CHESTERTON

280™ Heavy Duty Dual Cartridge Seal

280 Mixer Seal option puts high reliability in motion

Every aspect of the CHESTERTON 280 design is optimized for high reliability in demanding conditions. The 280 "motion tolerant" Dual Seal withstands run-out and end-play common to mixers, double-ended or vertical turbine pumps and other rotating equipment. Instant pressure shift capability eliminates worries under jarring purge and reverse pressure cycles. Vibration isolated faces thrive under conditions of drag and shear that destroy common seals. Internal cooling results in stable, long-life sealing.

Radial motion capabilities
Small sizes 0.060" (1,50mm) TIR
Large sizes 0.188" (5,00mm) TIR
Extra Large sizes 0.250" (6,00mm) TIR

Axial motion capabilities
Small sizes ± 0.060" (1,50mm)
Large sizes ± 0.075" (1,90mm)
Extra Large sizes ± 0.125" (3,00mm)

Universal applicability

The 180 Single Cartridge and 280 Dual Cartridge Seals have been designed to be rugged performers in sealing applications across industry segments. Having undergone a rigorous in-house and field testing program, the 180 and 280 are proven in applications ranging from light hydrocarbon service to sand slurry and many things in between. They are proven performers for plant-wide standardization providing maximum reliability. Use the 180 Single Seal and the 280 Dual Seal to solve your sealing problems today.

180™ Single Cartridge Seal

280™ Dual Cartridge Seal

Chesterton ISO certificates available on www.chesterton.com/corporate/iso

CHESTERTON
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CHESTERTON
Global Solutions, Local Service.

280™ Heavy Duty Dual Cartridge Seal

KEEPING THE PLANET CLEAN CHESTERTON

- Self-centering, self-aligning dual seal
- Vibration-isolated faces
- Tight concentric tracking for ideal face mating prevents wiping or run-out
- Ideal for viscous, sticky, or polymerizing fluid applications
- Exclusive, unrestricted dual balance for reliability even at elevated pressures

Upgrade to the new standard for reliability in heavy duty dual cartridge sealing

CHESTERTON®

280™ Heavy Duty Dual Cartridge Seal

Upgrade to the new, higher level of reliability and performance in Heavy Duty Dual Cartridge Sealing

The CHESTERTON 280 Heavy Duty Dual Cartridge Seal is specifically designed to handle demanding, high torque applications. This superior, high performance product is an ideal selection for such difficult applications as high concentration black liquor, hard-to-seal monomers such as actrylonitrile, vinyl chloride monomer, and any other potentially solidifying liquids and latex. The 280 provides superior value when used in tough chemical slurries that require non-diluting environmental control and where vibration could occur.

Enhanced thermal control

Unrestricted Dual Pressure Balance – The 280 provides for a 75% ratio for double or tandem barrier mode, while an instantaneous shift prevents opening under system upset conditions. The seal can run with high pressure both inside and outside because the seal balance is optimized to both the ID and OD pressure.

Internal Barrier Channel – The internal pumping system provides efficient barrier fluid flow and heat removal away from the faces. The heat transfers into barrier fluid, not into the process, for high capacity cooling.

Seal Rings Located for Optimum Heat Dissipation – The increased radial clearance provides efficient barrier fluid flow and heat removal.

When you see CHESTERTON, you see the future of sealing.

High torque capability

O-ring Support – The 280 provides O-ring support by locating every O-ring on the OD of the seal rings to prevent compression hang-up under elevated temperatures. This provides cushion and support during high torque start-ups. This configuration allows the O-rings to slide to a clean surface for maximum slurry capability.

Cushioned High-Strength Drives – The 280's corrugated graphite cushioned drive prevents face damage from high-torque start-ups and viscous shearing forces that are associated with sealing sticky products. The inboard shroud provides physical protection to the seal ring and a smooth surface for O-ring travel.

