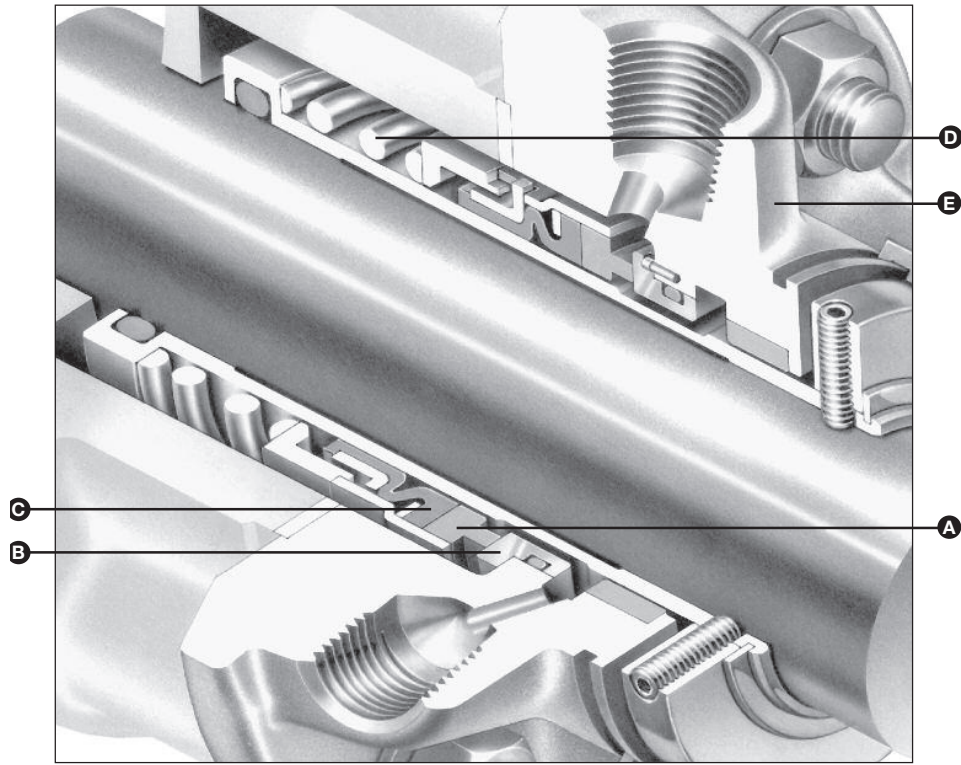




- A – Face/Primary ring
- B – Seat/Mating ring
- C – Elastomer bellows
- D – Spring
- E – Gland



Product Description

The 5600 Series is a modular cartridge seal family that includes interchangeable elastomer bellows, metal bellows and elastomer O-ring pusher seal designs.

The Type 5611 single seal arrangements incorporate the John Crane Type 1 seal head assembly with the universal cartridge adaptive hardware.

- Automatic adjustment compensates for abnormal shaft end play and runout, primary ring seal face wear, equipment tolerances, and service life
- Seal has quench options of carbon ring throttle bush (5611Q) and lip seal (5611L)

Design Features

- Non-clogging, single-coil spring
- Positive mechanical drive
- Full convolution elastomer bellows
- Fits ANSI B73.1M, ISO 3069 and DIN 24960 seal chambers

