



FLUOROCARBON MECHANICAL SEAL DIVISION

RACO FACE SEALS

SERIES 1100

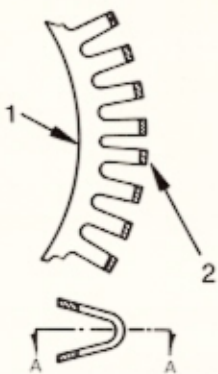


Raco Face Seal Features

- Positive Cryogenic sealing
- Chemically inert cover
—423°F to 500°F service.
- High spring resiliency
- High unit loading of sealing surfaces.
- Pressure actuated design
- Vacuum to high pressures
- Unlimited shelf life

Raco Face Type Stamped Spring

The Raco spring differs from all other seal springs in that it has a continuous loading lip (1). Slots (2) located in the middle of the strip do not reach the spring's edge. This design feature creates an uninterrupted, high unit load sealing surface essential for low temperature sealing.



The Raco Face Seal is a pressure actuated, spring energized device for use in flange sealing and similar axial squeeze applications. The "Raco's" "U" shaped Teflon® cover is actuated by a unique, "U" shaped spring with a continuous high unit loading surface. These features assure positive, leak tight sealing in cryogenic and other low temperature service. The Raco concept accepts moderate deflection or gland separation and requires very low bolt or flange loads to affect a seal (typically 20 to 50 pounds per inch of circumference).

Design features which make the "Raco" an excellent low temperature seal lend themselves to efficient vacuum and other positive exclusion sealing service.

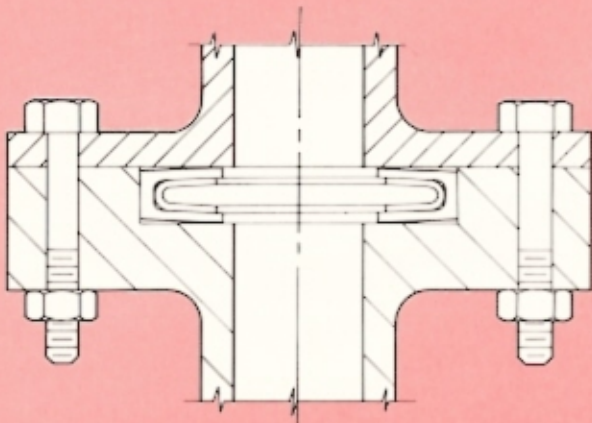
The combination of Teflon® cover and stainless steel spring make the seal virtually inert to all materials it may be required to seal.

Raco Face Seals are available in both internal and external pressure versions.

Standard Raco Cross Sections

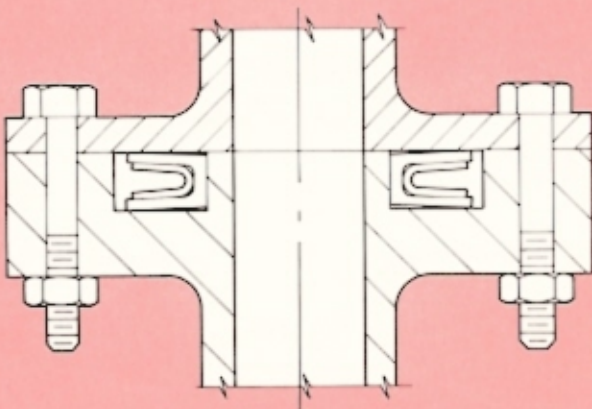
Raco Inside Face Seal (Internal Pressure)

Series 1160 (3/32"), 1170 (1/8"), 1180 (3/16"),
1190 (1/4")



Raco Outside Face Seal (External Pressure/Vacuum)

Series 1161 (3/32"), 1171 (1/8"), 1181 (3/16"),
1191 (1/4")