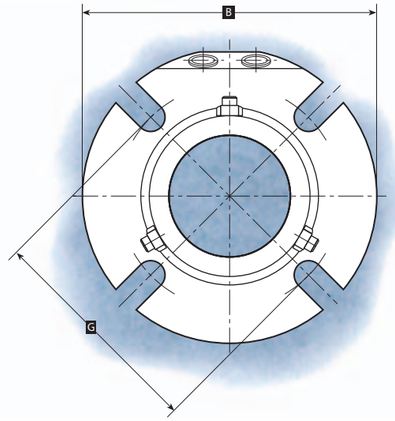
Direct Centering Clips – The centering clips on the 280 prevent the seal surfaces from wiping across each other, thereby keeping the faces free of dirt particles. This allows better face tracking and makes the seal more tolerant to shaft deflection and other adverse operating conditions.

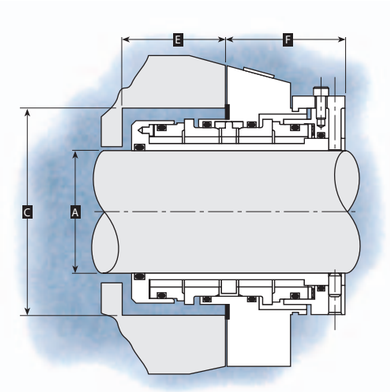
Maximum slurry handling capability

Patented Self-Centering Lock Ring™ – This mechanism enables the seal faces to run true even if the stuffing box facing is not perpendicular to the shaft, thereby promoting reduced water usage and longer seal life. This extends the life of the secondary seals because there is no cyclical movement of the seal faces. The seal faces are isolated from unknown vibration such as poor alignment, shaft deflection, cavitation, piping or similar sources. The 280 helps ensure longer life and reliable sealing.

Monolithic Seal Faces – The 280 seal is the only self-centering, self-aligning dual seal with vibration-isolated faces. Its exclusive, unrestricted dual balance means greater reliability even at elevated temperatures. The faces maintain flatness during pressure and temperature changes preventing leakage during process upsets and intermittent operation. The result is a higher reliability, longer-life seal.

CHESTERTON®





280 MIXER – Dimensional Data/Metric

SHAFT SIZE	GLAND OD	STUFFING BOX BORE		SB DEPTH	OB LENGTH	BOLT CIRCLE BY BOLT SIZE						
A	B MAX	C MIN	C MAX	E MIN	F MAX	8 MM	10 MM	12 MM	G MIN 16 MM	20 MM	24 MM	30 MM
35	114	60	62	40	54	85	88	–	–	–	–	–
38	127	63	68	40	54	90	93	–	–	–	–	–
60	165	86	97	40	54	118	121	124	–	–	–	–
65	199	102	116	52	63	–	–	140	143	–	–	–
70	202	108	119	52	63	–	–	144	147	–	–	–
75	208	114	125	52	63	–	–	151	154	–	–	–
80	211	117	129	52	63	–	–	153	156	159	–	–
85	216	124	135	52	63	–	–	160	164	167	–	–
90	225	130	141	52	63	–	–	166	169	172	–	–
95	228	133	144	52	63	–	–	169	172	176	–	–
100	228	140	151	52	63	–	–	176	179	182	–	–
110	241	149	160	52	63	–	–	185	188	191	–	–
120	279	171	–	83	104	–	–	–	–	227	230	236
130	292	184	–	83	104	–	–	–	–	239	242	248
140	298	191	–	83	104	–	–	–	–	246	249	255
150	311	203	–	83	104	–	–	–	–	258	261	267
160	323	216	–	83	104	–	–	–	–	271	274	280
170	330	222	–	83	104	–	–	–	–	277	280	286
180	342	235	–	83	104	–	–	–	–	290	293	299
190	349	241	–	83	104	–	–	–	–	296	299	305
200	361	254	–	83	104	–	–	–	–	309	312	318