Performance Capabilities

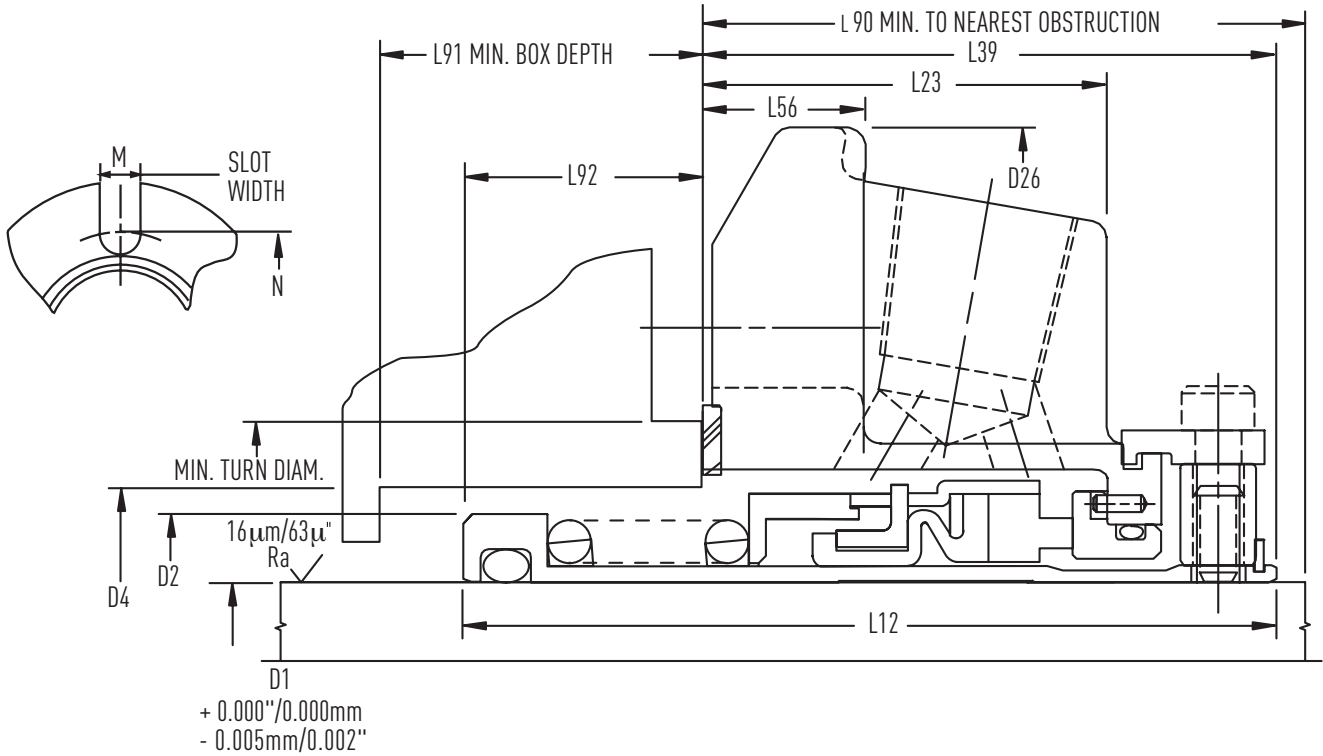
- Temperature: -30° to 205°C/-20° to 400°F
- Pressure: Up to 28 barg/400 psig
- Speed: Up to 25 m/s/5000 fpm
- End play/axial float allowance: 0.13mm/0.005"
- Runout/out of squareness: 0.05mm/0.002"

Available with John Crane Diamond® Technology

- Brings the features and benefits of pure diamond to mechanical seals
- Withstands abrasive, chemically-aggressive, poor-lubricating and intermittent, dry-running applications
- Reduces energy consumption and cooling requirements



Type 5611 Typical Arrangement



Type 5611 Dimensional Data (Inches)

