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Component

**Environmental
Multi-Spring Mechanical Seals
SMI™ and SME™ Series**

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SMI™ - design features

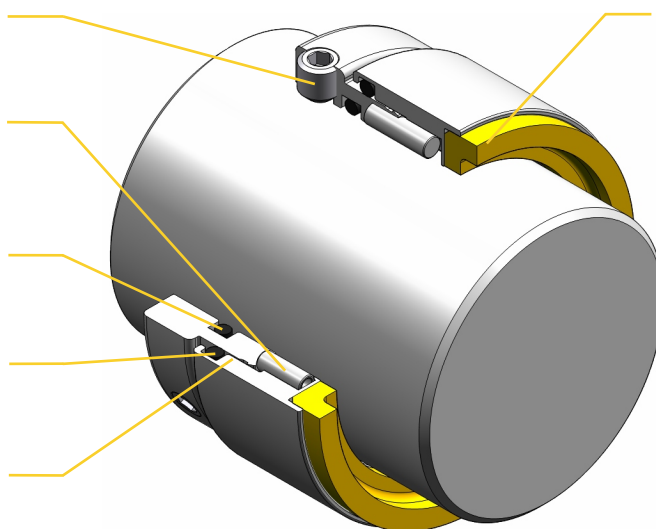
Positive clamping
Grub-screwed directly to the pump shaft or sleeve to ensure effective drive to the rotary face.

Springs out of fluid
The Alloy 276 springs are not in the pumped fluid where they could corrode or clog and so remain effective for the whole of the seal life.

No fretting of pump shaft
The seal internal o-ring is static on the shaft and guaranteed never to fret the pump shaft or sleeve.

Anti clog
The dynamic o-ring moves onto a clean area as seal faces wear. Components remain free for longer seal life.

Balanced
Hydraulic balance is achieved within the seal design and does not require a stepped shaft. Face loading is reduced to give cooler running and longer seal life.



Secured rotary face
Shrink fitting improves durability and face retention under extreme operating conditions.



SME™

external balanced seals

SME™ - design features

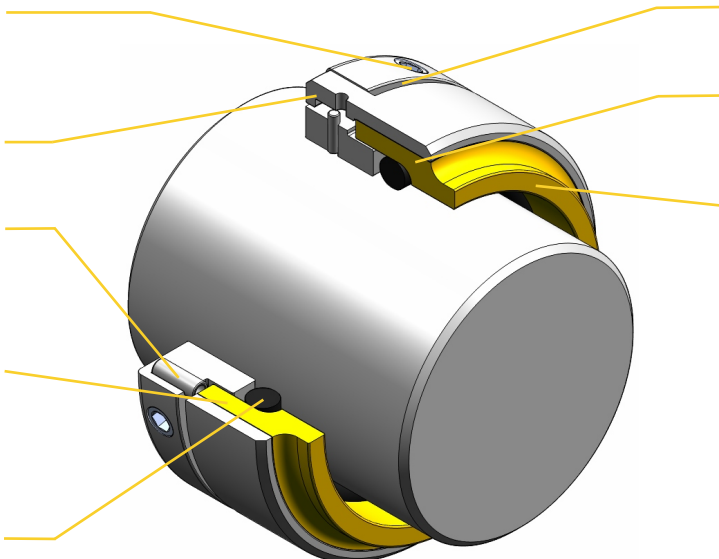
External clamping
Easily set to the correct working length, enabling pump efficiency adjustments to be made without dismantling the pump.

Positive drive lugs
Drive forces are evenly distributed around the rotary face to reduce stress.

Springs out of fluid
The Alloy 276 springs are not in the pumped fluid where they could corrode or clog, so remain effective for the whole of the seal life.

Balanced
Hydraulic balance is achieved within the seal design and does not require a stepped shaft. Face loading is reduced to give cooler running and longer seal life.

Anti clog
The dynamic o-ring moves onto a clean area as seal faces wear. Components remain free for longer seal life.



Visual examination
Visible spring gap allows monitoring of face wear.

