

Features

- Exceptional chemical resistance with a cost-efficient replacement for FFKM seals for chemical applications.
- Temperature capability from -20°C to 140°C.
- Compliant to key global regulatory standards: FDA, USP Class VI
- Cost effective alternative to FFKM.
- Specific product recommendations for an extensive range of applications, from the simplest to the most extreme.
- Resistant to compression set and cold flow issues of solid PTFE seals.

RS PRO FEP Viton®/FKM Encapsulated O-rings

RS Stock No.: xxx-xxxx



RS PRO is the own brand of RS. The RS PRO Seal of Approval is your assurance of professional quality, a guarantee that every part is rigorously tested, inspected, and audited against demanding standards. Making RS PRO the Smart Choice for our customers.

Product Description

Our FEP encapsulated 'O'-rings provide a high performance and low-cost sealing solutions for a variety of chemically demanding applications, or where regulatory compliance is particularly important.

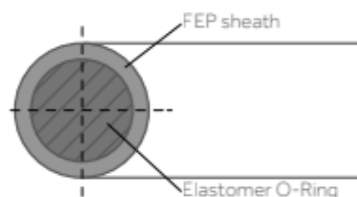
The combination of elastomers and encapsulation choice enables our encapsulated seals to achieve a combination of temperature, chemical and cost performance unrivalled by pure elastomeric solutions.

FEP encapsulated O-rings are recommended when a standard O-ring has inadequate chemical resistance for an application. They are also recommended when a solid PTFE O-ring does not have the elasticity for reliable, long term fluid sealing. They are often used where chemical resistance and or hygiene is required.

Typical Industries: Food, Chemical, Petrochemical, Pharmaceutical

General Specifications

Type	O-Ring
Material	FEP Encapsulated Viton®/FKM
Encapsulation	FEP - Fluorinated Ethylene Propylene (transparent)
Core	Viton®/FKM
Hardness	90-95 Shore A
Minimum Operating Temperature	-20°C
Maximum Operating Temperature	+140°C
Temperature Range	-20°C to +140°C (-4°F to +284°F)
Inside Diameter	Please see table below
Outside Diameter	Please see table below
Thickness	Please see table below
BS Standard	Please see table below
Compliance/Certifications	FDA, USP Class VI, EC 1935/2004 & LABS
Recommended Maximum Stretch	Maximum I.D stretch of the 'O'-ring should be 7% for Viton®/FKM. Stretch should be evenly applied to the circumference with use of a fitting tool.

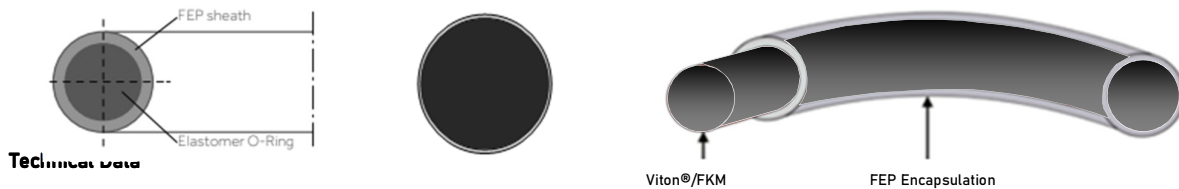


What is an Encapsulated O-ring?

FEP Encapsulated 'O'-ring seal is an 'O'-ring bound by a seamless and uniform Fluorinated Ethylene Propylene (FEP) encapsulation, which encloses an elastomeric core, completely protecting it from the media. The combination of elastomers and encapsulation choice enables our encapsulated seals to achieve a combination of temperature, chemical and cost performance unrivalled by pure elastomeric solutions. The elastomeric core provides the energising sealing force.

Viton®/FKM Inner Core

Delivering greater chemical resistance than Silicone. If the encapsulation is damaged, Viton®/FKM provides greater resilience to chemical attack. This is the choice for LABS Silicone free product.



Technical Data

The FEP encapsulation is the essential component of the Chem-Ring®. Within normal application temperatures, FEP resins are vulnerable to only a few chemicals. In some instances, at or near the suggested service limit temperatures of FEP 140°C (284°F) a few chemicals at high concentrations have been reported to be reactive.

