

FLUID POWER SEALS DIVISION

ENGINEERED SEALING SOLUTIONS AND CUSTOM KITS
FOR HEAVY DUTY HYDRAULIC AND PNEUMATIC APPLICATIONS



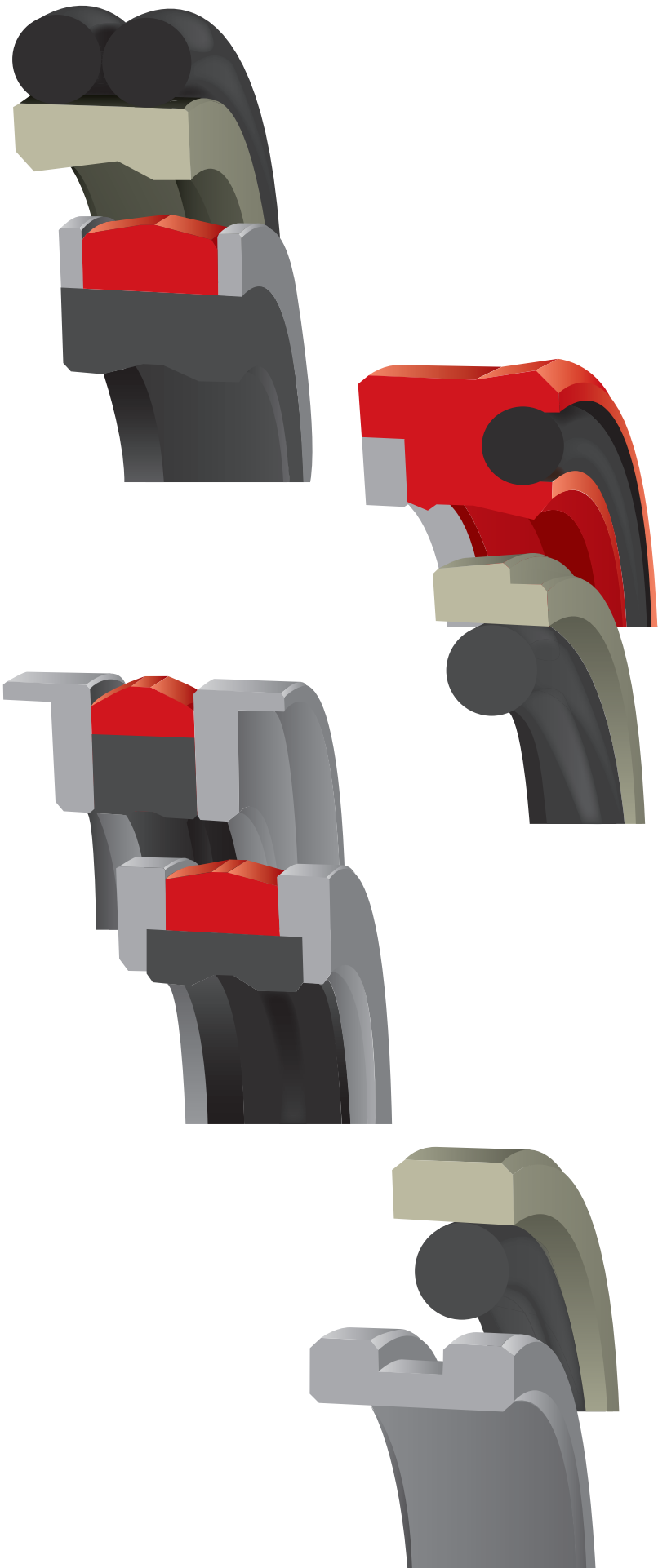
Custom-made machined seals – Product and service overview



sealfluid

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Think Sealing





FLUID POWER SEALS DIVISION

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SealFluid, the Fluid Power Seals Division of F.lli Paris S.r.l. offers a comprehensive range of product, engineered solutions and services for heavy-duty fluid power equipment. All important seal components for hydraulic, pneumatic cylinders and presses from standard to special/custom-made ones can be found in its new machined seal product portfolio, which help to improve reliability, availability and efficiency of the fluid power, fluid handling and power transmission systems.

Unique combination of state-of-the-art material technology (Polyurethanes, Elastomers, Fluoroplastics and Engineered Hard Plastics), seal design capabilities, flexible CNC production technology and industry, application expertise allows SealFluid to design, develop seal components and complete seal systems for critical fluid power applications across multiple heavy industries.

Challenging high speed, high pressure or extreme temperature operating conditions require equipment specific, accurate and rapid solutions, whenever unexpected failures occur.

Almost unlimited seal designs, extensive range of seal materials and any dimensions can be produced, offering short turnaround or JIT is expected by end-users in today`s economic environment.

SealFluid's product portfolio covers

- Wipers Seals
- Rod Seals
- Piston Seals
- Static Seals
- Wear Rings
- Anti-Extrusion Rings (Back-up Rings) and
- Other ancillary devices
- Rotary seals
- Custom tailored, application specific seal solutions
- Custom kits

The aim of FP F.lli Paris with this new engineering and service division to perfect its offering to the fluid power market, equipment and provide outstanding services, exceeding customers' expectations

- Quick responsiveness
- Greater application engineering support
- Flexibility manufacturing capability for all the different applications
- One-Stop-Shop industrial solutions (complete cylinder repair and upgrade kits)
- Technology and constant high quality of the products

in combination with rapid delivery from its FasTrack Service Center.