Secured rotary face
Shrink fitting improves durability and face retention under extreme operating conditions.

Non metallic wetted parts
No metal parts in contact with pumped media, therefore able to operate in corrosive applications.



SMI™ & SME™ - technical specification

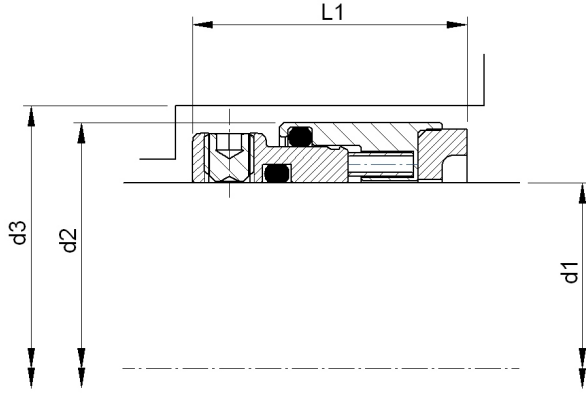
metal parts	316 Stainless Steel as standard, other materials also available.
o-rings	Viton® (Fluorocarbon) or Ethylene Propylene (EPR) as standard. Aflas®, Kalrez® and other elastomers available to order.
rotary face	Carbon, Silicon Carbide or Tungsten Carbide* (SMI only) as standard. Antimony Carbon available on request.

springs	Alloy 276
temperature	-30°C to 260°C (-22°F to 500°F) dependent upon specified elastomer and system configuration
pressure limits	711mm HG Vacuum to 30 Bar (-28" HG - 440 PSI).

As the conditions of use are outside the control of first4seals, the information contained within this brochure is given in good faith but without warranty. The above temperature and pressure limits are individual maximum values for SOFT/HARD seal face combinations only. The values are provided for guidance only and are intended for use by suitably qualified application engineers. It is recommended that all users contact the first4seals Technical Department for advice on any new application.

SMI™

internal balanced seals



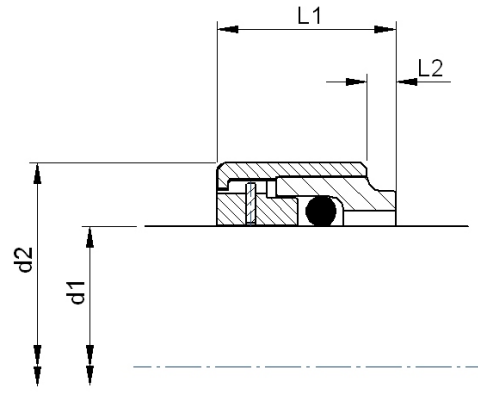
SMI™ - size chart

d1	d2	d3	L1
Metric	Seal O.D.	S/Box I.D.	Working length
19	33.0	34.9	32.5
20	34.0	36.0	32.5
22	36.2	38.1	32.5
24	38.0	40.0	32.5
25	39.0	41.0	32.5
28	42.0	44.0	32.5
30	44.0	46.0	32.5
32	45.6	48.0	32.5
33	47.0	49.0	32.5
35	49.0	51.0	32.5
38	52.8	54.0	33.5
40	54.8	56.0	33.5
43	57.8	59.0	33.5
45	59.8	61.0	33.5
48	62.8	64.0	33.5
50	64.8	66.0	33.5
53	67.8	69.0	33.5
55	69.8	71.0	33.5
58	72.8	74.0	33.5
60	74.8	76.0	33.5
63	78.2	79.0	33.5
65	82.5	84.0	36.5
68	85.5	87.0	36.5
70	87.5	89.0	36.5
75	92.5	94.0	36.5
80	97.5	99.0	36.5
85	102.5	104.0	36.5
90	107.5	109.0	36.5
95	112.8	114.0	36.5
100	117.5	119.0	36.5