Use of Barrier Fluid Systems*

SHAFT SIZE		SPEED	BARRIER FLUID MAX. PRESSURE		BARRIER FLUID SYSTEM
INCH	METRIC	RPM	PSI	BAR	RECOMMENDATION
1.000 - 2.500	25 - 60	1750	250	17	Tank
1.000 - 2.500	25 - 60	3500	100	6.5	Tank
1.000 - 2.500	25 - 60	3500	100-250	6.5-17	Tank/Water Cooled
2.625 - 4.750	65 - 120	1750	100	6.5	Tank
2.625 - 4.750	65 - 120	1750	100-250	6.5-17	Tank/Water Cooled
2.625 - 4.750	65 - 120	3500	100	6.5	Tank/Water Cooled
2.625 - 4.750	65 - 120	3500	100-250	6.5-17	Forced Circulation
5.000 - 8.000	130 - 200	200	200	13	Tank/Water Cooled
5.000 - 8.000	130 - 200	875	100	6.5	Tank/Water Cooled
5.000 - 8.000	130 - 200	875	100-200	6.5-13	Forced Circulation
5.000 - 8.000	130 - 200	1750	200	13	Forced Circulation

* Recommended barrier fluid system for various shaft sizes and operating conditions with 100°F (38°C) process fluid.

Recommendations are based on water or water/glycol mixture as the barrier fluid. Use of oil as a barrier fluid, or applications with high temperature process fluids will reduce maximum barrier fluid pressure.

Applications with process temperatures in excess of 150°F (66°C) will require a water cooled barrier fluid tank or forced circulation system for optimum performance.

280 MIXER – Dimensional Data/Inch

SHAFT SIZE	GLAND OD	STUFFING BOX BORE		SB DEPTH	OB LENGTH	BOLT CIRCLE BY BOLT SIZE						
A	B MAX	C MIN	C MAX	E MIN	F MAX	3/8"	1/2"	5/8"	G MIN 3/4"	7/8"	1"	1 1/8"
1.000	4.11	2.00	2.04	1.58	2.13	2.88	–	–	–	–	–	–
1.125	4.11	2.12	2.27	1.58	2.13	3.14	–	–	–	–	–	–
1.250	4.36	2.25	2.33	1.58	2.13	3.14	3.26		–	–	–	–
1.375	4.49	2.37	2.44	1.58	2.13	3.33	3.46	–	–	–	–	–
1.500	4.99	2.50	2.69	1.58	2.13	3.53	3.66	–	–	–	–	–
1.625	5.49	2.62	2.81	1.58	2.13	3.65	3.78	–	–	–	–	–
1.750	5.49	2.75	2.94	1.58	2.13	3.78	3.91	–	–	–	–	–
1.875	5.49	2.87	3.19	1.58	2.13	4.03	4.16	–	–	–	–	–
2.000	5.99	3.00	3.44	1.58	2.13	4.28	4.41	4.53	–	–	–	–
