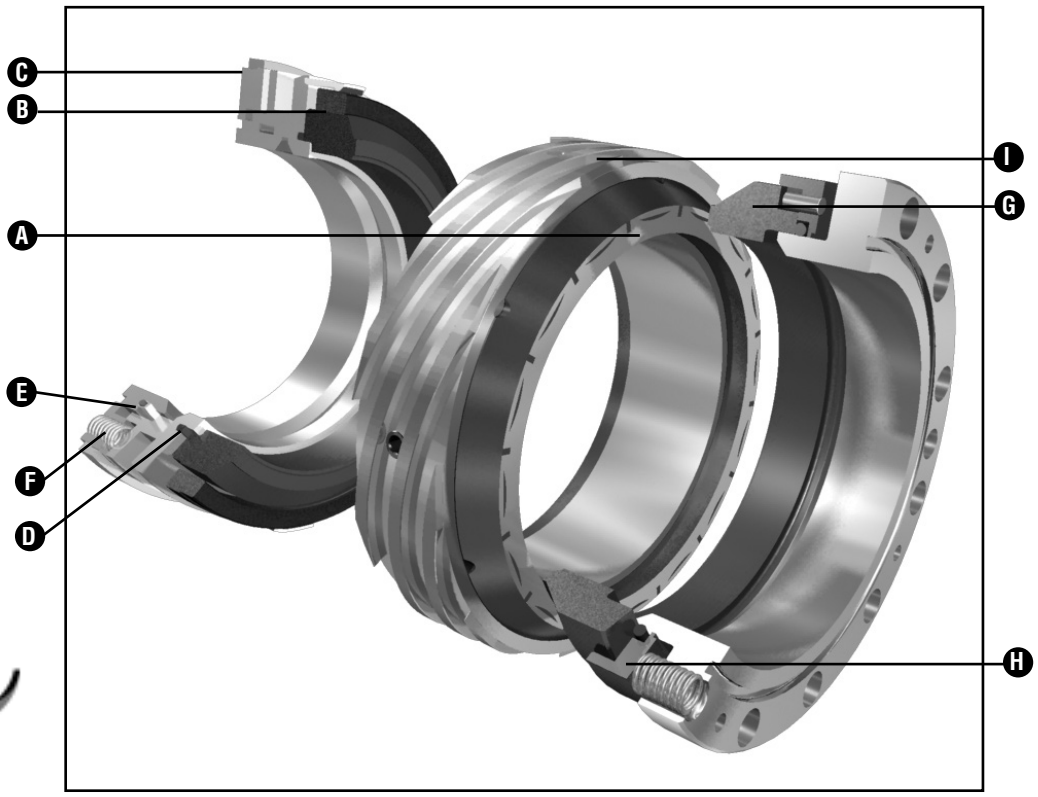
TYPE 8600

HIGH PERFORMANCE SEAL

Technical Specification

A – LaserFace™ Mating Ring
B – Armoured Composite Ring (ACR)
C – Carrier
D – Elastomeric Support Ring (ESR)
E – Polymer Secondary Seal
F – Spring
G – Cranite Primary Ring
H – Thrust Ring
I – Pumping Scroll



Product Description

The Type 8600 High Duty Seal range, available in single and dual arrangements, is designed for the highest pressures and speeds.

- Ideally suited for offshore, pipeline and injection duties
- Stationary, multi-spring design ensures optimum operation across the speed range
- Complies with API 610 and can be supplied to other international standards such as NACE MR-01-075

Performance Capabilities

Temperature: -40°F to 300°F/-40°C to 150°C

Pressure: Vacuum to 2900 psi(g)/200 bar(g)