d1	d5	d3	L2
Imperial	Seal O.D.	S/Box I.D.	Working Length
0.750	1.299	1.374	1.280
0.875	1.425	1.500	1.280
1.000	1.551	1.626	1.280
1.125	1.677	1.752	1.280
1.250	1.795	1.890	1.280
1.375	1.929	2.008	1.280
1.500	2.079	2.126	1.319
1.625	2.205	2.252	1.319
1.750	2.331	2.374	1.319
1.875	2.457	2.500	1.319
2.000	2.579	2.626	1.319
2.125	2.705	2.752	1.319
2.250	2.831	2.874	1.319
2.375	2.957	3.000	1.319
2.500	3.079	3.126	1.319
2.625	3.315	3.374	1.437
2.750	3.441	3.500	1.437
2.875	3.563	3.626	1.437
3.000	3.689	3.752	1.437
3.125	3.815	3.874	1.437
3.250	3.941	4.000	1.437
3.375	4.063	4.126	1.437
3.500	4.189	4.252	1.437
3.625	4.315	4.374	1.437
3.750	4.441	4.488	1.437
3.875	4.563	4.626	1.437
4.000	4.689	4.752	1.437

SME™

external balanced seals



SME™ - size chart

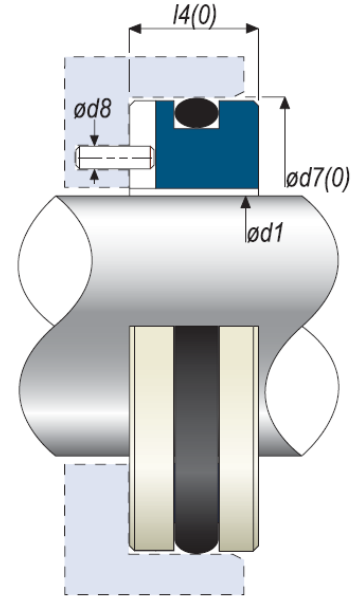
d1	d2	L1	L2
Metric	Rotary O.D.	Working Length	Nose Extension
25	45.0	28.5	4.5
28	48.0	28.5	4.5
30	50.0	28.5	4.5
32	52.0	28.5	4.5
35	55.0	28.5	4.5
38	58.1	28.5	4.5
40	60.0	28.5	4.5
43	63.0	28.5	4.5
45	65.0	28.5	4.5
48	68.0	28.5	4.5
50	70.0	28.5	4.5
53	73.0	28.5	4.5
55	75.0	28.5	4.5
58	78.0	28.5	4.5
60	80.3	28.5	4.5
63	83.5	28.5	4.5
65	90.4	35.0	6.5
68	93.4	35.0	6.5
70	95.3	35.0	6.5
75	100.4	35.0	6.5
80	105.4	35.0	6.5
85	110.4	35.0	6.5
90	115.4	35.0	6.5
95	120.7	35.0	6.5
100	125.4	35.0	6.5

d1	d5	L1	L2
Imperial	Rotary O.D.	Working Length	Nose Extension
1.000	1.787	1.122	0.177
1.125	1.843	1.122	0.177
1.250	2.047	1.122	0.177
1.375	2.165	1.122	0.177
1.500	2.287	1.122	0.177
1.625	2.413	1.122	0.177
1.750	2.539	1.122	0.177
1.875	2.661	1.122	0.177
2.000	2.787	1.122	0.177
2.125	2.913	1.122	0.177
2.250	3.039	1.122	0.177
2.375	3.161	1.122	0.177
2.500	3.287	1.122	0.177
2.625	3.626	1.378	0.256
2.750	3.752	1.378	0.256
2.875	3.878	1.378	0.256
3.000	4.000	1.378	0.256
3.125	4.126	1.378	0.256
3.250	4.252	1.378	0.256
3.375	4.378	1.378	0.256
3.500	4.500	1.378	0.256
3.625	4.626	1.378	0.256
3.750	4.752	1.378	0.256
3.875	4.874	1.378	0.256
4.000	5.000	1.378	0.256

The stationary faces listed are stocked in Stainless Steel, Ceramic, Silicon Carbide and Tungsten Carbide.