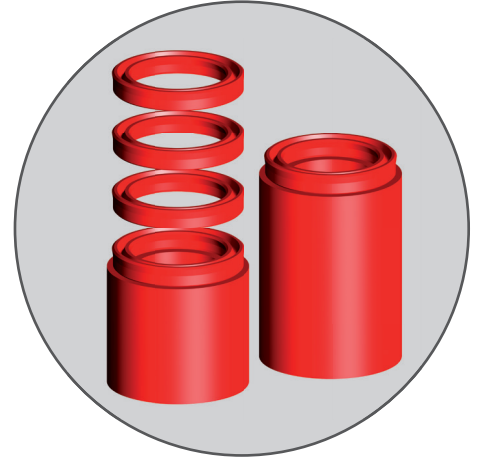
Member of:

sealcore[®]
network

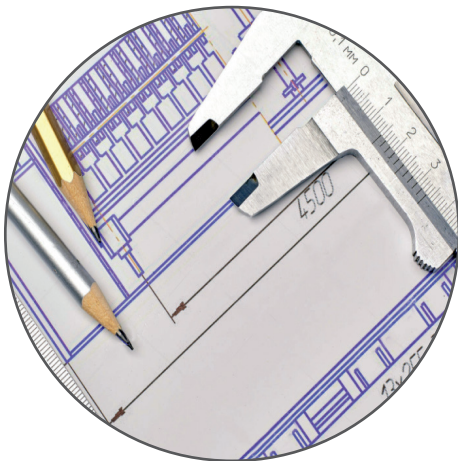
Services

Rapid and Custom-made

- No tooling required
- Fast prototyping and prompt production by CNC machining
- Quick turnaround time and door-to-door delivery service
- Specialized software for standard profiles and for development of special designs
- Standard profiles for standard and non-standard dimensions
- Custom tailored solutions for standard and non-standard dimensions



CNC technology | Integrated CAD/CA | Flexible Production | JIT Supply



Integrated Customer Services

- Consultation and application survey on-site
- Industry expertise and application know-how
- Troubleshooting
- Design/development of optimum solutions
- Custom tailored seal kits
- Engineering support for cylinder repair and upgrade

Engineered Solutions | On-site Services | Cylinder Upgrade

Materials

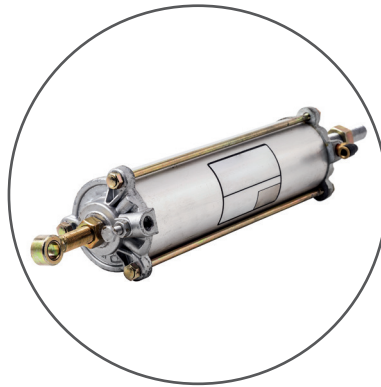
- High-performance polymers for demanding, critical applications
- Extended stock of industry standard materials for immediate manufacturing when required
- Industry materials on demand for specific applications: food and beverage, water grade polymers, NORSEK and API certified materials for oil and gas
- Field tested and application proven compounds



Polyurethanes | Elastomers | PTFE Compounds | Engineered Plastics



Hydraulic cylinders



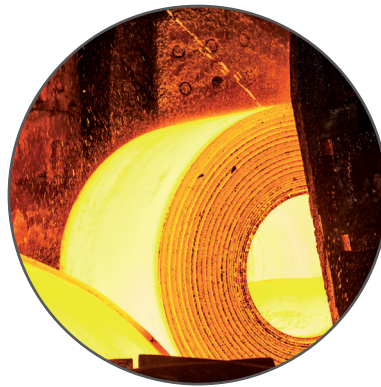
Pneumatic cylinders



Valve actuators



Mobile mining equipment



Metal



Presses, forming machines



Hydropower



Wind power



Oil & Gas



Tire & Rubber



Plastic



Food & Beverage

Typical Material Properties

Material Data			Material Type					
			SFM200 (HPU 95A)	SFM201 (FDA HPU 95A)	SFM202 (HPU 90A)	SFM210 (HPU 55D)	SFM220 (C-HPU)	SFM230 (C-HPU 57D)
Properties	Standard	Unit	Values	Values	Values	Values	Values	Values
		Metric	Metric	Metric	Metric	Metric	Metric	Metric
Standard color			Red	Blue	Yellow	Yellow	Red	Yellow
Durometer Shore A	ISO 868	Shore A	95 ± 2	95 ± 2	90 ± 2	-	96 ± 2	-
Durometer Shore D	ISO 868	Shore D	48 ± 2	48 ± 2	-	55 ± 2	48 ± 2	57 ± 3
Specific gravity/Density	DIN EN ISO 1183	kg/m ³	1200	1200	1200	1210	1110	1160
Modulus @ 100%	DIN 53504	Mpa	≥ 15	≥ 15	≥ 11	≥ 20	≥ 12	≥ 20
Modulus @ 300%	DIN 53504	Mpa	≥ 28	≥ 28	≥ 28	≥ 35	≥ 22	≥ 33
Tensile strength	DIN 53504	Mpa	≥ 50	≥ 50	≥ 50	≥ 45	≥ 45	≥ 45
Elongation at break	DIN 53504	%	≥ 350	≥ 350	≥ 380	≥ 340	≥ 450	≥ 350
Tear strength	DIN ISO 34-1	kN/m	≥ 110	≥ 110	-	≥ 110	≥ 80	≥ 110
Abrasion	DIN 53516	mm ³	17	17	-	25	20	25
Compression set 70°C/24h 25% compression	ISO 815	%	≤ 27	≤ 27	≤ 27	≤ 30	≤ 30	≤ 30
Compression set 100°C/24h 25% compression	ISO 815	%	≤ 33	≤ 33	-	≤ 35	≤ 35	≤ 35
Minimum service temperature		°C	-20	-20	-20	-20	-37	-30
Maximum service temperature		°C	110	110	110	110	110	110