Size D1	D2	D4		D26	L12	L23	L39	L56	L90	L91	L92	M	N
		Min.	Max.										
1.000	1.375	1.500	1.889	4.000	2.739	1.353	1.954	0.531	2.000	0.910	0.785	0.525	2.805
1.125	1.500	1.625	2.015	4.125	2.595	1.446	2.062	0.531	2.125	0.658	0.533	0.525	2.933
1.250	1.687	1.812	2.294	4.250	2.718	1.446	2.062	0.531	2.125	0.781	0.656	0.525	3.213
1.375	1.812	1.937	2.421	4.375	2.625	1.446	2.062	0.531	2.125	0.688	0.563	0.525	3.338
1.500	2.000	2.125	2.680	4.875	2.960	1.487	2.125	0.593	2.187	0.960	0.835	0.525	3.599
1.625	2.125	2.250	2.812	5.000	3.022	1.487	2.125	0.593	2.187	1.022	0.897	0.562	3.766
1.750	2.250	2.375	2.918	5.250	3.038	1.487	2.125	0.593	2.187	1.038	0.913	0.562	3.875
1.875	2.375	2.500	2.918	5.250	3.038	1.487	2.125	0.593	2.187	1.038	0.913	0.562	3.875
2.000	2.687	2.750	3.015	5.500	3.454	1.601	2.312	1.063	2.375	1.266	1.141	0.562	4.000
2.125	2.812	2.875	3.360	5.859	3.454	1.601	2.312	0.593	2.375	1.266	1.141	0.687	4.469
2.250	2.750	2.875	3.485	6.500	3.579	1.601	2.312	0.593	2.375	1.391	1.266	0.687	4.566
2.375	3.062	3.125	3.610	6.500	3.468	1.717	2.466	0.625	2.528	1.127	1.002	0.687	4.719
2.500	3.250	3.375	3.891	6.750	3.829	1.717	2.563	0.625	2.625	1.391	1.266	0.687	5.000
2.625	3.500	3.625	4.062	6.750	3.978	1.625	2.500	0.625	2.562	1.603	1.478	0.687	5.170
2.750	3.500	3.625	4.062	6.750	3.978	1.625	2.500	0.625	2.562	1.603	1.478	0.687	5.170
2.875	3.625	3.695	4.186	7.000	3.978	1.725	2.500	0.625	2.562	1.603	1.478	0.687	5.312
3.000	3.937	4.000	4.469	7.750	4.172	1.787	2.562	0.685	2.625	1.735	1.610	0.812	5.720
3.125	4.062	4.125	4.600	7.875	4.187	1.593	2.562	*	2.687	1.750	1.625	0.812	5.845
3.250	4.062	4.125	4.600	7.437	4.187	1.593	2.510	*	2.635	1.802	1.677	0.812	5.845
3.375	4.312	4.375	4.850	8.125	4.375	1.593	2.562	*	2.687	1.938	1.813	0.812	6.095
3.500	4.437	4.500	4.975	8.250	4.344	1.593	2.562	*	2.687	1.907	1.782	0.812	6.220
3.625	4.562	4.625	5.100	8.375	4.625	1.593	2.562	*	2.687	2.188	2.063	0.687	6.250
3.750	4.632	4.724	5.199	8.750	4.437	1.593	2.562	*	2.687	2.000	1.875	0.687	6.770
3.875	4.812	4.905	5.375	8.750	4.500	1.593	2.562	*	2.687	2.063	1.938	0.812	6.636
4.000	4.937	5.031	5.500	9.000	4.812	1.593	2.562	*	2.687	2.375	2.250	0.812	6.761

*Not applicable. Refer to L23 for sizes over 3.000 mm.

TYPE 5611/5611L/5611Q

ELASTOMER METAL BELLOWS SEALS

Type 5611 Large Bore Dimensional Data (Inches)

Size D1	D2	D4		D26	L12	L23	L39	L56	L90	L91	L92	M	N	Min. Turn Dia.
		Min.	Max.											
1.375	1.812	2.875	3.023	5.375	2.625	1.446	2.062	0.625	2.125	0.688	0.563	0.562	4.062	3.268
1.750	2.250	3.500	3.925	6.500	3.038	1.487	2.125	0.656	2.187	1.038	0.913	0.687	5.093	3.885
1.875	2.375	3.625	3.734	6.500	3.038	1.316	1.954	0.485	2.017	1.209	1.084	0.687	5.093	**
2.125	2.687	3.875	4.250	7.156	3.454	1.570	2.282	0.749	2.407	1.297	1.172	0.687	5.687	4.264
2.500	3.250	4.750	4.875	8.000	3.829	1.697	2.407	0.656	2.532	1.547	1.422	0.687	6.062	5.139
2.625	3.437	4.625	4.740	8.000	3.978	1.617	2.329	0.578	2.454	1.774	1.649	0.687	6.062	***
2.750	3.437	4.750	4.875	8.000	3.978	1.697	2.407	0.656	2.532	1.696	1.571	0.687	6.062	5.139

