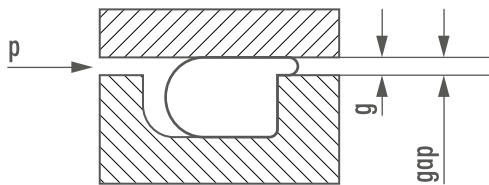


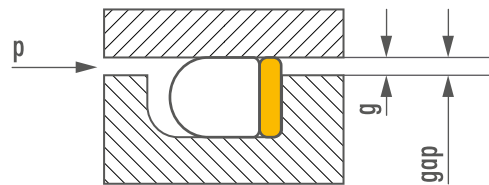
Back-up rings



Back-up rings are manufactured as protective and supportive elements made of extrusion-free material, mostly with a rectangular profile. In static applications they are installed together with an elastomer seal - as a rule an O-ring - into the groove. The tight fit between back-up ring and bore hole or rod prevents extrusion of the pressurized O-ring into the clearance gap.

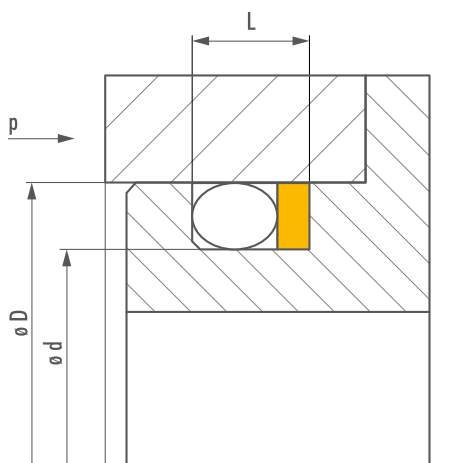


Gap extrusion damages the O-ring

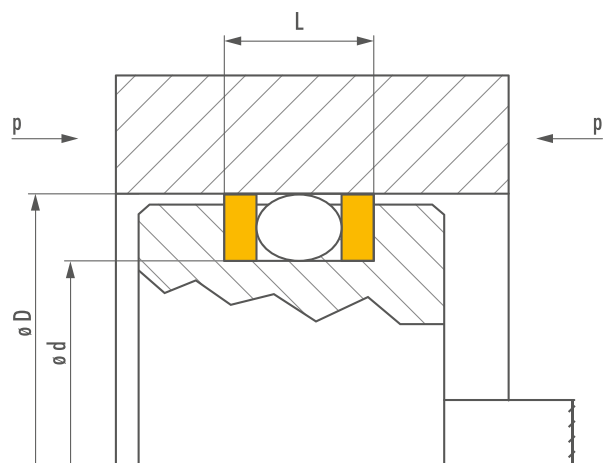


Back-up ring protects the O-ring

Back-up rings are applicable both in static as well as in translational or slow rotating motions.



When pressure is uni-directional, a back-up ring is installed on the low pressure side.



When pressure is bi-directional, two back-up rings should be installed, one on each side of the O-ring.



Back-up rings BU

- Rectangular profile
- For static and reciprocating or slow rotating motions



Back-up rings BC

- Rectangular profile, cut
- An alternative to uncut back-up rings where these are not mountable or when a split groove cannot be used
- For static and reciprocating motions
- Scarf cut at a 30° or 45° angle, back-up ring cutting is chipless to avoid gap formation in the installed state.



Back-up rings BCU

- Concave profile
- Predominantly used in static applications, reciprocating movements are possible
- The enlarged contact surface area prevents extreme deformation of the O-ring under pulsating pressures
- Due to its form stability, the O-ring favorably influences sealing force and service life



Back-up rings BCC

- Concave profile, cut
- Predominantly used in static applications, reciprocating movements are possible
- Increased mating surface prevents extreme deformation of the O-ring under pulsating pressures
- Due to its form stability, the O-ring favorably influences sealing force and service life
- An alternative to the uncut back-up rings BCU where these are not mountable or when a split groove cannot be used



Back-up rings BP

- Back-up ring, spiral form
- An alternative to uncut back-up rings where these are not mountable or when a split groove cannot be used
- For static and reciprocating motions
- Scarf cut at a 30° or 45° angle
- Use in high temperature fluctuation applications
- Helical contraction and expansion compensates larger tolerance changes