Part Numbering System

Gland Dimensions

1180-334-1-0

Flange Face Seal

1160 1170 1180 1190
1161 1171 1181 1191

1. Seal Type

2. Size Dash Number

3. Cover Material

4. Spring Material

1. The first four numbers indicate the basic seal type:

Inside Face Type

1160 3/32" Nom. Cross Section

1170 1/8" Nom. Cross Section

1180 3/16" Nom. Cross Section

1190 1/4" Nom. Cross Section

Outside Face Type

1161 3/32" Nom. Cross Section

1171 1/8" Nom. Cross Section

1181 3/16" Nom. Cross Section

1191 1/4" Nom. Cross Section

2. The next three numbers indicate the seal size dash number. See tabulations on pages 3 thru 7.

3. This number indicates the seal cover material.

P/N Code

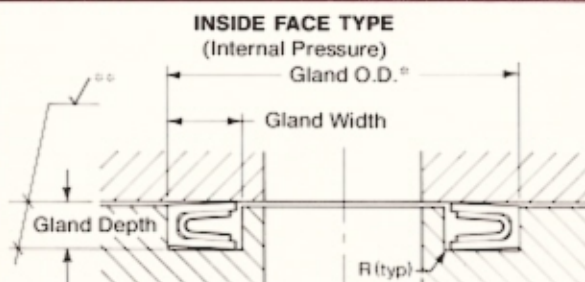
- 1 Virgin TFE (Teflon)
- 3 Fluoroloy SL
- 6 80% TFE, 15% Glass
5% Moly Disulfide
- 7 FEP (Teflon)
- 8 Fluoroloy G
- 9 Fluoroloy X
- 10 Fluoroloy K
- 12 85% TFE, 15% Graphite
- 14 Fluorogold
- 17 Kel-F

4. The last dash number indicates spring material.

P/N Code

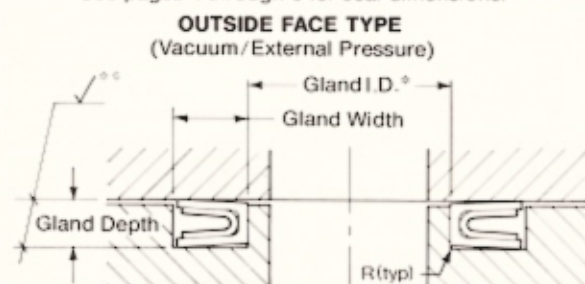
- 0 301 S.S. Standard (Recommended for most applications)
- 1 301 S.S. Heavy
- 2 Inconel—718 Standard
- 3 Inconel—718 Heavy

Consult factory for other cover and spring materials.



*Gland O.D. is equal to maximum seal O.D. + .010-.000.

See pages 4 through 6 for seal dimensions.



*Gland I.D. is equal to minimum seal I.D. + .000-.010.

See pages 4 through 6 for seal dimensions.

Size Dash No.	Nom. Cross-Section	Gland Width	Gland Depth	R
110 thru 149	3/32	.141 Min.	.089/.091	.005/.015
210 thru 281	1/8	.188 Min.	.121/.123	.005/.025
322 thru 384	3/16	.281 Min.	.186/.188	.005/.030
417 thru 460	1/4	.375 Min.	.238/.241	.005/.030

HARDWARE SURFACE FINISH RECOMMENDATIONS

Fluid Being Sealed	Surface Finish	
	Dynamic Surface	Static Surface
CRYOGENICS		4 to 8 RMS
HELIUM GAS	4 to 8	6 to 12
HYDROGEN GAS	RMS	RMS
FREON		
AIR		
NITROGEN GAS	6 to 16	12 to 32
ARGON GAS	RMS	RMS
NATURAL GAS		
FUEL		
(Aircraft, Automotive)		
WATER		
HYDRAULIC OIL	8 to 16	16 to 63
CRUDE OIL	RMS	RMS
SEALANTS		

32 RMS is standard surface finish recommended for most static sealing applications. The table above lists exceptions to the standard. The "lay" of surfaces for static face seals must be concentric.

RACO

Flange Face Seal

1160

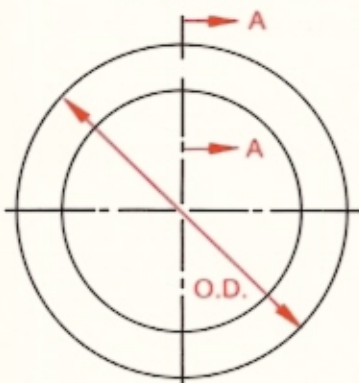
1170

1180

1190

Internal Pressure

Size measurement
is to the O.D.