O-ring mounted, monolithic 'H' configuration stationary faces to suit most common European (H-STAT) or common American (HA-STAT) housing dimensions.

These faces include a rear face pin slot which provides anti-rotation in a short operational length.

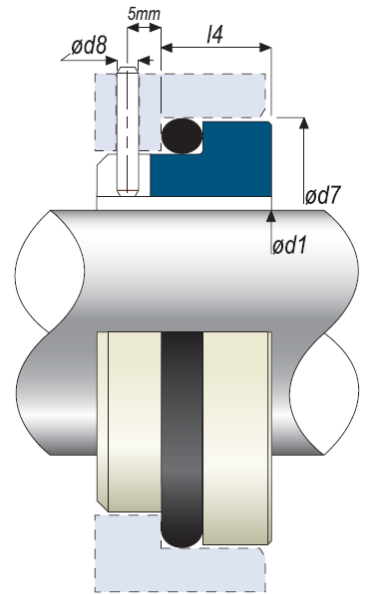


H-STAT/HA-STAT - size chart

d1		d7 (H)		d70 (HA)		d8		L4 (H)		L40 (HA)	
Metric	Inches	Metric	Inches	Metric	Inches	Metric	Inches	Metric	Inches	Metric	Inches
10.0	0.394	24.6	0.969	N/A	N/A	3.0	0.118	8.7	0.344	N/A	N/A
12.0	0.472	27.8	1.094	N/A	N/A	3.0	0.118	8.7	0.344	N/A	N/A
12.7	0.500	27.8	1.094	25.4	1.000	3.0	0.118	8.7	0.344	7.9	0.311
13.0	0.512	27.8	1.094	N/A	N/A	3.0	0.118	8.7	0.344	N/A	N/A
14.0	0.551	31.0	1.219	N/A	N/A	3.0	0.118	10.3	0.406	N/A	N/A
15.0	0.591	31.0	1.219	N/A	N/A	3.0	0.118	10.3	0.406	N/A	N/A
15.8	0.625	30.9	1.217	31.7	1.250	3.0	0.118	10.3	0.406	10.3	0.406
16.0	0.630	31.0	1.219	N/A	N/A	3.0	0.118	10.3	0.406	N/A	N/A
18.0	0.709	34.2	1.344	N/A	N/A	3.0	0.118	10.3	0.406	N/A	N/A
19.1	0.750	34.2	1.346	34.9	1.375	3.0	0.118	10.3	0.406	10.3	0.406
20.0	0.787	35.7	1.406	N/A	N/A	3.0	0.118	10.3	0.406	N/A	N/A
22.0	0.866	37.3	1.469	N/A	N/A	3.0	0.118	10.3	0.406	N/A	N/A
22.2	0.875	37.3	1.469	38.1	1.500	3.0	0.118	10.3	0.406	10.3	0.406
24.0	0.945	40.5	1.594	N/A	N/A	3.0	0.118	10.3	0.406	N/A	N/A
25.0	0.984	40.5	1.594	N/A	N/A	3.0	0.118	10.3	0.406	N/A	N/A
25.4	1.000	40.5	1.594	41.2	1.625	3.0	0.118	10.3	0.406	11.1	0.437
28.0	1.102	47.6	1.875	N/A	N/A	3.5	0.138	12.0	0.472	N/A	N/A
28.6	1.125	47.6	1.875	44.4	1.750	3.5	0.138	11.9	0.469	11.1	0.437
30.0	1.181	50.8	2.000	N/A	N/A	3.5	0.138	12.0	0.472	N/A	N/A
31.7	1.250	50.8	2.000	47.6	1.875	3.5	0.138	11.9	0.469	11.1	0.437
32.0	1.260	50.8	2.000	N/A	N/A	3.5	0.138	12.0	0.472	N/A	N/A
33.0	1.299	54.0	2.125	N/A	N/A	3.5	0.138	12.0	0.472	N/A	N/A