Material Data			Material Type					
			SFM300 (NBR 85A)	SFM303 (NBR FDA 80A)	SFM304 (T-NBR 80A)	SFM310 (H-NBR 85A)	SFM311 (H-NBR 90A)	SFM320 (EPDM Peroxyd 85A)
Properties	Standard	Unit	Values	Values	Values	Values	Values	Values
		Metric	Metric	Metric	Metric	Metric	Metric	Metric
Standard color			Black	Blue	Black	Green	Black	Black
Durometer Shore A	ISO 868	Shore A	85 ± 5	80 ± 5	80 ± 5	85 ± 5	90 ± 5	85 ± 5
Durometer Shore D	ISO 868	Shore D	-	-	-	-	-	-
Specific gravity/Density	DIN EN ISO 1183	kg/m ³	1280	1230	1270	1320	1450	1220
Modulus @ 100%	DIN 53504	Mpa	≥ 11	≥ 5	≥ 9	≥ 11	≥ 6	-
Modulus @ 300%	DIN 53504	Mpa	-	-	-	-	-	-
Tensile strength	DIN 53504	Mpa	≥ 17	≥ 8	≥ 14	≥ 20	≥ 9	≥ 12
Elongation at break	DIN 53504	%	≥ 150	≥ 140	≥ 140	≥ 190	≥ 220	≥ 80
Tear strength	DIN ISO 34-1	kN/m	≥ 18	≥ 15	≥ 15	≥ 15	20	≥ 10
Abrasion	DIN 53516	mm ³	100	248	-	135	130	140
Compression set 70°C/24h 25% compression	ISO 815	%	≤ 5	≤ 13	≤ 6	≤ 12	≤ 26	≤ 7
Compression set 100°C/24h 25% compression	ISO 815	%	≤ 6	-	≤ 9	≤ 14	≤ 32	≤ 7
Minimum service temperature		°C	-30	-22	-50	-20	-20	-45
Maximum service temperature		°C	110	100	110	150	150	130

Material Data			Material Type - Fluoroplastics					
			SFM400 PTFE unfilled FDA	SFM416 (PTFE Glass filled)	SFM418 (PTFE Glass +MoS2 filled)	SFM423 (PTFE Carbon 25% filled)	SFM433 (PTFE Graphite 15% filled)	SFM441 (PTFE Bronze 40% filled)
Properties	Standard	Unit	Values	Values	Values	Values	Values	Values
		Metric	Metric	Metric	Metric	Metric	Metric	Metric
Standard color			White	White	Grey/black	Black	Black	Brown
Durometer Shore A	ISO 868	Shore A	-	-	-	-	-	-
Durometer Shore D	ISO 868	Shore D	55 ± 3	60 ± 3	58 ± 3	67 ± 3	60 ± 3	60 ± 3
Ball indentation hardness	DIN53456 H135/30	MPa	23±5	24±5	27±5	35±5	26±5	33±5
Specific gravity/Density	DIN53479	kg/m ³	2150	2210	2250	2060	2130	3110
Tensile strength	ASTM D 4757-79	MPa	≥ 27	≥ 17	≥ 16	≥ 12	≥ 14	≥ 22
Elongation at break	ASTM D 4757-79	%	≥ 250	≥ 170	≥ 185	≥ 45	≥ 110	≥ 210
Compressive strength	DIN 53455	MPa	≥ 4	≥ 8	≥ 8	-	-	≥ 10
Thermal conductivity	DIN 52612	kJ/(m ^h *K)	0,8	1,3	1,1	3,5	4,0	4,0
Coefficient of thermal expansion	25-200 °C	K ⁻¹ *10 ⁻⁵	19	10,7	13	10,9	11,2	8
Coefficient of friction *	23 °C	μ	0,08	0,16	0,13	0,17	0,14	0,13
Young's modulus	ISO 527	MPa	540	1320	1320	-	-	1375
Minimum service temperature		°C	-200	-200	-200	-200	-200	-200
Maximum service temperature		°C	260	260	260	260	260	260

Other materials by request

Polyurethanes					
SFM231 (C-HPU 72D)	SFM240 (Low Temperature PU 94A)	SFM241 (Low temperature PU 94A)	SFM242 (Low Temperature PU 57D)	SFM250 (Self-lubricated PU 96A)	SFM251 (Self-lubricated PU 55D)
Values	Values	Values	Values	Values	Values
Metric	Metric	Metric	Metric	Metric	Metric
Black	Dark blue	Dark blue	Dark blue	Grey	Grey
-	94 ± 2	94 ± 2	-	96 ± 2	-
70 ± 3	-	-	57 ± 3	48 ± 2	55 ± 3
1210	1170	1130	1130	1190	1210
≥ 30	≥ 12	≥ 12	≥ 12	≥ 12	≥ 16
	≥ 22	≥ 22	≥ 22	≥ 22	≥ 35
≥ 50	≥ 50	≥ 45	≥ 45	≥ 45	≥ 45
≥ 150	≥ 550	≥ 450	≥ 450	≥ 350	≥ 340
≥ 110	≥ 80	≥ 80	≥ 80	≥ 80	≥ 110
-	17	20	20	15	25
-	≤ 27	≤ 27	≤ 27	≤ 30	≤ 30
-	≤ 33	≤ 30	≤ 30	≤ 35	≤ 35
-20	-50	-55	-55	-20	-20
110	110	110	110	110	110