Speed: Up to 164 f/s/50 m/s

Design Features

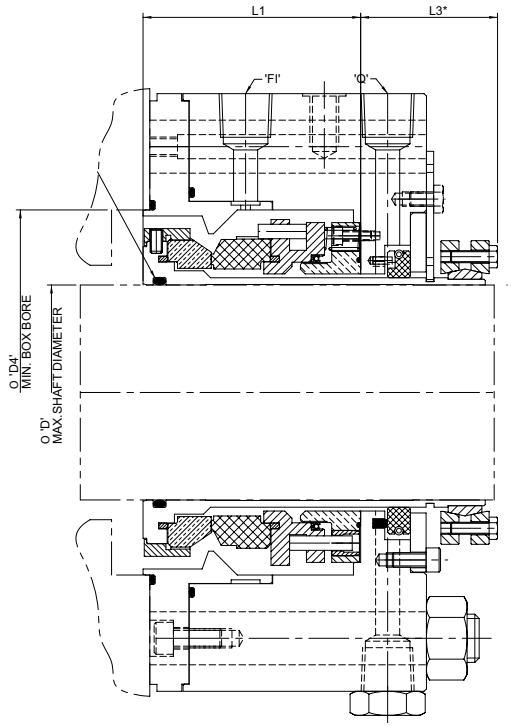
- Available in single, double, tandem, dry tandem and pressurized tandem seal designs
- Advanced composite face materials
- FEA optimized seal faces, with LaserFace™ Technology as standard on double pressurized seals
- Unique carbon-fiber reinforcement option (ACR) for high static reverse pressure capability
- Hang-up resistant polymer secondary seals
- ESR seal face support, used to achieve stable face presentation

TYPE 8600

HIGH PERFORMANCE SEAL

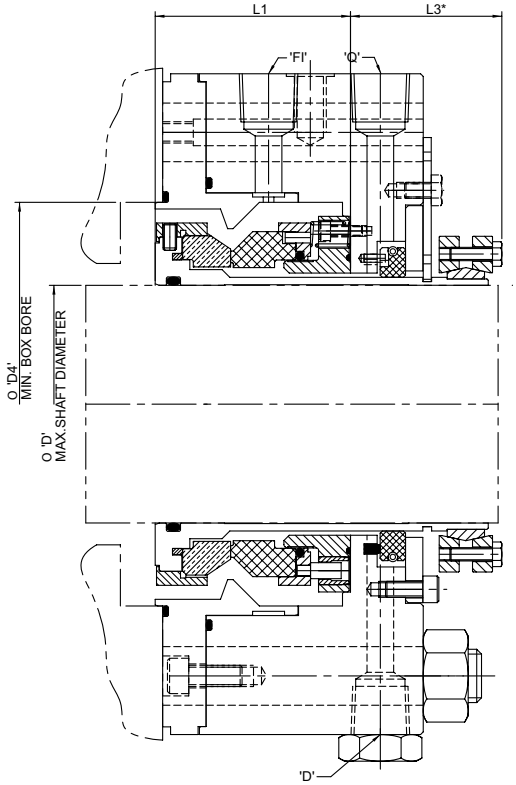
Technical Specification

Type 8620 - Style 01- Dimensional Data



Seal Size Code	Max Shaft (mm)	Box Bore	L1	L3	Seal Size Code	Max Shaft (inch)	Box Bore	L1	L3
0412	35.2	85	73.8	35	**0412**	1.386	3.740	2.906	1.378
0444	38.4	88	73.8	35	**0444**	1.512	3.858	2.906	1.378
0476	41.6	91	73.8	35	**0476**	1.638	3.976	2.906	1.378
0508	44.8	94.6	73.8	35	**0508**	1.764	4.118	2.906	1.378
0539	47.9	98	79.3	35	**0539**	1.886	4.252	3.122	1.378
0571	51.1	101	79.3	35	**0571**	2.012	4.370	3.122	1.378
0603	54.3	104.6	79.3	35	**0603**	2.138	4.512	3.122	1.378
0635	57.5	107.6	79.3	35	**0635**	2.264	4.630	3.122	1.378
0666	60.6	110.6	79.3	35	**0666**	2.386	4.748	3.122	1.378
0698	63.8	119	85.8	35	**0698**	2.512	5.079	3.378	1.378
0762	70.2	125.6	85.8	35	**0762**	2.764	5.339	3.378	1.378
0825	76.5	132	85.8	35	**0825**	3.012	5.591	3.378	1.378
0889	82.9	138	85.8	35	**0889**	3.264	5.827	3.378	1.378
0952	89.2	146	90.3	45	**0952**	3.512	6.142	3.555	1.772
1016	95.6	152.6	90.3	45	**1016**	3.764	6.402	3.555	1.772
1079	101.9	158.6	90.3	45	**1079**	4.012	6.638	3.555	1.772
1143	108.3	165	90.3	45	**1143**	4.264	6.890	3.555	1.772
1206	114.2	182	102.8	45	**1206**	4.496	7.559	4.047	1.772
1270	119.9	188.6	102.8	45	**1270**	4.720	7.819	4.047	1.772
1333	125.6	195	102.8	45	**1333**	4.945	8.071	4.047	1.772
1397	131.3	201.6	102.8	45	**1397**	5.169	8.331	4.047	1.772
1460	137.0	207.6	102.8	45	**1460**	5.394	8.567	4.047	1.772
1524	144.4	214	102.8	45	**1524**	5.685	8.819	4.047	1.772
1587	150.2	220.6	102.8	45	**1587**	5.913	9.079	4.047	1.772
1619	152.2	233.6	117.8	55	**1619**	5.992	9.591	4.638	2.165
1682	159.8	240	117.8	55	**1682**	6.291	9.843	4.638	2.165
1746	165.4	246.6	117.8	55	**1746**	6.512	10.102	4.638	2.165
1809	171.3	252.6	117.8	55	**1809**	6.744	10.339	4.638	2.165
1873	177.0	259	117.8	55	**1873**	6.969	10.591	4.638	2.165
1936	182.8	265.6	117.8	55	**1936**	7.197	10.850	4.638	2.165
2000	188.4	272	117.8	55	**2000**	7.417	11.102	4.638	2.165
2063	196.0	278	117.8	55	**2063**	7.717	11.339	4.638	2.165

