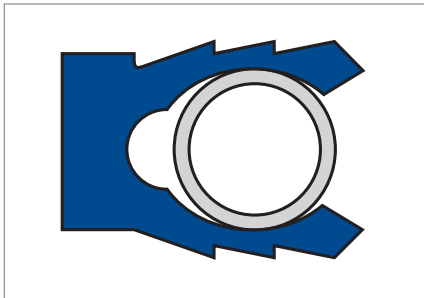


# MERKEL U-RINGS MADE OF PTFE



Merkel U-Rings made of PTFE

## PRODUCT DESCRIPTION

- One-sided with pressure applied to seal
- Metal spring is used as pre-load component for the sealing lips
- System pressure overrides the pre-load during operation.

## PRODUCT ADVANTAGES

- Small housing
- Suitable for high pressures and vacuum
- Suitable for stroke, rotary, pivoting movements and for static applications
- Universal chemical resistance
- Large temperature range
- Good dry running properties
- Low friction forces
- Free of stick-slip
- Resistant to ageing
- Permanently elastic due to metal spring.

## APPLICATION

Fittings manufacture, general chemistry, mechanical engineering, foodstuffs industry, pharmaceuticals, petrochemicals.

- e.g. ball cocks, flanges/covers, rotary joints and manifolds, hot water and steam valves, valve journals, control shafts, reciprocating pumps, bearings.

## MATERIAL

The mechanical properties such as pressure resistance and resistance to abrasion, thermal expansion etc. can be improved for specific applications through the addition of fillers.

The most important materials are:

- PTFE/carbon
- PTFE/carbon fibre
- PTFE/ glass/MoS<sub>2</sub>
- PTFE/ekonol
- PTFE/aramide
- UH MW PE

Spring materials: 1.4310 (AISI 301), 2.4711, elgiloy.

## OPERATING CONDITIONS

Material	PTFE
Pressure p* in MPa	dynamic <45, static <120
Temperature range in °C	-200 ... +260
Sliding speed v in m/s	reciprocating <10, rotating <2,5

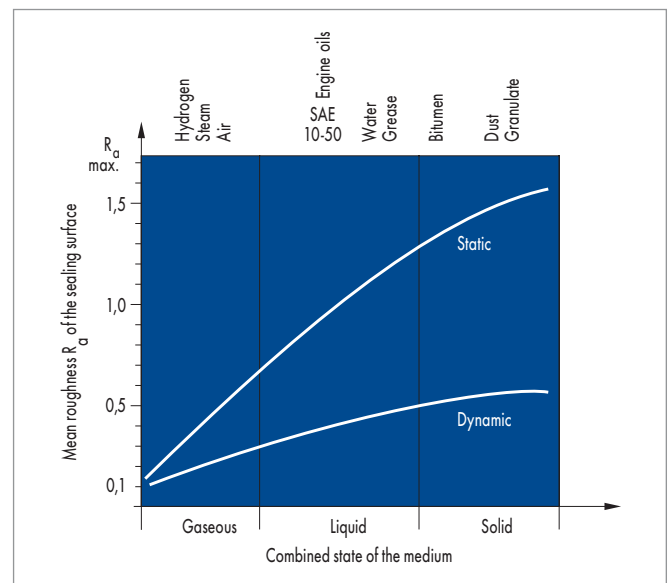
\* From 25 MPa the usage of back-up rings can be necessary (depending on gap width, temperature, pressure, material). Also gaps caused by the expansion of the components can make the usage of back-up rings necessary. Please consult our advisory service.

Surface quality

Sealing surfaces, dynamic/static: → Fig. 2

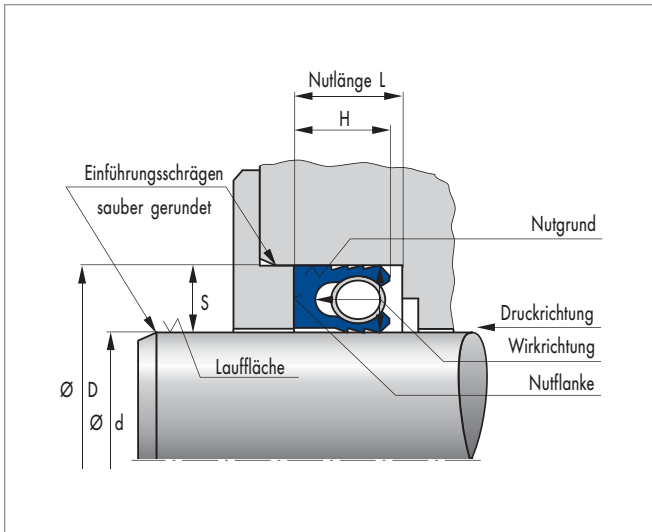
Lead-in chamfers:  $R_a < 1,6 \mu\text{m}$

Groove flanks:  $R_a < 2,5 \mu\text{m}$



Surface recommendation for sealing surfaces.

