D_N - 4.0$	5.0	6.4	0.25
3.00	2.60	2.30	0.70	$D_N - 5.2$	$D_N - 4.6$	5.4	6.8	0.25
3.53	3.10	2.70	0.70	$D_N - 6.2$	$D_N - 5.4$	6.2	7.6	0.25
3.55	3.10	2.70	0.70	$D_N - 6.2$	$D_N - 5.4$	6.2	7.6	0.25
4.00	3.50	3.10	0.85	$D_N - 7.0$	$D_N - 6.2$	6.9	8.6	0.25
5.00	4.40	4.00	0.85	$D_N - 8.8$	$D_N - 8.0$	8.3	10.0	0.25
5.30	4.70	4.30	0.85	$D_N - 9.4$	$D_N - 8.6$	9.0	10.9	0.25
5.33	4.70	4.30	0.85	$D_N - 9.4$	$D_N - 8.6$	9.0	10.9	0.25
5.70	5.00	4.60	0.85	$D_N - 10.0$	$D_N - 9.2$	9.0	11.0	0.25
6.00	5.30	4.90	0.85	$D_N - 10.6$	$D_N - 9.8$	9.3	11.2	0.25
6.99	6.10	5.80	1.25	$D_N - 12.2$	$D_N - 11.6$	12.3	15.1	0.25
8.00	7.10	6.70	1.25	$D_N - 14.2$	$D_N - 13.4$	12.6	15.4	0.25
8.40	7.50	7.10	1.25	$D_N - 15.0$	$D_N - 14.2$	12.8	15.6	0.25

**Table 81: Installation dimensions for the spiral Back-up Ring type,
External sealing, material PTFE – Inch**

O-Ring Cross- Section-Ø d_2	Back-up Ring Cross-Section			Groove dimensions				
	Radial height W		Thickness	Groove diameter d_3 h9		Groove width		Radius
	Dynamic	Static	T	Dynamic	Static	$b_2 + 0.010$	$b_3 + 0.010$	$r \pm 0.008$
inch								
0.059	0.049	0.043	0.020	$D_N - 0.098$	$D_N - 0.087$	0.118	0.157	0.010
0.063	0.051	0.047	0.020	$D_N - 0.102$	$D_N - 0.094$	0.122	0.161	0.010
0.070	0.057	0.051	0.028	$D_N - 0.114$	$D_N - 0.102$	0.150	0.205	0.010
0.071	0.057	0.051	0.028	$D_N - 0.114$	$D_N - 0.102$	0.150	0.205	0.010
0.079	0.065	0.059	0.028	$D_N - 0.130$	$D_N - 0.118$	0.161	0.217	0.010
0.094	0.081	0.071	0.028	$D_N - 0.161$	$D_N - 0.142$	0.181	0.236	0.010
0.098	0.085	0.075	0.028	$D_N - 0.169$	$D_N - 0.150$	0.185	0.240	0.010
0.103	0.089	0.079	0.028	$D_N - 0.177$	$D_N - 0.157$	0.197	0.252	0.010
0.104	0.089	0.079	0.028	$D_N - 0.177$	$D_N - 0.157$	0.197	0.252	0.010
0.118	0.102	0.091	0.028	$D_N - 0.205$	$D_N - 0.181$	0.213	0.268	0.010
0.139	0.122	0.106	0.028	$D_N - 0.244$	$D_N - 0.213$	0.244	0.299	0.010
0.140	0.122	0.106	0.028	$D_N - 0.244$	$D_N - 0.213$	0.244	0.299	0.010
0.157	0.138	0.122	0.033	$D_N - 0.276$	$D_N - 0.244$	0.272	0.339	0.010
0.197	0.173	0.157	0.033	$D_N - 0.346$	$D_N - 0.315$	0.327	0.394	0.010
0.209	0.185	0.169	0.033	$D_N - 0.370$	$D_N - 0.339$	0.354	0.429	0.010
0.210	0.185	0.169	0.033	$D_N - 0.370$	$D_N - 0.339$	0.354	0.429	0.010
0.224	0.197	0.181	0.033	$D_N - 0.394$	$D_N - 0.362$	0.354	0.433	0.010
0.236	0.209	0.193	0.033	$D_N - 0.417$	$D_N - 0.386$	0.366	0.441	0.010
0.275	0.240	0.228	0.049	$D_N - 0.480$	$D_N - 0.457$	0.484	0.594	0.010
0.315	0.280	0.264	0.049	$D_N - 0.559$	$D_N - 0.528$	0.496	0.606	0.010
0.331	0.295	0.280	0.049	$D_N - 0.591$	$D_N - 0.559$	0.504	0.614	0.010

ORDERING EXAMPLE

Back-up Ring:	Type BP (spiral) for O-Ring seal
Application:	Dynamic, external sealing
Bore diameter:	$D_N = 120.00$ mm (4.724 inch)
Groove diameter:	$d_3 = 111.20$ mm (4.378 inch)
O-Ring Cross-Section:	$d_2 = 5.00$ mm (0.197 inch)
Back-up Ring material:	PTFE, virgin

For material code see page 151

TSS Article No. **BP 44 0 1112 - PT00**

Back-Up Ring (Spiral) ———

Radial Height (mm) W x 10 ———

T-dimension (Standard, mm) ———

Groove-Ø (mm) d_3 x 10 ———

Quality Index (Standard) ———

Material Code (Standard) ———



**Table 82: Preferred series for dynamic application, spiral Back-up Ring
Type BP, External sealing, material PTFE – Metric**

Bore Ø	Groove Ø	Groove width		Radi- us	Back-up Ring dimension	TSS Part No.	O-Ring TSS Part No.	O-Ring dimension
D _N H8	d ₃ h9	b ₂ +0.25	b ₃ +0.25	r ±0.2	OD x W x T			d ₁ x d ₂
mm								
6.0	3.1	3.8	5.2	0.25	6.0 x 1.45 x 0.70	BP14H00031	ORAR00006	2.90 x 1.78
6.0	3.5	3.0	4.0	0.25	6.0 x 1.25 x 0.50	BP12H00035	OR1500300	3.00 x 1.50
8.0	5.1	3.8	5.2	0.25	8.0 x 1.45 x 0.70	BP14H00051	ORAR00008	4.47 x 1.78
8.0	5.5	3.0	4.0	0.25	8.0 x 1.25 x 0.50	BP12H00055	OR1500500	5.00 x 1.50
10.0	7.1	3.8	5.2	0.25	10.0 x 1.45 x 0.70	BP14H00071	ORAR00011	7.65 x 1.78
10.0	7.5	3.0	4.0	0.25	10.0 x 1.25 x 0.50	BP12H00075	OR1500700	7.00 x 1.50
12.0	8.7	4.1	5.5	0.25	12.0 x 1.65 x 0.70	BP16H00087	OR2000800	8.00 x 2.00
12.0	9.1	3.8	5.2	0.25	12.0 x 1.45 x 0.70	BP14H00091	ORAR00012	9.25 x 1.78
14.0	10.7	4.1	5.5	0.25	14.0 x 1.65 x 0.70	BP16H00107	OR2001000	10.00 x 2.00
14.0	11.1	3.8	5.2	0.25	14.0 x 1.45 x 0.70	BP14H00111	ORAR00013	10.82 x 1.78
15.0	11.7	4.1	5.5	0.25	15.0 x 1.65 x 0.70	BP16H00117	OR2001100	11.00 x 2.00
15.0	12.1	3.8	5.2	0.25	15.0 x 1.45 x 0.70	BP14H00121	ORAR00014	12.42 x 1.78
16.0	12.7	4.1	5.5	0.25	16.0 x 1.65 x 0.70	BP16H00127	OR2001200	12.00 x 2.00
16.0	13.1	3.8	5.2	0.25	16.0 x 1.45 x 0.70	BP14H00131	ORAR00015	14.00 x 1.78
18.0	14.7	4.1	5.5	0.25	18.0 x 1.65 x 0.70	BP16H00147	OR2001400	14.00 x 2.00
18.0	15.1	3.8	5.2	0.25	18.0 x 1.45 x 0.70	BP14H00151	ORAR00016	15.60 x 1.78
20.0	16.7	4.1	5.5	0.25	20.0 x 1.65 x 0.70	BP16H00167	OR2001600	16.00 x 2.00
20.0	17.1	3.8	5.2	0.25	20.0 x 1.45 x 0.70	BP14H00171	ORAR00017	17.17 x 1.78
22.0	18.7	4.1	5.5	0.25	22.0 x 1.65 x 0.70	BP16H00187	OR2001800	18.00 x 2.00
22.0	19.1	3.8	5.2	0.25	22.0 x 1.45 x 0.70	BP14H00191	ORAR00018	18.77 x 1.78
25.0	21.7	4.1	5.5	0.25	25.0 x 1.65 x 0.70	BP16H00217	OR2002100	21.00 x 2.00
25.0	22.1	3.8	5.2	0.25	25.0 x 1.45 x 0.70	BP14H00221	ORAR00020	21.95 x 1.78
28.0	22.8	5.4	6.8	0.25	28.0 x 2.60 x 0.70	BP2600228	OR3002200	22.00 x 3.00
28.0	23.5	5.0	6.4	0.25	28.0 x 2.25 x 0.70	BP22H00235	ORAR00119	23.47 x 2.62
30.0	24.8	5.4	6.8	0.25	30.0 x 2.60 x 0.70	BP2600248	OR3002400	24.00 x 3.00
30.0	25.5	5.0	6.4	0.25	30.0 x 2.25 x 0.70	BP22H00255	ORAR00120	25.07 x 2.62
32.0	26.8	5.4	6.8	0.25	32.0 x 2.60 x 0.70	BP2600268	OR3002600	26.00 x 3.00
35.0	29.8	5.4	6.8	0.25	35.0 x 2.60 x 0.70	BP2600298	OR3002900	29.00 x 3.00
35.0	30.5	5.0	6.4	0.25	35.0 x 2.25 x 0.70	BP22H00305	ORAR00123	29.82 x 2.62
40.0	34.8	5.4	6.8	0.25	40.0 x 2.60 x 0.70	BP2600348	OR3003400	34.00 x 3.00
40.0	35.5	5.0	6.4	0.25	40.0 x 2.25 x 0.70	BP22H00355	ORAR00126	34.59 x 2.62
42.0	36.8	5.4	6.8	0.25	42.0 x 2.60 x 0.70	BP2600368	OR3003600	36.00 x 3.00
42.0	37.5	5.0	6.4	0.25	42.0 x 2.25 x 0.70	BP22H00375	ORAR00127	36.17 x 2.62
45.0	39.8	5.4	6.8	0.25	45.0 x 2.60 x 0.70	BP2600398	OR3003900	39.00 x 3.00
45.0	40.5	5.0	6.4	0.25	45.0 x 2.25 x 0.70	BP22H00405	ORAR00129	39.34 x 2.62
48.0	41.0	6.9	8.6	0.25	48.0 x 3.50 x 0.85	BP3500410	OR4004000	40.00 x 4.00
48.0	41.8	6.2	7.6	0.25	48.0 x 3.10 x 0.70	BP31D0418	ORAR00223	40.87 x 3.53
50.0	43.0	6.9	8.6	0.25	50.0 x 3.50 x 0.85	BP3500430	OR4004200	42.00 x 4.00
50.0	43.8	6.2	7.6	0.25	50.0 x 3.10 x 0.70	BP31D0438	ORAR00224	44.04 x 3.53
52.0	45.0	6.9	8.6	0.25	52.0 x 3.50 x 0.85	BP3500450	OR4004400	44.00 x 4.00



Bore Ø	Groove Ø	Groove width		Radi- us	Back-up Ring dimension	TSS Part No.	O-Ring TSS Part No.	O-Ring dimension
D _N H8	d ₃ h9	b ₂ +0.25	b ₃ +0.25	r ±0.2	OD x W x T			d ₁ x d ₂
mm								
52.0	45.8	6.2	7.6	0.25	52.0 x 3.10 x 0.70	BP31D0458	ORAR00224	44.04 x 3.53
55.0	48.0	6.9	8.6	0.25	55.0 x 3.50 x 0.85	BP3500480	OR4004700	47.00 x 4.00
55.0	48.8	6.2	7.6	0.25	55.0 x 3.10 x 0.70	BP31D0488	ORAR00225	47.22 x 3.53
60.0	53.0	6.9	8.6	0.25	60.0 x 3.50 x 0.85	BP3500530	OR4005200	52.00 x 4.00
60.0	53.8	6.2	7.6	0.25	60.0 x 3.10 x 0.70	BP31D0538	ORAR00227	53.57 x 3.53
63.0	56.0	6.9	8.6	0.25	63.0 x 3.50 x 0.85	BP3500560	OR4005500	55.00 x 4.00
63.0	56.8	6.2	7.6	0.25	63.0 x 3.10 x 0.70	BP31D0568	ORAR00228	56.74 x 3.53
65.0	58.0	6.9	8.6	0.25	65.0 x 3.50 x 0.85	BP3500580	OR4005700	57.00 x 4.00
65.0	58.8	6.2	7.6	0.25	65.0 x 3.10 x 0.70	BP31D0588	ORAR00228	56.74 x 3.53
70.0	63.0	6.9	8.6	0.25	70.0 x 3.50 x 0.85	BP3500630	OR4006200	62.00 x 4.00
70.0	63.8	6.2	7.6	0.25	70.0 x 3.10 x 0.70	BP31D0638	ORAR00230	63.09 x 3.53
75.0	68.0	6.9	8.6	0.25	75.0 x 3.50 x 0.85	BP3500680	OR4006700	67.00 x 4.00
75.0	68.8	6.2	7.6	0.25	75.0 x 3.10 x 0.70	BP31D0688	ORAR00231	66.27 x 3.53
80.0	73.0	6.9	8.6	0.25	80.0 x 3.50 x 0.85	BP3500730	OR4007200	72.00 x 4.00
80.0	73.8	6.2	7.6	0.25	80.0 x 3.10 x 0.70	BP31D0738	ORAR00233	72.62 x 3.53
85.0	78.0	6.9	8.6	0.25	85.0 x 3.50 x 0.85	BP3500780	OR4007700	77.00 x 4.00
85.0	78.8	6.2	7.6	0.25	85.0 x 3.10 x 0.70	BP31D0788	ORAR00235	78.97 x 3.53
90.0	80.6	9.0	10.9	0.25	90.0 x 4.70 x 0.85	BP4700806	ORAR00338	78.74 x 5.33
90.0	81.2	8.3	10.0	0.25	90.0 x 4.40 x 0.85	BP4400812	OR5008000	80.00 x 5.00
95.0	85.6	9.0	10.9	0.25	95.0 x 4.70 x 0.85	BP4700856	ORAR00340	85.09 x 5.33
95.0	86.2	8.3	10.0	0.25	95.0 x 4.40 x 0.85	BP4400862	OR5008500	85.00 x 5.00
100.0	90.6	9.0	10.9	0.25	100.0 x 4.70 x 0.85	BP4700906	ORAR00342	91.44 x 5.33
100.0	91.2	8.3	10.0	0.25	100.0 x 4.40 x 0.85	BP4400912	OR5009000	90.00 x 5.00
105.0	95.6	9.0	10.9	0.25	105.0 x 4.70 x 0.85	BP4700956	ORAR00343	94.62 x 5.33
105.0	96.2	8.3	10.0	0.25	105.0 x 4.40 x 0.85	BP4400962	OR5009500	95.00 x 5.00
110.0	100.6	9.0	10.9	0.25	110.0 x 4.70 x 0.85	BP4701006	ORAR00345	100.97 x 5.33
110.0	101.2	8.3	10.0	0.25	110.0 x 4.40 x 0.85	BP4401012	OR5010000	100.00 x 5.00
115.0	105.6	9.0	10.9	0.25	115.0 x 4.70 x 0.85	BP4701056	ORAR00346	104.14 x 5.33
115.0	106.2	8.3	10.0	0.25	115.0 x 4.40 x 0.85	BP4401062	OR5010500	105.00 x 5.00
120.0	110.6	9.0	10.9	0.25	120.0 x 4.70 x 0.85	BP4701106	ORAR00348	110.49 x 5.33
120.0	111.2	8.3	10.0	0.25	120.0 x 4.40 x 0.85	BP4401112	OR5011000	110.00 x 5.00
125.0	115.6	9.0	10.9	0.25	125.0 x 4.70 x 0.85	BP4701156	ORAR00349	113.67 x 5.33
125.0	116.2	8.3	10.0	0.25	125.0 x 4.40 x 0.85	BP4401162	OR5011500	115.00 x 5.00
130.0	120.6	9.0	10.9	0.25	130.0 x 4.70 x 0.85	BP4701206	ORAR00351	120.02 x 5.33
130.0	121.2	8.3	10.0	0.25	130.0 x 4.40 x 0.85	BP4401212	OR5012000	120.00 x 5.00
135.0	122.8	12.3	15.1	0.25	135.0 x 6.10 x 1.25	BP6101228	ORAR00427	120.02 x 6.99
140.0	127.8	12.3	15.1	0.25	140.0 x 6.10 x 1.25	BP6101278	ORAR00429	126.37 x 6.99
150.0	137.8	12.3	15.1	0.25	150.0 x 6.10 x 1.25	BP6101378	ORAR00432	135.89 x 6.99
160.0	147.8	12.3	15.1	0.25	160.0 x 6.10 x 1.25	BP6101478	ORAR00435	145.42 x 6.99
170.0	157.8	12.3	15.1	0.25	170.0 x 6.10 x 1.25	BP6101578	ORAR00438	158.12 x 6.99
180.0	167.8	12.3	15.1	0.25	180.0 x 6.10 x 1.25	BP6101678	ORAR00439	164.47 x 6.99
190.0	177.8	12.3	15.1	0.25	190.0 x 6.10 x 1.25	BP6101778	ORAR00441	177.17 x 6.99



Bore Ø	Groove Ø	Groove width		Radi- us	Back-up Ring dimension	TSS Part No.	O-Ring TSS Part No.	O-Ring dimension
D _N H8	d ₃ h9	b ₂ +0.25	b ₃ +0.25	r ±0.2	OD x W x T			d ₁ x d ₂
mm								
200.0	187.8	12.3	15.1	0.25	200.0 x 6.10 x 1.25	BP6101878	ORAR00442	183.52 x 6.99
210.0	197.8	12.3	15.1	0.25	210.0 x 6.10 x 1.25	BP6101978	ORAR00444	196.22 x 6.99
220.0	207.8	12.3	15.1	0.25	220.0 x 6.10 x 1.25	BP6102078	ORAR00445	202.57 x 6.99
230.0	217.8	12.3	15.1	0.25	230.0 x 6.10 x 1.25	BP6102178	ORAR00446	215.27 x 6.99
240.0	227.8	12.3	15.1	0.25	240.0 x 6.10 x 1.25	BP6102278	ORAR00447	227.97 x 6.99
250.0	237.8	12.3	15.1	0.25	250.0 x 6.10 x 1.25	BP6102378	ORAR00448	240.67 x 6.99
280.0	267.8	12.3	15.1	0.25	280.0 x 6.10 x 1.25	BP6102678	ORAR00450	266.07 x 6.99
300.0	287.8	12.3	15.1	0.25	300.0 x 6.10 x 1.25	BP6102878	ORAR00451	278.77 x 6.99
320.0	307.8	12.3	15.1	0.25	320.0 x 6.10 x 1.25	BP6103078	ORAR00453	304.17 x 6.99
350.0	337.8	12.3	15.1	0.25	350.0 x 6.10 x 1.25	BP6103378	ORAR00455	329.57 x 6.99
400.0	387.8	12.3	15.1	0.25	400.0 x 6.10 x 1.25	BP6103878	ORAR00459	380.37 x 6.99
420.0	407.8	12.3	15.1	0.25	420.0 x 6.10 x 1.25	BP6104078	ORAR00461	405.26 x 6.99
450.0	437.8	12.3	15.1	0.25	450.0 x 6.10 x 1.25	BP6104378	ORAR00463	430.66 x 6.99
480.0	467.8	12.3	15.1	0.25	480.0 x 6.10 x 1.25	BP6104678	ORAR00465	456.06 x 6.99
500.0	487.8	12.3	15.1	0.25	500.0 x 6.10 x 1.25	BP6104878	ORAR00467	481.46 x 6.99

Further sizes available on request.

