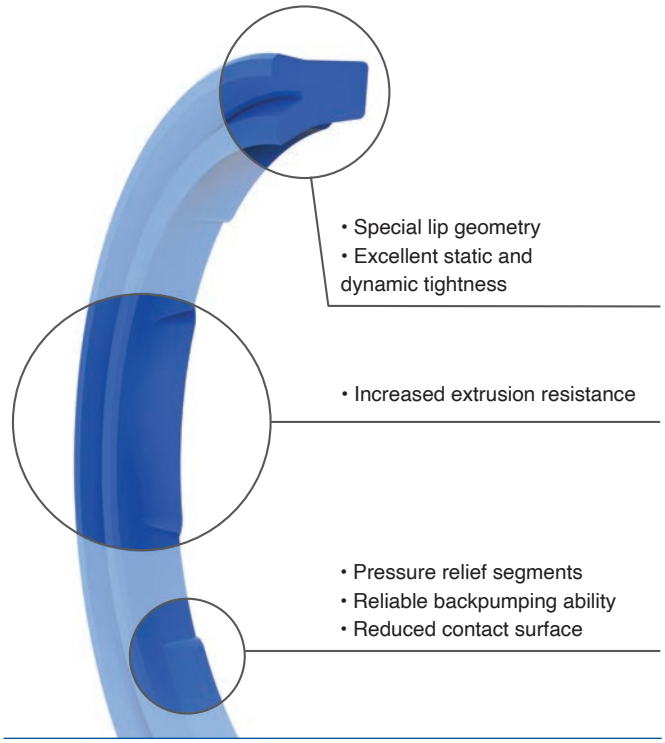
FR200®

Low Friction Rod Seal

FR200 is a high-performance polyurethane rod seal engineered to deliver low friction, rapid response to sudden pressure changes, and long service life in light to medium-duty hydraulic systems. Its advanced lip geometry, combined with a thin lubrication film, minimizes heat build-up and enhances dynamic sealing efficiency. Manufactured from robust 94 Shore A PU, FR200 offers excellent wear resistance, while its integrated hydrodynamic pressure relief channels and nutring-style scraper lip eliminate the need for separate drainage ports, simplifying installation and improving overall system reliability.

- **Low Friction**
- **Low Leakage**
- **Pressure Relief**



Comparison of Properties

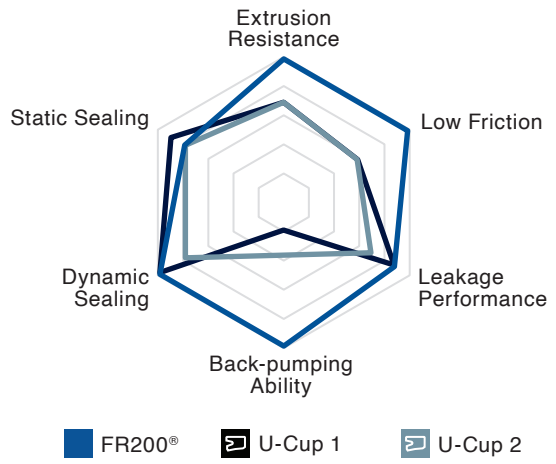


Table 4.1

Friction Forces (kN)

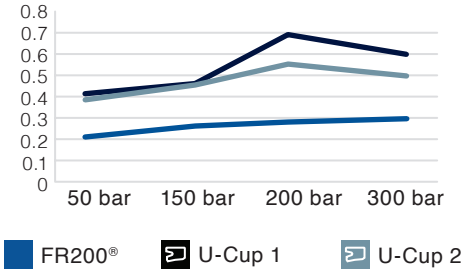


Table 4.2

Leakage (ml/100m)

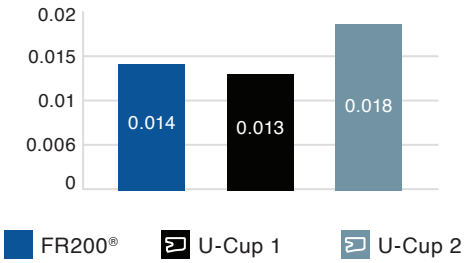
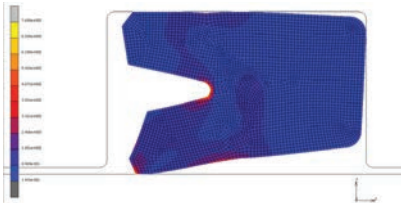
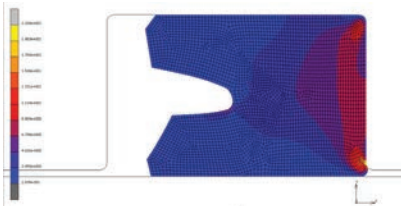


Table 4.3

FR200 Finite Element Analysis



FR200® - 050
Pressure: 0 bar



FR200® - 050
Pressure: 250 bar
Extrusion Gap: 0.3mm

Picture 4.1

FR200®

Low Friction Rod Seal



Advantages

- Good sealing effect
- Low friction
- Long service life

Application

- Agricultural machinery
- Construction machinery
- Loading platforms
- Injection moulding machines
- Forklifts
- Standard industrial cylinders

Operating Conditions

MOTION:	Linear		
PRESSURE(bar):	400 bar (max)		
SPEED(m/s):	0.5 m/s (max)		
TEMPATURE (°C):	-35/+100 °C	+5/+50 °C	-30/+40 °C
MEDIA TYPE:	Mineral Oils	HFA/HFB	HFC

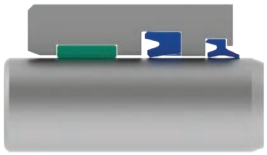
NOTE: The above values (speed, pressure, temperature) are maximum values, all cannot be used at the same time.