2.125	5.99	3.12	3.56	1.58	2.13	4.40	4.53	4.65	–	–	–	–
2.250	5.99	3.25	3.62	1.58	2.13	4.46	4.59	4.71	–	–	–	–
2.375	6.49	3.37	3.81	1.58	2.13	4.65	4.78	4.90	–	–	–	–
2.500	7.70	4.00	4.44	2.05	2.50	–	5.42	5.55	–	–	–	–
2.625	7.83	4.12	4.56	2.05	2.50	–	5.50	5.62	–	–	–	–
2.750	7.94	4.25	4.69	2.05	2.50	–	5.65	5.77	–	–	–	–
2.875	7.99	4.37	4.81	2.05	2.50	–	5.80	5.92	–	–	–	–
3.000	8.19	4.50	4.94	2.05	2.50	–	5.93	6.05	–	–	–	–
3.125	8.30	4.62	5.06	2.05	2.50	–	6.02	6.14	6.27	–	–	–
3.250	8.44	4.75	5.19	2.05	2.50	–	6.18	6.31	6.43	–	–	–
3.375	8.49	4.87	5.31	2.05	2.50	–	6.31	6.44	6.56	–	–	–
3.500	8.71	5.00	5.44	2.05	2.50	–	6.38	6.51	6.63	–	–	–
3.625	8.84	5.12	5.56	2.05	2.50	–	6.52	6.64	6.77	–	–	–
3.750	8.96	5.25	5.69	2.05	2.50	–	6.66	6.78	6.91	–	–	–
3.875	8.99	5.37	5.81	2.05	2.50	–	6.79	6.90	7.03	–	–	–
4.000	8.99	5.50	5.94	2.05	2.50	–	6.91	7.05	7.16	–	–	–
4.125	9.33	5.62	6.06	2.05	2.50	–	7.03	7.15	7.28	–	–	–
4.250	9.49	5.75	6.19	2.05	2.50	–	7.18	7.30	7.43	–	–	–
4.375	9.49	5.87	6.31	2.05	2.50	–	7.28	7.40	7.53	–	–	–
4.500	10.49	6.00	6.44	2.05	2.50	–	7.40	7.53	7.65	–	–	–
4.750	10.98	6.75	–	3.25	4.09	–	–	–	–	8.92	9.04	9.17
5.000	11.23	7.00	–	3.25	4.09	–	–	–	–	9.17	9.29	9.42
5.250	11.48	7.25	–	3.25	4.09	–	–	–	–	9.42	9.54	9.67
5.500	11.73	7.50	–	3.25	4.09	–	–	–	–	9.67	9.79	9.92
5.750	11.98	7.75	–	3.25	4.09	–	–	–	–	9.92	10.04	10.17
6.000	12.23	8.00	–	3.25	4.09	–	–	–	–	10.17	10.29	10.42
6.250	12.48	8.25	–	3.25	4.09	–	–	–	–	10.42	10.54	10.67
6.500	12.73	8.50	–	3.25	4.09	–	–	–	–	10.67	10.79	10.92
6.750	12.98	8.75	–	3.25	4.09	–	–	–	–	10.92	11.04	11.17
7.000	13.23	9.00	–	3.25	4.09	–	–	–	–	11.17	11.29	11.42
7.250	13.48	9.25	–	3.25	4.09	–	–	–	–	11.42	11.54	11.67
7.500	13.73	9.50	–	3.25	4.09	–	–	–	–	11.67	11.79	11.92
7.750	13.98	9.75	–	3.25	4.09	–	–	–	–	11.92	12.04	12.17
8.000	14.23	10.00	–	3.25	4.09	–	–	–	–	12.17	12.29	12.42