This table shows the possible range of available dimensions (Back-up Rings). However, these dimensions are not always stock items.



Table 83: Preferred series for dynamic application, spiral Back-up Ring
Type BP, External sealing, material PTFE – Inch

Bore Ø	Groove Ø	Groove width		Radius	Back-up Ring dimension	TSS Part No.	O-Ring TSS Part No.	O-Ring dimension
D _N H8	d ₃ h9	b ₂ +0.010	b ₃ +0.010	r ±0.008	OD x W x T			d ₁ x d ₂
inch								
0.236	0.122	0.150	0.205	0.010	0.236 x 0.057 x 0.028	BP14H00031	ORAR00006	0.114 x 0.070
0.236	0.138	0.118	0.157	0.010	0.236 x 0.049 x 0.020	BP12H00035	OR1500300	0.118 x 0.059
0.315	0.201	0.150	0.205	0.010	0.315 x 0.057 x 0.028	BP14H00051	ORAR00008	0.176 x 0.070
0.315	0.217	0.118	0.157	0.010	0.315 x 0.049 x 0.020	BP12H00055	OR1500500	0.197 x 0.059
0.394	0.280	0.150	0.205	0.010	0.394 x 0.057 x 0.028	BP14H00071	ORAR00011	0.301 x 0.070
0.394	0.295	0.118	0.157	0.010	0.394 x 0.057 x 0.020	BP12H00075	OR1500700	0.276 x 0.059
0.472	0.343	0.161	0.217	0.010	0.472 x 0.065 x 0.028	BP16H00087	OR2000800	0.315 x 0.079
0.472	0.358	0.150	0.205	0.010	0.472 x 0.057 x 0.028	BP14H00091	ORAR00012	0.364 x 0.070
0.551	0.421	0.161	0.217	0.010	0.551 x 0.065 x 0.028	BP16H00107	OR2001000	0.394 x 0.079
0.551	0.437	0.150	0.205	0.010	0.551 x 0.057 x 0.028	BP14H00111	ORAR00013	0.426 x 0.070
0.591	0.461	0.161	0.217	0.010	0.591 x 0.065 x 0.028	BP16H00117	OR2001100	0.433 x 0.079
0.591	0.476	0.150	0.205	0.010	0.591 x 0.057 x 0.028	BP14H00121	ORAR00014	0.489 x 0.070
0.630	0.500	0.161	0.217	0.010	0.630 x 0.065 x 0.028	BP16H00127	OR2001200	0.472 x 0.079
0.630	0.516	0.150	0.205	0.010	0.630 x 0.057 x 0.028	BP14H00131	ORAR00015	0.551 x 0.070
0.709	0.579	0.161	0.217	0.010	0.709 x 0.065 x 0.028	BP16H00147	OR2001400	0.551 x 0.079
0.709	0.594	0.150	0.205	0.010	0.709 x 0.057 x 0.028	BP14H00151	ORAR00016	0.614 x 0.070
0.787	0.657	0.161	0.217	0.010	0.787 x 0.065 x 0.028	BP16H00167	OR2001600	0.630 x 0.079
0.787	0.673	0.150	0.205	0.010	0.787 x 0.057 x 0.028	BP14H00171	ORAR00017	0.676 x 0.070
0.866	0.736	0.161	0.217	0.010	0.866 x 0.065 x 0.028	BP16H00187	OR2001800	0.709 x 0.079
0.866	0.752	0.150	0.205	0.010	0.866 x 0.057 x 0.028	BP14H00191	ORAR00018	0.739 x 0.070
0.984	0.854	0.161	0.217	0.010	0.984 x 0.065 x 0.028	BP16H00217	OR2002100	0.827 x 0.079
0.984	0.870	0.150	0.205	0.010	0.984 x 0.057 x 0.028	BP14H00221	ORAR00020	0.864 x 0.070
1.102	0.898	0.213	0.268	0.010	1.102 x 0.102 x 0.028	BP2600228	OR3002200	0.866 x 0.118
1.102	0.925	0.197	0.252	0.010	1.102 x 0.089 x 0.028	BP22H00235	ORAR00119	0.924 x 0.103
1.181	0.976	0.213	0.268	0.010	1.181 x 0.102 x 0.028	BP2600248	OR3002400	0.945 x 0.118
1.181	1.004	0.197	0.252	0.010	1.181 x 0.089 x 0.028	BP22H00255	ORAR00120	0.987 x 0.103
1.260	1.055	0.213	0.268	0.010	1.260 x 0.102 x 0.028	BP2600268	OR3002600	1.024 x 0.118
1.378	1.173	0.213	0.268	0.010	1.378 x 0.102 x 0.028	BP2600298	OR3002900	1.142 x 0.118
1.378	1.201	0.197	0.252	0.010	1.378 x 0.089 x 0.028	BP22H00305	ORAR00123	1.174 x 0.103
1.575	1.370	0.213	0.268	0.010	1.575 x 0.102 x 0.028	BP2600348	OR3003400	1.339 x 0.118
1.575	1.398	0.197	0.252	0.010	1.575 x 0.089 x 0.028	BP22H00355	ORAR00126	1.362 x 0.103
1.654	1.449	0.213	0.268	0.010	1.654 x 0.102 x 0.028	BP2600368	OR3003600	1.417 x 0.118
1.654	1.476	0.197	0.252	0.010	1.654 x 0.089 x 0.028	BP22H00375	ORAR00127	1.424 x 0.103
1.772	1.567	0.213	0.268	0.010	1.772 x 0.102 x 0.028	BP2600398	OR3003900	1.535 x 0.118
1.772	1.594	0.197	0.252	0.010	1.772 x 0.089 x 0.028	BP22H00405	ORAR00129	1.549 x 0.103
1.890	1.614	0.272	0.339	0.010	1.890 x 0.138 x 0.033	BP3500410	OR4004000	1.575 x 0.157
1.890	1.646	0.244	0.299	0.010	1.890 x 0.122 x 0.028	BP31D0418	ORAR00223	1.609 x 0.139
1.969	1.693	0.272	0.339	0.010	1.969 x 0.138 x 0.033	BP3500430	OR4004200	1.654 x 0.157
1.969	1.724	0.244	0.299	0.010	1.969 x 0.122 x 0.028	BP31D0438	ORAR00224	1.734 x 0.139
2.047	1.772	0.272	0.339	0.010	2.047 x 0.138 x 0.033	BP3500450	OR4004400	1.732 x 0.157



Bore Ø	Groove Ø	Groove width		Radius	Back-up Ring dimension	TSS Part No.	O-Ring TSS Part No.	O-Ring dimension
D _N H8	d ₃ h9	b ₂ +0.010	b ₃ +0.010	r ±0.008	OD x W x T			d ₁ x d ₂
inch								
2.047	1.803	0.244	0.299	0.010	2.047 x 0.122 x 0.028	BP31D0458	ORAR00224	1.734 x 0.139
2.165	1.890	0.272	0.339	0.010	2.165 x 0.138 x 0.033	BP3500480	OR4004700	1.850 x 0.157
2.165	1.921	0.244	0.299	0.010	2.165 x 0.122 x 0.028	BP31D0488	ORAR00225	1.859 x 0.139
2.362	2.087	0.272	0.339	0.010	2.362 x 0.138 x 0.033	BP3500530	OR4005200	2.047 x 0.157
2.362	2.118	0.244	0.299	0.010	2.362 x 0.122 x 0.028	BP31D0538	ORAR00227	2.109 x 0.139
2.480	2.205	0.272	0.339	0.010	2.480 x 0.138 x 0.033	BP3500560	OR4005500	2.165 x 0.157
2.480	2.236	0.244	0.299	0.010	2.480 x 0.122 x 0.028	BP31D0568	ORAR00228	2.234 x 0.139
2.559	2.283	0.272	0.339	0.010	2.559 x 0.138 x 0.033	BP3500580	OR4005700	2.244 x 0.157
2.559	2.315	0.244	0.299	0.010	2.559 x 0.122 x 0.028	BP31D0588	ORAR00228	2.234 x 0.139
2.756	2.480	0.272	0.339	0.010	2.756 x 0.138 x 0.033	BP3500630	OR4006200	2.441 x 0.157
2.756	2.512	0.244	0.299	0.010	2.756 x 0.122 x 0.028	BP31D0638	ORAR00230	2.484 x 0.139
2.953	2.677	0.272	0.339	0.010	2.953 x 0.138 x 0.033	BP3500680	OR4006700	2.638 x 0.157
2.953	2.709	0.244	0.299	0.010	2.953 x 0.122 x 0.028	BP31D0688	ORAR00231	2.609 x 0.139
3.150	2.874	0.272	0.339	0.010	3.150 x 0.138 x 0.033	BP3500730	OR4007200	2.835 x 0.157
3.150	2.906	0.244	0.299	0.010	3.150 x 0.122 x 0.028	BP31D0738	ORAR00233	2.859 x 0.139
3.346	3.071	0.272	0.339	0.010	3.346 x 0.138 x 0.033	BP3500780	OR4007700	3.031 x 0.157
3.346	3.102	0.244	0.299	0.010	3.346 x 0.122 x 0.028	BP31D0788	ORAR00235	3.109 x 0.139
3.543	3.173	0.354	0.429	0.010	3.543 x 0.185 x 0.033	BP4700806	ORAR00338	3.100 x 0.210
3.543	3.197	0.327	0.394	0.010	3.543 x 0.173 x 0.033	BP4400812	OR5008000	3.150 x 0.197
3.740	3.370	0.354	0.429	0.010	3.740 x 0.185 x 0.033	BP4700856	ORAR00340	3.350 x 0.210
3.740	3.394	0.327	0.394	0.010	3.740 x 0.173 x 0.033	BP4400862	OR5008500	3.346 x 0.197
3.937	3.567	0.354	0.429	0.010	3.937 x 0.185 x 0.033	BP4700906	ORAR00342	3.600 x 0.210
3.937	3.591	0.327	0.394	0.010	3.937 x 0.173 x 0.033	BP4400912	OR5009000	3.543 x 0.197
4.134	3.764	0.354	0.429	0.010	4.134 x 0.185 x 0.033	BP4700956	ORAR00343	3.725 x 0.210
4.134	3.787	0.327	0.394	0.010	4.134 x 0.173 x 0.033	BP4400962	OR5009500	3.740 x 0.197
4.331	3.961	0.354	0.429	0.010	4.331 x 0.185 x 0.033	BP4701006	ORAR00345	3.975 x 0.210
4.331	3.984	0.327	0.394	0.010	4.331 x 0.173 x 0.033	BP4401012	OR5010000	3.937 x 0.197
4.528	4.157	0.354	0.429	0.010	4.528 x 0.185 x 0.033	BP4701056	ORAR00346	4.100 x 0.210
4.528	4.181	0.327	0.394	0.010	4.528 x 0.173 x 0.033	BP4401062	OR5010500	4.134 x 0.197
4.724	4.354	0.354	0.429	0.010	4.724 x 0.185 x 0.033	BP4701106	ORAR00348	4.350 x 0.210
4.724	4.378	0.327	0.394	0.010	4.724 x 0.173 x 0.033	BP4401112	OR5011000	4.331 x 0.197
4.921	4.551	0.35	0.429	0.010	4.921 x 0.185 x 0.033	BP4701156	ORAR00349	4.475 x 0.210
4.921	4.575	0.327	0.394	0.010	4.921 x 0.173 x 0.033	BP4401162	OR5011500	4.528 x 0.197
5.118	4.748	0.354	0.429	0.010	5.118 x 0.185 x 0.033	BP4701206	ORAR00351	4.725 x 0.210
5.118	4.772	0.327	0.394	0.010	5.118 x 0.173 x 0.033	BP4401212	OR5012000	4.724 x 0.197
5.315	4.835	0.484	0.594	0.010	5.315 x 0.240 x 0.049	BP6101228	ORAR00427	4.725 x 0.275
5.512	5.031	0.484	0.594	0.010	5.512 x 0.240 x 0.049	BP6101278	ORAR00429	4.975 x 0.275
5.906	5.425	0.484	0.594	0.010	5.906 x 0.240 x 0.049	BP6101378	ORAR00432	5.350 x 0.275
6.299	5.819	0.484	0.594	0.010	6.299 x 0.240 x 0.049	BP6101478	ORAR00435	5.725 x 0.275
6.693	6.213	0.484	0.594	0.010	6.693 x 0.240 x 0.049	BP6101578	ORAR00438	6.225 x 0.275



Bore Ø	Groove Ø	Groove width		Radius	Back-up Ring dimension	TSS Part No.	O-Ring TSS Part No.	O-Ring dimension
D _N H8	d ₃ h9	b ₂ +0.010	b ₃ +0.010	r ±0.008	OD x W x T			d ₁ x d ₂
inch								
7.087	6.606	0.484	0.594	0.010	7.087 x 0.240 x 0.049	BP6101678	ORAR00439	6.475 x 0.275
7.480	7.000	0.484	0.594	0.010	7.480 x 0.240 x 0.049	BP6101778	ORAR00441	6.975 x 0.275
7.874	7.394	0.484	0.594	0.010	7.874 x 0.240 x 0.049	BP6101878	ORAR00442	7.225 x 0.275
8.268	7.787	0.484	0.594	0.010	8.268 x 0.240 x 0.049	BP6101978	ORAR00444	7.725 x 0.275
8.661	8.181	0.484	0.594	0.010	8.661 x 0.240 x 0.049	BP6102078	ORAR00445	7.975 x 0.275
9.055	8.575	0.484	0.594	0.010	9.055 x 0.240 x 0.049	BP6102178	ORAR00446	8.475 x 0.275
9.449	8.969	0.484	0.594	0.010	9.449 x 0.240 x 0.049	BP6102278	ORAR00447	8.975 x 0.275
9.843	9.362	0.484	0.594	0.010	9.843 x 0.240 x 0.049	BP6102378	ORAR00448	9.475 x 0.275
11.024	10.543	0.484	0.594	0.010	11.024 x 0.240 x 0.049	BP6102678	ORAR00450	10.475 x 0.275
11.811	11.331	0.484	0.594	0.010	11.811 x 0.240 x 0.049	BP6102878	ORAR00451	10.975 x 0.275
12.598	12.118	0.484	0.594	0.010	12.598 x 0.240 x 0.049	BP6103078	ORAR00453	11.975 x 0.275
13.780	13.299	0.484	0.594	0.010	13.780 x 0.240 x 0.049	BP6103378	ORAR00455	12.975 x 0.275
15.748	15.268	0.484	0.594	0.010	15.748 x 0.240 x 0.049	BP6103878	ORAR00459	14.975 x 0.275
16.535	16.055	0.484	0.594	0.010	16.535 x 0.240 x 0.049	BP6104078	ORAR00461	15.955 x 0.275
17.717	17.236	0.484	0.594	0.010	17.717 x 0.240 x 0.049	BP6104378	ORAR00463	16.955 x 0.275
18.898	18.417	0.484	0.594	0.010	18.898 x 0.240 x 0.049	BP6104678	ORAR00465	17.955 x 0.275
19.685	19.205	0.484	0.594	0.010	19.685 x 0.240 x 0.049	BP6104878	ORAR00467	18.955 x 0.275

Further sizes available on request.

This table shows the possible range of available dimensions (Back-up Rings). However, these dimensions are not always stock items.



■ H.2 Internal Sealing (Rod), Static and Dynamic Applications

H.2.1 RECTANGULAR BACK-UP RING TYPES, UNCUT (BU) AND CUT (BG), MATERIAL PTFE

The following figure and tables include installation recommendations and Back-up Ring dimensions for internal sealing applications with the rectangular Back-up Ring types BU (uncut) and BG (cut).

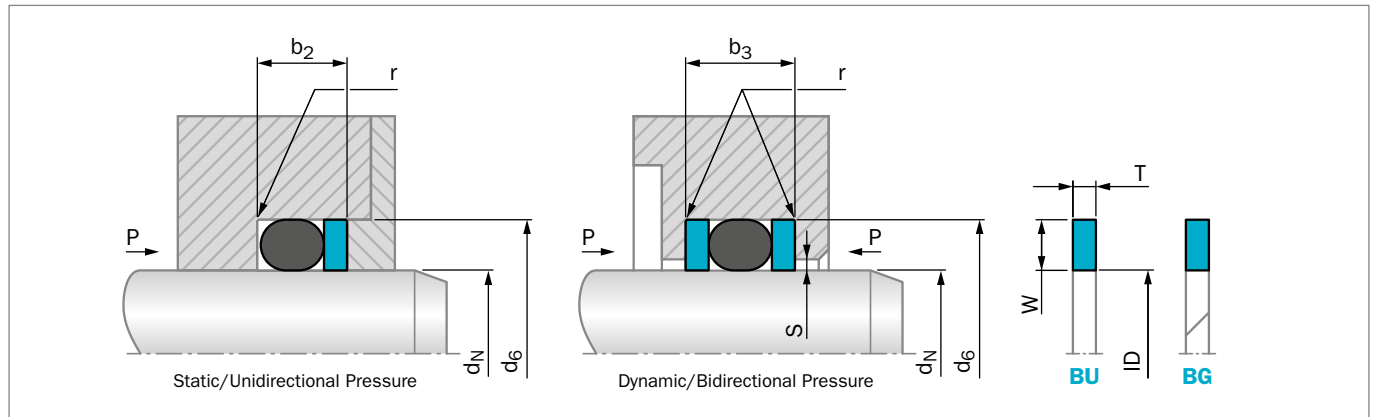


Figure 59: Installation drawing internal sealing, rectangular Back-up Ring types

Table 84: Installation dimensions for rectangular Back-up Ring types, uncut and cut, Internal sealing, material PTFE – Metric

O-Ring Cross-Section Ø d_2	Back-up Ring Cross section			Groove dimensions				
	Radial height W		Thickness	Groove diameter d_6 H9		Groove width		Radius
	Dynamic	Static	T	Dynamic	Static	$b_2 + 0.25$	$b_3 + 0.25$	$r \pm 0.2$
mm								
1.50	1.25	1.10	1.00	$d_N + 2.5$	$d_N + 2.2$	3.00	4.00	0.25
1.60	1.30	1.20	1.00	$d_N + 2.6$	$d_N + 2.4$	3.10	4.10	0.25
1.78	1.45	1.30	1.40	$d_N + 2.9$	$d_N + 2.6$	3.80	5.20	0.25
1.80	1.45	1.30	1.40	$d_N + 2.9$	$d_N + 2.6$	3.80	5.20	0.25
2.00	1.65	1.50	1.40	$d_N + 3.3$	$d_N + 3.0$	4.10	5.50	0.25
2.40	2.05	1.80	1.40	$d_N + 4.1$	$d_N + 3.6$	4.60	6.00	0.25
2.50	2.15	1.90	1.40	$d_N + 4.3$	$d_N + 3.8$	4.70	6.10	0.25
2.62	2.25	2.00	1.40	$d_N + 4.5$	$d_N + 4.0$	5.00	6.40	0.25
2.65	2.25	2.00	1.40	$d_N + 4.5$	$d_N + 4.0$	5.00	6.40	0.25
3.00	2.60	2.30	1.40	$d_N + 5.2$	$d_N + 4.6$	5.40	6.80	0.25
3.53	3.10	2.70	1.40	$d_N + 6.2$	$d_N + 5.4$	6.20	7.60	0.25
3.55	3.10	2.70	1.40	$d_N + 6.2$	$d_N + 5.4$	6.20	7.60	0.25
4.00	3.50	3.10	1.70	$d_N + 7.0$	$d_N + 6.2$	6.90	8.60	0.25
5.00	4.40	4.00	1.70	$d_N + 8.8$	$d_N + 8.0$	8.30	10.00	0.25
5.30	4.70	4.30	1.70	$d_N + 9.4$	$d_N + 8.6$	9.00	10.90	0.25
5.33	4.70	4.30	1.70	$d_N + 9.4$	$d_N + 8.6$	9.00	10.9	0.25
5.70	5.00	4.60	1.70	$d_N + 10.0$	$d_N + 9.2$	9.00	11.00	0.25
6.00	5.30	4.90	1.70	$d_N + 10.6$	$d_N + 9.8$	9.30	11.20	0.25
6.99	6.10	5.80	2.50	$d_N + 12.2$	$d_N + 11.6$	12.30	15.10	0.25
8.00	7.10	6.70	2.50	$d_N + 14.2$	$d_N + 13.4$	12.60	15.40	0.25
8.40	7.50	7.10	2.50	$d_N + 15.0$	$d_N + 14.2$	12.80	15.60	0.25