**FITTING & INSTALLATION**



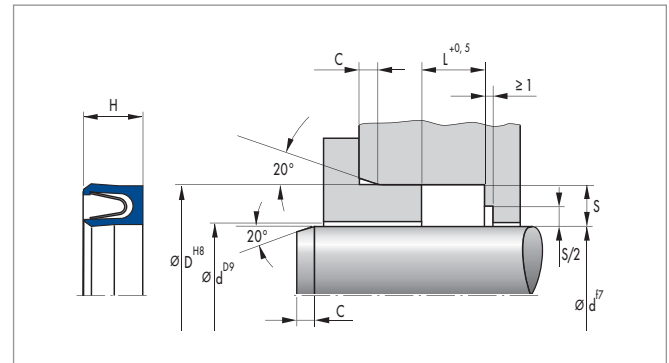
Terms for the housings

Installation preferably in axially accessible grooves.

- If it is necessary to clip or snap, e.g., into half open housings, please consult us
- Provide lead-in chamfers on rods and housings
- Avoid sharp edges
- The housings must be clean and free of foreign bodies.

**U-RING NRVI  
(TYPE 9492 WITH V-SHAPED SPRING)**

Standard material	Spring material
PTFE carbon	1.4310 (AISI 301)



Installation example

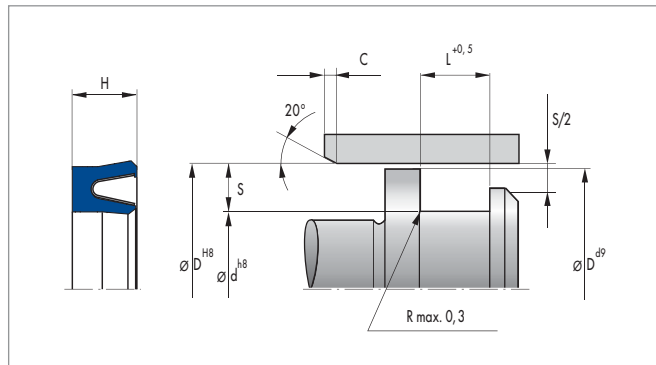
**Sizing recommendation**

This sizing recommendation is an addition to the article list. It is only used if the article list does not contain a suitable size.

Available dimension range d		S	H	L	C
from	to				
>10	20	2,25	3,10	3,60	>1,0
>20	40	3,10	4,30	4,80	>1,2
>40	150	4,70	6,50	7,10	>1,5
>150	2000	6,10	8,50	9,50	>2,0

**U-RING NRVA  
(TYPE 9490 WITH V-SHAPED SPRING)**

Standard material	Spring material
PTFE carbon	1.4310 (AISI 301)



Installation example

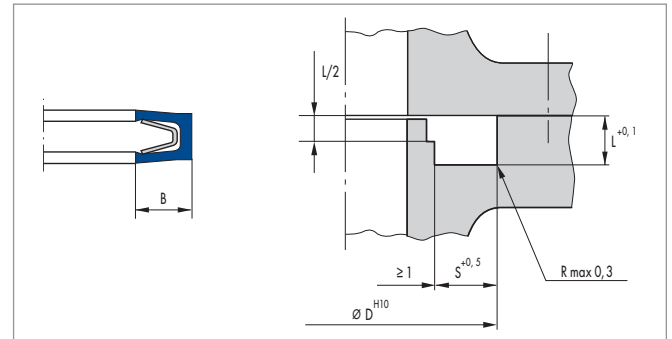
**Sizing recommendation**

This sizing recommendation is an addition to the article list. It is only used if the article list does not contain a suitable size.