35.0	1.375	53.9	2.125	50.8	2.000	3.5	0.138	11.9	0.469	11.1	0.437
38.0	1.500	57.1	2.250	53.9	2.125	3.5	0.138	11.9	0.469	11.1	0.437
40.0	1.575	60.4	2.375	N/A	N/A	3.5	0.138	12.0	0.472	N/A	N/A
41.2	1.625	60.3	2.375	60.3	2.375	3.5	0.138	11.9	0.469	12.7	0.500
42.0	1.654	63.5	2.500	N/A	N/A	3.5	0.138	12.0	0.472	N/A	N/A
43.0	1.693	63.5	2.500	N/A	N/A	3.5	0.138	12.0	0.472	N/A	N/A
44.4	1.750	63.5	2.500	63.5	2.500	3.5	0.138	11.9	0.469	12.7	0.500
45.0	1.772	63.5	2.500	N/A	N/A	3.5	0.138	12.0	0.472	N/A	N/A
47.6	1.875	66.6	2.625	66.6	2.625	3.5	0.138	11.9	0.469	12.7	0.500
48.0	1.890	66.7	2.625	N/A	N/A	3.5	0.138	12.0	0.472	N/A	N/A
50.0	1.969	69.9	2.750	N/A	N/A	3.5	0.138	13.5	0.531	N/A	N/A
50.8	2.000	69.8	2.750	69.8	2.750	3.5	0.138	13.5	0.531	12.7	0.500
53.0	2.087	73.1	2.875	N/A	N/A	3.5	0.138	13.5	0.531	N/A	N/A
53.9	2.125	73.0	2.875	76.2	3.000	3.5	0.138	13.5	0.531	14.2	0.559
55.0	2.165	76.2	3.000	N/A	N/A	3.5	0.138	13.5	0.531	N/A	N/A
57.1	2.250	76.2	3.000	79.4	3.125	3.5	0.138	13.5	0.531	14.2	0.559
58.0	2.283	79.4	3.125	N/A	N/A	3.5	0.138	13.5	0.531	N/A	N/A
60.0	2.362	79.4	3.125	N/A	N/A	3.5	0.138	13.5	0.531	N/A	N/A
60.3	2.375	79.4	3.125	82.5	3.250	3.5	0.138	13.5	0.531	14.2	0.559
63.0	2.480	82.6	3.250	N/A	N/A	3.5	0.138	13.5	0.531	N/A	N/A
63.5	2.500	82.5	3.250	85.7	3.375	3.5	0.138	13.5	0.531	14.2	0.559
65.0	2.559	92.1	3.625	N/A	N/A	4.5	0.177	15.9	0.626	N/A	N/A
66.6	2.625	92.1	3.625	85.7	3.375	4.5	0.177	15.9	0.626	15.8	0.625
69.8	2.750	95.2	3.750	88.9	3.500	4.5	0.177	15.9	0.626	15.8	0.625
70.0	2.756	95.3	3.750	N/A	N/A	4.5	0.177	15.9	0.626	N/A	N/A
73.0	2.875	98.4	3.875	95.2	3.750	4.5	0.177	15.9	0.626	15.8	0.625
75.0	2.953	101.7	4.000	N/A	N/A	4.5	0.177	15.9	0.626	N/A	N/A
76.2	3.000	101.6	4.000	98.4	3.875	4.5	0.177	15.9	0.626	15.8	0.625

