

TECHNICAL INFORMATION

Static Seals | Spiral back-up ring Internal and External Sealing Type, BP

Description

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 elastomer 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.

Typical application examples are: injection moulding machines, machine tools, presses, excavators, agricultural machines and valves for hydraulic circuits.

Type BP has a rectangular cross-section and is made of PTFE. It consists of two spiral windings which are cut at the ends at an angle. It's used both static and dynamic applications is used in reciprocating movements. Dimensional stability of the O-ring improves the sealing force and increases the service life and is preferred for installations in a closed grooves where uncut back-up rings are not suitable.

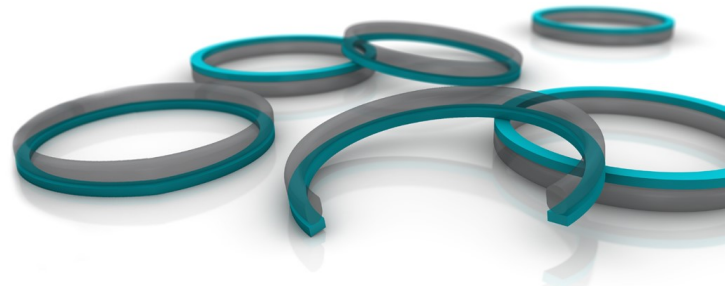
Advantages

- Rectangular cross section
- Material: PTFE
- Cut angle of 30° or 45°
- Consists as 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 without difficulties by a screw-like elongation and contraction



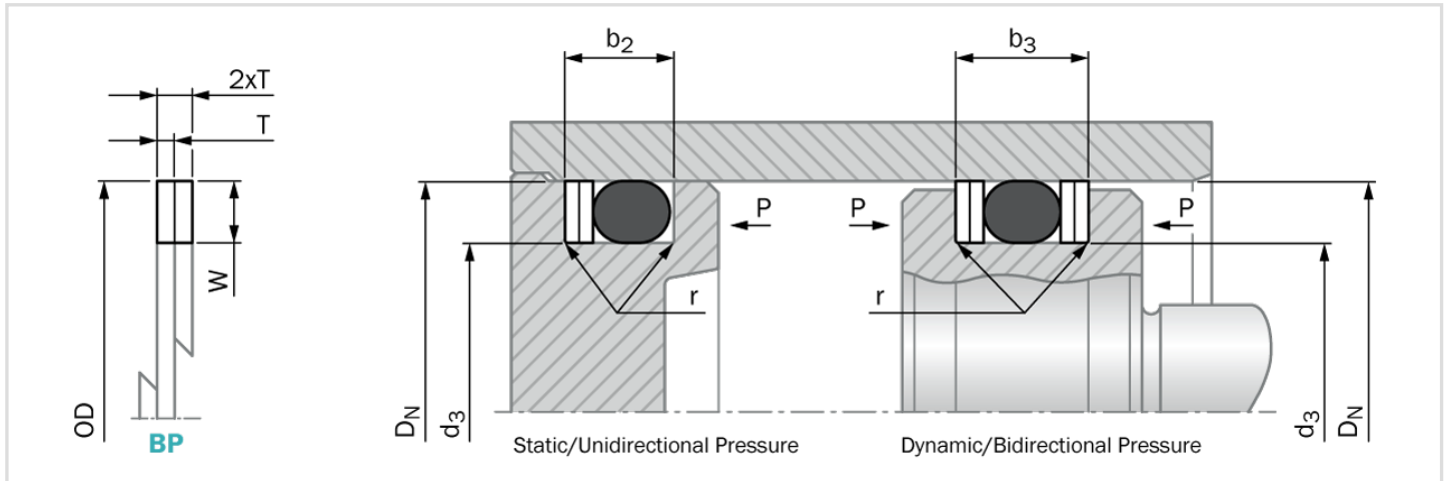
Technical Data

| | | |
|----------------------|---|--|
| Static applications | : | Up to approximately 250 MPa (depending on back-up ring material and sealing gap) |
| Dynamic applications | : | Reciprocating up to approximately 40 MPa Oscillating / slowly rotating up to approximately 15 MPa |
| Speed | : | Reciprocating or rotating up to approximately 2 m/s (depending on the material) |
| Temperature | : | -200 °C to +260 °C (depending on the material) |