Material Information

U-Ring	Remarks
Polyurethane-PU9401	Standard produced material code
Polyurethane-PU9411	Material code used for high temperatures

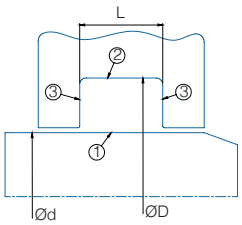
Note: In the special application conditions (temperature, media, etc.) Can be produced from different materials. You can refer to Table 2.10 for details or you can contact our sales department.

Sample Design



NOTE: In light and medium duty cylinders, it can be used with double wiper without the need for discharge hole.

Surface Roughness

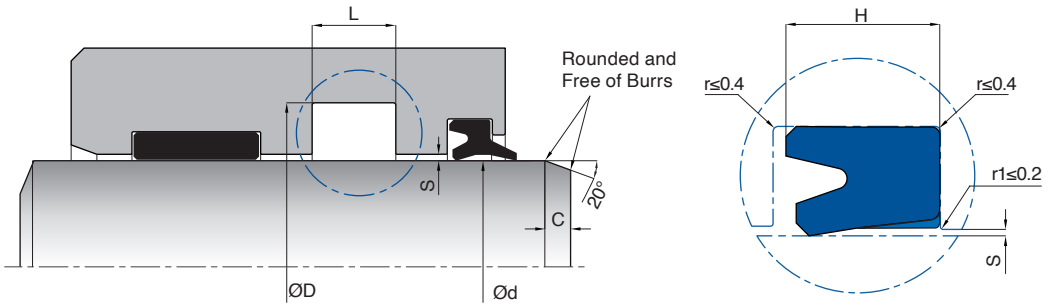


	1 (rod)	2 (groove base)	3 (groove flanks)
Ra	0.1-0.4 μm	0.2-1.6 μm	0.2-3.2 μm
Rmax	< 3.2 μm	< 6.3 μm	< 16 μm
Rmr	When C=0.25xRz on the dynamic work surface and reference line C_{ref}=%5 the working surface contact area should be approximately between 50% and 70%.		

Installation Information

Easily assembled into closed grooves by the rod seal installation tools according to the minimum diameter values that are given in the table 3.2. Open grooves are recommended for the values that are outside this table. It is very important that the assembly tools must be of soft material and have no sharp edges. Before installation the rod seal should be oiled with system oil.

FR200® Low Friction Rod Seal



Cross Section (mm)	Max. Permissible Sealing Gap Value "S_{max}" (mm) for FR200®		
	160 bar	250 bar	315 bar
≤5	0.50	0.40	0.35
>5	0.55	0.45	0.40

S_{max} values are suitable for operating conditions up to 60°C. The S_{max} value should be calculated according to the formula on page 64 and it is recommended not to exceed the given S_{max} value.

KASTAŞ NO	d (f8)	D (H10)	L (+0.2/-0)	H	C	KASTAŞ CODE
FR200-015	15	20	5	4.5	2	10000004
FR200-016	16	24	6.3	5.7	2	10000005
FR200-016/1	16	22	5.7	5.1	2	10000006
FR200-018	18	26	6.3	5.7	2	10000007
FR200-020	20	28	6.3	5.7	2	10000009
FR200-020/1	20	26	5.7	5.1	2	10000010
FR200-022	22	30	6.3	5.7	3	10000011
FR200-022/1	22	32	8	7.2	3	10000012
FR200-025	25	33	6.3	5.7	3	10000014
FR200-025/1	25	35	8	7.2	3	10000015
FR200-025/2	25	31	5.7	5.1	3	10000016
FR200-028	28	36	6.3	5.7	3	10000020
FR200-028/1	28	38	8	7	3	10000021
FR200-030	30	40	8	7.2	3	10000022
FR200-030/1	30	38	6.3	5.7	3	10000023
FR200-032	32	42	8	7.2	3	10000026
FR200-036	36	46	8	7.2	3	10000029
FR200-036/1	36	44	6.3	5.7	3	10000031
FR200-040	40	50	8	7.2	3.5	10000036
FR200-040/1	40	48	7	6.3	3.5	10000038
FR200-045	45	55	8	7.2	3.5	10000042
FR200-045/1	45	53	6.3	5.7	3.5	10000043
FR200-050	50	60	8	7.2	3.5	10000045
FR200-055	55	65	8	7.2	4.5	10000049
FR200-056	56	71	12.5	11.2	4.5	10000050
FR200-060	60	70	8	7.2	4.5	10000052
FR200-060/1	60	75	12.5	11.2	4.5	10000053
FR200-063	63	78	12.5	11.2	4.5	10000054
FR200-065	65	75	8	7.2	4.5	10000056
FR200-070	70	85	12.5	11.2	4.5	10000057
FR200-080	80	95	12.5	11.2	5	10000059
FR200-090	90	105	12.5	11.2	5	10000061
FR200-100	100	120	16	14.4	5	10000062