Available dimension range d		S	H	L	C
from	to				
>15	25	2,25	3,10	3,60	≥1,0
>25	45	3,10	4,30	4,80	≥1,2
>45	155	4,70	6,50	7,10	≥1,5
>155	2000	6,10	8,50	9,50	≥2,0

**U-RING NRVA  
(TYPE 9494 WITH V-SHAPED SPRING –  
EXTERNAL PRESSURE)**

Standard material	Spring material
PTFE carbon	1.4310 (AISI 301)



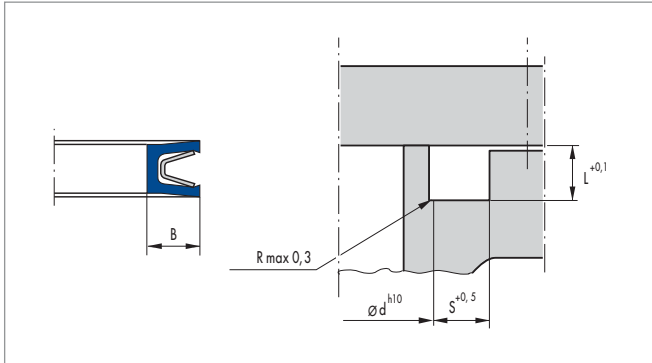
Installation example

**Sizing recommendation**

Available dimension range d		B	L	S
from	to			
30	150	3,1	2,25	3,6
50	500	4,3	3,10	4,8
70	1000	6,5	4,70	7,1
100	1400	8,5	6,10	9,5

**U-RING NRVFI  
(TYPE 9493 WITH V-SHAPED SPRING – INTERNAL PRESSURE)**

Standard material	Spring material
PTFE carbon	1.4310 (AISI 301)



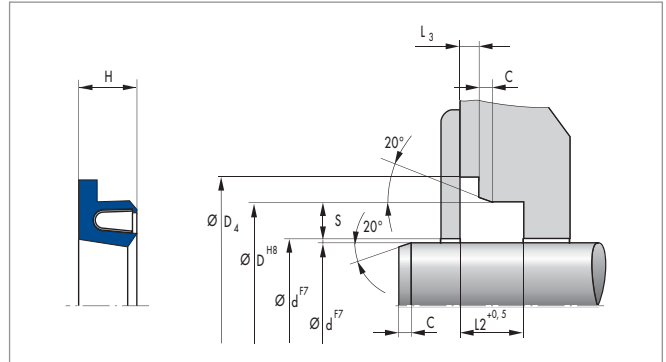
Installation example

Sizing recommendation

Available dimension range d		B	L	S
from	to			
40	250	3,1	2,25	3,6
50	500	4,3	3,10	4,8
70	1000	6,5	4,70	7,1
100	1400	8,5	6,10	9,5

**U-RING NRVV  
(TYPE 9489 WITH V-SHAPED SPRING)**

Standard material	Spring material
PTFE carbon	1.4310 (AISI 301)



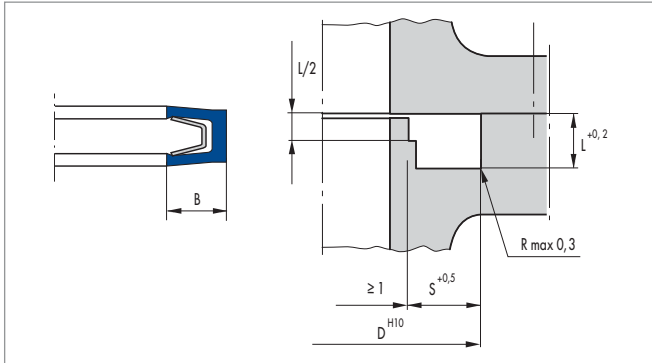
Installation example

Sizing recommendation

Available dimension range d		S	H	D4	L2	L3 - 0,1	C
from	to						
10	20	2,50	3,1	$d+9,0+0,15$	3,6	0,85	1,0
>20	40	3,50	4,3	$d+12,5+0,2$	4,8	1,35	1,2
>40	200	5,25	6,5	$d+17,5+0,3$	1,8	7,80	1,5

**U-RING NRUFI  
(TYPE 9487 WITH U-SHAPED SPRING –  
INTERNAL PRESSURE)**

Standard material	Spring material
PTFE carbon	1.4310 (AISI 301)



Installation example

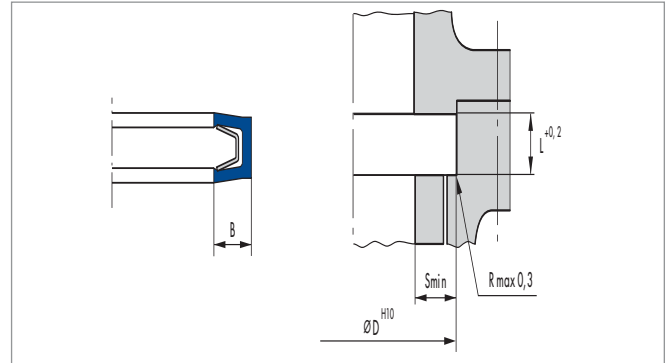
Sizing recommendation

Available dimension range d		B	L*		S
from	to		from	to	
60	1400	11,5	10,0	13,0	B+0,5
75	1400	14,5	12,0	15,0	B+0,5
100	1400	17,0	14,0	18,0	B+1,0
150	1400	20,0	17,5	21,0	B+1,0

\* Use of medium heights are to be used as a matter of preference.