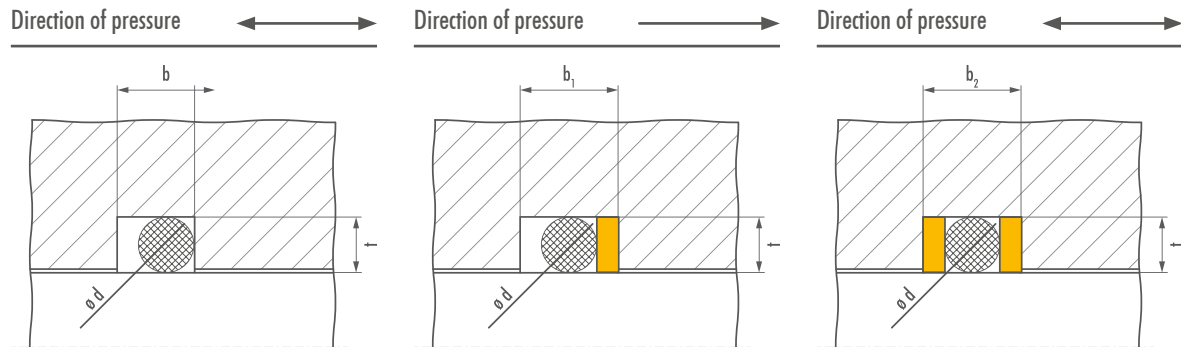


Back-up rings BUQ

- Special design in PTFE (snap-back, quenched)
- Simple installation in closed groove spaces thanks to the spring-back characteristics of PTFE
- Since these back-up rings deviate from standard design dimensions, they are manufactured only on request per drawing



O-ring installation space details and recommendations



O-ring installation dimensions in static applications

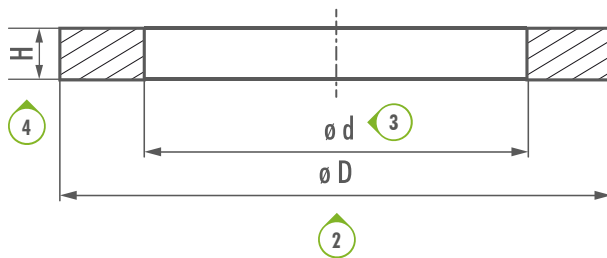
Cross section (mm)	Groove depth (mm)	w/o Back-up ring (mm)	1 Back-up ring (mm)	2 Back-up rings (mm)	Recommended back-up ring width (mm)
ϕd	$d \pm 0.05$	$w + 0.25$	$w1 + 0.25$	$w2 + 0.25$	
1.50	1.10	2.10	3.10	4.10	1.00
1.78	1.35	2.50	3.50	4.50	1.00
2.00	1.56	2.70	4.20	5.70	1.50
2.50	2.05	3.30	4.80	6.30	1.50
2.62	2.18	3.50	5.00	6.50	1.50
3.00	2.52	3.90	5.40	6.90	1.50
3.50	3.00	4.40	5.90	7.40	1.50
3.53	3.00	4.40	5.90	7.40	1.50
4.00	3.40	5.00	6.70	8.40	1.70
5.00	4.25	6.30	8.00	9.70	1.70
5.33	4.53	6.70	8.40	10.10	1.70
5.70	4.85	7.10	9.10	11.10	2.00
6.00	5.10	7.50	9.50	11.50	2.00
6.99	5.94	8.80	10.80	12.80	2.00
7.00	5.95	8.80	10.80	12.80	2.00
8.00	6.80	10.00	12.50	15.00	2.50
10.0	8.50	12.50	15.00	17.50	2.50



Further application notes:

In static, but also in dynamic applications, gap extrusion is a risk typically associated with high pressures or small O-ring cross sections.

A back-up seal must always be used together with an O-ring. The back-up ring itself does not function as a seal.



Materials

PTFE pure (CCN-01), standard material	PTFE + glass fiber	POM, PA, PEEK ...
PTFE + bronze	PTFE + carbon	

Application limitations (dependent on back-up ring material and clearance gap)

STATIC APPLICATION: up to 250 MPa operating pressure	Speed: up to approx. 2 m/s
DYNAMIC APPLICATION: - Translational motion: up to approx. 40 MPa - Rotating: up to approx. 15 MPa	Operating temperature: -200 °C to +200 °C

To place a quick order for the correct product, please use the order information system below.

SYSTEM: **Type** **Outer diameter D** x **Inner diameter d** x **H** » **Material**

 (1) (2) (3) (4) (5)

EXAMPLE: **Back-up seal, cut, outside sealing** **45 x 36 x 1.4** **PTFE pure**

 (1) (2) (3) (4) (5)