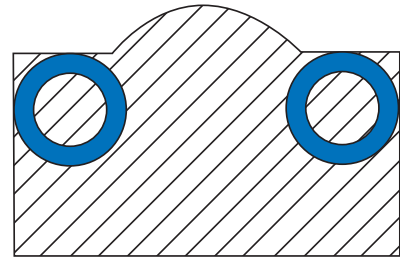


# SPRING SEALS

FREUDENBERG  
OIL & GAS TECHNOLOGIES

 **FREUDENBERG**  
INNOVATING TOGETHER

# SPRING SEALS



Freudenberg Oil & Gas Technologies' Spring Seals are mostly used in stab and static applications for high cyclic pressure and temperature peaks of up to 15,000 psi (1034 bar) and 210 °C (410 °F) or higher depending on housing design and material choice.

Traditional sealing solutions cannot provide adequate safety here. The integrated spiral spring ensures high pressure resilience, excellent resistance to rolling and bunching and simple fitting. A standard range designed to suit AS668B O-ring housings is available to be retrofitted into original O-ring grooves in three standard lengths. Used for many oil and gas applications like wellheads, downhole and surface equipment, Freudenberg Oil & Gas Technologies' Spring Seals are supplied in a wide range of materials. Custom sizes are also available.

## Available in a wide range of first-class materials

Spring Seals from Freudenberg Oil & Gas Technologies are available in commercial grades like NBR, HNBR, FKM and our high performance GAZGUARD® grades, engineered to offer superior performance. This includes Norsok M-710 RGD, Norsok M-710 sour gas and ISO 10423 (API 6A) chemical ageing immersion and fixture testing and ISO 10423 F.1.11 pressure and thermal cycling testing.

seal nominal section		groove length/axial depth			groove radial width		total diametrical extrusion clearance		corner radii			
							spring seal		internal		external	
inch	mm		inch	mm	inch	mm	inch	mm	inch	mm	inch	mm
0.103	2.62	long	0.260 0.256	6.6 6.5	0.094 0.091	2.39 2.31	0.008	0.20	0.031	0.80	0.010 0.005	0.25 0.13
		medium	0.201 0.197	5.1 5.0			N/A					
		short	0.146 0.138	3.7 3.5			N/A					
0.139	3.53	long	0.311 0.303	7.9 7.7	0.125 0.122	3.18 3.10	0.012	0.30	0.031	0.80	0.010 0.005	0.25 0.13
		medium	0.252 0.244	6.4 6.2			N/A					
		short	0.193 0.185	4.9 4.7			N/A					
0.210	5.33	long	0.425 0.417	10.8 10.6	0.188 0.184	4.78 4.67	0.014	0.35	0.031	0.80	0.010 0.005	0.25 0.13
		medium	0.354 0.346	9.0 8.8								
		short	0.283 0.276	7.2 7.0								
0.275	6.99	long	0.583 0.575	14.8 14.6	0.250 0.245	6.35 6.22	0.016	0.40	0.031	0.80	0.010 0.005	0.25 0.13
		medium	0.480 0.472	12.2 12.0								
		short	0.378 0.370	9.6 9.4								

## Housing Dimensions

AS 568B Ref.	housing dimensions			
	inch		mm	
	external	internal	external	internal
<b>0.103" (2.62 mm) nominal section seal</b>				
116	0.938	0.750	23.81	19.05
117	1.000	0.813	25.40	20.64
118	1.063	0.875	26.99	22.23
119	1.125	0.938	28.58	23.81
120	1.188	1.000	30.16	25.40
121	1.250	1.063	31.75	26.99
122	1.313	1.125	33.34	28.58
123	1.375	1.188	34.93	30.16
124	1.438	1.250	36.51	31.75
125	1.500	1.313	38.10	33.34
126	1.563	1.375	39.69	34.93
127	1.625	1.438	41.28	36.51
128	1.688	1.500	42.86	38.10
129	1.750	1.563	44.45	39.69
130	1.813	1.625	46.04	41.28
131	1.875	1.688	47.63	42.86
132	1.938	1.750	49.21	44.45
133	2.000	1.813	50.80	46.04
134	2.063	1.875	52.39	47.63
135	2.125	1.938	53.98	49.21
136	2.188	2.000	55.56	50.80
137	2.250	2.063	57.15	52.39
138	2.313	2.125	58.74	53.98
139	2.375	2.188	60.33	55.56
140	2.438	2.250	61.91	57.15
141	2.500	2.313	63.50	58.74
142	2.563	2.375	65.09	60.33
143	2.625	2.438	66.68	61.91
144	2.688	2.500	68.26	63.50
145	2.750	2.563	69.85	65.09
146	2.813	2.625	71.44	66.68
147	2.875	2.688	73.03	68.26