**Table 85: Installation dimensions for rectangular Back-up Ring types, uncut and cut, Internal sealing, material PTFE – Inch**

O-Ring Cross-Section $\emptyset$ d_2	Back-up Ring Cross section			Groove dimensions				
	Radial height W		Thickness	Groove diameter d_6 H9		Groove width		Radius
	Dynamic	Static	T	Dynamic	Static	$b_2 + 0.010$	$b_3 + 0.010$	$r \pm 0.008$
inch								
0.059	0.049	0.043	0.039	$d_N + 0.098$	$d_N + 0.087$	0.118	0.157	0.010
0.063	0.051	0.047	0.039	$d_N + 0.102$	$d_N + 0.094$	0.122	0.161	0.010
0.070	0.057	0.051	0.055	$d_N + 0.114$	$d_N + 0.102$	0.150	0.205	0.010
0.071	0.057	0.051	0.055	$d_N + 0.114$	$d_N + 0.102$	0.150	0.205	0.010
0.079	0.065	0.059	0.055	$d_N + 0.130$	$d_N + 0.118$	0.161	0.217	0.010
0.094	0.081	0.071	0.055	$d_N + 0.161$	$d_N + 0.142$	0.181	0.236	0.010
0.098	0.085	0.075	0.055	$d_N + 0.169$	$d_N + 0.150$	0.185	0.240	0.010
0.103	0.089	0.079	0.055	$d_N + 0.177$	$d_N + 0.157$	0.197	0.252	0.010
0.104	0.089	0.079	0.055	$d_N + 0.177$	$d_N + 0.157$	0.197	0.252	0.010
0.118	0.102	0.091	0.055	$d_N + 0.205$	$d_N + 0.181$	0.213	0.268	0.010
0.139	0.122	0.106	0.055	$d_N + 0.244$	$d_N + 0.213$	0.244	0.299	0.010
0.140	0.122	0.106	0.055	$d_N + 0.244$	$d_N + 0.213$	0.244	0.299	0.010
0.157	0.138	0.122	0.067	$d_N + 0.276$	$d_N + 0.244$	0.272	0.339	0.010
0.197	0.173	0.157	0.067	$d_N + 0.346$	$d_N + 0.315$	0.327	0.394	0.010
0.209	0.185	0.169	0.067	$d_N + 0.370$	$d_N + 0.339$	0.354	0.429	0.010
0.210	0.185	0.169	0.067	$d_N + 0.370$	$d_N + 0.339$	0.354	0.429	0.010
0.224	0.197	0.181	0.067	$d_N + 0.394$	$d_N + 0.362$	0.354	0.433	0.010
0.236	0.209	0.193	0.067	$d_N + 0.417$	$d_N + 0.386$	0.366	0.441	0.010
0.275	0.240	0.228	0.098	$d_N + 0.480$	$d_N + 0.457$	0.484	0.594	0.010
0.315	0.280	0.264	0.098	$d_N + 0.559$	$d_N + 0.528$	0.496	0.606	0.010
0.331	0.295	0.280	0.098	$d_N + 0.591$	$d_N + 0.559$	0.504	0.614	0.010

ORDERING EXAMPLE

Back-up Ring:	Type BU (uncut) for O-Ring seal
Application:	Static, internal sealing
Rod diameter:	$d_N = 25.00$ mm (0.984 inch)
O-Ring cross section:	$d_2 = 2.62$ mm (0.103 inch)
Back-up Ring material:	PTFE, virgin

For material code see page 151

TSS Article No.**BU 20 0 0250 - PT00**

Back-Up Ring (Uncut) —

Radial Height (mm) W x 10 —

T-dimension (Standard, mm) —

Rod- $\emptyset$ (mm) d_N x 10 —

Quality Index (Standard) —

Material Code (Standard) —



**Table 86: Preferred series for static application, rectangular Back-up Ring
Type BU (uncut), Internal sealing, material PTFE – Metric**

Rod Ø	Groove Ø	Groove width		Radius	Back-up Ring dimension	TSS Part No.	O-Ring TSS Part No.	O-Ring dimension
d _N f7	d _G H9	b ₂ +0.25	b ₃ +0.25	r ±0.2	ID x W x T			d ₁ x d ₂
mm								
4.0	6.20	3.00	4.00	0.25	4.0 x 1.1 x 1.4	BU11L0040	OR1500400	4.00 x 1.50
4.0	6.60	3.80	5.20	0.25	4.0 x 1.3 x 1.4	BU1300040	ORAR00007	3.68 x 1.78
5.0	7.20	3.00	4.00	0.25	5.0 x 1.1 x 1.4	BU1100050	OR1500500	5.00 x 1.50
5.0	7.60	3.80	5.20	0.25	5.0 x 1.3 x 1.4	BU1300050	ORAR00008	4.47 x 1.78
6.0	8.20	3.00	4.00	0.25	6.0 x 1.1 x 1.4	BU1100060	OR1500600	6.00 x 1.50
6.0	8.60	3.80	5.20	0.25	6.0 x 1.3 x 1.4	BU1300060	ORAR00010	6.07 x 1.78
8.0	10.60	3.80	5.20	0.25	8.0 x 1.3 x 1.4	BU1300080	ORAR00011	7.65 x 1.78
8.0	11.00	4.10	5.50	0.25	8.0 x 1.5 x 1.4	BU1500080	OR2000800	8.00 x 2.00
10.0	12.60	3.80	5.20	0.25	10.0 x 1.3 x 1.4	BU1300100	ORAR00013	10.82 x 1.78
10.0	13.00	4.10	5.50	0.25	10.0 x 1.5 x 1.4	BU1500100	OR2001000	10.00 x 2.00
12.0	14.60	3.80	5.20	0.25	12.0 x 1.3 x 1.4	BU1300120	ORAR00014	12.42 x 1.78
12.0	15.00	4.10	5.50	0.25	12.0 x 1.5 x 1.4	BU1500120	OR2001200	12.00 x 2.00
14.0	16.60	3.80	5.20	0.25	14.0 x 1.3 x 1.4	BU1300140	ORAR00015	14.00 x 1.78
14.0	17.00	4.10	5.50	0.25	14.0 x 1.5 x 1.4	BU1500140	OR2001400	14.00 x 2.00
15.0	17.60	3.80	5.20	0.25	15.0 x 1.3 x 1.4	BU1300150	ORAR00016	15.60 x 1.78
15.0	18.00	4.10	5.50	0.25	15.0 x 1.5 x 1.4	BU1500150	OR2001500	15.00 x 2.00
16.0	18.60	3.80	5.20	0.25	16.0 x 1.3 x 1.4	BU1300160	ORAR00016	15.60 x 1.78
16.0	19.00	4.10	5.50	0.25	16.0 x 1.5 x 1.4	BU1500160	OR2001600	16.00 x 2.00
18.0	20.60	3.80	5.20	0.25	18.0 x 1.3 x 1.4	BU1300180	ORAR00018	18.77 x 1.78
18.0	21.00	4.10	5.50	0.25	18.0 x 1.5 x 1.4	BU1500180	OR2001800	18.00 x 2.00
20.0	22.60	3.80	5.20	0.25	20.0 x 1.3 x 1.4	BU1300200	ORAR00019	20.35 x 1.78
20.0	23.00	4.10	5.50	0.25	20.0 x 1.5 x 1.4	BU1500200	OR2002000	20.00 x 2.00
22.0	26.00	5.00	6.40	0.25	22.0 x 2.0 x 1.4	BU2000220	ORAR00118	21.89 x 2.62
22.0	26.60	5.40	6.80	0.25	22.0 x 2.3 x 1.4	BU2300220	OR3002200	22.00 x 3.00
25.0	29.00	5.00	6.40	0.25	25.0 x 2.0 x 1.4	BU2000250	ORAR00120	25.07 x 2.62
25.0	29.60	5.40	6.80	0.25	25.0 x 2.3 x 1.4	BU2300250	OR3002500	25.00 x 3.00
28.0	32.00	5.00	6.40	0.25	28.0 x 2.0 x 1.4	BU2000280	ORAR00122	28.24 x 2.62
28.0	32.60	5.40	6.80	0.25	28.0 x 2.3 x 1.4	BU2300280	OR3002800	28.00 x 3.00
30.0	34.00	5.00	6.40	0.25	30.0 x 2.0 x 1.4	BU2000300	ORAR00123	29.83 x 2.62
30.0	34.60	5.40	6.80	0.25	30.0 x 2.3 x 1.4	BU2300300	OR3003000	30.00 x 3.00
32.0	36.00	5.00	6.40	0.25	32.0 x 2.0 x 1.4	BU2000320	ORAR00125	31.42 x 2.62
32.0	36.60	5.40	6.80	0.25	32.0 x 2.3 x 1.4	BU2300320	OR3003200	32.00 x 3.00
35.0	39.00	5.00	6.40	0.25	35.0 x 2.0 x 1.4	BU2000350	ORAR00126	34.59 x 2.62
35.0	39.60	5.40	6.80	0.25	35.0 x 2.3 x 1.4	BU2300350	OR3003500	35.00 x 3.00
36.0	40.00	5.00	6.40	0.25	36.0 x 2.0 x 1.4	BU2000360	ORAR00127	36.17 x 2.62
36.0	40.60	5.40	6.80	0.25	36.0 x 2.3 x 1.4	BU2300360	OR3003600	36.00 x 3.00
40.0	45.40	6.20	7.60	0.25	40.0 x 2.7 x 1.4	BU2700400	ORAR00223	40.87 x 3.53
40.0	46.20	6.90	8.60	0.25	40.0 x 3.1 x 1.7	BU3100400	OR4004000	40.00 x 4.00
42.0	47.40	6.20	7.60	0.25	42.0 x 2.7 x 1.4	BU2700420	ORAR00223	40.87 x 3.53
42.0	48.20	6.90	8.60	0.25	42.0 x 3.1 x 1.7	BU3100420	OR4004200	42.00 x 4.00



Rod Ø	Groove Ø	Groove width		Radius	Back-up Ring dimension	TSS Part No.	O-Ring TSS Part No.	O-Ring dimension
d _N f7	d _G H9	b ₂ +0.25	b ₃ +0.25	r ±0.2	ID x W x T			d ₁ x d ₂
mm								
45.0	50.40	6.20	7.60	0.25	45.0 x 2.7 x 1.4	BU2700450	ORAR00224	44.04 x 3.53
45.0	51.20	6.90	8.60	0.25	45.0 x 3.1 x 1.7	BU3100450	OR4004500	45.00 x 4.00
48.0	53.40	6.20	7.60	0.25	48.0 x 2.7 x 1.4	BU2700480	ORAR00225	47.22 x 3.53
48.0	54.20	6.90	8.60	0.25	48.0 x 3.1 x 1.7	BU3100480	OR4004800	48.00 x 4.00
50.0	55.40	6.20	7.60	0.25	50.0 x 2.7 x 1.4	BU2700500	ORAR00226	50.39 x 3.53
50.0	56.20	6.90	8.60	0.25	50.0 x 3.1 x 1.7	BU3100500	OR4005000	50.00 x 4.00
52.0	57.40	6.20	7.60	0.25	52.0 x 2.7 x 1.4	BU2700520	ORAR00226	50.39 x 3.53
52.0	58.20	6.90	8.60	0.25	52.0 x 3.1 x 1.7	BU3100520	OR4005200	52.00 x 4.00
55.0	60.40	6.20	7.60	0.25	55.0 x 2.7 x 1.4	BU2700550	ORAR00227	53.57 x 3.53
55.0	61.20	6.90	8.60	0.25	55.0 x 3.1 x 1.7	BU3100550	OR4005500	55.00 x 4.00
56.0	61.40	6.20	7.60	0.25	56.0 x 2.7 x 1.4	BU2700560	ORAR00228	56.74 x 3.53
56.0	62.20	6.90	8.60	0.25	56.0 x 3.1 x 1.7	BU3100560	OR4005600	56.00 x 4.00
60.0	65.40	6.20	7.60	0.25	60.0 x 2.7 x 1.4	BU2700600	ORAR00229	59.92 x 3.53
60.0	66.20	6.90	8.60	0.25	60.0 x 3.1 x 1.7	BU3100600	OR4006000	60.00 x 4.00
63.0	68.40	6.20	7.60	0.25	63.0 x 2.7 x 1.4	BU2700630	ORAR00230	63.09 x 3.53
63.0	69.20	6.90	8.60	0.25	63.0 x 3.1 x 1.7	BU3100630	OR4006300	63.00 x 4.00
65.0	70.40	6.20	7.60	0.25	65.0 x 2.7 x 1.4	BU2700650	ORAR00231	66.27 x 3.53
65.0	71.20	6.90	8.60	0.25	65.0 x 3.1 x 1.7	BU3100650	OR4006500	65.40 x 4.00
70.0	75.40	6.20	7.60	0.25	70.0 x 2.7 x 1.4	BU2700700	ORAR00232	69.44 x 3.53
70.0	76.20	6.90	8.60	0.25	70.0 x 3.1 x 1.7	BU3100700	OR4007000	70.00 x 4.00
75.00	80.40	6.20	7.60	0.25	75.0 x 2.7 x 1.4	BU2700750	ORAR00234	75.79 x 3.53
75.00	81.20	6.90	8.60	0.25	75.0 x 3.1 x 1.7	BU3100750	OR4007500	75.00 x 4.00
80.00	88.00	8.30	10.00	0.25	80.0 x 4.0 x 1.7	BU4000800	OR5008000	80.00 x 5.00
80.00	88.60	9.00	10.90	0.25	80.0 x 4.3 x 1.7	BU4300800	ORAR00339	81.92 x 5.33
85.00	93.00	9.00	10.90	0.25	85.0 x 4.0 x 1.7	BU4000850	OR5008500	85.00 x 5.00
85.00	93.60	8.30	10.00	0.25	85.0 x 4.3 x 1.7	BU4300850	ORAR00340	85.09 x 5.33
90.00	98.00	8.30	10.00	0.25	90.0 x 4.0 x 1.7	BU4000900	OR5009000	90.00 x 5.00
90.00	98.60	9.00	10.90	0.25	90.0 x 4.3 x 1.7	BU4300900	ORAR00342	91.44 x 5.33
95.00	103.00	8.30	10.00	0.25	95.0 x 4.0 x 1.7	BU4000950	OR5009500	95.00 x 5.00
95.00	103.60	9.00	10.90	0.25	95.0 x 4.3 x 1.7	BU4300950	ORAR00343	94.62 x 5.33
100.00	108.00	8.30	10.00	0.25	100.0 x 4.0 x 1.7	BU4001000	OR5010000	100.00 x 5.00
100.00	108.60	9.00	10.90	0.25	100.0 x 4.3 x 1.7	BU4301000	ORAR00345	100.97 x 5.33
105.00	113.00	8.30	10.00	0.25	105.0 x 4.0 x 1.7	BU4001050	OR5010500	105.00 x 5.00
105.00	113.60	9.00	10.90	0.25	105.0 x 4.3 x 1.7	BU4301050	ORAR00346	104.14 x 5.33
110.00	118.00	8.30	10.00	0.25	110.0 x 4.0 x 1.7	BU4001100	OR5011000	110.00 x 5.00
110.00	118.60	9.00	10.90	0.25	110.0 x 4.3 x 1.7	BU4301100	ORAR00348	110.49 x 5.33
115.00	123.00	8.30	10.00	0.25	115.0 x 4.0 x 1.7	BU4001150	OR5011500	115.00 x 5.00
115.00	123.60	9.00	10.90	0.25	115.0 x 4.3 x 1.7	BU4301150	ORAR00349	113.67 x 5.33
120.00	128.00	8.30	10.00	0.25	120.0 x 4.0 x 1.7	BU4001200	OR5012000	120.00 x 5.00
120.00	128.60	9.00	10.90	0.25	120.0 x 4.3 x 1.7	BU4301200	ORAR00351	120.02 x 5.33
125.00	133.00	8.30	10.00	0.25	125.0 x 4.0 x 1.7	BU4001250	OR5012500	125.00 x 5.00
125.00	133.60	9.00	10.90	0.25	125.0 x 4.3 x 1.7	BU4301250	ORAR00353	126.37 x 5.33



Rod Ø	Groove Ø	Groove width		Radius	Back-up Ring dimension	TSS Part No.	O-Ring TSS Part No.	O-Ring dimension
d _N f7	d ₆ H9	b ₂ +0.25	b ₃ +0.25	r ±0.2	ID x W x T			d ₁ x d ₂
mm								
130.00	138.00	8.30	10.00	0.25	130.0 x 4.0 x 1.7	BU4001300	OR5013000	130.00 x 5.00
130.00	138.60	9.00	10.90	0.25	130.0 x 4.3 x 1.7	BU4301300	ORAR00354	129.54 x 5.33
135.00	146.60	12.30	15.10	0.25	135.0 x 5.8 x 2.5	BU5801350	ORAR00432	135.89 x 6.99
140.00	151.60	12.30	15.10	0.25	140.0 x 5.8 x 2.5	BU5801400	ORAR00433	139.07 x 6.99
150.00	161.60	12.30	15.10	0.25	150.0 x 5.8 x 2.5	BU5801500	ORAR00437	151.77 x 6.99
160.00	171.60	12.30	15.10	0.25	160.0 x 5.8 x 2.5	BU5801600	ORAR00438	158.12 x 6.99
170.00	181.60	12.30	15.10	0.25	170.0 x 5.8 x 2.5	BU5801700	ORAR00440	170.82 x 6.99
180.00	191.60	12.30	15.10	0.25	180.0 x 5.8 x 2.5	BU5801800	ORAR00442	183.52 x 6.99
190.00	201.60	12.30	15.10	0.25	190.0 x 5.8 x 2.5	BU5801900	ORAR00443	189.87 x 6.99
200.00	211.60	12.30	15.10	0.25	200.0 x 5.8 x 2.5	BU5802000	ORAR00445	202.57 x 6.99
210.00	221.60	12.30	15.10	0.25	210.0 x 5.8 x 2.5	BU5802100	ORAR00446	215.27 x 6.99
220.00	231.60	12.30	15.10	0.25	220.0 x 5.8 x 2.5	BU5802200	ORAR00446	215.27 x 6.99
230.00	241.60	12.30	15.10	0.25	230.0 x 5.8 x 2.5	BU5802300	ORAR00447	227.97 x 6.99
240.00	251.60	12.30	15.10	0.25	240.0 x 5.8 x 2.5	BU5802400	ORAR00448	240.67 x 6.99
250.00	261.60	12.30	15.10	0.25	250.0 x 5.8 x 2.5	BU5802500	ORAR00449	253.37 x 6.99
280.00	291.60	12.30	15.10	0.25	280.0 x 5.8 x 2.5	BU5802800	ORAR00451	278.77 x 6.99
300.00	311.60	12.30	15.10	0.25	300.0 x 5.8 x 2.5	BU5803000	ORAR00453	304.17 x 6.99
320.00	331.60	12.30	15.10	0.25	320.0 x 5.8 x 2.5	BU5803200	ORAR00454	316.87 x 6.99
350.00	361.60	12.30	15.10	0.25	350.0 x 5.8 x 2.5	BU5803500	ORAR00457	354.97 x 6.99
360.00	371.60	12.30	15.10	0.25	360.0 x 5.8 x 2.5	BU5803600	ORAR00457	354.97 x 6.99
400.00	411.60	12.30	15.10	0.25	400.0 x 5.8 x 2.5	BU5804000	ORAR00461	405.26 x 6.99

Further sizes available on request.

