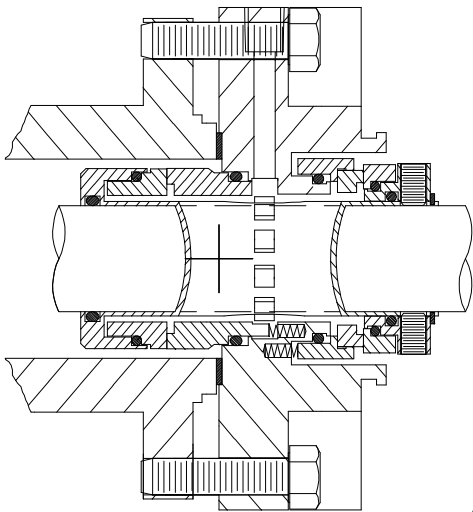




## DELTA DOUBLE CARTRIDGE SEAL WITH PUMPING RING

High efficiency forced circulation pumping ring design. Double-balanced stationary design with options for 2 piece stationary and corrosive service metal insert.

### STYLE 3220



### Technical Features

**High efficiency pumping design** provides 400% increase in flow, providing superior heat removal through the circulated barrier fluid.

**Self-venting, bi-directional barrier fluid connections** accommodate shaft rotations in either direction on horizontal and vertically mounted equipment.

**Double balanced, stationary design** can be operated in two modes. In double mode the barrier fluid pressure higher is than stuffing box pressure. In tandem mode the barrier fluid pressure is lower than stuffing box pressure and can accommodate pressure reversals at the inboard faces.

**Cool running double cartridge design** combines large internal clearances, optimal inboard and outboard face widths, and centrally located flush ports. These features maximize the circumferential flow around the seal faces, resulting in more efficient cooling and extended seal life.

**Optional special metal insert** provides a cost effective alternative for corrosive service. This design variation uses a special metal insert (Titanium, Hastelloy "B", "C") for the process wetted surface in a standard 316 SS gland.

**Rotary inboard faces stabilized under compression** are flexibly mounted utilizing o-rings for their shock and vibration absorption qualities. This eliminates premature fractures in the faces under thermal and mechanical shock that can cause catastrophic failures in other designs with faces under tension.

**Balanced stationary cartridge design utilizes all static o-rings**, which eliminates damage to the pump shaft/sleeve or seal normally caused by rotary pusher component or pusher cartridge type seals, allowing use of solid pump shafts that minimize deflection.

**Interchangeable faces enable application customization**, accommodating the widest range of operating conditions and applications in industry. Monolithic, one-piece designs provide unequalled face stability under fluctuating system operating conditions. Two piece face designs that assure optimum seal performance for the most challenging, demanding environments where one piece face construction is vulnerable to premature failure.

**Positive hold, metal centering clips** center the seal in both the axial and radial directions.

Choose from spare parts kits for field repair or the optional factory repair program. State of the art, easy-to-install design uses the least number of components, simplifying field repair, resulting in low life cycle costs.

All seals are pressure tested at the factory assuring 100% startup sealability.

### Optional Features and Ordering Information:

- 2 piece stationary face
- Special metal insert: order seal model S220

### Application Data

**Shaft speed:** To 3600 RPM

**Pressure:** Vacuum to 400 PSI

**Temperature:** See O-ring limitations

### Materials

**Metal Parts:** 316SS, Alloy 20, Hastelloy "C", Titanium

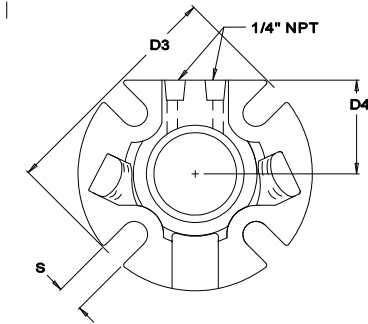
**Springs:** Hastelloy "C"

**Faces:** Combinations of Carbon, Sintered-Silicon Carbide, and Tungsten Carbide

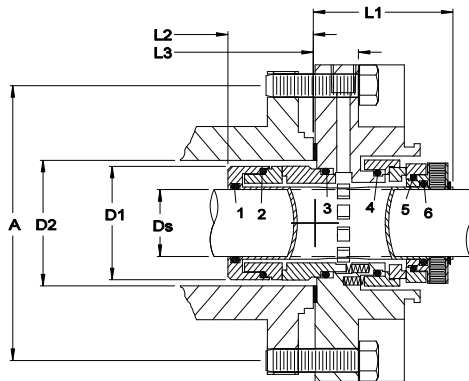
**Elastomers:** Viton, EPR, Kalrez, Aflas, Teflon

# DIMENSIONAL DATA FOR DELTA SEAL STYLE 3220

**FRONT VIEW**

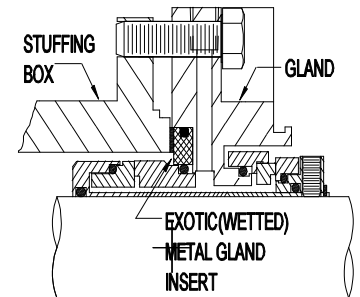


**SIDE VIEW**



**OPTIONAL GLAND FEATURE**

Optional exotic metal gland insert for corrosive environments. (Hastelloy "C", "B", Titanium, etc.)