Type 8620 - Style 02 - Dimensional Data



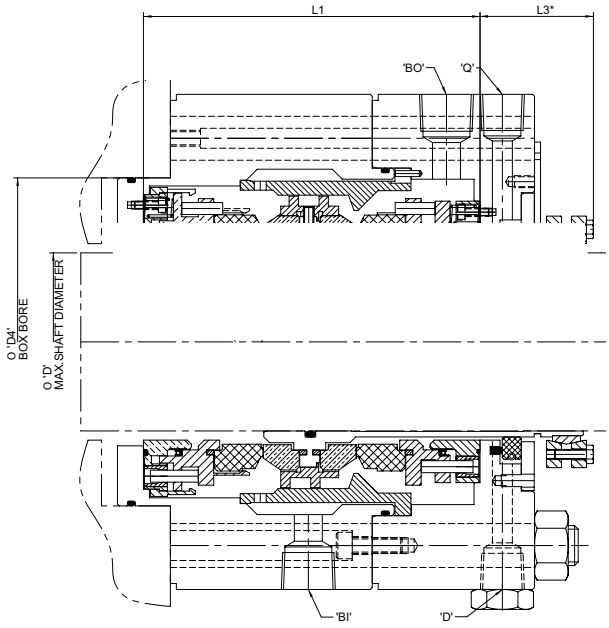
Seal Size Code	Max Shaft (mm)	Box Bore	L1	L3	Seal Size Code	Max Shaft (inch)	Box Bore	L1	L3
0412	35.2	85	57.8	35	**0412**	1.386	3.740	2.276	1.378
0444	38.4	88	57.8	35	**0444**	1.512	3.858	2.276	1.378
0476	41.6	91	57.8	35	**0476**	1.638	3.976	2.276	1.378
0508	44.8	94.6	57.8	35	**0508**	1.764	4.118	2.276	1.378
0539	47.9	98	63.3	35	**0539**	1.886	4.252	2.492	1.378
0571	51.1	101	63.3	35	**0571**	2.012	4.370	2.492	1.378
0603	54.3	104.6	63.3	35	**0603**	2.138	4.512	2.492	1.378
0635	57.5	107.6	63.3	35	**0635**	2.264	4.630	2.492	1.378
0666	60.6	110.6	63.3	35	**0666**	2.386	4.748	2.492	1.378
0698	63.8	119	68.8	35	**0698**	2.512	5.079	2.709	1.378
0762	70.2	125.6	68.8	35	**0762**	2.764	5.339	2.709	1.378
0825	76.5	132	68.8	35	**0825**	3.012	5.591	2.709	1.378
0889	82.9	138	68.8	35	**0889**	3.264	5.827	2.709	1.378
0952	89.2	146	73.3	45	**0952**	3.512	6.142	2.886	1.772
1016	95.6	152.6	73.3	45	**1016**	3.764	6.402	2.886	1.772
1079	101.9	158.6	73.3	45	**1079**	4.012	6.638	2.886	1.772
1143	108.3	165	73.3	45	**1143**	4.264	6.890	2.886	1.772
1206	114.2	182	84.8	45	**1206**	4.496	7.559	3.339	1.772
1270	119.9	188.6	84.8	45	**1270**	4.720	7.819	3.339	1.772
1333	125.6	195	84.8	45	**1333**	4.945	8.071	3.339	1.772
1397	131.3	201.6	84.8	45	**1397**	5.169	8.331	3.339	1.772
1460	137.0	207.6	84.8	45	**1460**	5.394	8.567	3.339	1.772
1524	144.4	214	84.8	45	**1524**	5.685	8.819	3.339	1.772
1587	150.2	220.6	84.8	45	**1587**	5.913	9.079	3.339	1.772
1619	152.2	233.6	97.8	55	**1619**	5.992	9.591	3.850	2.165
1682	159.8	240	97.8	55	**1682**	6.291	9.843	3.850	2.165
1746	165.4	246.6	97.8	55	**1746**	6.512	10.102	3.850	2.165
1809	171.3	252.6	97.8	55	**1809**	6.744	10.339	3.850	2.165
1873	177.0	259	97.8	55	**1873**	6.969	10.591	3.850	2.165
1936	182.8	265.6	97.8	55	**1936**	7.197	10.850	3.850	2.165
2000	188.4	272	97.8	55	**2000**	7.417	11.102	3.850	2.165
2063	196.0	278	97.8	55	**2063**	7.717	11.339	3.850	2.165