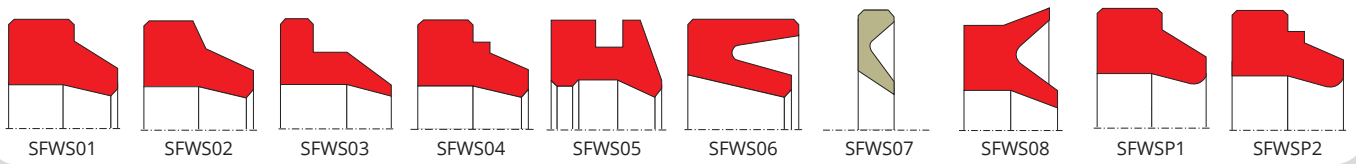
Material Type - Elastomers								
SFM321 (EPDM FDA 82A)	SFM330 (FPM 82A)	SFM331 (FPM FDA 80A)	SFM332 (FPM 85A)	SFM333 (FPM ED 85A)	SFM337 (FPM FDA 80A)	SFM340 (TFE/P AFLAS 83A)	SFM350 (MVQ Silicon)	SFM351 (MVQ Silicon FDA)
Values	Values	Values	Values	Values	Values	Values	Values	Values
Metric	Metric	Metric	Metric	Metric	Metric	Metric	Metric	Metric
White	Brown	Brown	Black	Black	Blue	Black	Blue	Transparent
82 ± 5	82 ± 5	80 ± 5	85 ± 5	85 ± 5	80 ± 5	83 ± 5	85 ± 5	85 ± 5
-	-	-	-	-	-	-	-	-
1220	2530	2400	1870	1860	2530	1730	1550	1225
≥ 4	≥ 6	≥ 6	≥ 7	≥ 6	≥ 4	≥ 7	≥ 5	≥ 4
-	-	-	-	-	-	-	-	-
≥ 7	≥ 9	≥ 8	≥ 9	≥ 10	≥ 7	≥ 9	≥ 7	≥ 8
≥ 160	≥ 200	≥ 150	≥ 140	≥ 200	≥ 180	≥ 200	≥ 100	≥ 250
-	20	-	≥ 7	≥ 20	≥ 41	≥ 6	≥ 16,4	≥ 8
291	175	200	-	175	252	230	52	-
≤ 25	≤ 17	≤ 7	≤ 13	≤ 30	≤ 6	40	≤ 10	≤ 14
≤ 30	≤ 20	≤ 9	≤ 15	≤ 35	≤ 8	-	≤ 30	≤ 22
-45	-20	-20	-20	-20	-17	-5	-60	-60
130	220	220	210	220	200	200	200	200

Material Type - Engineered Plastics								
SFM500 (POM)	SFM501 (POM)	SFM510 (PA6C)	SFM511 (PA6C MoS2 filled)	SFM520 (PEEK)	SFM521 (PEEK glass filled)	SFM530 (UHMWPE)	SFM531 (UHMWPE glass filled)	SFM540 (HYTREL)
Values	Values	Values	Values	Values	Values	Values	Values	Values
Metric	Metric	Metric	Metric	Metric	Metric	Metric	Metric	Metric
White	Black	Natural	Black	Tan	Cream	Natural	White	Orange
-	-	-	-	-	-	-	-	-
81 ± 3	81 ± 3	84 ± 3	84 ± 3	85 ± 3	88 ± 3	61 ± 3	69 ± 3	54 ± 3
144	144	165	165		1510	36	36	-
1410	1410	1145	1145	1320	1510	930	930	1190
60	60	80	80	100	180	40	-	≥ 28
≥ 30	≥ 30	≥ 20	≥ 20	≥ 45	≥ 155.8	≥ 50	≥ 40	≥ 300
≥ 88	≥ 88	≥ 95	≥ 95	≥ 125	≥ 250	-	≥	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
0,28	0,28	0,39	0,39	-	-	0,25	-	-
2500	2500	3000	3000	-	-	680	-	-
-45	-45	-45	-45	-110	-110	-200	-200	-30
100	100	100	100	240	250	80	80	120