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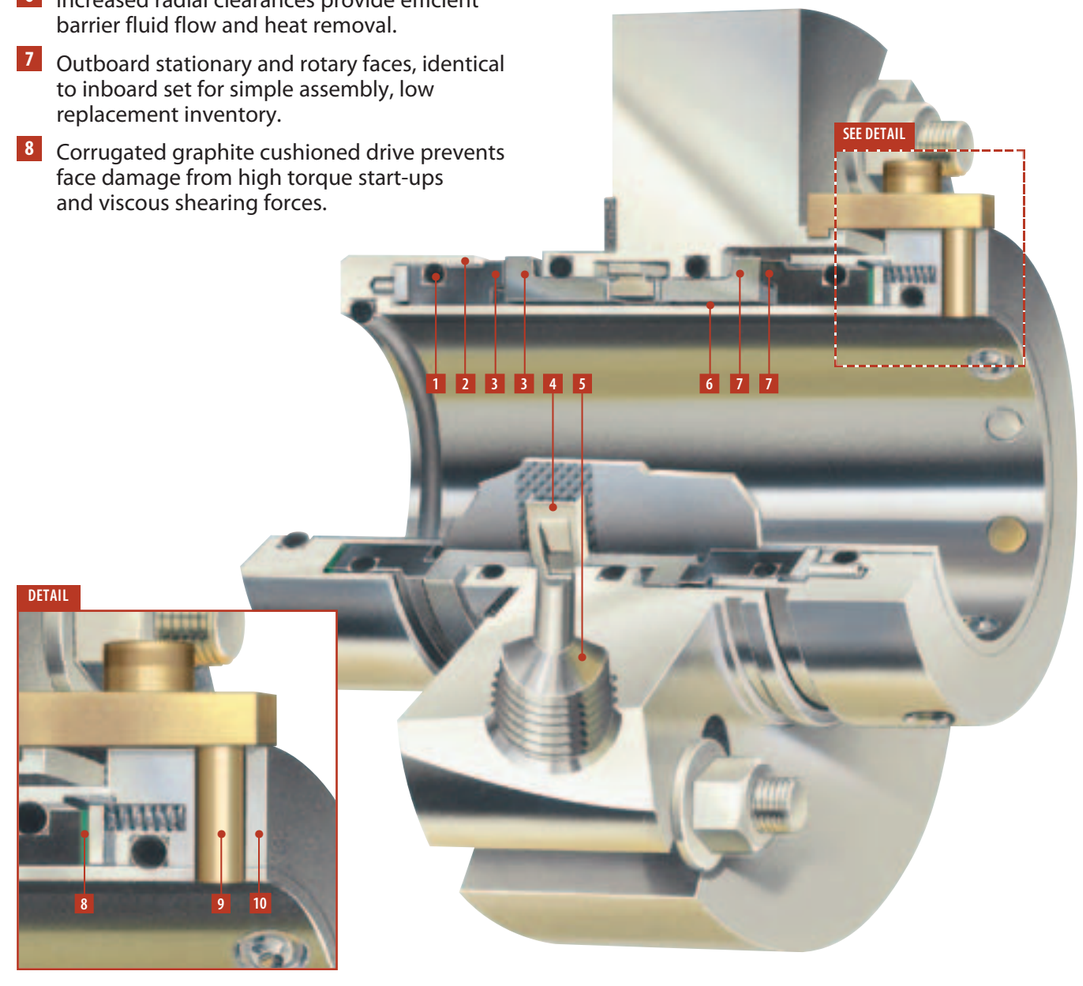
Construction Details