SMI™ G46 DIN L - size chart

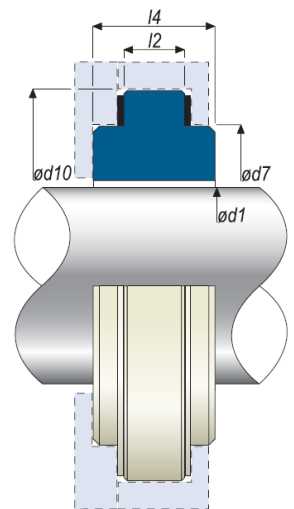
d1		d7		d8		L4	
Metric	Inches	Metric	Inches	Metric	Inches	Metric	Inches
10.0	0.394	21.0	0.827	3.0	0.118	8.6	0.339
12.0	0.472	23.0	0.906	3.0	0.118	8.6	0.339
14.0	0.551	25.0	0.984	3.0	0.118	8.6	0.339
16.0	0.630	27.0	1.063	3.0	0.118	8.6	0.339
18.0	0.709	33.0	1.260	3.0	0.118	10.0	0.394
20.0	0.787	35.0	1.378	3.0	0.118	10.0	0.394
22.0	0.866	37.0	1.457	3.0	0.118	10.0	0.394
24.0	0.945	39.0	1.535	3.0	0.118	10.0	0.394
25.0	0.984	40.0	1.575	3.0	0.118	10.0	0.394
28.0	1.102	43.0	1.693	3.0	0.118	10.0	0.394
30.0	1.181	45.0	1.772	3.0	0.118	10.0	0.394
32.0	1.260	48.0	1.890	3.0	0.118	10.0	0.394
33.0	1.299	48.0	1.890	3.0	0.118	10.0	0.394
35.0	1.378	50.0	1.969	3.0	0.118	10.0	0.394
38.0	1.496	56.0	2.205	4.0	0.157	11.0	0.433
40.0	1.575	58.0	2.283	4.0	0.157	11.0	0.433
43.0	1.693	61.0	2.402	4.0	0.157	11.0	0.433
45.0	1.772	63.0	2.480	4.0	0.157	11.0	0.433
48.0	1.890	66.0	2.598	4.0	0.157	11.0	0.433
50.0	1.969	70.0	2.756	4.0	0.157	13.0	0.512
53.0	2.087	73.0	2.874	4.0	0.157	13.0	0.512
55.0	2.165	75.0	2.953	4.0	0.157	13.0	0.512
58.0	2.283	78.0	3.071	4.0	0.157	13.0	0.512
60.0	2.362	80.0	3.150	4.0	0.157	13.0	0.512
63.0	2.480	83.0	3.268	4.0	0.157	13.0	0.512
65.0	2.559	85.0	3.346	4.0	0.157	13.0	0.512
68.0	2.677	90.0	3.543	4.0	0.157	15.3	0.602
70.0	2.756	92.0	3.622	4.0	0.157	15.3	0.602
75.0	2.953	97.0	3.819	4.0	0.157	15.3	0.602
80.0	3.150	105.0	4.134	4.0	0.157	15.7	0.618
85.0	3.346	110.0	4.331	4.0	0.157	15.7	0.618
90.0	3.543	115.0	4.528	4.0	0.157	15.7	0.618
95.0	3.740	120.0	4.724	4.0	0.157	15.7	0.618
100.0	3.937	125.0	4.921	4.0	0.157	15.7	0.618