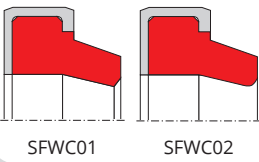
Profile Overview

Wiper Seals

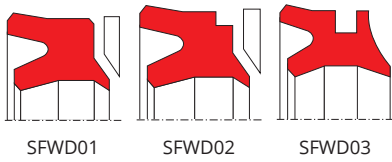
WS Wiper Seals



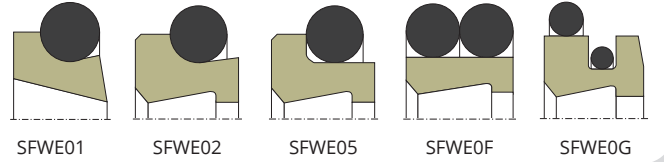
WC Wiper Seals



WD Wiper Seals

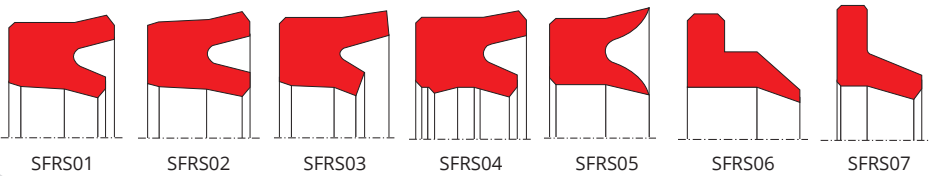


WE Wiper Seals

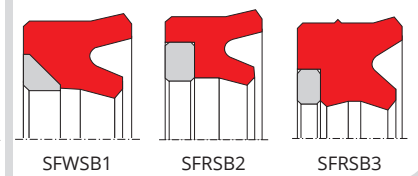


Rod Seals

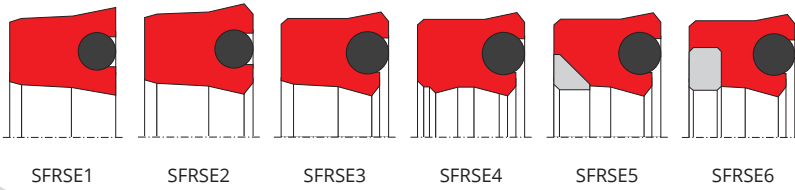
RS Rod Seals



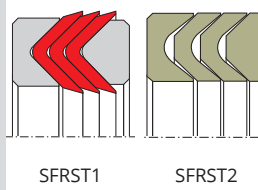
RSB Rod Seals



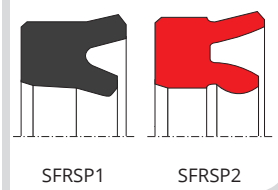
RSE Rod Seals



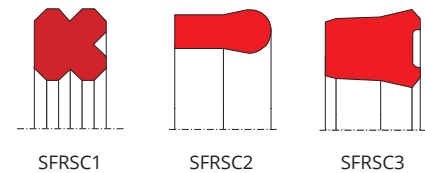
RST V-Ring Sets



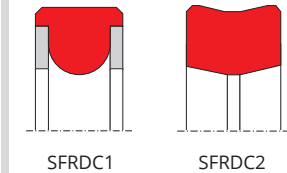
RSP Rod Seals



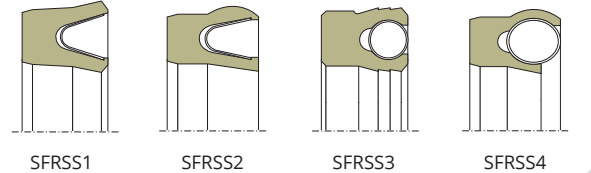
RSC Rod Seals



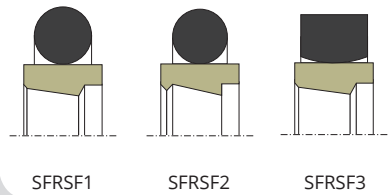
RDC Rod Seals



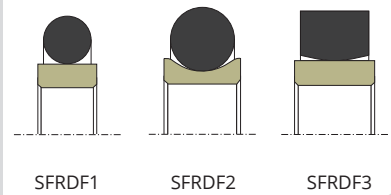
RSS Rod Seals



RSF Rod Seals

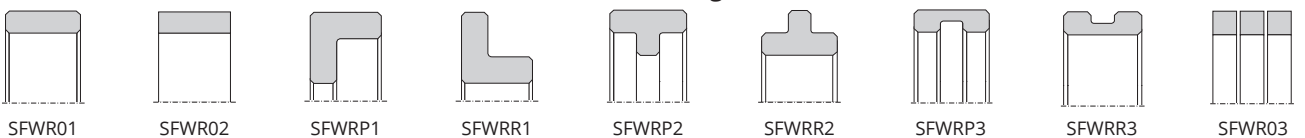


RDF Rod Seals



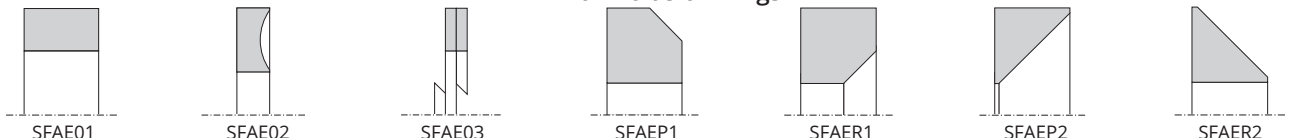
Wear Rings

WR Wear Rings



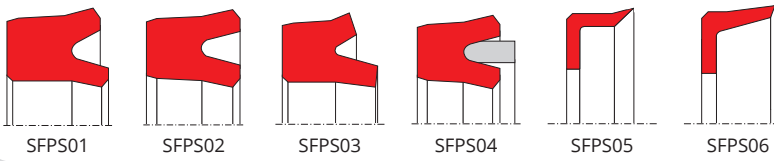
Anti-Extrusion Rings

AE Anti-Extrusion Rings

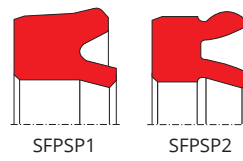


Piston Seals

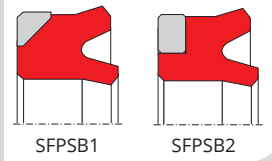
PS Piston Seals



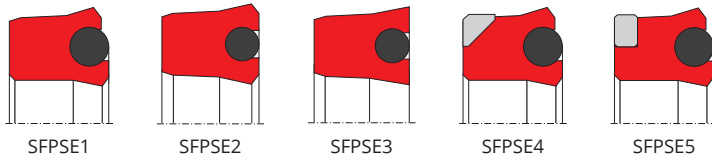
PSP Piston Seals



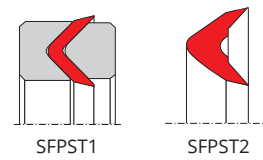
PSB Piston Seals



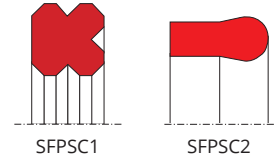
PSE Piston Seals



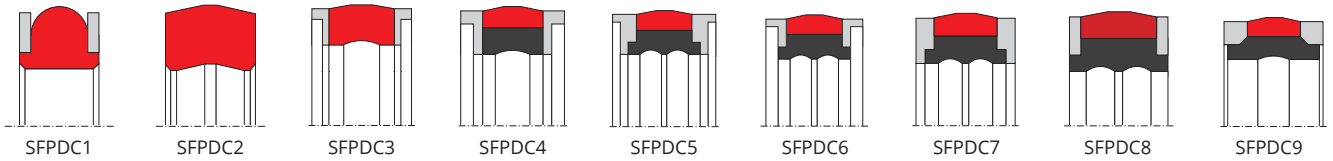
PST V-Ring Sets



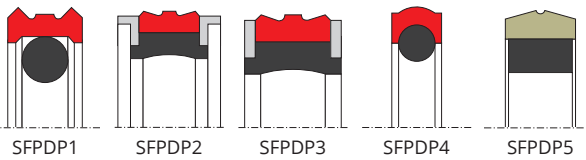
PSC Piston Seals



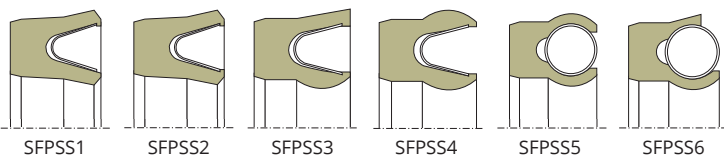
PDC Piston Seals



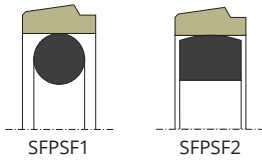
PDP Piston Seals



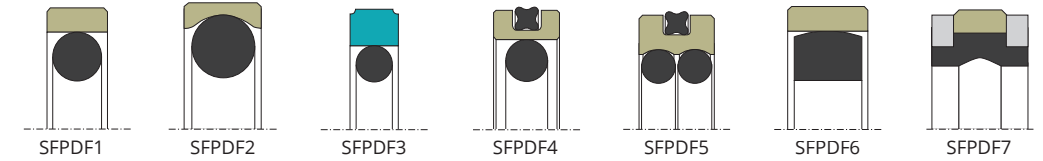
PSS Piston Seals



PSF Piston Seals

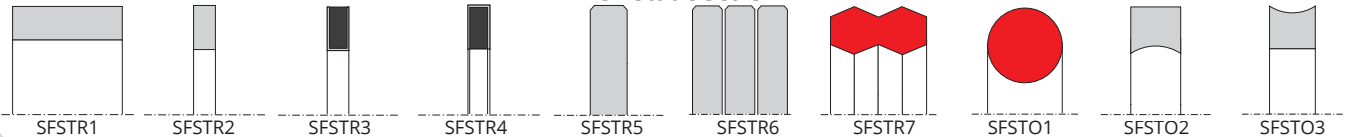


PDF Piston Seals

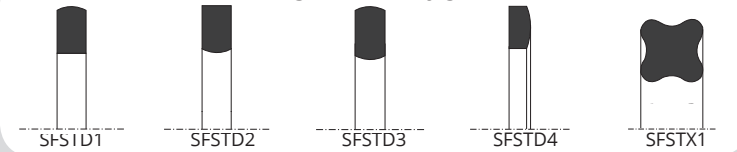


Static Seals

ST Static Seals

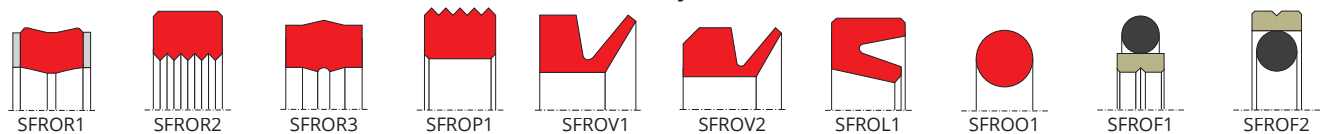


ST Static Seals



Rotary Seals

RO Rotary Seals



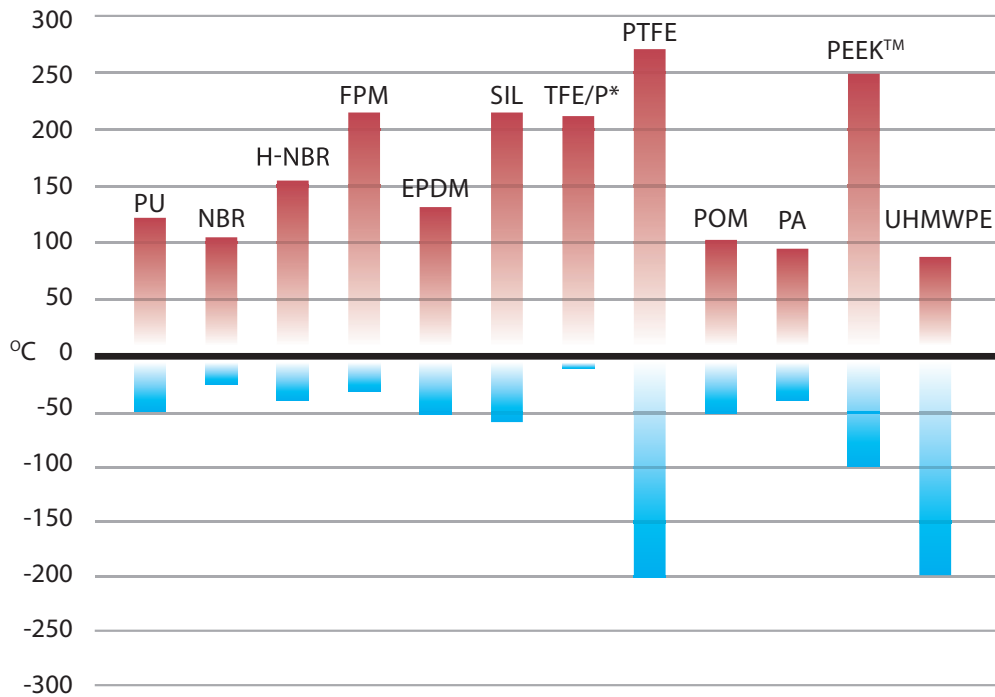
RO Rotary Seals



Materials – Main Applications

	Code	Type	Durom.	Col.	Main applications	
POLYURETHANE	SFM200	HPU	95 Shore A		Wiper seals, rod and piston seals, vee packings, buffer seals, anti-extrusion rings for O-Rings, static seals, rotary seals	
	SFM201	HPU	95 Shore A		Wiper seals, rod and piston seals, vee packings, buffer seals, anti-extrusion rings for O-Rings, static seal, rotary seals	
	SFM202	HPU	90 Shore A		Wiper seals, rod and piston seals, vee packings, static seals, rotary seals	
	SFM210	HPU	55 Shore D		Slide rings of rod and piston seals, slide rings of WE wiper seals, anti-extrusion rings for statatis seals	
	SFM220	C-HPU	96 Shore A		Wiper seals, rod and piston seals, vee packings, buffer seals, anti-extrusion rings for O-Rings, static seals, rotary seals	