Example for Ordering

1180 -XXX -X-X

1. Seal Type

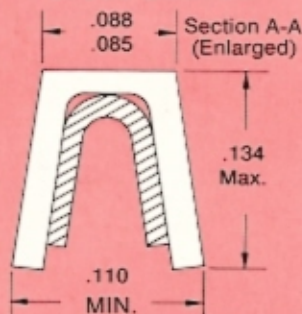
2. Size Dash Number

3. Cover Material
(See Page 3)

4. Spring Material
(See Page 3)

1160

3/32" Nominal Cross Section

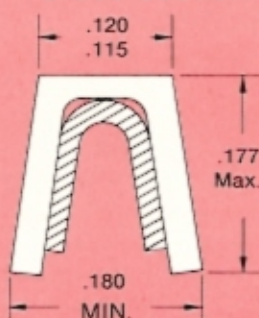


Size Dash Seal O.D.
Number (+.000 -.010)

110	.562
111	.625
112	.687
113	.750
114	.812
115	.875
116	.937
117	1.000
118	1.062
119	1.125
120	1.187
121	1.250
122	1.312
123	1.375
124	1.437
125	1.500
126	1.562
127	1.625
128	1.687
129	1.750
130	1.812
131	1.875
132	1.937
133	2.000
134	2.062
135	2.125
136	2.187
137	2.250
138	2.312
139	2.375
140	2.437
141	2.500
142	2.562
143	2.625
144	2.687
145	2.750
146	2.812
147	2.875
148	2.937
149	3.000

1170

1/8" Nominal Cross Section



Size Dash Seal O.D.
Number (+.000 -.010)

210	1.000
211	1.062
212	1.125
213	1.187
214	1.250
215	1.312
216	1.375
217	1.437
218	1.500
219	1.562
220	1.625
221	1.687
222	1.750
223	1.875
224	2.000
225	2.125
226	2.250
227	2.375
228	2.500
229	2.625
230	2.750
231	2.875
232	3.000
233	3.125
234	3.250
235	3.375
236	3.500
237	3.625
238	3.750
239	3.875
240	4.000
241	4.125
242	4.250
243	4.375
244	4.500
245	4.625
246	4.750
247	4.875
248	5.000
249	5.125
250	5.250
251	5.375
252	5.500
253	5.625
254	5.750
255	5.875
256	6.000
257	6.125
258	6.250
259	6.500
260	6.750
261	7.000
262	7.250
263	7.500
264	7.750
265	8.000
266	8.250
267	8.500
268	8.750
269	9.000
270	9.250
271	9.500

Note:

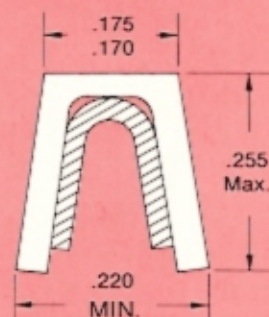
1. If space permits, use the larger cross-sections listed above.
2. Diameters between those listed in these tables and larger diameters are available. Consult factory for details.

(1/8" Cross Section Continued.)

272	9.750
273	10.000
274	10.250
275	10.750
276	11.250
277	11.750
278	12.250
279	12.750
280	13.250
281	13.750

1180

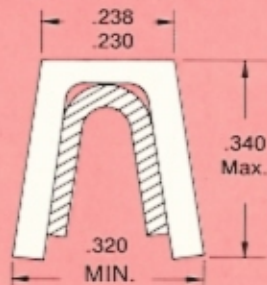
3/16" Nominal Cross Section



Size Dash Seal O.D.
Number (+.000 -.010)

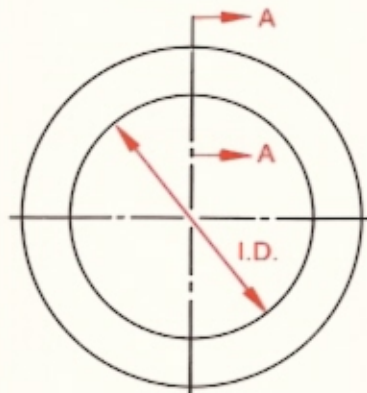
322	1.500
323	1.625
324	1.750
325	1.875
326	2.000
327	2.125
328	2.250
329	2.375
330	2.500
331	2.625
332	2.750
333	2.875
334	3.000
335	3.125
336	3.250
337	3.375
338	3.500
339	3.625
340	3.750
341	3.875
342	4.000
343	4.125
344	4.250
345	4.375
346	4.500
347	4.625
348	4.750
349	4.875
350	5.000
351	5.125
352	5.250
353	5.375
354	5.500
355	5.625
356	5.750
357	5.875
358	6.000
359	6.125
360	6.250
361	6.500
362	6.750
363	7.000
364	7.250
365	7.500
366	7.750
367	8.000
368	8.250