Groove Dimension Table

FEP Rings are designed to be used in all standard 'O'-ring grooves with the same housing dimensions and clearances as for standard elastomeric seals. Our recommendations for BS ISO 3601-1/AS 568 imperial standard 'O'-ring grooves are tabled here.

Cross Section	A	B Static	B Dynamic	B Pneumatic
1.78 mm 0.070"	2.36 – 2.49 mm 0.093 – 0.098"	1.42 – 1.52 mm 0.0563 – 0.060"	1.55 – 1.60 mm 0.061 – 0.063"	1.63 – 1.65 mm 0.064 – 0.065"
2.62 mm 0.103"	3.56 – 3.68 mm 0.140 – 0.145"	2.082 – 2.21 mm 0.082 – 0.087"	2.29 – 2.36 mm 0.090 – 0.093"	2.38 – 2.44 mm 0.094 – 0.096"
3.53 mm 0.139"	4.78 – 4.88 mm 0.187 – 0.192"	2.82 – 3.00 mm 0.111 – 0.118"	3.10 – 3.18 mm 0.122 – 0.125"	3.23 – 3.28 mm 0.127 – 0.129"
5.33 mm 0.210"	7.14 – 7.26 mm 0.281 – 0.286"	4.27 – 4.52 mm 0.168 – 0.178"	4.67 – 4.80 mm 0.184 – 0.189"	4.90 – 4.95 mm 0.193 – 0.195"
6.99 mm 0.275"	9.53 – 9.65 mm 0.375 – 0.380"	5.59 – 5.89 mm 0.220 – 0.232"	6.15 – 6.27 mm 0.242 – 0.247"	6.43 – 6.48 mm 0.253 – 0.255"

Degree of squeeze

- 15/22% for static applications
- 10/15% for dynamic applications
- 8/10% for pneumatic applications

The amount of squeeze required varies with many factors, most critically, the pressure to be sealed.

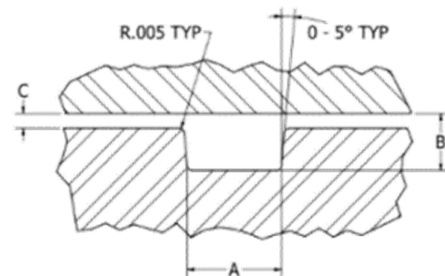
Seal Extrusion Radial Clearance Details

If the radial clearance gap (C on below diagram) between the sealing surface and the groove corners are too large and the pressure exceeds the deformation limit of the 'O' ring, extrusion of the ring material can occur. When this happens, the extruded material wears or frays with cycling and can cause seal failure. There are two possible options to minimise the potential for 'O' ring extrusion.

- Preferably, close the clearance gap (C) by modifying the shaft or housing dimensions, or use backup washers or other anti-extrusion devices.
- Alternatively, use the harder, higher modulus Viton™/FKM core, at the possible expense of higher friction and greater tendency to leak at lower pressure ranges.

Recommended maximum design radial clearance gap to prevent extrusions

Maximum Pressure	
PSI	FEP / Viton®/FKM
100	0.457 mm / 0.018"
250	0.406 mm / 0.016"
500	0.355 mm / 0.014"
750	0.304 mm / 0.012"
1000	0.279 mm / 0.011"
1500	0.228 mm / 0.009"
2000	0.152 mm / 0.006"
3000	0.101 mm / 0.004"