SME™ stationary options

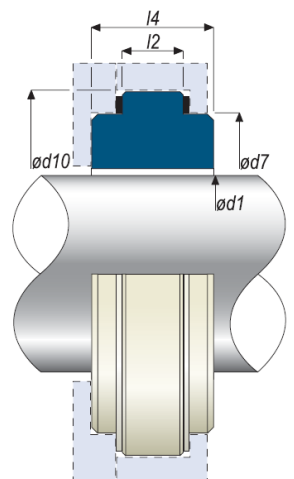
SME™ V-STAT - size chart

d1		d7		d10		L4		L1	
Metric	Inches	Metric	Inches	Metric	Inches	Metric	Inches	Metric	Inches
19.1	0.750	36.5	1.437	48.0	1.889	17.4	0.685	7.9	0.311
22.2	0.875	39.7	1.563	51.0	2.007	1.74	0.685	7.9	0.311
25.4	1.000	42.9	1.689	54.0	2.125	17.4	0.685	7.9	0.311
28.6	1.125	46.0	1.811	60.0	2.362	26.9	1.059	11.1	0.437
31.7	1.250	50.8	2.000	65.0	2.559	26.9	1.059	11.1	0.437
34.9	1.375	53.9	2.125	68.0	2.677	26.9	1.059	11.1	0.437
38.1	1.500	57.1	2.250	71.0	2.795	26.9	1.059	11.1	0.437
41.2	1.625	63.5	2.500	78.0	3.070	26.9	1.059	11.1	0.437
44.4	1.750	66.7	2.625	81.0	3.188	26.9	1.059	11.1	0.437
47.6	1.875	69.8	2.750	84.0	3.307	26.9	1.059	11.1	0.437
50.8	2.000	73.0	2.875	87.0	3.425	26.9	1.059	11.1	0.437
53.9	2.125	79.4	3.125	97.0	3.818	33.3	1.311	14.3	0.563
57.1	2.250	82.5	3.250	100.0	3.937	33.3	1.311	14.3	0.563
60.3	2.375	85.7	3.375	103.0	4.055	33.3	1.311	14.3	0.563
63.5	2.500	88.9	3.500	106.0	4.173	33.3	1.311	14.3	0.563
66.6	2.625	92.0	3.625	110.0	4.330	33.3	1.311	14.3	0.563
69.8	2.750	95.2	3.750	113.0	4.448	33.3	1.311	14.3	0.563
73.0	2.875	98.4	3.875	116.0	4.566	33.3	1.311	14.3	0.563
76.2	3.000	100.0	3.937	117.0	4.606	33.3	1.311	14.3	0.563



SME™ VA-STAT - size chart

d1		d7		d10		L4		L1	
Metric	Inches	Metric	Inches	Metric	Inches	Metric	Inches	Metric	Inches
28.6	1.125	47.4	1.865	56.8	2.237	9.5	0.375	20.6	0.812
34.9	1.375	53.7	2.115	66.1	2.604	9.5	0.375	22.2	0.875
34.9(G)	1.375	50.5	1.990	59.9	2.360	12.7	0.500	25.4	1.000
44.4	1.750	66.4	2.615	78.8	3.104	9.5	0.375	22.2	0.875
44.4(G)	1.750	63.2	2.490	76.1	2.995	12.7	0.500	25.4	1.000



Originating in 1989 first4seals is an ISO 9001:2008 certified 21st century seal supplier, which provides affordable, quality products and an excellent standard of service to the customer. It is committed to offering products that protect the environment by reducing pollution and emissions from rotating equipment.

The company's extensive product range consists of single spring, component, single and double cartridge seals available in both rotary and stationary arrangements and double seal support systems to suit some of the industry's most demanding applications.

Contact our Customer Service team for further information about how we can help you reduce your current seal spend and maximize your Mean Time Between Failures.

first4seals offers a comprehensive range of interchangeable equivalents to many competitor manufacturers including:

- John Crane®
- Eagle Burgmann®
- Flowserve®
- Chesterton®
- US Seal®
- Flex-A-Seal®

Interested in becoming a distributor?

first4seals is currently looking to recruit new distributors to help enhance its global coverage. Please contact us if you are interested in becoming a first4seals distributor:

Visit our brand new website www.first4seals.com and follow the "Become a Distributor" tab.



Mechanical Seal Repairs

Seal assessment

Each seal is cleaned to remove any chemicals or hazardous materials upon arrival and then individually inspected and assessed. The assessment process determines which components require replacement or refurbishment in order to generate an accurate and cost effective repair quotation. Materials specifications are identified through understanding of seal construction, operation and application.

Quotation

All repair quotations are based on specific parts that require refurbishment or replacement. This method is used to reduce repair costs and provide the most economic method of restoring a mechanical seal back to a usable condition.

Seal refurbishment

The refurbishment process restores seals to their original functionality at a fraction of the cost of replacement hardware. Our refurbishment service is available for all standard first4seals products and those of many leading manufacturers, to help prolong a mechanical seal's life span. We are able to repair competitor brands such as: Eagle Burgmann®, Chesterton®, Flowserve®, John Crane® and many more.