**U-RING NRUFA  
(TYPE 9486 WITH U-SHAPED SPRING –  
EXTERNAL PRESSURE)**

Standard material	Spring material
PTFE carbon	1.4310 (AISI 301)



Installation example

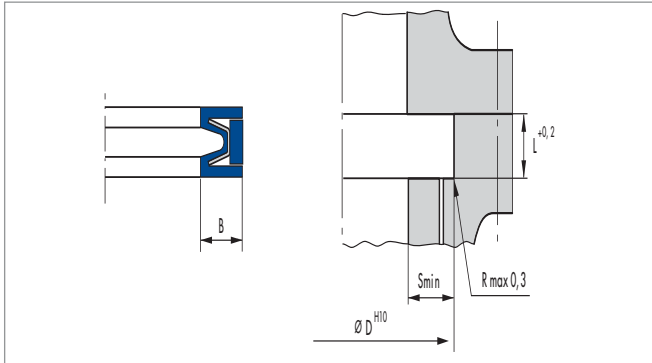
Sizing recommendation

Available dimension range d		B	L*		S
from	to		from	to	
60	1400	11,5	10,0	13,0	B+0,5
75	1400	14,5	12,0	15,0	B+0,5
100	1400	17,0	14,0	18,0	B+1,0
150	1400	20,0	17,5	21,0	B+1,0

\* Use of medium heights are to be used as a matter of preference.

**U-RING NRUF1  
(TYPE 9499 WITH CLOSED U-SHAPED SPRING –  
INTERNAL PRESSURE)**

Standard material	Spring material
PTFE carbon	1.4310 (AISI 301)



Installation example

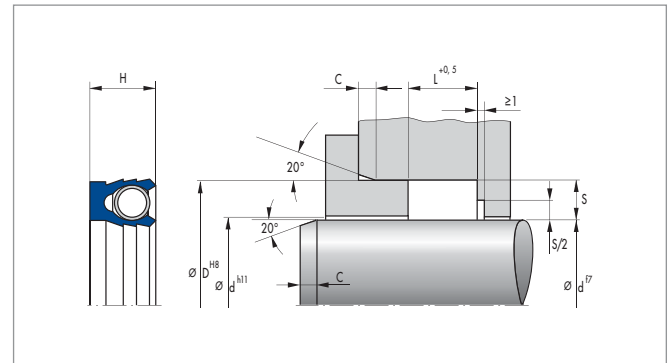
**Sizing recommendation**

Available dimension range d		B	L*		S
from	to		from	to	
60	1400	11,5	10,0	13,0	B+0,5
75	1400	14,5	12,0	15,0	B+0,5
100	1400	17,0	14,0	18,0	B+1,0
150	1400	20,0	17,5	21,0	B+1,0

\* Use of medium heights are to be used as a matter of preference.

**U-RING NRRI  
(TYPE 9442 WITH ROUND SPRING)**

Standard material	Spring material
PTFE carbon/PTFE glass/MoS <sub>2</sub>	1.4310 (AISI 301)



Installation example

**Sizing recommendation**

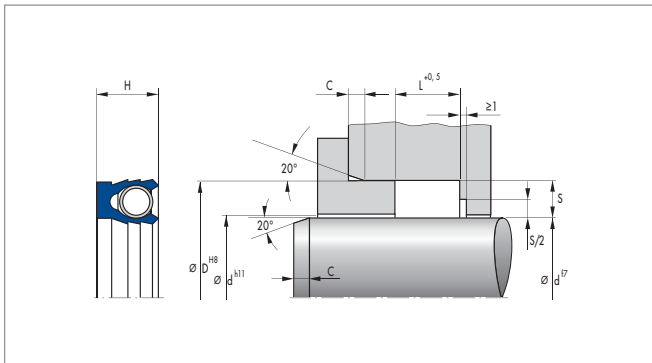
This sizing recommendation is an addition to the article list. It is only used if the article list does not contain a suitable size.