Product Code	Inner Diameter (mm)	Outside Diameter (mm)	Thickness	BS Standard
0732011	5.29	8.85	1.78	BS009
0732012	6.07	9.63	1.78	BS010
0731452	7.65	11.21	1.78	BS011
0731453	9.25	12.81	1.78	BS012
0731454	10.82	14.38	1.78	BS013
0731455	12.42	15.98	1.78	BS014
0731456	14	17.56	1.78	BS015
0731457	15.6	19.16	1.78	BS016
0731458	17.17	20.73	1.78	BS017
0731459	18.77	22.33	1.78	BS018
0731460	20.35	23.91	1.78	BS019
0731461	21.95	25.51	1.78	BS020
0731462	23.52	27.08	1.78	BS021
0731463	25.12	28.68	1.78	BS022
0731464	26.7	30.26	1.78	BS023
0731465	28.3	31.86	1.78	BS024
0731466	29.87	33.43	1.78	BS025
0731467	31.47	35.03	1.78	BS026
0731468	33.05	36.61	1.78	BS027
0731469	34.65	38.21	1.78	BS028
0731470	37.82	41.38	1.78	BS029
0731471	41	44.56	1.78	BS030
0731472	44.17	47.73	1.78	BS031
0731473	47.35	50.91	1.78	BS032
0731474	50.52	54.08	1.78	BS033
0731475	53.7	57.26	1.78	BS034
0731476	56.87	60.43	1.78	BS035
0731477	60.04	63.60	1.78	BS036
0731478	63.22	66.78	1.78	BS037
0731479	66.4	69.96	1.78	BS038
0731480	69.57	73.13	1.78	BS039
0731481	72.75	76.31	1.78	BS040
0732013	75.92	79.48	1.78	BS041
0732014	82.27	85.83	1.78	BS042
0732015	88.62	92.18	1.78	BS043
0732017	94.97	98.53	1.78	BS044
0732018	101.32	104.88	1.78	BS045
0732019	107.67	111.23	1.78	BS046
0732020	114.02	117.58	1.78	BS047
0732021	120.37	123.93	1.78	BS048

Product Code	Inner Diameter (mm)	Outside Diameter (mm)	Thickness	BS Standard
--------------	---------------------	-----------------------	-----------	-------------

0732023	126.72	130.28	1.78	BS049
0732024	133.07	136.63	1.78	BS050
0732025	9.19	14.43	2.62	BS110
0732026	10.77	16.01	2.62	BS111
0732027	12.37	17.61	2.62	BS112
0732028	13.95	19.19	2.62	BS113
0732029	15.54	20.78	2.62	BS114
0732030	17.12	22.36	2.62	BS115
0732031	18.72	23.96	2.62	BS116
0732032	20.29	25.53	2.62	BS117
0732033	21.9	27.14	2.62	BS118
0732034	23.47	28.71	2.62	BS119
0732035	25.07	30.31	2.62	BS120
0732036	26.65	31.89	2.62	BS121
0732037	28.25	33.49	2.62	BS122
0732039	29.82	35.06	2.62	BS123
0732040	31.42	36.66	2.62	BS124
0732041	33	38.24	2.62	BS125
0732042	34.6	39.84	2.62	BS126
0732043	36.17	41.41	2.62	BS127
0731482	37.77	43.01	2.62	BS128
0731483	39.35	44.59	2.62	BS129
0731484	40.95	46.19	2.62	BS130
0731485	42.52	47.76	2.62	BS131
0731486	44.12	49.36	2.62	BS132
0731487	45.7	50.94	2.62	BS133
0731488	17.3	22.54	2.62	BS134
0731489	48.9	54.14	2.62	BS135
0731490	50.47	55.71	2.62	BS136
0731491	52.07	57.31	2.62	BS137
0731492	53.65	58.89	2.62	BS138
0731493	55.25	60.49	2.62	BS139
0731494	56.82	62.06	2.62	BS140
0731495	58.42	63.66	2.62	BS141
0731496	60	65.24	2.62	BS142
0731497	61.6	66.84	2.62	BS143
0731498	63.17	68.41	2.62	BS144
0731499	64.77	70.01	2.62	BS145
0731500	66.35	71.59	2.62	BS146
0731501	67.95	73.19	2.62	BS147
0731587	69.52	74.76	2.62	BS148
0731588	71.12	76.36	2.62	BS149
0731589	72.7	77.94	2.62	BS150
0731590	75.87	81.11	2.62	BS151
0731591	82.22	87.46	2.62	BS152

Product Code	Inner Diameter (mm)	Outside Diameter (mm)	Thickness	BS Standard
--------------	---------------------	-----------------------	-----------	-------------