This table shows the possible range of available dimensions (Back-up Rings). However, these dimensions are not always stock items.



**Table 87: Preferred series for static application, rectangular Back-up Ring
Type BU (uncut), Internal sealing, material PTFE – Inch**

Rod Ø	Groove Ø	Groove width		Radius	Back-up Ring dimension	TSS Part No.	O-Ring TSS Part No.	O-Ring dimension
d _N f7	d _G H9	b ₂ +0.010	b ₃ +0.010	r ±0.008	ID x W x T			d ₁ x d ₂
inch								
0.157	0.244	0.118	0.157	0.010	0.157 x 0.043 x 0.055	BU11L0040	OR1500400	0.157 x 0.059
0.157	0.260	0.150	0.205	0.010	0.157 x 0.051 x 0.055	BU1300040	ORAR00007	0.145 x 0.070
0.197	0.283	0.118	0.157	0.010	0.197 x 0.043 x 0.055	BU1100050	OR1500500	0.197 x 0.059
0.197	0.299	0.150	0.205	0.010	0.197 x 0.051 x 0.055	BU1300050	ORAR00008	0.176 x 0.070
0.236	0.323	0.118	0.157	0.010	0.236 x 0.043 x 0.055	BU1100060	OR1500600	0.236 x 0.059
0.236	0.339	0.150	0.205	0.010	0.236 x 0.051 x 0.055	BU1300060	ORAR00010	0.239 x 0.070
0.315	0.417	0.150	0.205	0.010	0.315 x 0.051 x 0.055	BU1300080	ORAR00011	0.301 x 0.070
0.315	0.433	0.161	0.217	0.010	0.315 x 0.059 x 0.055	BU1500080	OR2000800	0.315 x 0.079
0.394	0.496	0.150	0.205	0.010	0.394 x 0.051 x 0.055	BU1300100	ORAR00013	0.426 x 0.070
0.394	0.512	0.161	0.217	0.010	0.394 x 0.059 x 0.055	BU1500100	OR2001000	0.394 x 0.079
0.472	0.575	0.150	0.205	0.010	0.472 x 0.051 x 0.055	BU1300120	ORAR00014	0.489 x 0.070
0.472	0.591	0.161	0.217	0.010	0.472 x 0.059 x 0.055	BU1500120	OR2001200	0.472 x 0.079
0.551	0.654	0.150	0.205	0.010	0.551 x 0.051 x 0.055	BU1300140	ORAR00015	0.551 x 0.070
0.551	0.669	0.161	0.217	0.010	0.551 x 0.059 x 0.055	BU1500140	OR2001400	0.551 x 0.079
0.591	0.693	0.150	0.205	0.010	0.591 x 0.051 x 0.055	BU1300150	ORAR00016	0.614 x 0.070
0.591	0.709	0.161	0.217	0.010	0.591 x 0.059 x 0.055	BU1500150	OR2001500	0.591 x 0.079
0.630	0.732	0.150	0.205	0.010	0.630 x 0.051 x 0.055	BU1300160	ORAR00016	0.614 x 0.070
0.630	0.748	0.161	0.217	0.010	0.630 x 0.059 x 0.055	BU1500160	OR2001600	0.630 x 0.079
0.709	0.811	0.150	0.205	0.010	0.709 x 0.051 x 0.055	BU1300180	ORAR00018	0.739 x 0.070
0.709	0.827	0.161	0.217	0.010	0.709 x 0.059 x 0.055	BU1500180	OR2001800	0.709 x 0.079
0.787	0.890	0.150	0.205	0.010	0.787 x 0.051 x 0.055	BU1300200	ORAR00019	0.801 x 0.070
0.787	0.906	0.161	0.217	0.010	0.787 x 0.059 x 0.055	BU1500200	OR2002000	0.787 x 0.079
0.866	1.024	0.197	0.252	0.010	0.866 x 0.079 x 0.055	BU2000220	ORAR00118	0.862 x 0.103
0.866	1.047	0.213	0.268	0.010	0.866 x 0.091 x 0.055	BU2300220	OR3002200	0.866 x 0.118
0.984	1.142	0.197	0.252	0.010	0.984 x 0.079 x 0.055	BU2000250	ORAR00120	0.987 x 0.103
0.984	1.165	0.213	0.268	0.010	0.984 x 0.091 x 0.055	BU2300250	OR3002500	0.984 x 0.118
1.102	1.260	0.197	0.252	0.010	1.102 x 0.079 x 0.055	BU2000280	ORAR00122	1.112 x 0.103
1.102	1.283	0.213	0.268	0.010	1.102 x 0.091 x 0.055	BU2300280	OR3002800	1.102 x 0.079
1.181	1.339	0.197	0.252	0.010	1.181 x 0.079 x 0.055	BU2000300	ORAR00123	1.174 x 0.103
1.181	1.362	0.213	0.268	0.010	1.181 x 0.091 x 0.055	BU2300300	OR3003000	1.181 x 0.118
1.260	1.417	0.197	0.252	0.010	1.260 x 0.079 x 0.055	BU2000320	ORAR00125	1.237 x 0.103
1.260	1.441	0.213	0.268	0.010	1.260 x 0.091 x 0.055	BU2300320	OR3003200	1.260 x 0.118
1.378	1.535	0.197	0.252	0.010	1.378 x 0.079 x 0.055	BU2000350	ORAR00126	1.362 x 0.103
1.378	1.559	0.213	0.268	0.010	1.378 x 0.091 x 0.055	BU2300350	OR3003500	1.378 x 0.118
1.417	1.575	0.197	0.252	0.010	1.417 x 0.079 x 0.055	BU2000360	ORAR00127	1.424 x 0.103
1.417	1.598	0.213	0.268	0.010	1.417 x 0.091 x 0.055	BU2300360	OR3003600	1.417 x 0.118
1.575	1.787	0.244	0.299	0.010	1.575 x 0.106 x 0.055	BU2700400	ORAR00223	1.609 x 0.139
1.575	1.815	0.272	0.339	0.010	1.575 x 0.122 x 0.067	BU3100400	OR4004000	1.575 x 0.157
1.654	1.866	0.244	0.299	0.010	1.654 x 0.106 x 0.055	BU2700420	ORAR00223	1.609 x 0.139
1.654	1.898	0.272	0.339	0.010	1.654 x 0.122 x 0.067	BU3100420	OR4004200	1.654 x 0.157



Rod Ø	Groove Ø	Groove width		Radius	Back-up Ring dimension	TSS Part No.	O-Ring TSS Part No.	O-Ring dimension
d _N f7	d ₆ H9	b ₂ +0.010	b ₃ +0.010	r ±0.008	ID x W x T			d ₁ x d ₂
inch								
1.772	1.984	0.244	0.299	0.010	1.772 x 0.106 x 0.055	BU2700450	ORAR00224	1.734 x 0.139
1.772	2.016	0.272	0.339	0.010	1.772 x 0.122 x 0.067	BU3100450	OR4004500	1.772 x 0.157
1.890	2.102	0.244	0.299	0.010	1.890 x 0.106 x 0.055	BU2700480	ORAR00225	1.859 x 0.139
1.890	2.134	0.272	0.339	0.010	1.890 x 0.122 x 0.067	BU3100480	OR4004800	1.890 x 0.157
1.969	2.181	0.244	0.299	0.010	1.969 x 0.106 x 0.055	BU2700500	ORAR00226	1.984 x 0.139
1.969	2.213	0.272	0.339	0.010	1.969 x 0.122 x 0.067	BU3100500	OR4005000	1.969 x 0.157
2.047	2.260	0.244	0.299	0.010	2.047 x 0.106 x 0.055	BU2700520	ORAR00226	1.984 x 0.139
2.047	2.291	0.272	0.339	0.010	2.047 x 0.122 x 0.067	BU3100520	OR4005200	2.047 x 0.157
2.165	2.378	0.244	0.299	0.010	2.165 x 0.106 x 0.055	BU2700550	ORAR00227	2.109 x 0.139
2.165	2.409	0.272	0.339	0.010	2.165 x 0.122 x 0.067	BU3100550	OR4005500	2.165 x 0.157
2.205	2.417	0.244	0.299	0.010	2.205 x 0.106 x 0.055	BU2700560	ORAR00228	2.234 x 0.139
2.205	2.449	0.272	0.339	0.010	2.205 x 0.122 x 0.067	BU3100560	OR4005600	2.205 x 0.157
2.362	2.575	0.244	0.299	0.010	2.362 x 0.106 x 0.055	BU2700600	ORAR00229	2.359 x 0.139
2.362	2.606	0.272	0.339	0.010	2.362 x 0.122 x 0.067	BU3100600	OR4006000	2.362 x 0.157
2.480	2.693	0.244	0.299	0.010	2.480 x 0.106 x 0.055	BU2700630	ORAR00230	2.484 x 0.139
2.480	2.724	0.272	0.339	0.010	2.480 x 0.122 x 0.067	BU3100630	OR4006300	2.362 x 0.157
2.559	2.772	0.244	0.299	0.010	2.559 x 0.106 x 0.055	BU2700650	ORAR00231	2.609 x 0.139
2.559	2.803	0.272	0.339	0.010	2.559 x 0.122 x 0.067	BU3100650	OR4006500	2.575 x 0.157
2.756	2.969	0.244	0.299	0.010	2.756 x 0.106 x 0.055	BU2700700	ORAR00232	2.734 x 0.139
2.756	3.000	0.272	0.339	0.010	2.756 x 0.122 x 0.067	BU3100700	OR4007000	2.756 x 0.157
2.953	3.165	0.244	0.299	0.010	2.953 x 0.106 x 0.055	BU2700750	ORAR00234	2.984 x 0.139
2.953	3.197	0.272	0.339	0.010	2.953 x 0.122 x 0.067	BU3100750	OR4007500	2.953 x 0.157
3.150	3.465	0.327	0.394	0.010	3.150 x 0.157 x 0.067	BU4000800	OR5008000	3.150 x 0.197
3.150	3.685	0.354	0.429	0.010	3.150 x 0.169 x 0.067	BU4300800	ORAR00339	3.225 x 0.210
3.346	3.488	0.354	0.429	0.010	3.346 x 0.157 x 0.067	BU4000850	OR5008500	3.346 x 0.197
3.346	3.661	0.327	0.394	0.010	3.346 x 0.169 x 0.067	BU4300850	ORAR00340	3.350 x 0.210
3.543	3.858	0.327	0.394	0.010	3.543 x 0.157 x 0.067	BU4000900	OR5009000	3.543 x 0.197
3.543	3.882	0.354	0.429	0.010	3.543 x 0.169 x 0.067	BU4300900	ORAR00342	3.600 x 0.210
3.740	4.055	0.327	0.394	0.010	3.740 x 0.157 x 0.067	BU4000950	OR5009500	3.740 x 0.197
3.740	4.079	0.354	0.429	0.010	3.740 x 0.169 x 0.067	BU4300950	ORAR00343	3.725 x 0.210
3.937	4.252	0.327	0.394	0.010	3.937 x 0.157 x 0.067	BU4001000	OR5010000	3.937 x 0.197
3.937	4.276	0.354	0.429	0.010	3.937 x 0.169 x 0.067	BU4301000	ORAR00345	3.975 x 0.210
4.134	4.449	0.327	0.394	0.010	4.134 x 0.157 x 0.067	BU4001050	OR5010500	4.134 x 0.197
4.134	4.472	0.354	0.429	0.010	4.134 x 0.169 x 0.067	BU4301050	ORAR00346	4.100 x 0.210
4.331	4.646	0.327	0.394	0.010	4.331 x 0.157 x 0.067	BU4001100	OR5011000	4.331 x 0.197
4.331	4.669	0.354	0.429	0.010	4.331 x 0.169 x 0.067	BU4301100	ORAR00348	4.350 x 0.210
4.528	4.843	0.327	0.394	0.010	4.528 x 0.157 x 0.067	BU4001150	OR5011500	4.528 x 0.197
4.528	4.866	0.354	0.429	0.010	4.528 x 0.169 x 0.067	BU4301150	ORAR00349	4.475 x 0.210
4.724	5.039	0.327	0.394	0.010	4.724 x 0.157 x 0.067	BU4001200	OR5012000	4.724 x 0.197
4.724	5.063	0.354	0.429	0.010	4.724 x 0.169 x 0.067	BU4301200	ORAR00351	4.725 x 0.210



Rod Ø	Groove Ø	Groove width		Radius	Back-up Ring dimension	TSS Part No.	O-Ring TSS Part No.	O-Ring dimension
d _N f7	d ₆ H9	b ₂ +0.010	b ₃ +0.010	r ±0.008	ID x W x T			d ₁ x d ₂
inch								
4.921	5.236	0.327	0.394	0.010	4.921 x 0.157 x 0.067	BU4001250	OR5012500	4.921 x 0.197
4.921	5.260	0.354	0.429	0.010	4.921 x 0.169 x 0.067	BU4301250	ORAR00353	4.975 x 0.210
5.118	5.433	0.327	0.394	0.010	5.118 x 0.157 x 0.067	BU4001300	OR5013000	5.118 x 0.197
5.118	5.457	0.354	0.429	0.010	5.118 x 0.169 x 0.067	BU4301300	ORAR00354	5.100 x 0.210
5.315	5.772	0.484	0.594	0.010	5.315 x 0.228 x 0.098	BU5801350	ORAR00432	5.350 x 0.275
5.512	5.969	0.484	0.594	0.010	5.512 x 0.228 x 0.098	BU5801400	ORAR00433	5.475 x 0.275
5.906	6.362	0.484	0.594	0.010	5.906 x 0.228 x 0.098	BU5801500	ORAR00437	5.975 x 0.275
6.299	6.756	0.484	0.594	0.010	6.299 x 0.228 x 0.098	BU5801600	ORAR00438	6.225 x 0.275
6.693	7.150	0.484	0.594	0.010	6.693 x 0.228 x 0.098	BU5801700	ORAR00440	6.725 x 0.275
7.087	7.543	0.484	0.594	0.010	7.087 x 0.228 x 0.098	BU5801800	ORAR00442	7.225 x 0.275
7.480	7.937	0.484	0.594	0.010	7.480 x 0.228 x 0.098	BU5801900	ORAR00443	7.475 x 0.275
7.874	8.331	0.484	0.594	0.010	7.874 x 0.228 x 0.098	BU5802000	ORAR00445	7.975 x 0.275
8.268	8.724	0.484	0.594	0.010	8.268 x 0.228 x 0.098	BU5802100	ORAR00446	8.475 x 0.275
8.661	9.118	0.484	0.594	0.010	8.661 x 0.228 x 0.098	BU5802200	ORAR00446	8.475 x 0.275
9.055	9.512	0.484	0.594	0.010	9.055 x 0.228 x 0.098	BU5802300	ORAR00447	8.975 x 0.275
9.449	9.906	0.484	0.594	0.010	9.449 x 0.228 x 0.098	BU5802400	ORAR00448	9.475 x 0.275
9.843	10.299	0.484	0.594	0.010	9.843 x 0.228 x 0.098	BU5802500	ORAR00449	9.975 x 0.275
11.024	11.480	0.484	0.594	0.010	11.024 x 0.228 x 0.098	BU5802800	ORAR00451	10.975 x 0.275
11.811	12.268	0.484	0.594	0.010	11.811 x 0.228 x 0.098	BU5803000	ORAR00453	11.975 x 0.275
12.598	13.055	0.484	0.594	0.010	12.598 x 0.228 x 0.098	BU5803200	ORAR00454	12.475 x 0.275
13.780	14.236	0.484	0.594	0.010	13.780 x 0.228 x 0.098	BU5803500	ORAR00457	13.975 x 0.275
14.173	14.630	0.484	0.594	0.010	14.173 x 0.228 x 0.098	BU5803600	ORAR00457	13.975 x 0.275
15.748	16.205	0.484	0.594	0.010	15.748 x 0.228 x 0.098	BU5804000	ORAR00461	15.955 x 0.275

Further sizes available on request.

This table shows the possible range of available dimensions (Back-up Rings). However, these dimensions are not always stock items.



H.2.2 CONCAVE BACK-UP RING TYPES, UNCUT (BB) AND CUT (BC), MATERIAL PTFE

The following figure and tables include installation recommendations and Back-up Ring dimensions for internal sealing applications with the concave Back-up Ring types BB (uncut) and BC (cut).