TYPE 8600

HIGH PERFORMANCE SEAL

Technical Specification

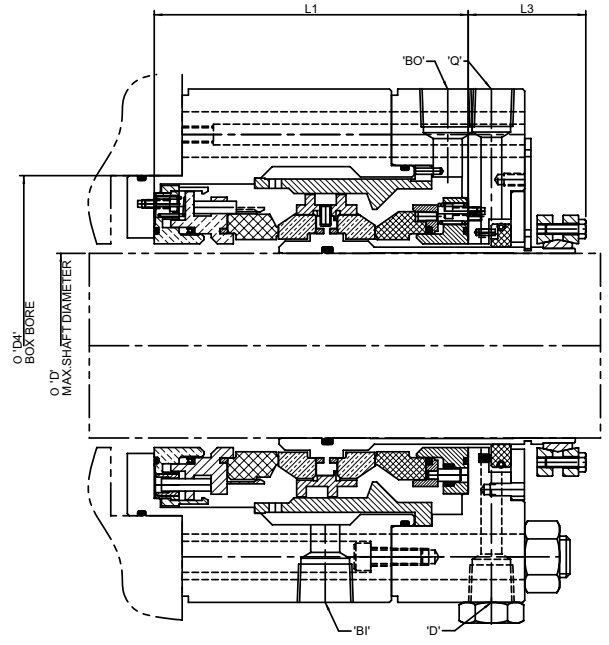
Type 8620 - Styles 11 & 21 - Dimensional Data



Seal Size Code	Max Shaft (mm)	Box Bore	L1	L3
0412	35.2	104.2	134.6	35
0444	38.4	107.3	134.6	35
0476	41.6	110.5	134.6	35
0508	44.8	113.7	134.6	35
0539	47.9	116.9	146.6	35
0571	51.1	120.0	146.6	35
0603	54.3	123.2	146.6	35
0635	57.5	126.4	146.6	35
0666	60.6	129.6	146.6	35
0698	63.8	138.9	159.6	35
0762	70.2	145.3	159.6	35
0825	76.5	151.6	159.6	35
0889	82.9	158.0	159.6	35
0952	89.2	164.3	168.6	45
1016	95.6	170.7	168.6	45
1079	101.9	177.0	168.6	45
1143	108.3	183.4	168.6	45
1206	114.2	202.4	191.6	45
1270	119.9	208.9	191.6	45
1333	125.6	215.4	191.6	45
1397	131.3	221.9	191.6	45
1460	137.0	227.9	191.6	45
1524	144.4	234.4	191.6	45
1587	150.2	240.9	191.6	45
1619	152.2	252.9	217.6	55
1682	159.8	259.4	217.6	55
1746	165.4	265.9	217.6	55
1809	171.3	271.9	217.6	55
1873	177.0	278.4	217.6	55
1936	182.8	284.9	217.6	55
2000	188.4	291.4	217.6	55
2063	196.0	297.4	217.6	55