0731592	88.57	93.81	2.62	BS153
0731593	94.92	100.16	2.62	BS154
0731594	101.27	106.51	2.62	BS155
0731595	107.62	112.86	2.62	BS156
0731597	113.97	119.21	2.62	BS157
0731598	120.32	125.56	2.62	BS158
0731599	126.67	131.91	2.62	BS159
0731600	133.02	138.26	2.62	BS160
0731601	139.37	144.61	2.62	BS161
0731340	145.72	150.96	2.62	BS162
0731341	152.07	157.31	2.62	BS163
0731342	158.42	163.66	2.62	BS164
0731343	164.77	170.01	2.62	BS165
0731345	171.12	176.36	2.62	BS166
0731346	177.47	182.71	2.62	BS167
0731347	183.82	189.06	2.62	BS168
0731348	190.17	195.41	2.62	BS169
0731349	196.52	201.76	2.62	BS170
0731351	202.87	208.11	2.62	BS171
0731694	209.22	214.46	2.62	BS172
0731695	215.57	220.81	2.62	BS173
0731696	221.92	227.16	2.62	BS174
0731698	228.27	233.51	2.62	BS175
0731699	234.62	239.86	2.62	BS176
0731700	240.97	246.21	2.62	BS177
0731701	247.32	252.56	2.62	BS178
0731702	12.29	19.35	3.53	BS206
0731703	13.87	20.93	3.53	BS207
0731705	15.47	22.53	3.53	BS208
0731706	17.04	24.10	3.53	BS209
0731707	18.64	25.70	3.53	BS210
0731708	20.22	27.28	3.53	BS211
0731709	21.82	28.88	3.53	BS212
0731711	23.39	30.45	3.53	BS213
0731712	25	32.06	3.53	BS214
0731713	26.57	33.63	3.53	BS215
0731714	28.17	35.23	3.53	BS216
0731715	29.75	36.81	3.53	BS217
0731716	31.34	38.40	3.53	BS218
0731717	32.92	39.98	3.53	BS219
0731718	34.52	41.58	3.53	BS220
0731719	36.1	43.16	3.53	BS221
0731720	37.7	44.76	3.53	BS222
0731721	40.87	47.93	3.53	BS223
0731722	44.05	51.11	3.53	BS224

Product Code	Inner Diameter (mm)	Outside Diameter (mm)	Thickness	BS Standard
--------------	---------------------	-----------------------	-----------	-------------

0731352	47.22	54.28	3.53	BS225
0731353	50.4	57.46	3.53	BS226
0731354	53.57	60.63	3.53	BS227
0731355	56.75	63.81	3.53	BS228
0731356	59.92	66.98	3.53	BS229
0731357	63.1	70.16	3.53	BS230
0731358	66.27	73.33	3.53	BS231
0731359	69.44	76.50	3.53	BS232
0731360	72.62	79.68	3.53	BS233
0731361	75.79	82.85	3.53	BS234
0731362	78.97	86.03	3.53	BS235
0731363	82.14	89.20	3.53	BS236
0731364	85.32	92.38	3.53	BS237
0731365	88.49	95.55	3.53	BS238
0731367	91.67	98.73	3.53	BS239
0731368	94.84	101.90	3.53	BS240
0731369	98.02	105.08	3.53	BS241
0731370	101.19	108.25	3.53	BS242
0731371	104.37	111.43	3.53	BS243
0731373	107.54	114.60	3.53	BS244
0731374	110.72	117.78	3.53	BS245
0731375	113.89	120.95	3.53	BS246
0731376	117.07	124.13	3.53	BS247
0731377	120.24	127.30	3.53	BS248
0731378	123.42	130.48	3.53	BS249
0731379	126.59	133.65	3.53	BS250
0731380	129.77	136.83	3.53	BS251
0731381	132.94	140.00	3.53	BS252
0731382	136.12	143.18	3.53	BS253
0731383	139.3	146.36	3.53	BS254
0731803	142.47	149.53	3.53	BS255
0731804	145.65	152.71	3.53	BS256
0731806	148.82	155.88	3.53	BS257
0731807	152	159.06	3.53	BS258
0731808	158.35	165.41	3.53	BS259
0731809	164.7	171.76	3.53	BS260
0731810	171.05	178.11	3.53	BS261
0731812	177.4	184.46	3.53	BS262
0731813	183.75	190.81	3.53	BS263
0731814	190.1	197.16	3.53	BS264
0731815	196.45	203.51	3.53	BS265
0731816	202.8	209.86	3.53	BS266
0731817	209.15	216.21	3.53	BS267
0731818	215.5	222.56	3.53	BS268
0731819	221.85	228.91	3.53	BS269