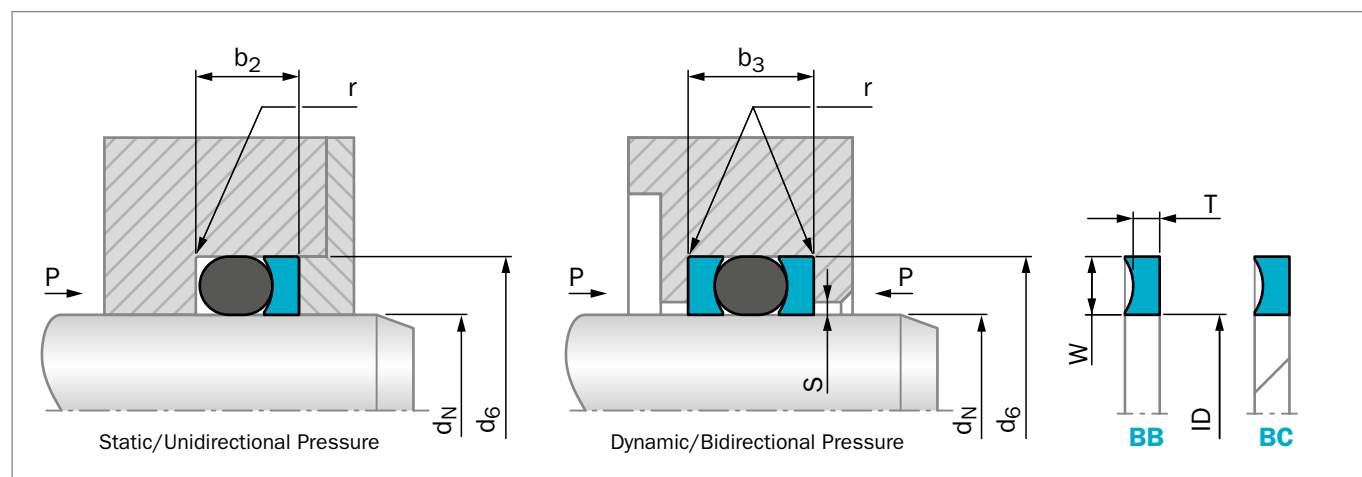


Figure 60: Installation drawing internal sealing, concave Back-up Ring types

Table 88: Installation dimensions for concave Back-up Ring types, uncut and cut, Internal sealing, material PTFE – Metric

O-Ring Cross- Section-Ø d_2	Back-up Ring Cross section			Groove dimensions				
	Radial height W		Thickness	Groove diameter d_6 H9		Groove width		Radius
	Dynamic	Static	T	Dynamic	Static	$b_2 + 0.25$	$b_3 + 0.25$	$r \pm 0.2$
mm								
1.50	1.25	1.10	1.0	$d_N + 2.5$	$d_N + 2.2$	3.0	4.0	0.25
1.60	1.30	1.20	1.0	$d_N + 2.6$	$d_N + 2.4$	3.1	4.1	0.25
1.78	1.45	1.30	1.4	$d_N + 2.9$	$d_N + 2.6$	3.8	5.2	0.25
1.80	1.45	1.30	1.4	$d_N + 2.9$	$d_N + 2.6$	3.8	5.2	0.25
2.00	1.65	1.50	1.4	$d_N + 3.3$	$d_N + 3.0$	4.1	5.5	0.25
2.40	2.05	1.80	1.4	$d_N + 4.1$	$d_N + 3.6$	4.6	6.0	0.25
2.50	2.15	1.90	1.4	$d_N + 4.3$	$d_N + 3.8$	4.7	6.1	0.25
2.62	2.25	2.00	1.4	$d_N + 4.5$	$d_N + 4.0$	5.0	6.4	0.25
2.65	2.25	2.00	1.4	$d_N + 4.5$	$d_N + 4.0$	5.0	6.4	0.25
3.00	2.60	2.30	1.4	$d_N + 5.2$	$d_N + 4.6$	5.4	6.8	0.25
3.53	3.10	2.70	1.4	$d_N + 6.2$	$d_N + 5.4$	6.2	7.6	0.25
3.55	3.10	2.70	1.4	$d_N + 6.2$	$d_N + 5.4$	6.2	7.6	0.25
4.00	3.50	3.10	1.7	$d_N + 7.0$	$d_N + 6.2$	6.9	8.6	0.25
5.00	4.40	4.00	1.7	$d_N + 8.8$	$d_N + 8.0$	8.3	10.0	0.25
5.30	4.70	4.30	1.7	$d_N + 9.4$	$d_N + 8.6$	9.0	10.9	0.25
5.33	4.70	4.30	1.7	$d_N + 9.4$	$d_N + 8.6$	9.0	10.9	0.25
5.70	5.00	4.60	1.7	$d_N + 10.0$	$d_N + 9.2$	9.0	11.0	0.25
6.00	5.30	4.90	1.7	$d_N + 10.6$	$d_N + 9.8$	9.3	11.2	0.25
6.99	6.10	5.80	2.5	$d_N + 12.2$	$d_N + 11.6$	12.3	15.1	0.25
8.00	7.10	6.70	2.5	$d_N + 14.2$	$d_N + 13.4$	12.6	15.4	0.25
8.40	7.50	7.10	2.5	$d_N + 15.0$	$d_N + 14.2$	12.8	15.6	0.25

**Table 89: Installation dimensions for concave Back-up Ring types, uncut and cut, Internal sealing, material PTFE – Inch**

O-Ring Cross- Section-Ø d_2	Back-up Ring Cross section			Groove dimensions				
	Radial height W		Thickness	Groove diameter d_6 H9		Groove width		Radius
	Dynamic	Static	T	Dynamic	Static	$b_2 + 0.010$	$b_3 + 0.010$	$r \pm 0.008$
inch								
0.059	0.049	0.043	0.039	$d_N + 0.098$	$d_N + 0.087$	0.118	0.157	0.010
0.063	0.051	0.047	0.039	$d_N + 0.102$	$d_N + 0.094$	0.122	0.161	0.010
0.070	0.057	0.051	0.055	$d_N + 0.114$	$d_N + 0.102$	0.150	0.205	0.010
0.071	0.057	0.051	0.055	$d_N + 0.114$	$d_N + 0.102$	0.150	0.205	0.010
0.079	0.065	0.059	0.055	$d_N + 0.130$	$d_N + 0.118$	0.161	0.217	0.010
0.094	0.081	0.071	0.055	$d_N + 0.161$	$d_N + 0.142$	0.181	0.236	0.010
0.098	0.085	0.075	0.055	$d_N + 0.169$	$d_N + 0.150$	0.185	0.240	0.010
0.103	0.089	0.079	0.055	$d_N + 0.177$	$d_N + 0.157$	0.197	0.252	0.010
0.104	0.089	0.079	0.055	$d_N + 0.177$	$d_N + 0.157$	0.197	0.252	0.010
0.118	0.102	0.091	0.055	$d_N + 0.205$	$d_N + 0.181$	0.213	0.268	0.010
0.139	0.122	0.106	0.055	$d_N + 0.244$	$d_N + 0.213$	0.244	0.299	0.010
0.140	0.122	0.106	0.055	$d_N + 0.244$	$d_N + 0.213$	0.244	0.299	0.010
0.157	0.138	0.122	0.067	$d_N + 0.276$	$d_N + 0.244$	0.272	0.339	0.010
0.197	0.173	0.157	0.067	$d_N + 0.346$	$d_N + 0.315$	0.327	0.394	0.010
0.209	0.185	0.169	0.067	$d_N + 0.370$	$d_N + 0.339$	0.354	0.429	0.010
0.210	0.185	0.169	0.067	$d_N + 0.370$	$d_N + 0.339$	0.354	0.429	0.010
0.224	0.197	0.181	0.067	$d_N + 0.394$	$d_N + 0.362$	0.354	0.433	0.010
0.236	0.209	0.193	0.067	$d_N + 0.417$	$d_N + 0.386$	0.366	0.441	0.010
0.275	0.240	0.228	0.098	$d_N + 0.480$	$d_N + 0.457$	0.484	0.594	0.010
0.315	0.280	0.264	0.098	$d_N + 0.559$	$d_N + 0.528$	0.496	0.606	0.010
0.331	0.295	0.280	0.098	$d_N + 0.591$	$d_N + 0.559$	0.504	0.614	0.010

ORDERING EXAMPLE

Back-up Ring:	Concave, type BB (uncut) for O-Ring seal
Application:	Static, external sealing
Rod diameter:	$d_N = 50.00$ mm (1.969 inch)
O-Ring cross section:	$d_2 = 3.53$ mm (0.139 inch)
Back-up Ring material:	PTFE, glassfiber filled (25%)

For material code see page 151

TSS Article No. **BB 27 0 0500 - PTGC**

Back-Up Ring (Uncut) ———

Radial Height (mm) W x 10 ———

T-dimension (Standard, mm) ———

Rod-Ø (mm) d_N x 10 ———

Quality Index (Standard) ———

Material Code (Standard) ———



**Table 90: Preferred series for static application, concave Back-up Ring
Type BB (uncut), Internal sealing, material PTFE – Metric**

Rod Ø	Groove Ø	Groove width		Radius	Back-up Ring dimension	TSS Part No.	O-Ring TSS Part No.	O-Ring dimension
d _N f7	d _G H9	b ₂ +0.25	b ₃ +0.25	r ±0.2	ID x W x T			d ₁ x d ₂
mm								
4.0	6.2	3.0	4.0	0.25	4.0 x 1.1 x 1.4	BB1100040	OR1500400	4.00 x 1.50
4.0	6.6	3.8	5.2	0.25	4.0 x 1.3 x 1.4	BB1300040	ORAR00007	3.68 x 1.78
5.0	7.2	3.0	4.0	0.25	5.0 x 1.1 x 1.4	BB1100050	OR1500500	5.00 x 1.50
5.0	7.6	3.8	5.2	0.25	5.0 x 1.3 x 1.4	BB1300050	ORAR00008	4.47 x 1.78
6.0	8.2	3.0	4.0	0.25	6.0 x 1.1 x 1.4	BB1100060	OR1500600	6.00 x 1.50
6.0	8.6	3.8	5.2	0.25	6.0 x 1.3 x 1.4	BB1300060	ORAR00010	6.07 x 1.78
8.0	10.6	3.8	5.2	0.25	8.0 x 1.3 x 1.4	BB1300080	ORAR00011	7.65 x 1.78
8.0	11.0	4.1	5.5	0.25	8.0 x 1.5 x 1.4	BB1500080	OR2000800	8.00 x 2.00
10.0	12.6	3.8	5.2	0.25	10.0 x 1.3 x 1.4	BB1300100	ORAR00013	10.82 x 1.78
10.0	13.0	4.1	5.5	0.25	10.0 x 1.5 x 1.4	BB1500100	OR2001000	10.00 x 2.00
12.0	14.6	3.8	5.2	0.25	12.0 x 1.3 x 1.4	BB1300120	ORAR00014	12.42 x 1.78
12.0	15.0	4.1	5.5	0.25	12.0 x 1.5 x 1.4	BB1500120	OR2001200	12.00 x 2.00
14.0	16.6	3.8	5.2	0.25	14.0 x 1.3 x 1.4	BB1300140	ORAR00015	14.00 x 1.78
14.0	17.0	4.1	5.5	0.25	14.0 x 1.5 x 1.4	BB1500140	OR2001400	14.00 x 2.00
15.0	17.6	3.8	5.2	0.25	15.0 x 1.3 x 1.4	BB1300150	ORAR00016	15.60 x 1.78
15.0	18.0	4.1	5.5	0.25	15.0 x 1.5 x 1.4	BB1500150	OR2001500	15.00 x 2.00
16.0	18.6	3.8	5.2	0.25	16.0 x 1.3 x 1.4	BB1300160	ORAR00016	15.60 x 1.78
16.0	19.0	4.1	5.5	0.25	16.0 x 1.5 x 1.4	BB1500160	OR2001600	16.00 x 2.00
18.0	20.6	3.8	5.2	0.25	18.0 x 1.3 x 1.4	BB1300180	ORAR00018	18.77 x 1.78
18.0	21.0	4.1	5.5	0.25	18.0 x 1.5 x 1.4	BB1500180	OR2001800	18.00 x 2.00
20.0	22.6	3.8	5.2	0.25	20.0 x 1.3 x 1.4	BB1300200	ORAR00019	20.35 x 1.78
20.0	23.0	4.1	5.5	0.25	20.0 x 1.5 x 1.4	BB1500200	OR2002000	20.00 x 2.00
22.0	26.0	5.0	6.4	0.25	22.0 x 2.0 x 1.4	BB2000220	ORAR00118	21.89 x 2.62
22.0	26.6	5.4	6.8	0.25	22.0 x 2.3 x 1.4	BB2300220	OR3002200	22.00 x 3.00
25.0	29.0	5.0	6.4	0.25	25.0 x 2.0 x 1.4	BB2000250	ORAR00120	25.07 x 2.62
25.0	29.6	5.4	6.8	0.25	25.0 x 2.3 x 1.4	BB2300250	OR3002500	25.00 x 3.00
28.0	32.0	5.0	6.4	0.25	28.0 x 2.0 x 1.4	BB2000280	ORAR00122	28.24 x 2.62
28.0	32.6	5.4	6.8	0.25	28.0 x 2.3 x 1.4	BB2300280	OR3002800	28.00 x 2.00
30.0	34.0	5.0	6.4	0.25	30.0 x 2.0 x 1.4	BB2000300	ORAR00123	29.83 x 2.62
30.0	34.6	5.4	6.8	0.25	30.0 x 2.3 x 1.4	BB2300300	OR3003000	30.00 x 3.00
32.0	36.0	5.0	6.4	0.25	32.0 x 2.0 x 1.4	BB2000320	ORAR00125	31.42 x 2.62
32.0	36.6	5.4	6.8	0.25	32.0 x 2.3 x 1.4	BB2300320	OR3003200	32.00 x 3.00
35.0	39.0	5.0	6.4	0.25	35.0 x 2.0 x 1.4	BB2000350	ORAR00126	34.59 x 2.62
35.0	39.6	5.4	6.8	0.25	35.0 x 2.3 x 1.4	BB2300350	OR3003500	35.00 x 3.00
36.0	40.0	5.0	6.4	0.25	36.0 x 2.0 x 1.4	BB2000360	ORAR00127	36.17 x 2.62
36.0	40.6	5.4	6.8	0.25	36.0 x 2.3 x 1.4	BB2300360	OR3003600	36.00 x 3.00
40.0	45.4	6.2	7.6	0.25	40.0 x 2.7 x 1.4	BB2700400	ORAR00223	40.87 x 3.53
40.0	46.2	6.9	8.6	0.25	40.0 x 3.1 x 1.7	BB3100400	OR4004000	40.00 x 4.00
42.0	47.4	6.2	7.6	0.25	42.0 x 2.7 x 1.4	BB2700420	ORAR00223	40.87 x 3.53
42.0	48.2	6.9	8.6	0.25	42.0 x 3.1 x 1.7	BB3100420	OR4004200	42.00 x 4.00



Rod Ø	Groove Ø	Groove width		Radius	Back-up Ring dimension	TSS Part No.	O-Ring TSS Part No.	O-Ring dimension
d _N f7	d ₆ H9	b ₂ +0.25	b ₃ +0.25	r ±0.2	ID x W x T			d ₁ x d ₂
mm								
45.0	50.4	6.2	7.6	0.25	45.0 x 2.7 x 1.4	BB2700450	ORAR00224	44.04 x 3.53
45.0	51.2	6.9	8.6	0.25	45.0 x 3.1 x 1.7	BB3100450	OR4004500	45.00 x 4.00
48.0	53.4	6.2	7.6	0.25	48.0 x 2.7 x 1.4	BB2700480	ORAR00225	47.22 x 3.53
48.0	54.2	6.9	8.6	0.25	48.0 x 3.1 x 1.7	BB3100480	OR4004800	48.00 x 4.00
50.0	55.4	6.2	7.6	0.25	50.0 x 2.7 x 1.4	BB2700500	ORAR00226	50.39 x 3.53
50.0	56.2	6.9	8.6	0.25	50.0 x 3.1 x 1.7	BB3100500	OR4005000	50.00 x 4.00
52.0	57.4	6.2	7.6	0.25	52.0 x 2.7 x 1.4	BB2700520	ORAR00226	50.39 x 3.53
52.0	58.2	6.9	8.6	0.25	52.0 x 3.1 x 1.7	BB3100520	OR4005200	52.00 x 4.00
55.0	60.4	6.2	7.6	0.25	55.0 x 2.7 x 1.4	BB2700550	ORAR00227	53.57 x 3.53
55.0	61.2	6.9	8.6	0.25	55.0 x 3.1 x 1.7	BB3100550	OR4005500	55.00 x 4.00
56.0	61.4	6.2	7.6	0.25	56.0 x 2.7 x 1.4	BB2700560	ORAR00228	56.74 x 3.53
56.0	62.2	6.9	8.6	0.25	56.0 x 3.1 x 1.7	BB3100560	OR4005600	56.00 x 4.00
60.0	65.4	6.2	7.6	0.25	60.0 x 2.7 x 1.4	BB2700600	ORAR00229	59.92 x 3.53
60.0	66.2	6.9	8.6	0.25	60.0 x 3.1 x 1.7	BB3100600	OR4006000	60.00 x 4.00
63.0	68.4	6.2	7.6	0.25	63.0 x 2.7 x 1.4	BB2700630	ORAR00230	63.09 x 3.53
63.0	69.2	6.9	8.6	0.25	63.0 x 3.1 x 1.7	BB3100630	OR4006300	63.00 x 4.00
65.0	70.4	6.2	7.6	0.25	65.0 x 2.7 x 1.4	BB2700650	ORAR00231	66.27 x 3.53
65.0	71.2	6.9	8.6	0.25	65.0 x 3.1 x 1.7	BB3100650	OR4006500	65.00 x 4.00
70.0	75.4	6.2	7.6	0.25	70.0 x 2.7 x 1.4	BB2700700	ORAR00232	69.44 x 3.53
70.0	76.2	6.9	8.6	0.25	70.0 x 3.1 x 1.7	BB3100700	OR4007000	70.00 x 4.00
75.0	80.4	6.2	7.6	0.25	75.0 x 2.7 x 1.4	BB2700750	ORAR00234	75.79 x 3.53
75.0	81.2	6.9	8.6	0.25	75.0 x 3.1 x 1.7	BB3100750	OR4007500	75.00 x 4.00
80.0	88.0	8.3	10.0	0.25	80.0 x 4.0 x 1.7	BB4000800	OR5008000	80.00 x 5.00
80.0	88.6	9.0	10.9	0.25	80.0 x 4.3 x 1.7	BB4300800	ORAR00339	81.92 x 5.33
85.0	93.0	8.3	10.0	0.25	85.0 x 4.0 x 1.7	BB4000850	OR5008500	85.00 x 5.00
85.0	93.6	9.0	10.9	0.25	85.0 x 4.3 x 1.7	BB4300850	ORAR00340	85.09 x 5.33
90.0	98.0	8.3	10.0	0.25	90.0 x 4.0 x 1.7	BB4000900	OR5009000	90.00 x 5.00
90.0	98.6	9.0	10.9	0.25	90.0 x 4.3 x 1.7	BB4300900	ORAR00342	91.44 x 5.33
95.0	103.0	8.3	10.0	0.25	95.0 x 4.0 x 1.7	BB4000950	OR5009500	95.00 x 5.00
95.0	103.6	9.0	10.9	0.25	95.0 x 4.3 x 1.7	BB4300950	ORAR00343	94.62 x 5.33
100.0	108.0	8.3	10.0	0.25	100.0 x 4.0 x 1.7	BB4001000	OR5010000	100.00 x 5.00
100.0	108.6	9.0	10.9	0.25	100.0 x 4.3 x 1.7	BB4301000	ORAR00345	100.97 x 5.33
105.0	113.0	8.3	10.0	0.25	105.0 x 4.0 x 1.7	BB4001050	OR5010500	105.00 x 5.00
105.0	113.6	9.0	10.9	0.25	105.0 x 4.3 x 1.7	BB4301050	ORAR00346	104.14 x 5.33
110.0	118.0	8.3	10.0	0.25	110.0 x 4.0 x 1.7	BB4001100	OR5011000	110.00 x 5.00
110.0	118.6	9.0	10.9	0.25	110.0 x 4.3 x 1.7	BB4301100	ORAR00348	110.49 x 5.33
115.0	123.0	8.3	10.0	0.25	115.0 x 4.0 x 1.7	BB4001150	OR5011500	115.00 x 5.00
115.0	123.6	9.0	10.9	0.25	115.0 x 4.3 x 1.7	BB4301150	ORAR00349	113.67 x 5.33
120.0	128.0	8.3	10.0	0.25	120.0 x 4.0 x 1.7	BB4001200	OR5012000	120.00 x 5.00
120.0	128.6	9.0	10.9	0.25	120.0 x 4.3 x 1.7	BB4301200	ORAR00351	120.02 x 5.33
125.0	133.0	8.3	10.0	0.25	125.0 x 4.0 x 1.7	BB4001250	OR5012500	125.00 x 5.00
125.0	133.6	9.0	10.9	0.25	125.0 x 4.3 x 1.7	BB4301250	ORAR00353	126.37 x 5.33



Rod Ø	Groove Ø	Groove width		Radius	Back-up Ring dimension	TSS Part No.	O-Ring TSS Part No.	O-Ring dimension
d _N f7	d ₆ H9	b ₂ +0.25	b ₃ +0.25	r ±0.2	ID x W x T			d ₁ x d ₂
mm								
130.0	138.0	8.3	10.0	0.25	130.0 x 4.0 x 1.7	BB4001300	OR5013000	130.00 x 5.00
130.0	138.6	9.0	10.9	0.25	130.0 x 4.3 x 1.7	BB4301300	ORAR00354	129.54 x 5.33
135.0	146.6	12.3	15.1	0.25	135.0 x 5.8 x 2.5	BB5801350	ORAR00432	135.89 x 6.99
140.0	151.6	12.3	15.1	0.25	140.0 x 5.8 x 2.5	BB5801400	ORAR00433	139.07 x 6.99
150.0	161.6	12.3	15.1	0.25	150.0 x 5.8 x 2.5	BB5801500	ORAR00437	151.77 x 6.99
160.0	171.6	12.3	15.1	0.25	160.0 x 5.8 x 2.5	BB5801600	ORAR00438	158.12 x 6.99
170.0	181.6	12.3	15.1	0.25	170.0 x 5.8 x 2.5	BB5801700	ORAR00440	170.82 x 6.99
180.0	191.6	12.3	15.1	0.25	180.0 x 5.8 x 2.5	BB5801800	ORAR00442	183.52 x 6.99
190.0	201.6	12.3	15.1	0.25	190.0 x 5.8 x 2.5	BB5801900	ORAR00443	189.87 x 6.99
200.0	211.6	12.3	15.1	0.25	200.0 x 5.8 x 2.5	BB5802000	ORAR00445	202.57 x 6.99
210.0	221.6	12.3	15.1	0.25	210.0 x 5.8 x 2.5	BB5802100	ORAR00446	215.27 x 6.99
220.0	231.6	12.3	15.1	0.25	220.0 x 5.8 x 2.5	BB5802200	ORAR00446	215.27 x 6.99
230.0	241.6	12.3	15.1	0.25	230.0 x 5.8 x 2.5	BB5802300	ORAR00447	227.97 x 6.99
240.0	251.6	12.3	15.1	0.25	240.0 x 5.8 x 2.5	BB5802400	ORAR00448	240.67 x 6.99
250.0	261.6	12.3	15.1	0.25	250.0 x 5.8 x 2.5	BB5802500	ORAR00449	253.37 x 6.99
280.0	291.6	12.3	15.1	0.25	280.0 x 5.8 x 2.5	BB5802800	ORAR00451	278.77 x 6.99
300.0	311.6	12.3	15.1	0.25	300.0 x 5.8 x 2.5	BB5803000	ORAR00453	304.17 x 6.99
320.0	331.6	12.3	15.1	0.25	320.0 x 5.8 x 2.5	BB5803200	ORAR00454	316.87 x 6.99
350.0	361.6	12.3	15.1	0.25	350.0 x 5.8 x 2.5	BB5803500	ORAR00457	354.97 x 6.99
360.0	371.6	12.3	15.1	0.25	360.0 x 5.8 x 2.5	BB5803600	ORAR00457	354.97 x 6.99
400.0	411.6	12.3	15.1	0.25	400.0 x 5.8 x 2.5	BB5804000	ORAR00461	405.26 x 6.99

Further sizes available on request.