Available dimension range d		S	H	L	C
from	to				
10	70	3,0*	4,2	4,7	>2
12	100	4,0*	5,0	5,5	>2
12	200	5,0*	7,5	8,0	>3
20	300	6,0	8,0	8,5	>3
40	500	7,5	11,0	11,5	>3
50	1000	10,0	15,0	15,5	>4
70	1400	12,5	18,0	18,5	>4
100	1400	15,0	22,5	23,0	>5
100	2000	20,0	30,0	30,5	>6

\* for a profile dimension ≤5 mm one sealing edge

**U-RING NRRA  
(TYPE 9474 WITH ROUND SPRING)**

Standard material	Spring material
PTFE carbon/PTFE glass/MoS <sub>2</sub>	1.4310 (AISI 301)



Installation example

**Sizing recommendation**

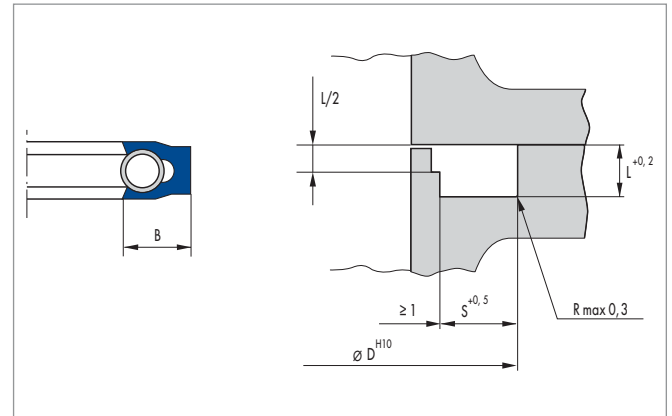
This sizing recommendation is an addition to the article list. It is only used if the article list does not contain a suitable size.

Available dimension range d		S	H	L	C
from	to				
16	70	3,0*	4,2	4,7	>2
23	100	4,0*	5,0	5,5	>2
30	200	5,0*	7,5	8,0	>3
42	300	6,0	8,0	8,5	>3
55	500	7,5	11,0	11,5	>3
70	1000	10,0	15,0	15,5	>4
95	1400	12,5	18,0	18,5	>4
130	1400	15,0	22,5	23,0	>5
140	2000	20,0	30,0	30,5	>6

\* for a profile dimension ≤5 mm one sealing edge

**U-RING NRRFI  
(TYPE 9459 WITH ROUND SPRING – INTERNAL PRES-SURE)**

Standard material	Spring material
PTFE carbon	1.4310 (AISI 301)



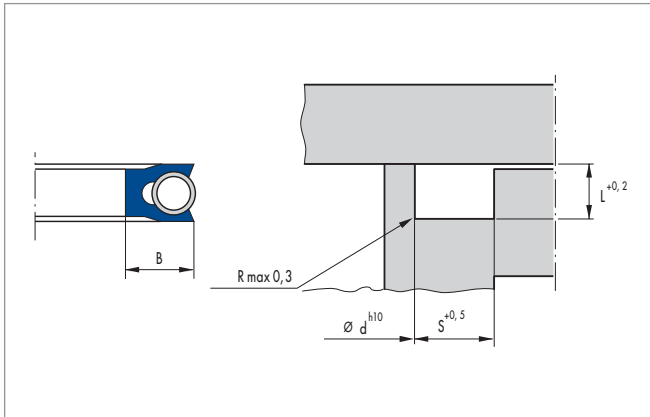
Installation example

**Sizing recommendation**

Available dimension range d		B	L	S
from	to			
25	70	4,2	3,0	4,7
30	100	5,0	4,0	5,5
50	200	7,5	5,0	8,0
60	300	8,0	6,0	8,5
80	500	11,0	7,5	11,5
100	1000	15,0	10,0	15,5
150	1400	18,0	12,5	18,5
250	1400	22,5	15,0	23,0
500	1400	30,0	20,0	30,5

## U-RING NRRFA (TYPE 9485 WITH ROUND SPRING – EXTERNAL PRESSURE)

Standard material	Spring material
PTFE carbon	1.4310 (AISI 301)



Installation example

### Sizing recommendation

Available dimension range d		B	L	S
from	to			
15	70	4,2	3,0	4,7
20	100	5,0	4,0	5,5
35	200	7,5	5,0	8,0
45	300	8,0	6,0	8,5
60	500	11,0	7,5	11,5
70	1000	15,0	10,0	15,5
115	1400	18,0	12,5	18,5
200	1400	22,5	15,0	23,0
440	1400	30,0	20,0	30,5