Product Code	Inner Diameter (mm)	Outside Diameter (mm)	Thickness	BS Standard
--------------	---------------------	-----------------------	-----------	-------------

0731820	228.2	235.26	3.53	BS270
0731821	234.55	241.61	3.53	BS271
0731822	240.9	247.96	3.53	BS272
0731921	247.25	254.31	3.53	BS273
0731922	253.6	260.66	3.53	BS274
0731923	266.3	273.36	3.53	BS275
0731924	279	286.06	3.53	BS276
0731925	291.7	298.76	3.53	BS277
0731926	304.4	311.46	3.53	BS278
0731927	329.8	336.86	3.53	BS279
0731929	355.2	362.26	3.53	BS280
0731930	380.6	387.66	3.53	BS281
0731931	405.26	412.32	3.53	BS282
0731932	430.66	437.72	3.53	BS283
0731933	456.06	463.12	3.53	BS284
0731935	23.16	33.82	5.33	BS317
0731936	24.77	35.43	5.33	BS318
0731937	26.34	37.00	5.33	BS319
0731938	27.94	38.60	5.33	BS320
0731939	29.51	40.17	5.33	BS321
0731941	31.12	41.78	5.33	BS322
0731942	32.69	43.35	5.33	BS323
0731943	34.29	44.95	5.33	BS324
0731944	37.47	48.13	5.33	BS325
0731945	40.65	51.31	5.33	BS326
0731946	43.82	54.48	5.33	BS327
0731947	46.99	57.65	5.33	BS328
0731948	50.16	60.82	5.33	BS329
0731949	53.34	64.00	5.33	BS330
0731950	56.52	67.18	5.33	BS331
0731951	59.69	70.35	5.33	BS332
0731384	62.87	73.53	5.33	BS333
0731385	66.04	76.70	5.33	BS334
0731386	69.22	79.88	5.33	BS335
0731387	72.39	83.05	5.33	BS336
0731389	75.57	86.23	5.33	BS337
0731390	78.74	89.40	5.33	BS338
0731391	81.92	92.58	5.33	BS339
0731392	85.09	95.75	5.33	BS340
0731393	88.27	98.93	5.33	BS341
0731395	91.44	102.10	5.33	BS342
0731396	94.62	105.28	5.33	BS343
0731397	97.79	108.45	5.33	BS344
0731398	100.96	111.62	5.33	BS345
0731399	104.14	114.80	5.33	BS346

Product Code	Inner Diameter (mm)	Outside Diameter (mm)	Thickness	BS Standard
--------------	---------------------	-----------------------	-----------	-------------

0731400	107.32	117.98	5.33	BS347
0731402	110.49	121.15	5.33	BS348
0731403	113.67	124.33	5.33	BS349
0731404	116.84	127.50	5.33	BS350
0731405	120.02	130.68	5.33	BS351
0731406	123.19	133.85	5.33	BS352
0731407	126.37	137.03	5.33	BS353
0731408	129.54	140.20	5.33	BS354
0731409	132.72	143.38	5.33	BS355
0731410	135.89	146.55	5.33	BS356
0731411	139.07	149.73	5.33	BS357
0731412	142.24	152.90	5.33	BS358
0731413	145.42	156.08	5.33	BS359
0731414	148.59	159.25	5.33	BS360
0731415	151.77	162.43	5.33	BS361
0731416	158.12	168.78	5.33	BS362
0731952	164.47	175.13	5.33	BS363
0731953	170.82	181.48	5.33	BS364
0731954	177.17	187.83	5.33	BS365
0731955	183.52	194.18	5.33	BS366
0731503	189.87	200.53	5.33	BS367
0731504	196.22	206.88	5.33	BS368
0731505	202.57	213.23	5.33	BS369
0731506	208.92	219.58	5.33	BS370
0731507	215.27	225.93	5.33	BS371
0731508	221.62	232.28	5.33	BS372
0731509	227.97	238.63	5.33	BS373
0731510	234.32	244.98	5.33	BS374
0731511	240.67	251.33	5.33	BS375
0731512	247.02	257.68	5.33	BS376
0731602	253.37	264.03	5.33	BS377
0731604	266.07	276.73	5.33	BS378
0731605	278.77	289.43	5.33	BS379
0731606	291.47	302.13	5.33	BS380
0731607	304.17	314.83	5.33	BS381
0731608	329.57	340.23	5.33	BS382
0731609	354.97	365.63	5.33	BS383
0731610	380.37	391.03	5.33	BS384
0731611	405.26	415.92	5.33	BS385
0731612	430.66	441.32	5.33	BS386
0731613	456.06	466.72	5.33	BS387
0731614	481.46	492.12	5.33	BS388
0731615	506.86	517.52	5.33	BS389
0731616	532.26	542.92	5.33	BS390
0731617	557.66	568.32	5.33	BS391