This table shows the possible range of available dimensions (Back-up Rings). However, these dimensions are not always stock items.



**Table 91: Preferred series for static application, concave Back-up Ring
Type BB (uncut), Internal sealing, material PTFE – Inch**

Rod Ø	Groove Ø	Groove width		Radius	Back-up Ring dimension	TSS Part No.	O-Ring TSS Part No.	O-Ring dimension
d _N f7	d _G H9	b ₂ +0.010	b ₃ +0.010	r ±0.008	ID x W x T			d ₁ x d ₂
inch								
0.157	0.244	0.118	0.157	0.010	0.157 x 0.043 x 0.055	BB1100040	OR1500400	0.157 x 0.059
0.157	0.260	0.150	0.205	0.010	0.157 x 0.051 x 0.055	BB1300040	ORAR00007	0.145 x 0.070
0.197	0.283	0.118	0.157	0.010	0.197 x 0.043 x 0.055	BB1100050	OR1500500	0.197 x 0.059
0.197	0.299	0.150	0.205	0.010	0.197 x 0.051 x 0.055	BB1300050	ORAR00008	0.176 x 0.070
0.236	0.323	0.118	0.157	0.010	0.236 x 0.043 x 0.055	BB1100060	OR1500600	0.236 x 0.059
0.236	0.339	0.150	0.205	0.010	0.236 x 0.091 x 0.055	BB1300060	ORAR00010	0.239 x 0.070
0.315	0.417	0.150	0.205	0.010	0.315 x 0.051 x 0.055	BB1300080	ORAR00011	0.301 x 0.070
0.315	0.433	0.161	0.217	0.010	0.315 x 0.059 x 0.055	BB1500080	OR2000800	0.315 x 0.079
0.394	0.496	0.150	0.205	0.010	0.394 x 0.051 x 0.055	BB1300100	ORAR00013	0.426 x 0.070
0.394	0.512	0.161	0.217	0.010	0.394 x 0.059 x 0.055	BB1500100	OR2001000	0.394 x 0.079
0.472	0.575	0.150	0.205	0.010	0.472 x 0.051 x 0.055	BB1300120	ORAR00014	0.489 x 0.070
0.472	0.591	0.161	0.217	0.010	0.472 x 0.059 x 0.055	BB1500120	OR2001200	0.472 x 0.079
0.551	0.654	0.150	0.205	0.010	0.551 x 0.051 x 0.055	BB1300140	ORAR00015	0.551 x 0.070
0.551	0.669	0.161	0.217	0.010	0.551 x 0.059 x 0.055	BB1500140	OR2001400	0.551 x 0.079
0.591	0.693	0.150	0.205	0.010	0.591 x 0.051 x 0.055	BB1300150	ORAR00016	0.614 x 0.070
0.591	0.709	0.161	0.217	0.010	0.591 x 0.059 x 0.055	BB1500150	OR2001500	0.591 x 0.079
0.630	0.732	0.150	0.205	0.010	0.630 x 0.051 x 0.055	BB1300160	ORAR00016	0.614 x 0.070
0.630	0.748	0.161	0.217	0.010	0.630 x 0.059 x 0.055	BB1500160	OR2001600	0.630 x 0.079
0.709	0.811	0.150	0.205	0.010	0.709 x 0.051 x 0.055	BB1300180	ORAR00018	0.739 x 0.070
0.709	0.827	0.161	0.217	0.010	0.709 x 0.059 x 0.055	BB1500180	OR2001800	0.709 x 0.079
0.787	0.890	0.150	0.205	0.010	0.787 x 0.051 x 0.055	BB1300200	ORAR00019	0.801 x 0.070
0.787	0.906	0.161	0.217	0.010	0.787 x 0.059 x 0.055	BB1500200	OR2002000	0.787 x 0.079
0.866	1.024	0.197	0.252	0.010	0.866 x 0.079 x 0.055	BB2000220	ORAR00118	0.862 x 0.103
0.866	1.047	0.213	0.268	0.010	0.866 x 0.091 x 0.055	BB2300220	OR3002200	0.866 x 0.118
0.984	1.142	0.197	0.252	0.010	0.984 x 0.079 x 0.055	BB2000250	ORAR00120	0.987 x 0.103
0.984	1.165	0.213	0.268	0.010	0.984 x 0.091 x 0.055	BB2300250	OR3002500	0.984 x 0.118
1.102	1.260	0.197	0.252	0.010	1.102 x 0.079 x 0.055	BB2000280	ORAR00122	1.112 x 0.103
1.102	1.283	0.213	0.268	0.010	1.102 x 0.091 x 0.055	BB2300280	OR3002800	1.102 x 0.079
1.181	1.339	0.197	0.252	0.010	1.181 x 0.079 x 0.055	BB2000300	ORAR00123	1.174 x 0.103
1.181	1.362	0.213	0.268	0.010	1.181 x 0.091 x 0.055	BB2300300	OR3003000	1.181 x 0.118
1.260	1.417	0.197	0.252	0.010	1.260 x 0.079 x 0.055	BB2000320	ORAR00125	1.237 x 0.103
1.260	1.441	0.213	0.268	0.010	1.260 x 0.091 x 0.055	BB2300320	OR3003200	1.260 x 0.118
1.378	1.535	0.197	0.252	0.010	1.378 x 0.079 x 0.055	BB2000350	ORAR00126	1.362 x 0.103
1.378	1.559	0.213	0.268	0.010	1.378 x 0.091 x 0.055	BB2300350	OR3003500	1.378 x 0.118
1.417	1.575	0.197	0.252	0.010	1.417 x 0.079 x 0.055	BB2000360	ORAR00127	1.424 x 0.103
1.417	1.598	0.213	0.268	0.010	1.417 x 0.091 x 0.055	BB2300360	OR3003600	1.417 x 0.118
1.575	1.787	0.244	0.299	0.010	1.575 x 0.106 x 0.055	BB2700400	ORAR00223	1.609 x 0.139
1.575	1.819	0.272	0.339	0.010	1.575 x 0.122 x 0.067	BB3100400	OR4004000	1.575 x 0.157
1.654	1.866	0.244	0.299	0.010	1.654 x 0.106 x 0.055	BB2700420	ORAR00223	1.609 x 0.139
1.654	1.898	0.272	0.339	0.010	1.654 x 0.122 x 0.067	BB3100420	OR4004200	1.654 x 0.157



Rod Ø	Groove Ø	Groove width		Radius	Back-up Ring dimension	TSS Part No.	O-Ring TSS Part No.	O-Ring dimension
d _N f7	d ₆ H9	b ₂ +0.010	b ₃ +0.010	r ±0.008	ID x W x T			d ₁ x d ₂
inch								
1.772	1.984	0.244	0.299	0.010	1.772 x 0.106 x 0.055	BB2700450	ORAR00224	1.734 x 0.139
1.772	2.016	0.272	0.339	0.010	1.772 x 0.122 x 0.067	BB3100450	OR4004500	1.772 x 0.157
1.890	2.102	0.244	0.299	0.010	1.890 x 0.106 x 0.055	BB2700480	ORAR00225	1.859 x 0.139
1.890	2.134	0.272	0.339	0.010	1.890 x 0.122 x 0.067	BB3100480	OR4004800	1.890 x 0.157
1.969	2.181	0.244	0.299	0.010	1.969 x 0.106 x 0.055	BB2700500	ORAR00226	1.984 x 0.139
1.969	2.213	0.272	0.339	0.010	1.969 x 0.122 x 0.067	BB3100500	OR4005000	1.969 x 0.157
2.047	2.260	0.244	0.299	0.010	2.047 x 0.106 x 0.055	BB2700520	ORAR00226	1.984 x 0.139
2.047	2.291	0.272	0.339	0.010	2.047 x 0.122 x 0.067	BB3100520	OR4005200	2.047 x 0.157
2.165	2.378	0.244	0.299	0.010	2.165 x 0.106 x 0.055	BB2700550	ORAR00227	2.109 x 0.139
2.165	2.409	0.272	0.339	0.010	2.165 x 0.122 x 0.067	BB3100550	OR4005500	2.165 x 0.157
2.205	2.417	0.244	0.299	0.010	2.205 x 0.106 x 0.055	BB2700560	ORAR00228	2.234 x 0.139
2.205	2.449	0.272	0.339	0.010	2.205 x 0.122 x 0.067	BB3100560	OR4005600	2.205 x 0.157
2.362	2.575	0.244	0.299	0.010	2.362 x 0.106 x 0.055	BB2700600	ORAR00229	2.359 x 0.139
2.362	2.606	0.272	0.339	0.010	2.362 x 0.122 x 0.067	BB3100600	OR4006000	2.362 x 0.157
2.480	2.693	0.244	0.299	0.010	2.480 x 0.106 x 0.055	BB2700630	ORAR00230	2.484 x 0.139
2.480	2.724	0.272	0.339	0.010	2.480 x 0.122 x 0.067	BB3100630	OR4006300	2.362 x 0.157
2.559	2.772	0.244	0.299	0.010	2.559 x 0.106 x 0.055	BB2700650	ORAR00231	2.609 x 0.139
2.559	2.803	0.272	0.339	0.010	2.559 x 0.122 x 0.067	BB3100650	OR4006500	2.575 x 0.157
2.756	2.969	0.244	0.299	0.010	2.756 x 0.106 x 0.055	BB2700700	ORAR00232	2.734 x 0.139
2.756	3.000	0.272	0.339	0.010	2.756 x 0.122 x 0.067	BB3100700	OR4007000	2.756 x 0.157
2.953	3.165	0.244	0.299	0.010	2.953 x 0.106 x 0.055	BB2700750	ORAR00234	2.984 x 0.139
2.953	3.197	0.272	0.339	0.010	2.953 x 0.122 x 0.067	BB3100750	OR4007500	2.953 x 0.157
3.150	3.465	0.327	0.394	0.010	3.150 x 0.157 x 0.067	BB4000800	OR5008000	3.150 x 0.197
3.150	3.488	0.354	0.429	0.010	3.150 x 0.169 x 0.067	BB4300800	ORAR00339	3.225 x 0.210
3.346	3.661	0.327	0.394	0.010	3.346 x 0.157 x 0.067	BB4000850	OR5008500	3.346 x 0.197
3.346	3.685	0.354	0.429	0.010	3.346 x 0.169 x 0.067	BB4300850	ORAR00340	3.350 x 0.210
3.543	3.858	0.327	0.394	0.010	3.543 x 0.157 x 0.067	BB4000900	OR5009000	3.543 x 0.197
3.543	3.882	0.354	0.429	0.010	3.543 x 0.169 x 0.067	BB4300900	ORAR00342	3.600 x 0.210
3.740	4.055	0.327	0.394	0.010	3.740 x 0.157 x 0.067	BB4000950	OR5009500	3.740 x 0.197
3.740	4.079	0.354	0.429	0.010	3.740 x 0.169 x 0.067	BB4300950	ORAR00343	3.725 x 0.210
3.937	4.252	0.327	0.394	0.010	3.937 x 0.157 x 0.067	BB4001000	OR5010000	3.937 x 0.197
3.937	4.276	0.354	0.429	0.010	3.937 x 0.169 x 0.067	BB4301000	ORAR00345	3.975 x 0.210
4.134	4.449	0.327	0.394	0.010	4.134 x 0.157 x 0.067	BB4001050	OR5010500	4.134 x 0.197
4.134	4.472	0.354	0.429	0.010	4.134 x 0.169 x 0.067	BB4301050	ORAR00346	4.100 x 0.210
4.331	4.646	0.327	0.394	0.010	4.331 x 0.157 x 0.067	BB4001100	OR5011000	4.331 x 0.197
4.331	4.669	0.354	0.429	0.010	4.331 x 0.169 x 0.067	BB4301100	ORAR00348	4.350 x 0.210
4.528	4.843	0.327	0.394	0.010	4.528 x 0.157 x 0.067	BB4001150	OR5011500	4.528 x 0.197
4.528	4.866	0.354	0.429	0.010	4.528 x 0.169 x 0.067	BB4301150	ORAR00349	4.475 x 0.210
4.724	5.039	0.327	0.394	0.010	4.724 x 0.157 x 0.067	BB4001200	OR5012000	4.724 x 0.197
4.724	5.063	0.354	0.429	0.010	4.724 x 0.169 x 0.067	BB4301200	ORAR00351	4.725 x 0.210



Rod Ø	Groove Ø	Groove width		Radius	Back-up Ring dimension	TSS Part No.	O-Ring TSS Part No.	O-Ring dimension
d _N f7	d ₆ H9	b ₂ +0.010	b ₃ +0.010	r ±0.008	ID x W x T			d ₁ x d ₂
inch								
4.921	5.236	0.327	0.394	0.010	4.921 x 0.157 x 0.067	BB4001250	OR5012500	4.921 x 0.197
4.921	5.260	0.354	0.429	0.010	4.921 x 0.169 x 0.067	BB4301250	ORAR00353	4.975 x 0.210
5.118	5.433	0.327	0.394	0.010	5.118 x 0.157 x 0.067	BB4001300	OR5013000	5.118 x 0.197
5.118	5.457	0.354	0.429	0.010	5.118 x 0.169 x 0.067	BB4301300	ORAR00354	5.100 x 0.210
5.315	5.772	0.484	0.594	0.010	5.315 x 0.228 x 0.098	BB5801350	ORAR00432	5.350 x 0.275
5.512	5.969	0.484	0.594	0.010	5.512 x 0.228 x 0.098	BB5801400	ORAR00433	5.475 x 0.275
5.906	6.362	0.484	0.594	0.010	5.906 x 0.228 x 0.098	BB5801500	ORAR00437	5.975 x 0.275
6.299	6.756	0.484	0.594	0.010	6.299 x 0.228 x 0.098	BB5801600	ORAR00438	6.225 x 0.275
6.693	7.150	0.484	0.594	0.010	6.693 x 0.228 x 0.098	BB5801700	ORAR00440	6.725 x 0.275
7.087	7.543	0.484	0.594	0.010	7.087 x 0.228 x 0.098	BB5801800	ORAR00442	7.225 x 0.275
7.480	7.937	0.484	0.594	0.010	7.480 x 0.228 x 0.098	BB5801900	ORAR00443	7.475 x 0.275
7.874	8.331	0.484	0.594	0.010	7.874 x 0.228 x 0.098	BB5802000	ORAR00445	7.975 x 0.275
8.268	8.724	0.484	0.594	0.010	8.268 x 0.228 x 0.098	BB5802100	ORAR00446	8.475 x 0.275
8.661	9.118	0.484	0.594	0.010	8.661 x 0.228 x 0.098	BB5802200	ORAR00446	8.475 x 0.275
9.055	9.512	0.484	0.594	0.010	9.055 x 0.228 x 0.098	BB5802300	ORAR00447	8.975 x 0.275
9.449	9.906	0.484	0.594	0.010	9.449 x 0.228 x 0.098	BB5802400	ORAR00448	9.475 x 0.275
9.843	10.299	0.484	0.594	0.010	9.843 x 0.228 x 0.098	BB5802500	ORAR00449	9.975 x 0.275
11.024	11.480	0.484	0.594	0.010	11.024 x 0.228 x 0.098	BB5802800	ORAR00451	10.975 x 0.275
11.811	12.268	0.484	0.594	0.010	11.811 x 0.228 x 0.098	BB5803000	ORAR00453	11.975 x 0.275
12.598	13.055	0.484	0.594	0.010	12.598 x 0.228 x 0.098	BB5803200	ORAR00454	12.475 x 0.275
13.780	14.236	0.484	0.594	0.010	13.780 x 0.228 x 0.098	BB5803500	ORAR00457	13.975 x 0.275
14.173	14.630	0.484	0.594	0.010	14.173 x 0.228 x 0.098	BB5803600	ORAR00457	13.975 x 0.275
15.748	16.205	0.484	0.594	0.010	15.748 x 0.228 x 0.098	BB5804000	ORAR00461	15.955 x 0.275

Further sizes available on request.

This table shows the possible range of available dimensions (Back-up Rings). However, these dimensions are not always stock items.