	SFM230	C-HPU	57 Shore D		Slide rings of rod and piston seals, slide rings of WE wiper seals, anti-extrusion rings for statatis seals	
	SFM231	C-HPU	70 Shore D		Slide rings of rod and piston cap seals, slide rings of WE wiper seals, anti-extrusion rings for statatis seals, wiper seals	
	SFM240	LT-PU	94 Shore A		Wiper seals, rod and piston seals, vee packings, buffer seals, anti-extrusion rings for O-Rings, static seal, rotary seals	
	SFM241	LT-PU	94 Shore A		Wiper seals, rod and piston seals, vee packings, buffer seals, anti-extrusion rings for O-Rings, static seal, rotary seals	
	SFM242	LT-PU	57 Shore D		Wiper seals, rod seals with energizers, slide rings of WE wiper seals, anti-extrusion rings for statatis seals	
	SFM250	HPU	96 Shore A		Wiper seals, rod and piston seals, vee packings, buffer seals, anti-extrusion rings for O-Rings, static seal, rotary seals	
	SFM251	HPU	55 Shore D		Slide rings of rod and piston seals, slide rings of WE wiper seals, anti-extrusion rings for statatis seals	
	NBR	SFM300	NBR	85 Shore A		Wiper seals, rod and piston seals, vee packings, profiled static seal components, energizers
		SFM303	NBR	80 Shore A		Wiper seals, rod and piston seals, vee packings, profiled static seal components, energizers
		FM304	T-NBR	80 Shore A		Wiper seals, rod and piston seals, vee packings, profiled static seal components, energizers
H-NBR	SFM310	H-NBR	85 Shore A		Wiper seals, rod and piston seals, vee packings, profiled static seal components, energizers	
	SFM311	H-NBR	90 Shore A		Wiper seals, rod and piston seals, vee packings, profiled static seal components, energizers	
EPDM	SFM320	EPDM	85 Shore A		Wiper seals, rod and piston seals, vee packings, profiled static seal components, energizers	
	SFM321	EPDM	82 Shore A		Wiper seals, rod and piston seals, vee packings, profiled static seal components, energizers	
FPM	SFM330	FPM	82 Shore A		Wiper seals, rod and piston seals, vee packings, profiled static seal components, energizers	
	SFM331	FPM	80 Shore A		Wiper seals, rod and piston seals, vee packings, profiled static seal components, energizers	
	SFM332	FPM	85 Shore A		Wiper seals, rod and piston seals, vee packings, profiled static seal components, energizers	
	SFM333	FPM	85 Shore A		Wiper seals, rod and piston seals, vee packings, profiled static seal components, energizers	
	SFM337	FPM	80 Shore A		Wiper seals, rod and piston seals, vee packings, profiled static seal components, energizers	
	TFE/P	SFM340	TFE/P	83 Shore A		Wiper seals, rod and piston seals, vee packings, profiled static seal components, energizers