Seal Size Code	Max Shaft (inch)	Box Bore	L1	L3
0412	1.386	4.102	5.299	1.378
0444	1.512	4.224	5.299	1.378
0476	1.638	4.350	5.299	1.378
0508	1.764	4.476	5.299	1.378
0539	1.886	4.602	5.772	1.378
0571	2.012	4.724	5.772	1.378
0603	2.138	4.850	5.772	1.378
0635	2.264	4.976	5.772	1.378
0666	2.386	5.102	5.772	1.378
0698	2.512	5.469	6.283	1.378
0762	2.764	5.720	6.283	1.378
0825	3.012	5.969	6.283	1.378
0889	3.264	6.220	6.283	1.378
0952	3.512	6.469	6.638	1.772
1016	3.764	6.720	6.638	1.772
1079	4.012	6.969	6.638	1.772
1143	4.264	7.220	6.638	1.772
1206	4.496	7.969	7.543	1.772
1270	4.720	8.224	7.543	1.772
1333	4.945	8.480	7.543	1.772
1397	5.169	8.736	7.543	1.772
1460	5.394	8.972	7.543	1.772
1524	5.685	9.228	7.543	1.772
1587	5.913	9.484	7.543	1.772
1619	5.992	9.957	8.567	2.165
1682	6.291	10.213	8.567	2.165
1746	6.512	10.469	8.567	2.165
1809	6.744	10.705	8.567	2.165
1873	6.969	10.961	8.567	2.165
1936	7.197	11.217	8.567	2.165
2000	7.417	11.472	8.567	2.165
2063	7.717	11.709	8.567	2.165

Type 8620 - Styles 12 & 22 - Dimensional Data



Seal Size Code	Max Shaft (mm)	Box Bore	L1	L3
0412	35.2	104.2	118.6	35
0444	38.4	107.3	118.6	35
0476	41.6	110.5	118.6	35
0508	44.8	113.7	118.6	35
0539	47.9	116.9	130.6	35
0571	51.1	120.0	130.6	35
0603	54.3	123.2	130.6	35
0635	57.5	126.4	130.6	35
0666	60.6	129.6	130.6	35
0698	63.8	138.9	142.6	35
0762	70.2	145.3	142.6	35
0825	76.5	151.6	142.6	35
0889	82.9	158.0	142.6	35
0952	89.2	164.3	151.6	45
1016	95.6	170.7	151.6	45
1079	101.9	177.0	151.6	45
1143	108.3	183.4	151.6	45
1206	114.2	202.4	173.6	45
1270	119.9	208.9	173.6	45
1333	125.6	215.4	173.6	45
1397	131.3	221.9	173.6	45
1460	137.0	227.9	173.6	45
1524	144.4	234.4	173.6	45
1587	150.2	240.9	173.6	45
1619	152.2	252.9	197.6	55
1682	159.8	259.4	197.6	55
1746	165.4	265.9	197.6	55
1809	171.3	271.9	197.6	55
1873	177.0	278.4	197.6	55
1936	182.8	284.9	197.6	55
2000	188.4	291.4	197.6	55
2063	196.0	297.4	197.6	55

Seal Size Code	Max Shaft (inch)	Box Bore	L1	L3
0412	1.386	4.102	4.669	1.378
0444	1.512	4.224	4.669	1.378
0476	1.638	4.350	4.669	1.378
0508	1.764	4.476	4.669	1.378
0539	1.886	4.602	5.142	1.378
0571	2.012	4.724	5.142	1.378
0603	2.138	4.850	5.142	1.378
0635	2.264	4.976	5.142	1.378
0666	2.386	5.102	5.142	1.378
0698	2.512	5.469	5.614	1.378
0762	2.764	5.720	5.614	1.378
0825	3.012	5.969	5.614	1.378
0889	3.264	6.220	5.614	1.378
0952	3.512	6.469	5.969	1.772
1016	3.764	6.720	5.969	1.772
1079	4.012	6.969	5.969	1.772
1143	4.264	7.220	5.969	1.772
1206	4.496	7.969	6.835	1.772
1270	4.720	8.224	6.835	1.772
1333	4.945	8.480	6.835	1.772
1397	5.169	8.736	6.835	1.772
1460	5.394	8.972	6.835	1.772
1524	5.685	9.228	6.835	1.772
1587	5.913	9.484	6.835	1.772
1619	5.992	9.957	7.780	2.165
1682	6.291	10.213	7.780	2.165
1746	6.512	10.469	7.780	2.165
1809	6.744	10.705	7.780	2.165
1873	6.969	10.961	7.780	2.165
1936	7.197	11.217	7.780	2.165
2000	7.417	11.472	7.780	2.165
2063	7.717	11.709	7.780	2.165