H.2.3 SPIRAL BACK-UP RING TYPES (BP), MATERIAL PTFE

The following figure and tables include installation recommendations and Back-up Ring dimensions for internal sealing applications with the spiral Back-up Ring type BP

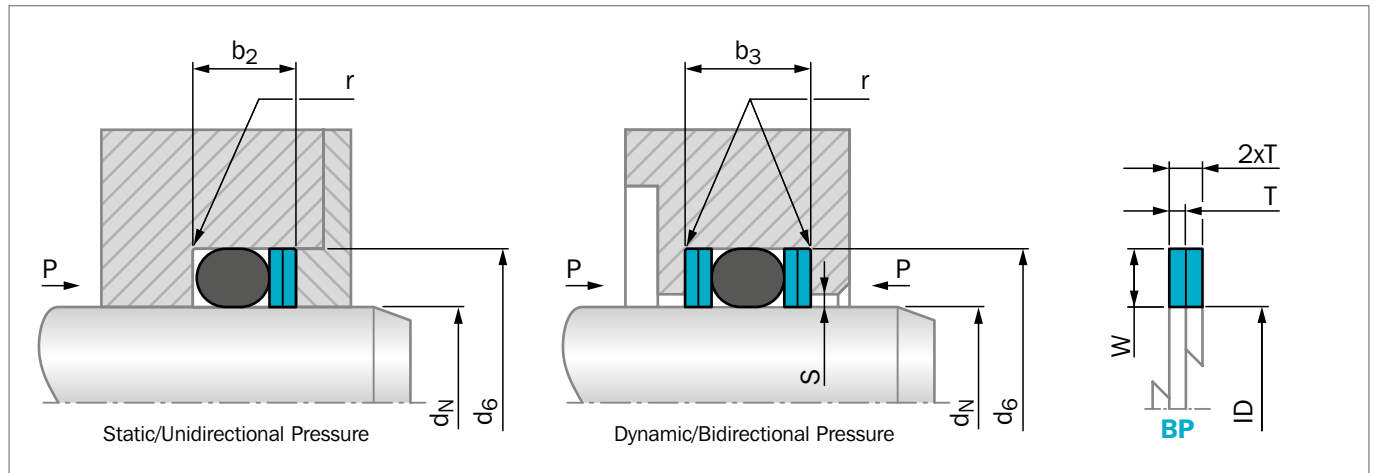


Figure 61: Installation drawing internal sealing, spiral Back-up Ring type

Table 92: Installation dimensions for the spiral Back-up Ring type, Internal sealing, material PTFE – Metric

O-Ring Cross- Section-Ø d_2	Back-up Ring Cross section			Groove dimensions				
	Radial height W		Thickness	Groove diameter d_6 H9		Groove width		Radius
	Dynamic	Static	T	Dynamic	Static	$b_2 + 0.25$	$b_3 + 0.25$	$r \pm 0.2$
mm								
1.50	1.25	1.10	0.50	$d_N + 2.5$	$d_N + 2.2$	3.0	4.0	0.25
1.60	1.30	1.20	0.50	$d_N + 2.6$	$d_N + 2.4$	3.1	4.1	0.25
1.78	1.45	1.30	0.70	$d_N + 2.9$	$d_N + 2.6$	3.8	5.2	0.25
1.80	1.45	1.30	0.70	$d_N + 2.9$	$d_N + 2.6$	3.8	5.2	0.25
2.00	1.65	1.50	0.70	$d_N + 3.3$	$d_N + 3.0$	4.1	5.5	0.25
2.40	2.05	1.80	0.70	$d_N + 4.1$	$d_N + 3.6$	4.6	6.0	0.25
2.50	2.15	1.90	0.70	$d_N + 4.3$	$d_N + 3.8$	4.7	6.1	0.25
2.62	2.25	2.00	0.70	$d_N + 4.5$	$d_N + 4.0$	5.0	6.4	0.25
2.65	2.25	2.00	0.70	$d_N + 4.5$	$d_N + 4.0$	5.0	6.4	0.25
3.00	2.60	2.30	0.70	$d_N + 5.2$	$d_N + 4.6$	5.4	6.8	0.25
3.53	3.10	2.70	0.70	$d_N + 6.2$	$d_N + 5.4$	6.2	7.6	0.25
3.55	3.10	2.70	0.70	$d_N + 6.2$	$d_N + 5.4$	6.2	7.6	0.25
4.00	3.50	3.10	0.85	$d_N + 7.0$	$d_N + 6.2$	6.9	8.6	0.25
5.00	4.40	4.00	0.85	$d_N + 8.8$	$d_N + 8.0$	8.3	10.0	0.25
5.30	4.70	4.30	0.85	$d_N + 9.4$	$d_N + 8.6$	9.0	10.9	0.25
5.33	4.70	4.30	0.85	$d_N + 9.4$	$d_N + 8.6$	9.0	10.9	0.25
5.70	5.00	4.60	0.85	$d_N + 10.0$	$d_N + 9.2$	9.0	11.0	0.25
6.00	5.30	4.90	0.85	$d_N + 10.6$	$d_N + 9.8$	9.3	11.2	0.25
7.00	6.10	5.80	1.25	$d_N + 12.2$	$d_N + 11.6$	12.3	15.1	0.25
8.00	7.10	6.70	1.25	$d_N + 14.2$	$d_N + 13.4$	12.6	15.4	0.25
8.40	7.50	7.10	1.25	$d_N + 15.0$	$d_N + 14.2$	12.8	15.6	0.25

**Table 93: Installation dimensions for the spiral Back-up Ring type,
Internal sealing, material PTFE – Inch**

O-Ring Cross- Section-Ø d_2	Back-up Ring Cross section			Groove dimensions				
	Radial height W		Thickness	Groove diameter d_6 H9		Groove width		Radius
	Dynamic	Static	T	Dynamic	Static	$b_2 + 0.010$	$b_3 + 0.010$	$r \pm 0.008$
inch								
0.059	0.049	0.043	0.020	$d_N + 0.098$	$d_N + 0.087$	0.118	0.157	0.010
0.063	0.051	0.047	0.020	$d_N + 0.102$	$d_N + 0.094$	0.122	0.161	0.010
0.070	0.057	0.051	0.028	$d_N + 0.114$	$d_N + 0.102$	0.150	0.205	0.010
0.071	0.057	0.051	0.028	$d_N + 0.114$	$d_N + 0.102$	0.150	0.205	0.010
0.079	0.065	0.059	0.028	$d_N + 0.130$	$d_N + 0.118$	0.161	0.217	0.010
0.094	0.081	0.071	0.028	$d_N + 0.161$	$d_N + 0.142$	0.181	0.236	0.010
0.098	0.085	0.075	0.028	$d_N + 0.169$	$d_N + 0.150$	0.185	0.240	0.010
0.103	0.089	0.079	0.028	$d_N + 0.177$	$d_N + 0.157$	0.197	0.252	0.010
0.104	0.089	0.079	0.028	$d_N + 0.177$	$d_N + 0.157$	0.197	0.252	0.010
0.118	0.102	0.091	0.028	$d_N + 0.205$	$d_N + 0.181$	0.213	0.268	0.010
0.139	0.122	0.106	0.028	$d_N + 0.244$	$d_N + 0.213$	0.244	0.299	0.010
0.140	0.122	0.106	0.028	$d_N + 0.244$	$d_N + 0.213$	0.244	0.299	0.010
0.157	0.138	0.122	0.033	$d_N + 0.276$	$d_N + 0.244$	0.272	0.339	0.010
0.197	0.173	0.157	0.033	$d_N + 0.346$	$d_N + 0.315$	0.327	0.394	0.010
0.209	0.185	0.169	0.033	$d_N + 0.370$	$d_N + 0.339$	0.354	0.429	0.010
0.210	0.185	0.169	0.033	$d_N + 0.370$	$d_N + 0.339$	0.354	0.429	0.010
0.224	0.197	0.181	0.033	$d_N + 0.394$	$d_N + 0.362$	0.354	0.433	0.010
0.236	0.209	0.193	0.033	$d_N + 0.417$	$d_N + 0.386$	0.366	0.441	0.010
0.276	0.240	0.228	0.049	$d_N + 0.480$	$d_N + 0.457$	0.484	0.594	0.010
0.315	0.280	0.264	0.049	$d_N + 0.559$	$d_N + 0.528$	0.496	0.606	0.010
0.331	0.295	0.280	0.049	$d_N + 0.591$	$d_N + 0.559$	0.504	0.614	0.010

ORDERING EXAMPLE

Back-up Ring:	Type BP (spiral) for O-Ring seal
Application:	Dynamic, internal sealing
Rod diameter:	$d_N = 56.00$ mm (2.205 inch)
O-Ring cross section:	$d_2 = 3.53$ mm (0.139 inch)
Back-up Ring material:	PTFE, bronze-filled (40%)

For material code see page 151

TSS Article No.

BP 31 0 0560 - PTB4

Back-Up Ring (Spiral) ————

Radial Height (mm) W x 10 ————

T-dimension (Standard, mm) ————

Rod-Ø (mm) d_N x 10 ————

Quality Index (Standard) ————

Material Code (Standard) ————



**Table 94: Preferred series for dynamic application, spiral Back-up Ring
Type BP, Internal sealing, material PTFE – Metric**

Rod Ø	Groove Ø	Groove width		Radius	Back-up Ring dimension	TSS Part No.	O-Ring TSS Part No.	O-Ring dimension
d _N f7	d ₆ H9	b ₂ +0.25	b ₃ +0.25	r ±0.2	ID x W x T			d ₁ x d ₂
mm								
4.00	6.50	3.00	4.00	0.25	4.0 x 1.25 x 0.50	BP12H00040	OR1500400	4.00 x 1.50
4.00	6.90	3.80	5.20	0.25	4.0 x 1.45 x 0.70	BP14H00040	ORAR00007	3.68 x 1.78
5.00	7.50	3.00	4.00	0.25	5.0 x 1.25 x 0.50	BP12H00050	OR1500500	5.00 x 1.50
5.00	7.90	3.80	5.20	0.25	5.0 x 1.45 x 0.70	BP14H00050	ORAR00008	4.47x 1.78
6.00	8.50	3.00	4.00	0.25	6.0 x 1.25 x 0.50	BP12H00060	OR1500600	6.00 x 1.50
6.00	8.90	3.80	5.20	0.25	6.0 x 1.45 x 0.70	BP14H00060	ORAR00010	6.07 x 1.78
8.00	10.90	3.80	5.20	0.25	8.0 x 1.45 x 0.70	BP14H00080	ORAR00011	7.65 x 1.78
8.00	11.30	4.10	5.50	0.25	8.0 x 1.65 x 0.70	BP16H00080	OR2000800	8.00 x 2.00
10.00	12.90	3.80	5.20	0.25	10.0 x 1.45 x 0.70	BP14H00100	ORAR00013	10.82 x 1.78
10.00	13.30	4.10	5.50	0.25	10.0 x 1.65 x 0.70	BP16H00100	OR2001000	10.00 x 2.00
12.00	14.90	3.80	5.20	0.25	12.0 x 1.45 x 0.70	BP14H00120	ORAR00014	12.42 x 1.78
12.00	15.30	4.10	5.50	0.25	12.0 x 1.65 x 0.70	BP16H00120	OR2001200	12.00 x 2.00
14.00	16.90	3.80	5.20	0.25	14.0 x 1.45 x 0.70	BP14H00140	ORAR00015	14.00 x 1.78
14.00	17.30	4.10	5.50	0.25	14.0 x 1.65 x 0.70	BP16H00140	OR2001400	14.00 x 2.00
15.00	17.90	3.80	5.20	0.25	15.0 x 1.45 x 0.70	BP14H00150	ORAR00016	15.60 x 1.78
15.00	18.30	4.10	5.50	0.25	15.0 x 1.65 x 0.70	BP16H00150	OR2001500	15.00 x 2.00
16.00	18.90	3.80	5.20	0.25	16.0 x 1.45 x 0.70	BP14H00160	ORAR00016	15.60 x 1.78
16.00	19.30	4.10	5.50	0.25	16.0 x 1.65 x 0.70	BP16H00160	OR2001600	16.00 x 2.00
18.00	20.90	3.80	5.20	0.25	18.0 x 1.45 x 0.70	BP14H00180	ORAR00018	18.77 x 1.78
18.00	21.30	4.10	5.50	0.25	18.0 x 1.65 x 0.70	BP16H00180	OR2001800	18.00 x 2.00
20.00	22.90	3.80	5.20	0.25	20.0 x 1.45 x 0.70	BP14H00200	ORAR00019	20.35 x 1.78
20.00	23.30	4.10	5.50	0.25	20.0 x 1.65 x 0.70	BP16H00200	OR2002000	20.00 x 2.00
22.00	26.50	5.00	6.40	0.25	22.0 x 2.25 x 0.70	BP22H00220	ORAR00118	21.89 x 2.62
22.00	27.20	5.40	6.80	0.25	22.0 x 2.60 x 0.70	BP2600220	OR3002200	22.00 x 3.00
25.00	29.50	5.00	6.40	0.25	25.0 x 2.25 x 0.70	BP22H00250	ORAR00120	25.07 x 2.62
25.00	30.20	5.40	6.80	0.25	25.0 x 2.60 x 0.70	BP2600250	OR3002500	25.00 x 3.00
28.00	32.50	5.00	6.40	0.25	28.0 x 2.25 x 0.70	BP22H00280	ORAR00122	28.24 x 2.62
28.00	33.20	5.40	6.80	0.25	28.0 x 2.60 x 0.70	BP2600280	OR3002800	28.00 x 3.00
30.00	34.50	5.00	6.40	0.25	30.0 x 2.25 x 0.70	BP22H00300	ORAR00123	29.83 x 2.62
30.00	35.20	5.40	6.80	0.25	30.0 x 2.60 x 0.70	BP2600300	OR3003000	30.00 x 3.00
32.00	36.50	5.00	6.40	0.25	32.0 x 2.25 x 0.70	BP22H00320	ORAR00125	31.42 x 2.62
32.00	37.20	5.40	6.80	0.25	32.0 x 2.60 x 0.70	BP2600320	OR3003200	32.00 x 3.00
35.00	39.50	5.00	6.40	0.25	35.0 x 2.25 x 0.70	BP22H00350	ORAR00126	24.59 x 2.62
35.00	40.20	5.40	6.80	0.25	35.0 x 2.60 x 0.70	BP2600350	OR3003500	35.00 x 3.00
36.00	40.50	5.00	6.40	0.25	36.0 x 2.25 x 0.70	BP22H00360	ORAR00127	36.17 x 2.62
36.00	41.20	5.40	6.80	0.25	36.0 x 2.60 x 0.70	BP2600360	OR3003600	36.00 x 3.00
40.00	46.20	6.20	7.60	0.25	40.0 x 3.10 x 0.70	BP31D0400	ORAR00223	40.87 x 3.53
40.00	47.00	6.90	8.60	0.25	40.0 x 3.50 x 0.85	BP3500400	OR4004000	40.00 x 4.00
42.00	48.20	6.20	7.60	0.25	42.0 x 3.10 x 0.70	BP31D0420	ORAR00223	40.87 x 3.53
42.00	49.00	6.90	8.60	0.25	42.0 x 3.50 x 0.70	BP35D0420	OR4004200	42.00 x 4.00



Rod Ø	Groove Ø	Groove width		Radius	Back-up Ring dimension	TSS Part No.	O-Ring TSS Part No.	O-Ring dimension
		b ₂ +0.25	b ₃ +0.25					
d _N f7	d ₆ H9			r ±0.2	ID x W x T			d ₁ x d ₂
mm								
45.00	51.20	6.20	7.60	0.25	45.0 x 3.10 x 0.70	BP31D0450	ORAR00224	44.04 x 3.53
45.00	52.00	6.90	8.60	0.25	45.0 x 3.50 x 0.85	BP3500450	OR4004500	45.00 x 4.00
48.00	54.20	6.20	7.60	0.25	48.0 x 3.10 x 0.70	BP31D0480	ORAR00225	47.22 x 3.53
48.00	55.00	6.90	8.60	0.25	48.0 x 3.50 x 0.85	BP3500480	OR4004800	48.00 x 4.00
50.00	56.20	6.20	7.60	0.25	50.0 x 3.10 x 0.70	BP31D0500	ORAR00226	50.39 x 3.53
50.00	57.00	6.90	8.60	0.25	50.0 x 3.50 x 0.85	BP3500500	OR4005000	50.00 x 4.00
52.00	58.20	6.20	7.60	0.25	52.0 x 3.10 x 0.70	BP31D0520	ORAR00226	50.39 x 3.53
52.00	59.00	6.90	8.60	0.25	52.0 x 3.50 x 0.85	BP3500520	OR4005200	52.00 x 4.00
55.00	61.20	6.20	7.60	0.25	55.0 x 3.10 x 0.70	BP31D0550	ORAR00227	53.57 x 3.53
55.00	62.00	6.90	8.60	0.25	55.0 x 3.50 x 0.85	BP3500550	OR4005500	55.00 x 4.00
56.00	62.20	6.20	7.60	0.25	56.0 x 3.10 x 0.70	BP31D0560	ORAR00228	56.74 x 3.53
56.00	63.00	6.90	8.60	0.25	56.0 x 3.50 x 0.85	BP3500560	OR4005600	56.00 x 4.00
60.00	66.20	6.20	7.60	0.25	60.0 x 3.10 x 0.70	BP31D0600	ORAR00229	59.92 x 3.53
60.00	67.00	6.90	8.60	0.25	60.0 x 3.50 x 0.85	BP3500600	OR4006000	60.00 x 4.00
63.00	69.20	6.20	7.60	0.25	63.0 x 3.10 x 0.70	BP31D0630	ORAR00230	63.09 x 3.53
63.00	70.00	6.90	8.60	0.25	63.0 x 3.50 x 0.85	BP3500630	OR4006300	63.00 x 4.00
65.00	71.20	6.20	7.60	0.25	65.0 x 3.10 x 0.70	BP31D0650	ORAR00231	66.27 x 3.53
65.00	72.00	6.90	8.60	0.25	65.0 x 3.50 x 0.85	BP3500650	OR4006500	65.00 x 4.00
70.00	76.20	6.20	7.60	0.25	70.0 x 3.10 x 0.70	BP31D0700	ORAR00232	69.44 x 3.53
70.00	77.00	6.90	8.60	0.25	70.0 x 3.50 x 0.85	BP3500700	OR4007000	70.00 x 4.00
75.00	81.20	6.20	7.60	0.25	75.0 x 3.1 x 0.7	BP31D0750	ORAR00234	75.79 x 3.53
75.00	82.00	6.90	8.60	0.25	75.0 x 3.5 x 0.9	BP3500750	OR4007500	75.00 x 4.00
80.00	88.80	8.30	10.00	0.25	80.0 x 4.4 x 0.9	BP4400800	OR5008000	80.00 x 5.00
80.00	89.40	9.00	10.90	0.25	80.0 x 4.7 x 0.9	BP4700800	ORAR00339	81.92 x 5.33
85.00	93.80	8.30	10.00	0.25	85.0 x 4.4 x 0.9	BP4400850	OR5008500	85.00 x 5.00
85.00	89.40	9.00	10.90	0.25	80.0 x 4.7 x 0.9	BP4700850	ORAR00340	85.09 x 5.33
90.00	98.80	8.30	10.00	0.25	90.0 x 4.4 x 0.9	BP4400900	OR5009000	90.00 x 5.00
90.00	99.40	9.00	10.90	0.25	90.0 x 4.7 x 0.9	BP4700900	ORAR00342	91.44 x 5.33
95.00	103.80	8.30	10.00	0.25	95.0 x 4.4 x 0.9	BP4400950	OR5009500	95.00 x 5.00
95.00	104.40	9.00	10.90	0.25	95.0 x 4.7 x 0.9	BP4700950	ORAR00343	94.62 x 5.33
100.00	108.80	8.30	10.00	0.25	100.0 x 4.4 x 0.9	BP4401000	OR5010000	100.00 x 5.00
100.00	109.40	9.00	10.90	0.25	100.0 x 4.7 x 0.9	BP4701000	ORAR00345	100.97 x 5.33
105.00	113.80	8.30	10.00	0.25	105.0 x 4.4 x 0.9	BP4401050	OR5010500	105.00 x 5.00
105.00	114.40	9.00	10.90	0.25	105.0 x 4.7 x 0.9	BP4701050	ORAR00346	104.14 x 5.33
110.00	118.80	8.30	10.00	0.25	110.0 x 4.4 x 0.9	BP4401100	OR5011000	110.00 x 5.00
110.00	119.40	9.00	10.90	0.25	110.0 x 4.7 x 0.9	BP4701100	ORAR00348	110.49 x 5.33
115.00	123.80	8.30	10.00	0.25	115.0 x 4.4 x 0.9	BP4401150	OR5011500	115.00 x 5.00
115.00	124.40	9.00	10.90	0.25	115.0 x 4.7 x 0.9	BP4701150	ORAR00349	113.67 x 5.33
120.00	128.80	8.30	10.00	0.25	120.0 x 4.4 x 0.9	BP4401200	OR5012000	120.00 x 5.00
120.00	129.40	9.00	10.90	0.25	120.0 x 4.7 x 0.9	BP4701200	ORAR00351	120.02 x 5.33
125.00	133.80	8.30	10.00	0.25	125.0 x 4.4 x 0.9	BP4401250	OR5012500	125.00 x 5.00
125.00	134.40	9.00	10.90	0.25	125.0 x 4.7 x 0.9	BP4701250	ORAR00353	126.37 x 5.33