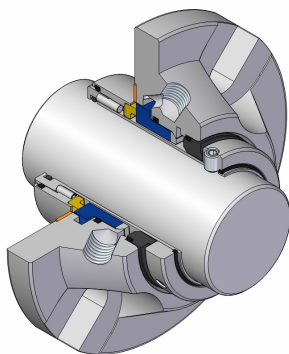
We are able to design and reverse engineer competitor components which may have failed in service. Components are modelled using state-of-the-art Computer Aided Design software to produce an accurate model. Components are manufactured using multi-axis CNC machines from a range of materials including standard 316L Stainless Steel, exotic alloys, PTFE and Carbon.

Quality

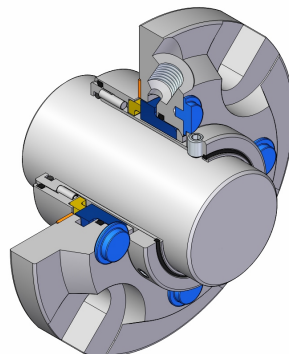
Quality and customer service are the highest priority and our business is certified to ISO 9001:2008. All repairs are carried out by experienced workshop technicians and monitored by our Technical Team to provide a service which offers a cost-effective and environmentally sound alternative to purchasing new seals. Each seal is pressure tested before it is sent back to the customer. Testing ensures that the seal is in full working order and will perform correctly when installed back into service.



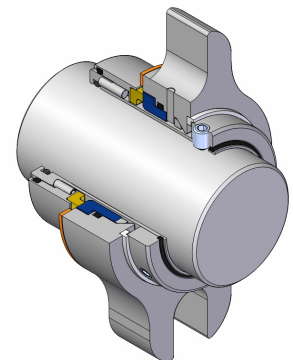
Other seals single & double cartridge seal in the F4S range:



301™ range

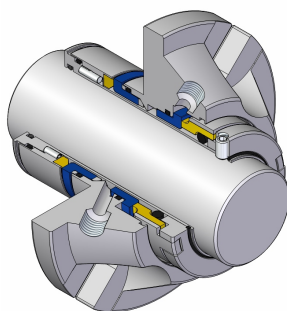


303A™ range

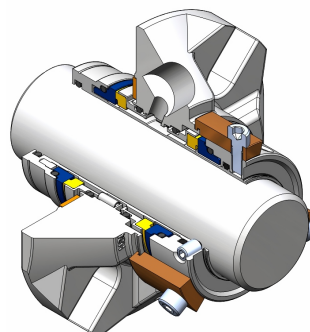


MV™ range

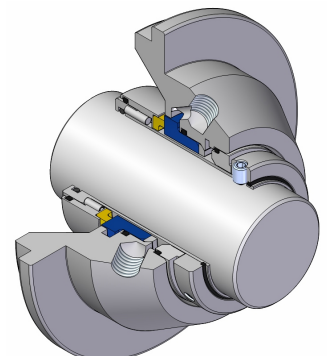
A range of single cartridge seals are available to suit all application needs. Seals to suit progressive cavity pumps (PCP) are also available in single and double formats. See our single seal literature for further details.



302™ range



f4s200™ range



PCP range

A range of double cartridge seals are available to suit all application needs. Seals to suit progressive cavity pumps (PCP) are also available in single and double formats. See our double seal literature for further details.

single spring seals



component seals



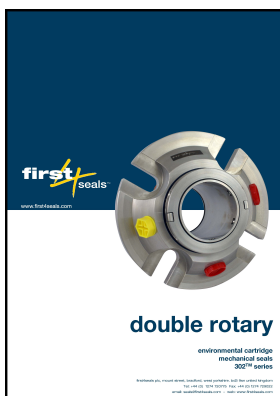
MV™ single rotary cartridge seals



301™/303A™ single rotary cartridge seals



302™ double rotary cartridge seals



f4s100™ single stationary cartridge seals



f4s200™ double stationary cartridge seals



seal support systems



THIS DOCUMENT IS DESIGNED TO PROVIDE DIMENSIONAL DATA AND IS NOT AN INDICATION OF AVAILABILITY FROM STOCK. SOME DESIGNS MAY BE SUBJECT TO MINIMUM ORDER QUANTITIES AND MANUFACTURING LEAD TIMES.



FM61505

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