369	8.500
370	8.750
371	9.000
372	9.250
373	9.500
374	9.750
375	10.000
376	10.250
377	10.500
378	10.750
379	11.000
380	11.500
381	12.000
382	12.500
383	13.000
384	13.500

1190**1/4" Nominal
Cross Section**

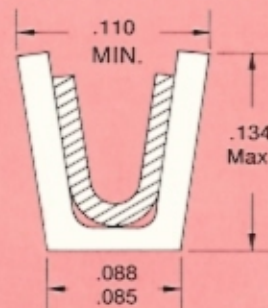
Size Dash Seal O.D.
Number (+.000 -.010)

417	4.000
418	4.125
419	4.250
420	4.375
421	4.500
422	4.625
423	4.750
424	4.875
425	5.000
426	5.125
427	5.250
428	5.375
429	5.500
430	5.625
431	5.750
432	5.875
433	6.000
434	6.125
435	6.250
436	6.375
437	6.500
438	6.750
439	7.000
440	7.250
441	7.500
442	7.750
443	8.000
444	8.250
445	8.500
446	9.000
447	9.500
448	10.000
449	10.500
450	11.000
451	11.500
452	12.000
453	12.500
454	13.000
455	13.500
456	14.000
457	14.500
458	15.000
459	15.500
460	16.000

RACO**Flange Face
Seal****1161****1171****1181****1191****Vacuum/External
Pressure**Size measurement
is to the I.D.**Example for Ordering****1161 -XXX-X-X**

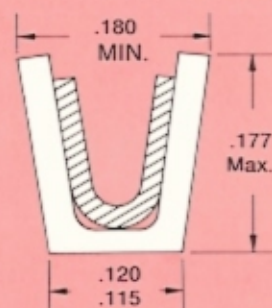
1. Seal Type

2. Size Dash Number

3. Cover Material
(See Page 3)4. Spring Material
(See Page 3)**1161****3/32" Nominal
Cross Section**

Size Dash Seal I.D.
Number (+.010 -.000)

110	.375
111	.437
112	.500
113	.562
114	.625
115	.687
116	.750
117	.812
118	.875
119	.937
120	1.000
121	1.062
122	1.125
123	1.187
124	1.250
125	1.312
126	1.375
127	1.437
128	1.500
129	1.562
130	1.625
131	1.687
132	1.750
133	1.812
134	1.875
135	1.937
136	2.000
137	2.062
138	2.125
139	2.187
140	2.250
141	2.312
142	2.375
143	2.437
144	2.500
145	2.562
146	2.625
147	2.687
148	2.750
149	2.812

1171**1/8" Nominal
Cross Section**

Size Dash Seal I.D.
Number (+.010 -.000)

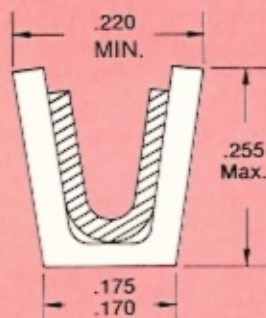
210	.750
211	.812
212	.875
213	.937
214	1.000
215	1.062
216	1.125
217	1.187
218	1.250
219	1.312
220	1.375
221	1.437
222	1.500
223	1.625
224	1.750
225	1.875
226	2.000
227	2.125
228	2.250
229	2.375
230	2.500
231	2.625
232	2.750
233	2.875
234	3.000
235	3.125
236	3.250
237	3.375
238	3.500
239	3.625
240	3.750
241	3.875
242	4.000
243	4.125
244	4.250
245	4.375
246	4.500
247	4.625
248	4.750
249	4.875
250	5.000
251	5.125
252	5.250
253	5.375
254	5.500
255	5.625
256	5.750
257	5.875
258	6.000
259	6.250
260	6.500
261	6.750
262	7.000
263	7.250
264	7.500
265	7.750
266	8.000
267	8.250
268	8.500
269	8.750
270	9.000
271	9.250

Note:

1. If space permits, use the larger cross-sections listed above.
2. Diameters between those listed in these tables and larger diameters are available. Consult factory for details.