AS 568B Ref.	housing dimensions			
	inch		mm	
	external	internal	external	internal
148	2.938	2.750	74.61	69.85
149	3.000	2.813	76.20	71.44
150	3.063	2.875	77.79	73.03
151	3.188	3.000	80.970	76.200
641	3.250	3.063	82.550	77.800
642	3.375	3.188	85.730	80.97
152	3.438	3.250	87.330	82.550
643	3.500	3.312	88.900	84.120
153	3.688	3.500	93.680	88.900
154	3.938	3.750	100.030	95.250
155	4.188	4.000	106.380	101.600
156	4.438	4.250	112.730	107.950
157	4.688	4.500	119.080	114.300
158	4.938	4.750	125.430	120.650
<b>0.139" (3.53 mm) nominal section seal</b>				
210	1.000	0.750	25.40	19.05
211	1.063	0.813	26.99	20.64
212	1.125	0.875	28.58	22.23
213	1.188	0.938	30.16	23.81
214	1.250	1.000	31.75	25.40
215	1.313	1.063	33.34	26.99
216	1.375	1.125	34.93	28.58
217	1.438	1.188	36.51	30.16
218	1.500	1.250	38.10	31.75
219	1.563	1.313	39.69	33.34
220	1.625	1.375	41.28	34.93
221	1.688	1.438	42.86	36.51
222	1.750	1.500	44.45	38.10
223	1.875	1.625	47.63	41.28
224	2.000	1.750	50.80	44.45
827	2.047	1.732	52.00	44.00
828	2.063	1.813	52.39	46.04
225	2.125	1.875	53.98	47.63
829	2.165	1.850	55.00	47.00
830	2.188	1.938	55.56	49.21
226	2.250	2.000	57.15	50.80
831	2.281	2.031	57.940	51.590
832	2.313	2.063	58.74	52.39

## Housing Dimensions

AS 568B Ref.	housing dimensions			
	inch		mm	
	external	internal	external	internal
227	2.375	2.125	60.33	53.98
833	2.441	2.126	62.00	54.00
834	2.438	2.188	61.91	55.56
228	2.500	2.250	63.50	57.15
835	2.531	2.281	64.290	57.930
836	2.563	2.313	65.09	58.74
229	2.625	2.375	66.68	60.33
837	2.677	2.362	68.00	60.00
838	2.688	2.438	68.26	61.91
230	2.750	2.500	69.85	63.50
839	2.795	2.480	71.00	63.00
840	2.813	2.563	71.44	65.09
231	2.875	2.625	73.03	66.68
841	2.913	2.598	74.00	66.00
842	2.938	2.688	74.61	68.26
232	3.000	2.750	76.20	69.85
843	3.031	2.717	77.00	69.00
844	3.063	2.813	77.79	71.44
233	3.125	2.875	79.38	73.03
845	3.189	2.835	81.00	72.00
846	3.188	2.938	80.96	74.61
234	3.250	3.000	82.55	76.20
235	3.375	3.125	85.73	79.38
236	3.500	3.250	88.90	82.55
237	3.625	3.375	92.08	85.73
238	3.750	3.500	95.25	88.90
239	3.875	3.625	98.43	92.08
240	4.000	3.750	101.60	95.25
241	4.125	3.875	104.78	98.43
242	4.250	4.000	107.95	101.60
243	4.375	4.125	111.13	104.78
244	4.500	4.250	114.30	107.95
245	4.625	4.375	117.48	111.13
246	4.750	4.500	120.65	114.30
247	4.875	4.625	123.83	117.48
248	5.000	4.750	127.00	120.65
249	5.125	4.875	130.18	123.83
250	5.250	5.000	133.35	127.00
251	5.375	5.125	136.53	130.18
252	5.500	5.250	139.70	133.35
253	5.625	5.375	142.88	136.53
254	5.750	5.500	146.05	139.70
255	5.875	5.625	149.23	142.88
256	6.000	5.750	152.40	146.05
257	6.125	5.875	155.58	149.23