1. Every O-ring is located on the OD of the seal rings to prevent compression hang-up under elevated temperatures. All move to a clean micro-polished surface to reduce hysteresis.
2. Inboard shroud provides physical protection to the seal ring and a smooth surface for O-ring travel.
3. Inboard rotary and stationary faces. Dynamic stress-relieving seal rings with rotating narrow face designed to prevent contaminant intrusion.
4. Barrier fluid channel with built-in cutwaters for enhanced pumping action and fluid exchange.
5. Large bore barrier fluid ports provide high capacity cooling.
6. Increased radial clearances provide efficient barrier fluid flow and heat removal.
7. Outboard stationary and rotary faces, identical to inboard set for simple assembly, low replacement inventory.
8. Corrugated graphite cushioned drive prevents face damage from high torque start-ups and viscous shearing forces.
9. Centering clips locate the stationary seal rings directly to the shaft for a truly centered seal. Direct centering minimizes seal face wiping and runout for maximum slurry capability.
10. Patented Self-Centering Lock Ring™ mechanism locks the 280 to the shaft, automatically aligning the faces with the shaft. The revolutionary Unified Seal Face Alignment then allows all 4 faces to maintain perpendicularity to the shaft centerline and minimize the effects of stuffing box face misalignment.



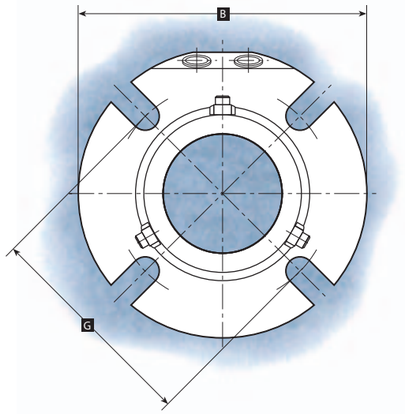
280 STANDARD – Dimensional Data/Inch

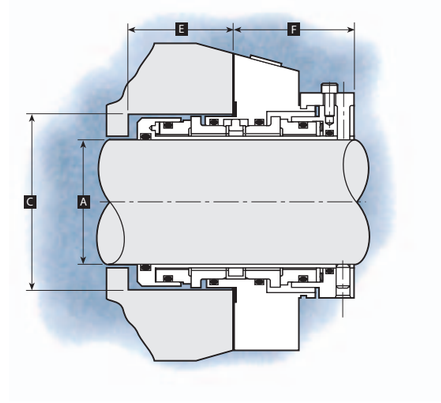
SHAFT SIZE	GLAND OD	STUFFING BOX BORE		SB DEPTH	OB LENGTH	BOLT CIRCLE BY BOLT SIZE			
						G MIN			
A	B MAX	C MIN	C MAX	E MIN	F MAX	3/8"	1/2"	5/8"	3/4"
1.000	4.11	1.75	2.01	1.58	2.13	2.88	–	–	–
1.125	4.11	1.88	2.04	1.58	2.13	2.88	–	–	–
1.250	4.11	2.00	2.27	1.58	2.13	3.14	–	–	–
1.375	4.36	2.13	2.33	1.58	2.13	3.13	3.25	–	–
1.500	4.49	2.25	2.44	1.58	2.13	3.33	3.45	–	–
1.625	4.99	2.38	2.69	1.58	2.13	3.52	3.65	–	–
1.750	5.49	2.50	2.81	1.58	2.13	3.65	3.77	–	–
1.875	5.49	2.63	2.94	1.58	2.13	3.78	3.90	–	–
2.000	5.49	2.75	3.19	1.58	2.13	4.03	4.15	–	–
2.125	5.99	2.88	3.44	1.58	2.13	4.28	4.41	4.53	–
2.250	5.99	3.00	3.56	1.58	2.13	4.40	4.53	4.65	–
2.375	5.99	3.13	3.59	1.58	2.13	4.46	4.59	4.71	–
2.500	6.49	3.25	3.81	1.58	2.13	4.65	4.78	4.90	–
2.625	6.45	3.63	3.93	2.05	2.50	–	5.02	5.15	–
2.750	7.70	3.75	4.44	2.05	2.50	–	5.42	5.55	–
2.875	7.83	3.88	4.56	2.05	2.50	–	5.50	5.62	–
3.000	7.94	4.00	4.69	2.05	2.50	–	5.65	5.77	–
3.125	7.99	4.13	4.81	2.05	2.50	–	5.80	5.92	–
3.250	8.19	4.25	4.94	2.05	2.50	–	5.93	6.05	–
3.375	8.30	4.38	5.06	2.05	2.50	–	6.02	6.14	6.27
3.500	8.44	4.50	5.19	2.05	2.50	–	6.18	6.31	6.43
3.625	8.49	4.63	5.31	2.05	2.50	–	6.31	6.44	6.56
3.750	8.71	4.75	5.44	2.05	2.50	–	6.38	6.51	6.63
3.875	8.84	4.88	5.56	2.05	2.50	–	6.52	6.64	6.77
4.000	8.96	5.00	5.69	2.05	2.50	–	6.66	6.78	6.91
4.125	8.99	5.13	5.81	2.05	2.50	–	6.79	6.90	7.03
4.250	8.99	5.25	5.94	2.05	2.50	–	6.91	7.04	7.16
4.375	9.33	5.38	6.06	2.05	2.50	–	7.03	7.15	7.28
4.500	9.49	5.50	6.19	2.05	2.50	–	7.18	7.30	7.43
4.625	9.49	5.63	6.31	2.05	2.50	–	7.28	7.40	7.53
4.750	10.49	5.75	6.44	2.05	2.50	–	7.40	7.53	7.65