(1/8" Cross Section Continued.)

272	9.500
273	9.750
274	10.000
275	10.500
276	11.000
277	11.500
278	12.000
279	12.500
280	13.000
281	13.500

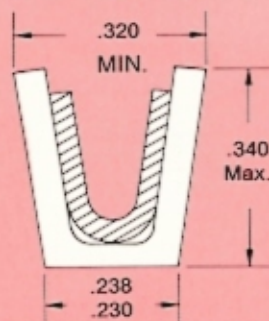
1181**3/16 Nominal
Cross Section**

Size Dash Number	Seal I.D. (+.010 -.000)
------------------	-------------------------

319	.875
320	.937
321	1.000
322	1.125
323	1.250
324	1.375
325	1.500
326	1.625
327	1.750
328	1.875
329	2.000
330	2.125
331	2.250
332	2.375
333	2.500
334	2.625

(3/16" Cross Section Continued.)

335	2.750
336	2.875
337	3.000
338	3.125
339	3.250
340	3.375
341	3.500
342	3.625
343	3.750
344	3.875
345	4.000
346	4.125
347	4.250
348	4.375
349	4.500
350	4.625
351	4.750
352	4.875
353	5.000
354	5.125
355	5.250
356	5.375
357	5.500
358	5.625
359	5.750
360	5.875
361	6.000
362	6.125
363	6.250
364	6.500
365	6.750
366	7.000
367	7.250
368	7.500
369	7.750
370	8.000
371	8.250
372	8.500
373	8.750
374	9.000
375	9.250
376	9.500
377	9.750
378	10.000
379	10.250
380	10.500
381	10.750
382	11.000
383	11.500
384	12.000

1191**1/4" Nominal
Cross Section**

Size Dash Number	Seal I.D. (+.010 -.000)
------------------	-------------------------

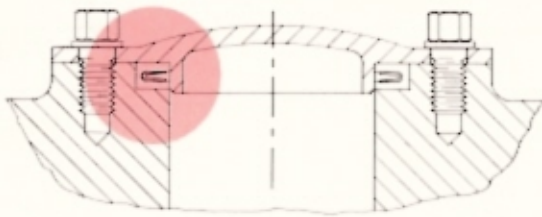
417	3.500
418	3.625
419	3.750
420	3.875
421	4.000
422	4.125
423	4.250
424	4.375
425	4.500
426	4.625
427	4.750
428	4.875
429	5.000
430	5.125
431	5.250
432	5.375
433	5.500
434	5.625
435	5.750
436	5.875
437	6.000
438	6.250
439	6.500
440	6.750
441	7.000
442	7.250
443	7.500
444	7.750
445	8.000
446	8.500

(1/4" Cross Section Continued.)

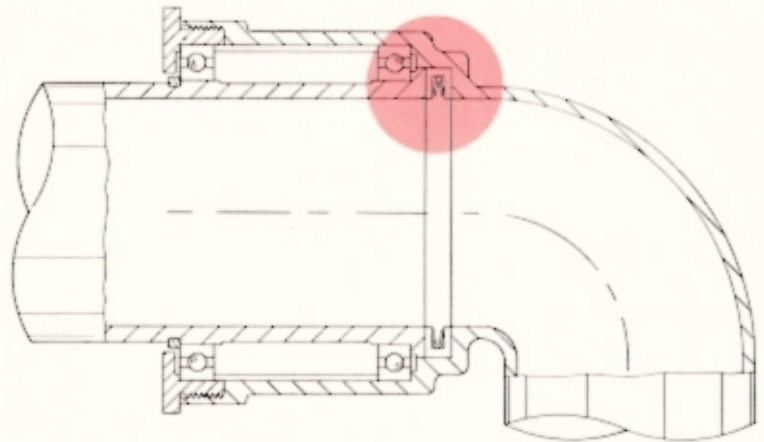
447	9.000
448	9.500
449	10.000
450	10.500
451	11.000
452	11.500
453	12.000
454	12.500
455	13.000
456	13.500
457	14.000
458	14.500
459	15.000
460	15.500