	MVQ	SFM350	MVQ	85 Shore A		Wiper seals, rod and piston seals, vee packings, profiled static seal components, energizers
		SFM351	MVQ	85 Shore A		Wiper seals, rod and piston seals, vee packings, profiled static seal components, energizers
	PTFE	SFM400	PTFE unfilled	55 Shore D		Anti-extrusion rings for statatis seals, wear rings, stacked sets and spring energised seals, rotary seals
		SFM416	PTFE Glass filled	60 Shore D		Anti-extrusion rings for statatis seals, wear rings, stacked sets and spring energised seals, rotary seals
		SFM418	PTFE Glass+MoS2 filled	58 Shore D		Slide rings of rod and piston cap seals, slide rings of WE wiper seals, anti-extrusion rings for statatis seals, wear rings, stacked sets and spring energised seals, rotary seals
		SFM423	PTFE Carbon filled	67 Shore D		Slide rings of rod and piston cap seals, slide rings of WE wiper seals, anti-extrusion rings for statatis seals, wear rings, stacked sets and spring energised seals, rotary seals
		SFM433	PTFE Graphite filled	60 Shore D		Slide rings of rod and piston cap seals, slide rings of WE wiper seals, anti-extrusion rings for statatis seals, wear rings, stacked sets and spring energised seals, rotary seals
		SFM441	PTFE Bronze filled	60 Shore D		Slide rings of rod and piston seals, slide rings of WE wiper seals, anti-extrusion rings for statatis seals, wear rings, stacked sets and spring energised seals, rotary seals
		PLASTICS	SFM500	POM	81 Shore D	
SFM501			POM	81 Shore D		Anti-extrusion rings for dynamic and static applications, wear rings guding components in light and medium duty applications, gland adapters for V-Ring sestis, wiper sals
SFM510	PA6C		84 Shore D		Anti-extrusion rings for dynamic and static applications, wear rings and guding components in light and medium duty applications, gland adapters for stacked sestis, gland adapters for V-ring sets	
SFM511	PA6C		84 Shore D		Anti-extrusion rings for dynamic and static applications, wear rings and guding components in light and medium duty applications, gland adapters for V-ring sets	
SFM520	PEEK		85 Shore D		Anti-extrusion rings for dynamic and static applications, wear rings and guide components in heavy duty applications, spring energised seals	
SFM521	PEEK		88 Shore D		Anti-extrusion rings for dynamic and static applications, wear rings and guiding components in heavy duty applications, spring energised seals	
SFM530	UHM-WPE		61 Shore D		Stacked sets, spring energised seals	
SFM531	UHM-WPE		69 Shore D		Stacked sets, spring energised seals	
SFM540	HYTREL		54 Shore D		Wiper seals, anti-extrusion rings, rod seals with energizers	