AS 568B Ref.	housing dimensions			
	inch		mm	
	external	internal	external	internal
258	6.250	6.000	158.75	152.40
259	6.500	6.250	165.100	158.750
260	6.750	6.500	171.450	165.100
261	7.000	6.750	177.800	171.450
262	7.250	7.000	184.150	177.800
263	7.500	7.250	190.500	184.150
264	7.750	7.500	196.850	190.500
265	8.000	7.750	203.200	196.850
<b>0.210" (5.33 mm) nominal section seal</b>				
325	1.875	1.500	47.63	38.10
325A	1.938	1.563	49.21	39.69
326	2.000	1.625	50.80	41.28
326A	2.063	1.688	52.39	42.86
327	2.125	1.750	53.98	44.45
328	2.250	1.875	57.15	47.63
329	2.375	2.000	60.33	50.80
330	2.500	2.125	63.50	53.98
330A	2.563	2.188	65.09	55.56
331	2.625	2.250	66.68	57.15
332	2.750	2.375	69.85	60.33
333	2.875	2.500	73.03	63.50
334	3.000	2.625	76.20	66.68
335	3.125	2.750	79.38	69.85
335A	3.188	2.813	80.96	71.44
336	3.250	2.875	82.55	73.03
337	3.375	3.000	85.73	76.20
338	3.500	3.125	88.90	79.38
339	3.625	3.250	92.08	82.55
340	3.750	3.375	95.25	85.73
341	3.875	3.500	98.43	88.90
342	4.000	3.625	101.60	92.08
343	4.125	3.750	104.78	95.25
344	4.250	3.875	107.95	98.43
345	4.375	4.000	111.13	101.60
346	4.500	4.125	114.30	104.78
347	4.625	4.250	117.48	107.95
348	4.750	4.375	120.65	111.13
349	4.875	4.500	123.83	114.30
350	5.000	4.625	127.00	117.48
351	5.125	4.750	130.18	120.65
861	5.197	4.822	132.000	122.480
352	5.250	4.875	133.35	123.83
862	5.315	4.882	135.00	124.00
353	5.375	5.000	136.53	127.00
863	5.433	5.000	138.00	127.00

## Housing Dimensions

AS 568B Ref.	housing dimensions			
	inch		mm	
	external	internal	external	internal
354	5.500	5.125	139.70	130.18
864	5.551	5.118	141.00	130.00
355	5.625	5.250	142.88	133.35
865	5.709	5.236	145.00	133.00
356	5.750	5.375	146.05	136.53
866	5.827	5.452	148.000	138.480
357	5.875	5.500	149.23	139.70
867	5.945	5.512	151.00	140.00
358	6.000	5.625	152.40	142.88
868	6.102	5.630	155.00	143.00
359	6.125	5.750	155.58	146.05
869	6.220	5.748	158.00	146.00
360	6.250	5.875	158.75	149.23
870	6.378	5.866	162.00	149.00
361	6.375	6.000	161.93	152.40
644	6.500	6.125	165.10	155.58
362	6.625	6.250	168.28	158.75
645	6.750	6.375	171.45	161.93
363	6.875	6.500	174.63	165.10
646	7.000	6.625	177.80	168.28
364	7.125	6.750	180.98	171.45
647	7.250	6.875	184.15	174.63
365	7.375	7.000	187.33	177.80
366	7.625	7.250	193.68	184.15
367	7.875	7.500	200.03	190.50
368	8.125	7.750	206.38	196.85
369	8.375	8.000	212.73	203.20
370	8.625	8.250	219.080	209.550
371	8.875	8.500	225.430	215.900
372	9.125	8.750	231.780	222.250
373	9.375	9.000	238.130	228.600
374	9.625	9.250	244.480	234.950
375	9.875	9.500	250.830	241.300
376	10.125	9.750	257.180	247.650
377	10.375	10.000	263.530	254.000
378	10.875	10.500	276.230	266.700
379	11.375	11.000	288.930	279.400
380	11.875	11.500	301.630	292.100
381	12.375	12.000	314.330	304.800
382	13.375	13.000	339.730	330.200
<b>0.275" (6.99 mm) nominal section seal</b>				
425	5.000	4.500	127.00	114.30
624	5.063	4.563	128.59	115.89
426	5.125	4.625	130.18	117.48
427	5.250	4.750	133.35	120.65