280 OVERSIZE – Dimensional Data/Inch

SHAFT SIZE	GLAND OD	STUFFING BOX BORE		SB DEPTH	OB LENGTH	BOLT CIRCLE BY BOLT SIZE				
						G MIN				
A	B MAX	C MIN	C MAX	E MIN	F MAX	3/8"	1/2"	5/8"	3/4"	7/8"
1.375	5.40	2.81	3.00	1.58	2.13	4.03	–	–	–	–
1.750	6.64	3.50	3.75	1.58	2.13	5.21	5.33	5.46	–	–
1.875	5.99	3.56	3.81	1.58	2.13	–	5.00	–	–	–
2.125	6.99	3.88	4.25	1.58	2.13	–	–	5.95	–	–
2.500	7.77	4.50	4.75	1.58	2.13	–	–	6.75	–	–
2.625	6.98	4.55	4.88	2.05	2.50	–	–	6.00	–	–
2.750	7.89	4.45	4.56	2.05	2.50	–	–	–	6.38	–
3.000	8.64	4.93	5.17	2.05	2.50	–	–	7.00	7.13	7.25
3.375	8.39	4.95	5.06	2.05	2.50	–	–	–	6.88	–
3.750	9.76	5.08	6.18	2.05	2.50	–	–	8.25	–	–
4.125	9.76	5.95	6.06	2.05	2.50	–	–	–	–	8.00
4.500	12.49	6.75	7.25	2.05	2.50	–	–	–	10.76	–
4.750	11.39	7.20	7.42	2.05	2.50	–	–	9.88	10.00	–

CHESTERTON®





280 STANDARD – Dimensional Data/Metric

SHAFT SIZE	GLAND OD	STUFFING BOX BORE		SB DEPTH	OB LENGTH	BOLT CIRCLE BY BOLT SIZE			
						G MIN			
A	B MAX	C MIN	C MAX	E MIN	F MAX	10 MM	12 MM	16 MM	20 MM
25	104	44	51	40	54	73	–	–	–
28	104	47	52	40	54	73	–	–	–
30	104	49	56	40	54	78	–	–	–
32	104	51	57	40	54	80	–	–	–
33	113	52	58	40	54	81	83	–	–
35	111	54	59	40	54	80	82	–	–
38	114	57	61	40	54	85	87	–	–
40	127	59	68	40	54	90	92	–	–
43	127	62	68	40	54	91	93	–	–
45	139	64	73	40	54	95	97	–	–
48	139	67	73	40	54	96	98	–	–
50	139	69	78	40	54	100	102	–	–
55	152	74	83	40	54	105	107	111	–
60	152	79	91	40	54	114	116	120	–
65	164	92	100	52	63	–	127	131	–
70	196	96	113	52	63	–	137	141	–
75	202	102	119	52	63	–	143	147	–
80	203	106	122	52	63	–	150	154	–
85	211	111	129	52	63	–	152	156	161
90	214	116	132	52	63	–	160	164	168
95	221	121	138	52	63	–	161	165	170
100	228	127	144	52	63	–	168	172	177
110	237	137	154	52	63	–	178	182	186
120	266	146	163	52	63	–	187	191	195

Specifications

OPERATING LIMITS

Speed Limits:
- To 4000 fpm (20 m/s)

Temperature Limits:
- To 300°F (150°C) Ethylene Propylene
- To 400°F (205°C) Fluorocarbon, AFLAS†
- To 500°F (260°C) Perfluoroelastomer

Pressure Limits:
- To 600 psi (40 bar) inboard, 250 psi (17 bar) outboard. Up to 4.750" (120mm) shaft size
- To 300 psi (20 bar) inboard, 200 psi (13 bar) outboard. Up to 8.000" (200mm) shaft size

Minimum Barrier Fluid Pressure:
- 30 psi (2 bar) minimum barrier fluid pressure recommended to properly lubricate outboard seal

STANDARD MATERIALS**

Rotary Faces:
- Carbon, Silicon Carbide, Tungsten Carbide

Stationary Faces:
- Silicon Carbide, Tungsten Carbide

Elastomers:
- Fluorocarbon, AFLAS† or EPR installed

All Metal Parts:
- 316SS

Springs:
- Hastelloy C*

† Asahi Glass Company Ltd. Registered Trademark.
* Haynes International, Inc. Registered Trademark.
** Other materials upon request.