Product Code	Inner Diameter (mm)	Outside Diameter (mm)	Thickness	BS Standard
--------------	---------------------	-----------------------	-----------	-------------

0731618	582.7	593.36	5.33	BS392
0731620	608.1	618.76	5.33	BS393
0731621	633.5	644.16	5.33	BS394
0731622	658.9	669.56	5.33	BS395
0731623	113.67	127.65	6.99	BS425
0731624	116.84	130.82	6.99	BS426
0731626	120.02	134.00	6.99	BS427
0731627	123.19	137.17	6.99	BS428
0731628	126.37	140.35	6.99	BS429
0731629	129.54	143.52	6.99	BS430
0731630	132.72	146.70	6.99	BS431
0731632	135.89	149.87	6.99	BS432
0731633	139.07	153.05	6.99	BS433
0731513	142.24	156.22	6.99	BS434
0731514	145.42	159.40	6.99	BS435
0731515	148.59	162.57	6.99	BS436
0731516	151.77	165.75	6.99	BS437
0731517	158.12	172.10	6.99	BS438
0731519	164.47	178.45	6.99	BS439
0731520	170.82	184.80	6.99	BS440
0731521	177.17	191.15	6.99	BS441
0731522	183.52	197.50	6.99	BS442
0731523	189.87	203.85	6.99	BS443
0731525	196.22	210.20	6.99	BS444
0731526	202.57	216.55	6.99	BS445
0731527	215.27	229.25	6.99	BS446
0731528	227.97	241.95	6.99	BS447
0731529	240.67	254.65	6.99	BS448
0731531	253.37	267.35	6.99	BS449
0731532	266.07	280.05	6.99	BS450
0731533	278.77	292.75	6.99	BS451
0731534	291.47	305.45	6.99	BS452
0731535	304.17	318.15	6.99	BS453
0731536	316.87	330.85	6.99	BS454
0731537	329.57	343.55	6.99	BS455
0731538	342.27	356.25	6.99	BS456
0731539	354.97	368.95	6.99	BS457
0731540	367.67	381.65	6.99	BS458
0731541	380.37	394.35	6.99	BS459
0731542	393.08	407.06	6.99	BS460
0731543	405.26	419.24	6.99	BS461
0731544	417.96	431.94	6.99	BS462
0731545	430.66	444.64	6.99	BS463
0731634	443.36	457.34	6.99	BS464
0731635	456.06	470.04	6.99	BS465

Product Code	Inner Diameter (mm)	Outside Diameter (mm)	Thickness	BS Standard
--------------	---------------------	-----------------------	-----------	-------------

0731636	468.76	482.74	6.99	BS466
0731637	481.46	495.44	6.99	BS467
0731638	494.16	508.14	6.99	BS468
0731639	506.86	520.84	6.99	BS469
0731640	532.26	546.24	6.99	BS470
0731641	557.66	571.64	6.99	BS471
0731642	582.7	596.68	6.99	BS472
0731643	608.1	622.08	6.99	BS473
0731644	633.5	647.48	6.99	BS474
0731645	658.9	672.88	6.99	BS475