Rod Ø	Groove Ø	Groove width		Radius	Back-up Ring dimension	TSS Part No.	O-Ring TSS Part No.	O-Ring dimension
d _N f7	d ₆ H9	b ₂ +0.25	b ₃ +0.25	r ±0.2	ID x W x T			d ₁ x d ₂
mm								
130.00	138.80	8.30	10.00	0.25	130.0 x 4.4 x 0.9	BP4401300	OR5013000	130.00 x 5.00
130.00	139.40	9.00	10.90	0.25	130.0 x 4.7 x 0.9	BP4701300	ORAR00354	129.54 x 5.33
135.00	147.20	12.30	15.10	0.25	135.0 x 6.1 x 1.3	BP6101350	ORAR00432	135.89 x 6.99
140.00	152.20	12.30	15.10	0.25	140.0 x 6.1 x 1.3	BP6101400	ORAR00433	139.07 x 6.99
150.00	162.20	12.30	15.10	0.25	150.0 x 6.1 x 1.3	BP6101500	ORAR00437	151.77 x 6.99
160.00	172.20	12.30	15.10	0.25	160.0 x 6.1 x 1.3	BP6101600	ORAR00438	158.12 x 6.99
170.00	182.20	12.30	15.10	0.25	170.0 x 6.1 x 1.3	BP6101700	ORAR00440	170.82 x 6.99
180.00	192.20	12.30	15.10	0.25	180.0 x 6.1 x 1.3	BP6101800	ORAR00442	183.52 x 6.99
190.00	202.20	12.30	15.10	0.25	190.0 x 6.1 x 1.3	BP6101900	ORAR00443	189.87 x 6.99
200.00	212.20	12.30	15.10	0.25	200.0 x 6.1 x 1.3	BP6102000	ORAR00445	202.57 x 6.99
210.00	222.20	12.30	15.10	0.25	210.0 x 6.1 x 1.3	BP6102100	ORAR00446	215.27 x 6.99
220.00	232.20	12.30	15.10	0.25	220.0 x 6.1 x 1.3	BP6102200	ORAR00446	215.27 x 6.99
230.00	242.20	12.30	15.10	0.25	230.0 x 6.1 x 1.3	BP6102300	ORAR00447	227.97 x 6.99
240.00	252.20	12.30	15.10	0.25	240.0 x 6.1 x 1.3	BP6102400	ORAR00448	240.67 x 6.99
250.00	262.20	12.30	15.10	0.25	250.0 x 6.1 x 1.3	BP6102500	ORAR00449	253.37 x 6.99
280.00	292.20	12.30	15.10	0.25	280.0 x 6.1 x 1.3	BP6102800	ORAR00451	278.77 x 6.99
300.00	312.20	12.30	15.10	0.25	300.0 x 6.1 x 1.3	BP6103000	ORAR00453	304.17 x 6.99
320.00	332.20	12.30	15.10	0.25	320.0 x 6.1 x 1.3	BP6103200	ORAR00454	316.87 x 6.99
350.00	362.20	12.30	15.10	0.25	350.0 x 6.1 x 1.3	BP6103500	ORAR00457	354.97 x 6.99
360.00	372.20	12.30	15.10	0.25	360.0 x 6.1 x 1.3	BP6103600	ORAR00457	354.97 x 6.99
400.00	412.20	12.30	15.10	0.25	400.0 x 6.1 x 1.3	BP6104000	ORAR00461	405.26 x 6.99

Further sizes available on request.

This table shows the possible range of available dimensions (Back-up Rings). However, these dimensions are not always stock items.



Table 95: Preferred series for dynamic application, spiral Back-up Ring
Type BP, Internal sealing, material PTFE – Inch

Rod Ø	Groove Ø	Groove width		Radius	Back-up Ring dimension	TSS Part No.	O-Ring TSS Part No.	O-Ring dimension
d _N f7	d ₆ H9	b ₂ +0.010	b ₃ +0.010	r ±0.008	ID x W x T			d ₁ x d ₂
inch								
0.157	0.256	0.118	0.157	0.010	0.157 x 0.049 x 0.020	BP12H00040	OR1500400	0.157 x 0.059
0.157	0.272	0.150	0.205	0.010	0.157 x 0.057 x 0.028	BP14H00040	ORAR00007	0.145 x 0.070
0.197	0.295	0.118	0.157	0.010	0.197 x 0.049 x 0.020	BP12H00050	OR1500500	0.197 x 0.059
0.197	0.311	0.150	0.205	0.010	0.197 x 0.057 x 0.028	BP14H00050	ORAR00008	0.176 x 0.070
0.236	0.335	0.118	0.157	0.010	0.236 x 0.049 x 0.020	BP12H00060	OR1500600	0.236 x 0.059
0.236	0.350	0.150	0.205	0.010	0.236 x 0.057 x 0.028	BP14H00060	ORAR00010	0.239 x 0.070
0.315	0.429	0.150	0.205	0.010	0.315 x 0.057 x 0.028	BP14H00080	ORAR00011	0.301 x 0.070
0.315	0.445	0.161	0.217	0.010	0.315 x 0.065 x 0.028	BP16H00080	OR2000800	0.315 x 0.079
0.394	0.508	0.150	0.205	0.010	0.394 x 0.057 x 0.028	BP14H00100	ORAR00013	0.426 x 0.070
0.394	0.524	0.161	0.217	0.010	0.394 x 0.065 x 0.028	BP16H00100	OR2001000	0.394 x 0.079
0.472	0.587	0.150	0.205	0.010	0.472 x 0.057 x 0.028	BP14H00120	ORAR00014	0.489 x 0.070
0.472	0.602	0.161	0.217	0.010	0.472 x 0.065 x 0.028	BP16H00120	OR2001200	0.472 x 0.079
0.551	0.665	0.150	0.205	0.010	0.551 x 0.057 x 0.028	BP14H00140	ORAR00015	0.551 x 0.070
0.551	0.681	0.161	0.217	0.010	0.551 x 0.065 x 0.028	BP16H00140	OR2001400	0.551 x 0.079
0.591	0.705	0.150	0.205	0.010	0.591 x 0.057 x 0.028	BP14H00150	ORAR00016	0.614 x 0.070
0.591	0.720	0.161	0.217	0.010	0.591 x 0.065 x 0.028	BP16H00150	OR2001500	0.591 x 0.079
0.630	0.744	0.150	0.205	0.010	0.630 x 0.057 x 0.028	BP14H00160	ORAR00016	0.614 x 0.070
0.630	0.760	0.161	0.217	0.010	0.630 x 0.065 x 0.028	BP16H00160	OR2001600	0.630 x 0.079
0.709	0.823	0.150	0.205	0.010	0.709 x 0.057 x 0.028	BP14H00180	ORAR00018	0.739 x 0.070
0.709	0.839	0.161	0.217	0.010	0.709 x 0.065 x 0.028	BP16H00180	OR2001800	0.709 x 0.079
0.787	0.902	0.150	0.205	0.010	0.787 x 0.057 x 0.028	BP14H00200	ORAR00019	0.801 x 0.070
0.787	0.917	0.161	0.217	0.010	0.787 x 0.065 x 0.028	BP16H00200	OR2002000	0.787 x 0.079
0.866	1.043	0.197	0.252	0.010	0.866 x 0.089 x 0.028	BP22H00220	ORAR00118	0.862 x 0.103
0.866	1.071	0.213	0.268	0.010	0.866 x 0.102 x 0.028	BP2600220	OR3002200	0.866 x 0.118
0.984	1.161	0.197	0.252	0.010	0.984 x 0.089 x 0.028	BP22H00250	ORAR00120	0.987 x 0.103
0.984	1.189	0.213	0.268	0.010	0.984 x 0.102 x 0.028	BP2600250	OR3002500	0.984 x 0.118
1.102	1.280	0.197	0.252	0.010	1.102 x 0.089 x 0.028	BP22H00280	ORAR00122	1.112 x 0.103
1.102	1.307	0.213	0.268	0.010	1.102 x 0.102 x 0.028	BP2600280	OR3002800	1.102 x 0.118
1.181	1.358	0.197	0.252	0.010	1.181 x 0.089 x 0.028	BP22H00300	ORAR00123	1.174 x 0.103
1.181	1.386	0.213	0.268	0.010	1.181 x 0.102 x 0.028	BP2600300	OR3003000	1.181 x 0.118
1.260	1.437	0.197	0.252	0.010	1.260 x 0.089 x 0.028	BP22H00320	ORAR00125	1.237 x 0.103
1.260	1.465	0.213	0.268	0.010	1.260 x 0.102 x 0.028	BP2600320	OR3003200	1.260 x 0.118
1.378	1.555	0.197	0.252	0.010	1.378 x 0.089 x 0.028	BP22H00350	ORAR00126	0.968 x 0.103
1.378	1.583	0.213	0.268	0.010	1.378 x 0.102 x 0.028	BP2600350	OR3003500	1.378 x 0.118
1.417	1.594	0.197	0.252	0.010	1.417 x 0.089 x 0.028	BP22H00360	ORAR00127	1.424 x 0.103
1.417	1.622	0.213	0.268	0.010	1.378 x 0.102 x 0.028	BP2600350	OR3003500	1.378 x 0.118
1.575	1.819	0.244	0.299	0.010	1.575 x 0.122 x 0.028	BP31D0400	ORAR00223	1.609 x 0.139
1.575	1.850	0.272	0.339	0.010	1.575 x 0.138 x 0.033	BP3500400	OR4004000	1.575 x 0.157
1.654	1.898	0.244	0.299	0.010	1.654 x 0.122 x 0.028	BP31D0420	ORAR00223	1.609 x 0.139
1.654	1.929	0.272	0.339	0.010	1.654 x 0.138 x 0.028	BP35D0420	OR4004200	1.654 x 0.079



Rod Ø	Groove Ø	Groove width		Radius	Back-up Ring dimension	TSS Part No.	O-Ring TSS Part No.	O-Ring dimension
		b ₂ +0.010	b ₃ +0.010					
d _N f7	d ₆ H9			r ±0.008	ID x W x T			d ₁ x d ₂
inch								
1.772	2.016	0.244	0.299	0.010	1.772 x 0.122 x 0.028	BP31D0450	ORAR00224	1.734 x 0.139
1.772	2.047	0.272	0.339	0.010	1.772 x 0.138 x 0.033	BP3500450	OR4004500	1.772 x 0.157
1.890	2.134	0.244	0.299	0.010	1.890 x 0.122 x 0.028	BP31D0480	ORAR00225	1.859 x 0.139
1.890	2.165	0.272	0.339	0.010	1.890 x 0.138 x 0.033	BP3500480	OR4004800	1.890 x 0.157
1.969	2.213	0.244	0.299	0.010	1.969 x 0.122 x 0.028	BP31D0500	ORAR00226	1.984 x 0.139
1.969	2.244	0.272	0.339	0.010	1.969 x 0.138 x 0.033	BP3500500	OR4005000	1.969 x 0.157
2.047	2.291	0.244	0.299	0.010	2.047 x 0.122 x 0.028	BP31D0520	ORAR00226	1.984 x 0.139
2.047	2.323	0.272	0.339	0.010	2.047 x 0.138 x 0.033	BP3500520	OR4005200	2.047 x 0.157
2.165	2.409	0.244	0.299	0.010	2.165 x 0.122 x 0.028	BP31D0550	ORAR00227	2.109 x 0.139
2.165	2.441	0.272	0.339	0.010	2.165 x 0.138 x 0.033	BP3500550	OR4005500	2.165 x 0.157
2.205	2.449	0.244	0.299	0.010	2.205 x 0.122 x 0.028	BP31D0560	ORAR00228	2.234 x 0.139
2.205	2.480	0.272	0.339	0.010	2.205 x 0.138 x 0.033	BP3500560	OR4005600	2.205 x 0.157
2.362	2.606	0.244	0.299	0.010	2.362 x 0.122 x 0.028	BP31D0600	ORAR00229	2.359 x 0.139
2.362	3.819	0.272	0.339	0.010	2.362 x 0.138 x 0.033	BP3500600	OR4006000	2.362 x 0.157
2.480	2.724	0.244	0.299	0.010	2.480 x 0.122 x 0.028	BP31D0630	ORAR00230	2.484 x 0.139
2.480	2.756	0.272	0.339	0.010	2.480 x 0.138 x 0.033	BP3500630	OR4006300	2.480 x 0.157
2.559	2.803	0.244	0.299	0.010	2.559 x 0.122 x 0.028	BP31D0650	ORAR00231	2.609 x 0.139
2.559	2.835	0.272	0.339	0.010	2.559 x 0.138 x 0.033	BP3500650	OR4006500	2.559 x 0.157
2.756	3.000	0.244	0.299	0.010	2.756 x 0.122 x 0.028	BP31D0700	ORAR00232	2.734 x 0.139
2.756	3.031	0.272	0.339	0.010	2.756 x 0.138 x 0.033	BP3500700	OR4007000	2.756 x 0.157
2.953	3.197	0.244	0.299	0.010	2.953 x 0.122 x 0.028	BP31D0750	ORAR00234	2.984 x 0.139
3.150	3.496	0.327	0.394	0.010	3.150 x 0.173 x 0.033	BP4400800	OR5008000	3.150 x 0.197
2.953	3.197	0.244	0.299	0.010	2.953 x 0.122 x 0.028	BP31D0750	ORAR00234	2.984 x 0.139
2.953	3.228	0.272	0.339	0.010	2.953 x 0.138 x 0.033	BP3500750	OR4007500	2.953 x 0.157
3.150	3.496	0.327	0.394	0.010	3.150 x 0.173 x 0.033	BP4400800	OR5008000	3.150 x 0.197
3.150	3.520	0.354	0.429	0.010	3.150 x 0.185 x 0.033	BP4700800	ORAR00339	3.225 x 0.210
3.346	3.693	0.327	0.394	0.010	3.346 x 0.173 x 0.033	BP4400850	OR5008500	3.346 x 0.197
3.346	3.717	0.354	0.429	0.010	3.346 x 0.185 x 0.033	BP4700850	ORAR00340	3.350 x 0.210
3.543	3.890	0.327	0.394	0.010	3.543 x 0.173 x 0.033	BP4400900	OR5009000	3.543 x 0.197
3.543	3.913	0.354	0.429	0.010	3.543 x 0.185 x 0.033	BP4700900	ORAR00342	3.600 x 0.210
3.740	4.087	0.327	0.394	0.010	3.740 x 0.173 x 0.033	BP4400950	OR5009500	3.740 x 0.197
3.740	4.110	0.354	0.429	0.010	3.740 x 0.185 x 0.033	BP4700950	ORAR00343	3.725 x 0.210
3.937	4.283	0.327	0.394	0.010	3.937 x 0.173 x 0.033	BP4401000	OR5010000	3.937 x 0.197
3.937	4.307	0.354	0.429	0.010	3.937 x 0.185 x 0.033	BP4701000	ORAR00345	3.975 x 0.210
4.134	4.480	0.327	0.394	0.010	4.134 x 0.173 x 0.033	BP4401050	OR5010500	4.134 x 0.197
4.134	4.504	0.354	0.429	0.010	4.134 x 0.185 x 0.033	BP4701050	ORAR00346	4.100 x 0.210
4.331	4.677	0.327	0.394	0.010	4.331 x 0.173 x 0.033	BP4401100	OR5011000	4.331 x 0.197
4.331	4.701	0.354	0.429	0.010	4.331 x 0.185 x 0.033	BP4701100	ORAR00348	4.350 x 0.210
4.528	4.874	0.327	0.394	0.010	4.528 x 0.173 x 0.033	BP4401150	OR5011500	4.528 x 0.197
4.528	4.898	0.354	0.429	0.010	4.528 x 0.185 x 0.033	BP4701150	ORAR00349	4.475 x 0.210



Rod Ø	Groove Ø	Groove width		Radius	Back-up Ring dimension	TSS Part No.	O-Ring TSS Part No.	O-Ring dimension
d _N f7	d ₆ H9	b ₂ +0.010	b ₃ +0.010	r ±0.008	ID x W x T			d ₁ x d ₂
inch								
4.724	5.071	0.327	0.394	0.010	4.724 x 0.173 x 0.033	BP4401200	OR5012000	4.724 x 0.197
4.724	5.094	0.354	0.429	0.010	4.724 x 0.185 x 0.033	BP4701200	ORAR00351	4.725 x 0.210
4.921	5.268	0.327	0.394	0.010	4.921 x 0.173 x 0.033	BP4401250	OR5012500	4.921 x 0.197
4.921	5.291	0.354	0.429	0.010	4.921 x 0.185 x 0.033	BP4701250	ORAR00353	4.975 x 0.210
5.118	5.465	0.327	0.394	0.010	5.118 x 0.173 x 0.033	BP4401300	OR5013000	5.118 x 0.197
5.118	5.488	0.354	0.429	0.010	5.118 x 0.185 x 0.033	BP4701300	ORAR00354	5.100 x 0.210
5.315	5.795	0.484	0.594	0.010	5.315 x 0.240 x 0.049	BP6101350	ORAR00432	5.350 x 0.275
5.512	5.992	0.484	0.594	0.010	5.512 x 0.240 x 0.049	BP6101400	ORAR00433	5.475 x 0.275
5.906	6.386	0.484	0.594	0.010	5.906 x 0.240 x 0.049	BP6101500	ORAR00437	5.975 x 0.275
6.299	6.780	0.484	0.594	0.010	6.299 x 0.240 x 0.049	BP6101600	ORAR00438	6.225 x 0.275
6.693	7.173	0.484	0.594	0.010	6.693 x 0.240 x 0.049	BP6101700	ORAR00440	6.725 x 0.275
7.087	7.567	0.484	0.594	0.010	7.087 x 0.240 x 0.049	BP6101800	ORAR00442	7.225 x 0.275
7.480	7.961	0.484	0.594	0.010	7.480 x 0.240 x 0.049	BP6101900	ORAR00443	7.475 x 0.275
7.874	8.354	0.484	0.594	0.010	7.874 x 0.240 x 0.049	BP6102000	ORAR00445	7.975 x 0.275
8.268	8.748	0.484	0.594	0.010	8.268 x 0.240 x 0.049	BP6102100	ORAR00446	8.475 x 0.275
8.661	9.142	0.484	0.594	0.010	8.661 x 0.240 x 0.049	BP6102200	ORAR00446	8.475 x 0.275
9.055	9.535	0.484	0.594	0.010	9.055 x 0.240 x 0.049	BP6102300	ORAR00447	8.975 x 0.275
9.449	9.929	0.484	0.594	0.010	9.449 x 0.240 x 0.049	BP6102400	ORAR00448	9.475 x 0.275
9.843	10.323	0.484	0.594	0.010	9.843 x 0.240 x 0.049	BP6102500	ORAR00449	9.975 x 0.275
11.024	11.504	0.484	0.594	0.010	11.024 x 0.240 x 0.049	BP6102800	ORAR00451	10.975 x 0.275
11.811	12.291	0.484	0.594	0.010	11.811 x 0.240 x 0.049	BP6103000	ORAR00453	11.975 x 0.275
12.598	13.079	0.484	0.594	0.010	12.598 x 0.240 x 0.049	BP6103200	ORAR00454	12.475 x 0.275
13.780	14.260	0.484	0.594	0.010	13.780 x 0.240 x 0.049	BP6103500	ORAR00457	13.975 x 0.275
14.173	14.654	0.484	0.594	0.010	14.173 x 0.240 x 0.049	BP6103600	ORAR00457	13.975 x 0.275
15.748	16.228	0.484	0.594	0.010	15.748 x 0.240 x 0.049	BP6104000	ORAR00461	15.955 x 0.275

Further sizes available on request.

This table shows the possible range of available dimensions (Back-up Rings). However, these dimensions are not always stock items.