AS 568B Ref.	housing dimensions			
	inch		mm	
	external	internal	external	internal
428	5.375	4.875	136.53	123.83
625	5.438	4.938	138.11	125.41
429	5.500	5.000	139.70	127.00
430	5.625	5.125	142.88	130.18
431	5.750	5.250	146.05	133.35
626	5.813	5.313	147.64	134.94
432	5.875	5.375	149.23	136.53
433	6.000	5.500	152.40	139.70
434	6.125	5.625	155.58	142.88
435	6.250	5.750	158.75	146.05
436	6.375	5.875	161.93	149.23
437	6.500	6.000	165.10	152.40
872	6.625	6.125	168.28	155.58
438	6.750	6.250	171.45	158.75
627	6.813	6.313	173.04	160.34
874	6.875	6.375	174.63	161.93
439	7.000	6.500	177.80	165.10
628	7.063	6.563	179.39	166.69
876	7.125	6.625	180.98	168.28
439B	7.188	6.688	182.56	169.86
440	7.250	6.750	184.15	171.45
878	7.375	6.875	187.33	174.63
441	7.500	7.000	190.50	177.80
880	7.625	7.125	193.68	180.98
442	7.750	7.250	196.85	184.15
882	7.875	7.375	200.03	187.33
443	8.000	7.500	203.20	190.50
884	8.125	7.625	206.38	193.68
444	8.250	7.750	209.55	196.85
886	8.375	7.875	212.73	200.03
445	8.500	8.000	215.90	203.20
445M	8.625	8.125	219.075	206.375
445A	8.750	8.250	222.25	209.55
445B	8.875	8.375	225.43	212.73
446	9.000	8.500	228.60	215.90
446M	9.125	8.625	231.78	219.08
446A	9.250	8.750	234.95	222.25
446B	9.375	8.875	238.13	225.43
447	9.500	9.000	241.30	228.60
447M	9.625	9.125	244.48	231.78
447A	9.750	9.250	247.65	234.95
447B	9.875	9.375	250.83	238.13
448	10.000	9.500	254.00	241.30
448M	10.125	9.625	257.18	244.48
448A	10.250	9.750	260.35	247.65
449	10.500	10.000	266.70	254.00

## Housing Dimensions

AS 568B Ref.	housing dimensions			
	inch		mm	
	external	internal	external	internal
449M	10.625	10.125	269.875	257.175
449A	10.750	10.250	273.05	260.35
449B	10.875	10.375	276.23	263.53
450	11.000	10.500	279.40	266.70
450A	11.250	10.750	285.75	273.05
450B	11.375	10.875	288.93	276.23
451	11.500	11.000	292.10	279.40
451M	11.625	11.125	295.275	282.575
451A	11.750	11.250	298.45	285.75
451B	11.875	11.375	301.625	288.925
452	12.000	11.500	304.80	292.10
452M	12.125	11.625	307.98	295.28
452A	12.250	11.750	311.15	298.45
453	12.500	12.000	317.50	304.80
648	12.750	12.250	323.85	311.15
453B	12.875	12.375	327.03	314.33
454	13.000	12.500	330.20	317.50
454M	13.125	12.625	333.38	320.68
649	13.250	12.750	336.55	323.85
455	13.500	13.000	342.90	330.20
455B	13.875	13.375	352.425	339.725
650	13.750	13.250	349.25	336.55
456	14.000	13.500	355.60	342.90
456M	14.125	13.625	358.775	346.075
456A	14.250	13.750	361.95	349.25
457	14.500	14.000	368.30	355.60

AS 568B Ref.	housing dimensions			
	inch		mm	
	external	internal	external	internal

457M	14.625	14.125	371.475	358.775
457A	14.750	14.250	374.650	261.950
457B	14.875	14.375	377.83	365.13
458	15.000	14.500	381.00	368.30
458A	15.250	14.750	387.350	374.650
460	16.000	15.500	406.40	393.70
460A	16.250	15.750	412.75	400.05
461	16.500	16.000	419.10	406.40
461B	16.875	16.375	428.63	415.93
462	17.000	16.500	431.80	419.10
463	17.500	17.000	444.50	431.80
464	18.000	17.500	457.20	444.50
465	18.500	18.000	469.90	457.20
466	19.000	18.500	482.60	469.90
466A	19.250	18.750	488.95	476.25
466B	19.375	18.875	492.13	479.43
467	19.500	19.000	495.30	482.60
468	20.000	19.500	508.00	495.30
469	20.500	20.000	520.70	508.00
469A	21.000	20.500	533.400	520.700
470	21.500	21.000	546.10	533.40
471	22.500	22.000	571.50	558.80
472	23.500	23.000	596.90	584.20
473	24.500	24.000	622.30	609.60
474	25.500	25.000	647.70	635.00
475	26.500	26.000	673.10	660.40

product type	finished part drawing reference	size reference	housing length	compound type examples	anti extrusion element	example
spring seal	SPE = external bulge seal SPI = internal bulge seal	AS 568 Size nomenclature 100, 200, 300 and 400 series 2.62 through to 6.99 section non standards have A 700 series number	-1 short housing -2 medium housing -3 long housing	-702= Gazguard 702 HNBR -713= Gazguard 713 LT HNBR -026= Gazguard 026 FKM -029= Gazguard 029 LT FKM -728= Gazguard 728 LT HNBR -707= 90 HNBR RGD -031= 90 FKM RGD	-1= stainless steel -2= inconel 600 -3= PEEK 450G	<b>SPE-445-3-702-1</b> external seal AS 568-445 size, long housing in Gazguard 702 with stainless steel springs