Typical Applications

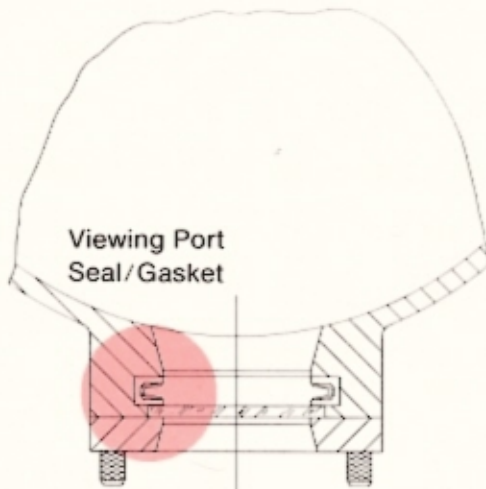
Cover Plate Seal



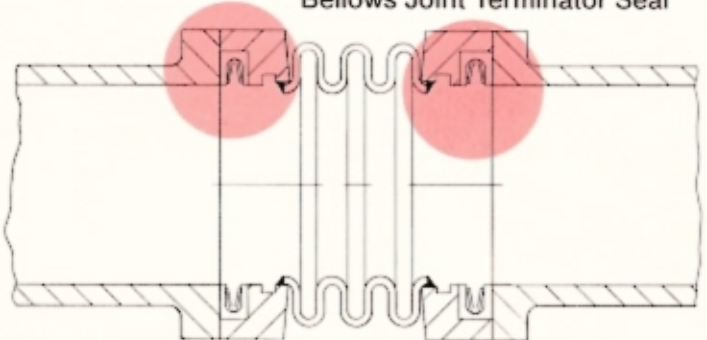
Swivel Joint Dynamic Seal



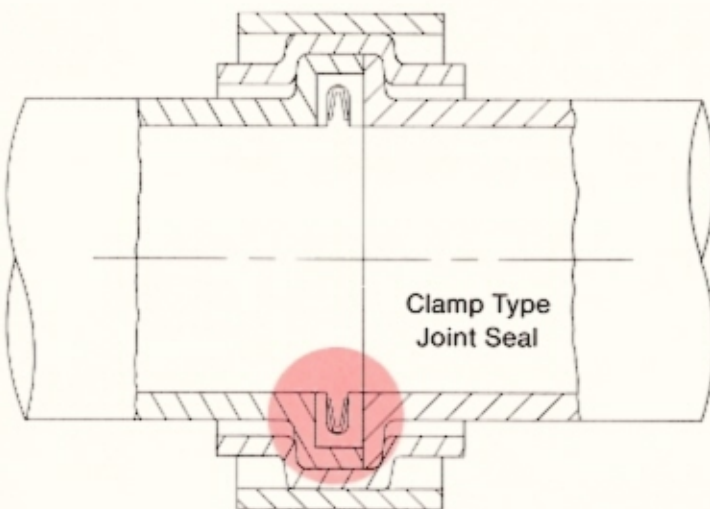
Viewing Port Seal/Gasket



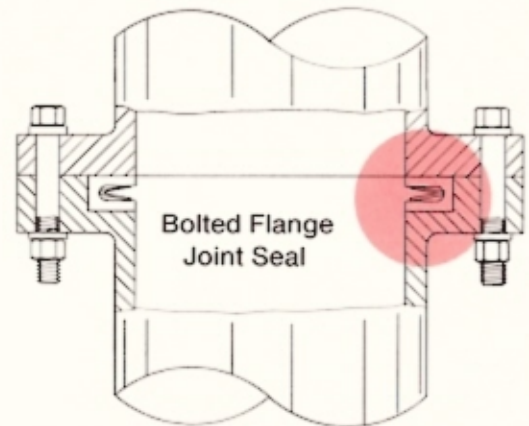
Bellows Joint Terminator Seal



Clamp Type Joint Seal



Bolted Flange Joint Seal



Guillotine/Slide Valve Seal