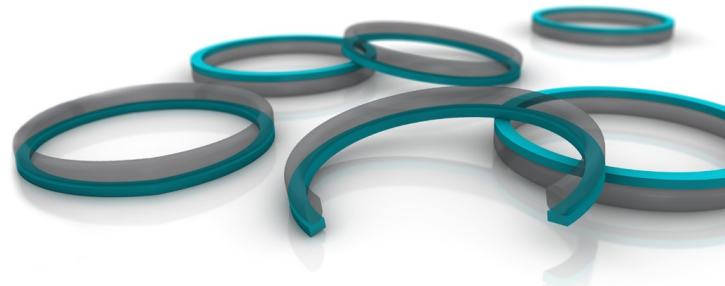
TECHNICAL INFORMATION

Static Seals | Spiral back-up ring Type BP, External Sealing Type



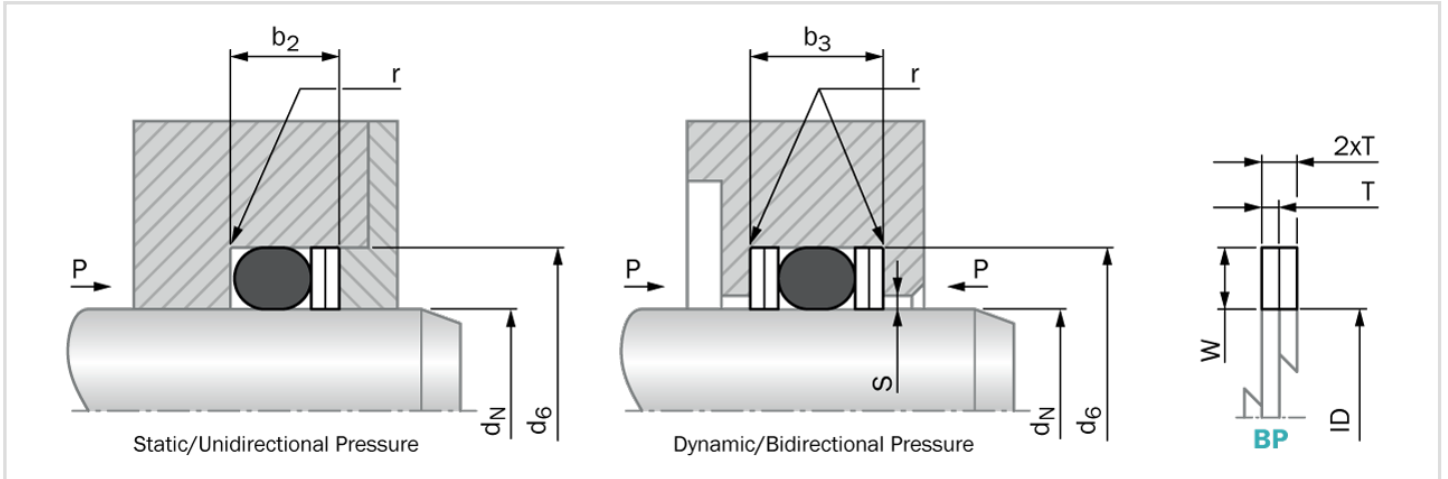
Installation dimensions - Standard recommendations

| 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 r ±0.2 |
| | Dynamic | Static | | Dynamic | Static | b ₂ +0.25 | b ₃ +0.25 | |
| 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 |



TECHNICAL INFORMATION

Static Seals | Spiral back-up ring Type BP, Internal Sealing Type



Installation dimensions - Standard recommendations

| O-Ring Cross section | Back-up Ring Cross-Section | | | Groove dimensions | | | | |
|----------------------|----------------------------|--------|-------------|--------------------------|--------------|--------------|--------------|--------------------|
| | Radial height W | | Thickness T | Groove diameter d_6 H9 | | Groove Width | | Radius $r \pm 0.2$ |
| | Dynamic | Static | | Dynamic | Static | $b_2 + 0.25$ | $b_3 + 0.25$ | |
| $\varnothing d_2$ | | | | | | | | |
| 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 |

Important Note

Installation suggestions, material recommendations, parameters and further data provided are always subject to the particular field of use and the application in which the seal is intended to be used, in particular the interaction of the seal with other components of the application. Therefore they neither constitute an agreement on the legal and factual nature nor a guarantee of quality. Technical changes and errors remain reserved.