DS Seal Size	D1 Sleeve OD	D2 Min	D2 Max	D3 Gland OD	D4 Gland Flat	A				S Slot Width	L1 Outside Length	L2 Inside Length	L3 Gland Length	Pos. 1 Oring	Pos. 2 Oring	Pos. 3 Oring	Pos. 4 Oring	Pos. 5 Oring	Pos. 6 Oring
						Min. Bolt Circle by Stud Size													
						3/8"	1/2"	5/8"	3/4"										
0.937	1.685	1.740	2.025	4.090	1.908	2.875	3.020	3.207	3.457	0.460	2.130	1.275	0.570	120	127	127	126	124	122
1.000	1.685	1.740	2.025	4.090	1.908	2.875	3.020	3.207	3.457	0.460	2.130	1.275	0.570	120	127	127	126	124	122
1.125	1.810	1.865	2.200	4.095	1.908	2.875	3.025	3.212	3.462	0.460	2.130	1.275	0.570	122	129	129	128	126	124
1.250	1.960	2.000	2.250	4.405	2.046	3.135	3.260	3.447	3.697	0.460	2.130	1.275	0.570	124	131	131	130	128	126
1.375	2.085	2.125	2.410	4.410	2.046	3.140	3.265	3.452	3.702	0.460	2.130	1.275	0.570	126	133	133	132	130	128
1.437	2.205	2.245	2.550	4.810	2.065	3.355	3.480	3.667	3.917	0.530	2.130	1.275	1.250	128	135	135	134	132	130
1.500	2.205	2.245	2.550	4.810	2.065	3.355	3.480	3.667	3.917	0.530	2.130	1.275	1.250	128	135	135	134	132	130
1.625	2.345	2.375	2.700	4.815	2.065	3.360	3.485	3.672	3.922	0.530	2.130	1.275	1.250	130	137	137	136	134	132
1.750	2.460	2.500	2.850	5.440	2.305	3.565	3.690	3.877	4.127	0.560	2.130	1.275	0.570	132	139	139	138	136	134
1.875	2.580	2.620	2.915	5.445	2.305	3.570	3.695	3.882	4.132	0.560	2.130	1.275	0.570	134	141	141	140	138	136
1.937	2.715	2.750	3.110	5.500	2.450	3.780	3.905	4.092	4.342	0.560	2.130	1.275	0.570	136	143	143	142	140	138
2.000	2.715	2.750	3.110	5.500	2.450	3.780	3.905	4.092	4.342	0.560	2.130	1.275	0.570	136	143	143	142	140	138
2.125	2.835	2.875	3.125	5.840	2.450	3.785	3.910	4.097	4.347	0.560	2.130	1.275	0.570	138	145	145	144	142	140
2.250	2.960	3.000	3.580	6.170	2.460	4.310	4.435	4.622	4.872	0.640	2.130	1.275	1.250	140	147	147	146	144	142
2.375	3.090	3.125	3.655	6.175	2.460	4.315	4.440	4.627	4.877	0.640	2.130	1.275	1.250	142	149	149	148	146	144
2.437	3.215	3.250	3.820	6.420	2.742	4.515	4.640	4.827	5.077	0.640	2.130	1.275	0.570	144	151	151	150	148	146
2.500	3.215	3.250	3.820	6.420	2.742	4.515	4.640	4.827	5.077	0.640	2.130	1.275	0.570	144	151	151	150	148	146
2.625	3.340	3.375	3.735	6.425	2.742	4.520	4.645	4.832	5.082	0.640	2.130	1.275	0.570	146	151	151	151	150	148
2.750	3.660	3.700	4.030	7.755	3.020	5.065	5.190	5.377	5.627	0.700	2.300	1.160	1.250	232	236	236	236	235	233
3.000	3.915	3.955	4.315	7.760	3.020	5.070	5.195	5.382	5.632	0.700	2.300	1.160	1.250	234	238	238	238	237	235
3.250	4.165	4.205	4.925	8.495	3.331	5.812	5.937	6.124	6.374	0.780	2.300	1.160	1.250	236	240	240	240	239	237
3.500	4.415	4.455	5.025	8.500	3.331	5.817	5.942	6.129	6.379	0.780	2.300	1.160	1.250	238	242	242	242	241	239
3.750	4.660	4.700	5.032	8.505	3.331	5.822	5.947	6.134	6.384	0.780	2.300	1.160	1.250	240	244	244	244	242	241
4.000	4.915	4.955	5.875	9.645	3.750	7.005	7.130	7.317	7.567	0.780	2.300	1.160	1.250	242	246	246	246	244	243
4.250	5.165	5.205	6.125	9.650	3.750	7.010	7.135	7.322	7.572	0.780	2.300	1.160	1.250	244	248	248	248	246	245
4.500	5.415	5.455	6.125	9.655	3.750	7.015	7.140	7.327	7.577	0.780	2.300	1.160	1.250	246	250	250	250	248	247
4.750	5.665	5.705	6.225	9.660	3.750	7.020	7.145	7.332	7.582	0.780	2.300	1.160	1.250	248	252	252	252	250	249

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