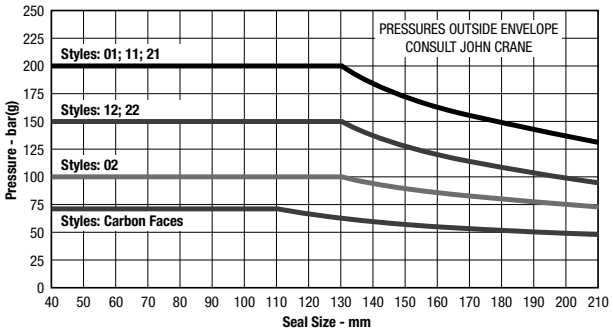
TYPE 8600

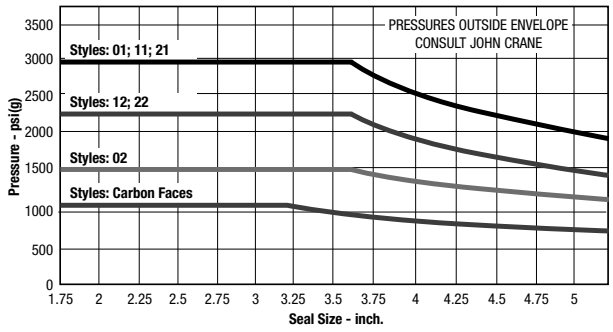
HIGH PERFORMANCE SEAL

Technical Specification

Basic Pressure Rating

Dynamic pressure limits of Type 8600 seals on hydrocarbons – Metric Units





Multiplier Factors

	Selection Considerations	Multiplier Factors
Speed	Up to 3600 RPM x 1.00 Above 3600 RPM (to a maximum of 164 f/s/50 m/s) Above 164 f/s/50 m/s*	x 1.00 x 3600/Speed (RPM)
Sealed Fluid Lubricity	Petrol/Gasoline, Kerosene or better Flashing Hydrocarbons (sg < 0.65), water	x 1.00 x 0.60, x 0.75 (water)
Sealed Fluid Temperature	Up to 175°F/ 80°C From 175 to 250°F/ 80 to 120°C From 250 to 355°F/120 to 180°C Above 355°F/180°C*	x 1.00 x 0.90 x 0.80

*Consult John Crane Engineering

Styles – The Type 8600 Series is a modular range allowing different combinations of inboard and outboard configurations and materials. Each style is represented by a two digit code: The first designates the inboard configuration, the second – the outboard.

Inboard

0* – Single Seal (see outboard)
1* – Cranite vs. SiC, Carrier Design, LaserFace
2* – Carbon Fibre Reinforced Cranite vs SiC, LaserFace

Outboard

***1** – Cranite vs. SiC, Carrier Design, LaserFace
***2** – Cranite vs. SiC, Thrust Ring Design, LaserFace

Minimum Pressure

Stuffing Box Pressure (P_B)	Minimum Differential Pressure
P_B < 50 bar(g)/725 psi(g)	P_B + 15 bar(g)/215 psi(g)
50 bar(g)/725 psi(g) ≤ P_B ≤ 120 bar(g)/1740 psi(g)	P_B + 20 bar(g)/290 psi(g)
P_B < 120 bar(g)/1740 psi(g)	P_B + 25 bar(g)/360 psi(g)

The basic pressure rating is for a standard seal, as shown in the typical arrangement, when installed according to the criteria given in this data sheet and generally accepted industrial practices.

The basic pressure rating assumes stable operation at 3600 rpm in a clean, cool, lubrication, non-volatile liquid with an adequate flush rate, when used with the multiplier factors, the basic pressure rating can be adjusted to provide a conservative estimate of the dynamic pressure rating. For process services outside this range or a more accurate assessment of the dynamic pressure rating, contact John Crane for more information.

Temperature Limits

Cartridge Limit

The maximum rating of the standard cartridge is 300°F/150°C. For higher temperatures, contact John Crane Engineering.

Seal Rings

Cranite vs. SiC\WC: 570°F/300°C
Carbon vs. SiC: 482°F/250°C

Secondary Seals/ Static Seals

Fluorocarbon 390°F/200°C (hydrocarbons)
275°F/135°C (water)
Polymer Seal 570°F/300°C

North America
United States of America
Tel: 1-847-967-2400
Fax: 1-847-967-3915

Europe
United Kingdom
Tel: 44-1753-224000
Fax: 44-1753-224224

Latin America
Brazil
Tel: 55-11-3371-2500
Fax: 55-11-3371-2599

Middle East & Africa
United Arab Emirates
Tel: 971-481-27800
Fax: 971-488-62830

Asia Pacific
Singapore
Tel: 65-6518-1800
Fax: 65-6518-1803