Typical operating temperature ranges by material grades



Food grades materials

SealFluid Code	Material	Color	Temperature range	FDA	3A Sanitary	EU 1935/2004	EU 10/2011 CE	KTW	DVGW W720
SFM200	HPU Polyurethane	Red	-20 to +110 °C	●	●	●	●		
SFM201	HPU Polyurethane	Blue	-20 to +110 °C	●	●	●	●		
SFM203	HPU Polyurethane	White	-20 to +110 °C	●			●		
SFM220	C-HPU Polyurethane	Red	-37 to +110 °C	●					
SFM223	C-HPU Polyurethane	White	-37 to +110 °C	●	●	●	●	●	●
SFM303	NBR FDA	Blue	-30 to +100 °C	●		●			
SFM321	EPDM FDA	White	-45 to +130 °C	●					
SFM322	EPDM FDA	Black	-45 to +90 °C	●	●	●			
SFM323	EPDM KTW	Black	-40 to +120 °C		●			●	●
SFM324	EPDM FDA	Blue	-30 to +130 °C	●		●			
SFM331	FPM FDA	Dark Red	-20 to +200 °C	●	●				
SFM337	FPM FDA	Blue	-17 to +200 °C	●	●		●		
SFM350	MVQ FDA	Blue	-60 to +200 °C	●		●	●		
SFM351	MVQ FDA	White	-60 to +200 °C	●		●	●		
SFM352	MVQ FDA	White	-60 to +200 °C	●		●			
SFM400	PTFE Unfilled FDA	White	-200 to +260 °C	●		●	●		
SFM500	POM	White	-45 to +100 °C	●					
SFM520	PEEK unfilled	Light Brown	-100 to +260 °C	●		●			

Note: The information in this document is to be considered reliable, but conditions and methods of use, which are beyond our control, may modify the results.

The information and data contained in this data-sheet are the result of a long and detailed research, however F.lli Paris S.r.l. cannot be considered responsible for any incorrect or incomplete data. Owing to the constant development of the products, we reserve the right to make changes to them without prior notice.

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SealFluid

Fluid Power Seals – a division of F.Ili Paris S.r.l.

F.Ili Paris S.r.l. a socio unico

Via Marconi 142/144

24060 Casteli Calepio (BG), ITALY

Tel.: +39 035 442 5511

Fax: +39 035 442 5478

info@fpparis.com

www.sealfluid.services