**Seal cartridge is OD registered on the turn diam. of 4.125".

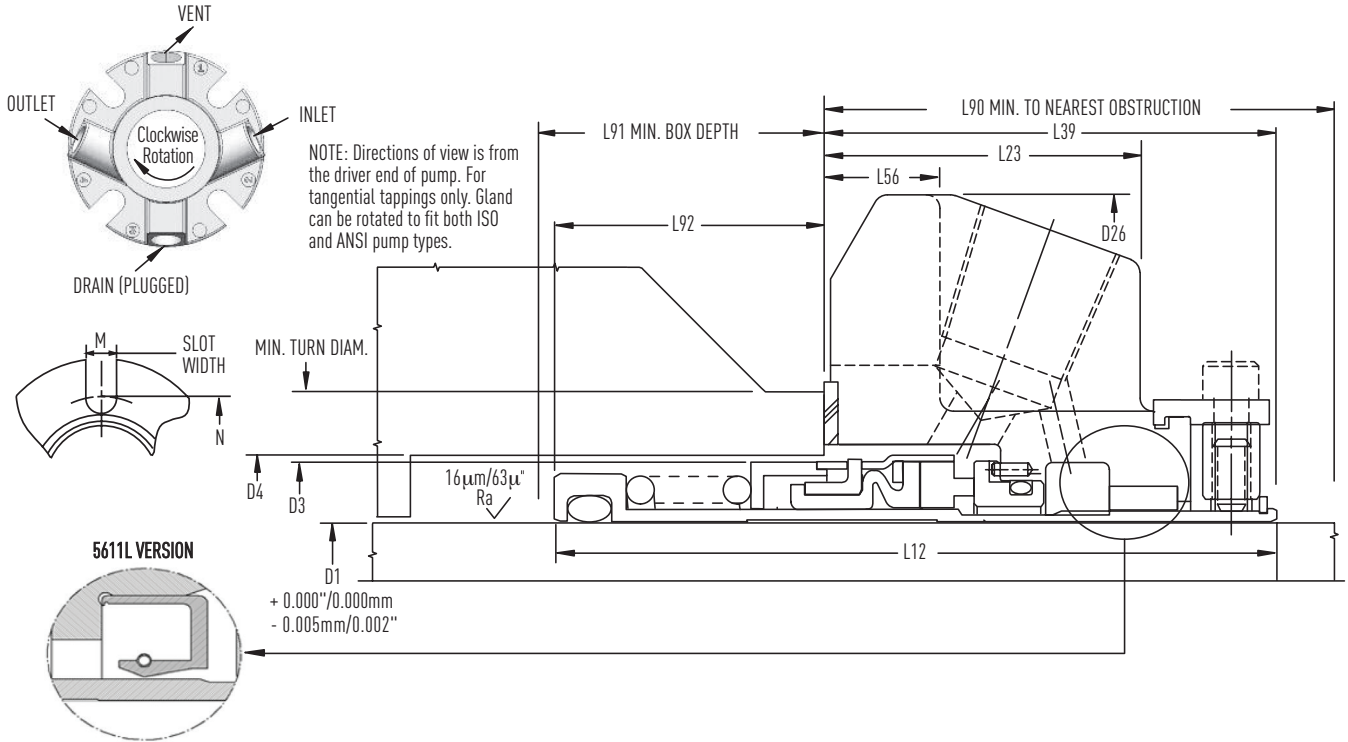
***Seal cartridge is OD registered on the turn diam. of 5.125".

Type 5611 Dimensional Data (mm)

Size D1	Size Code	D2	D4		D26	L12	L23	L39	L56	L90	L91	L92	M	N
			Min.	Max.										
24	0240	34.9	38.1	48.0	101.6	69.6	34.4	49.6	13.5	50.8	23.1	20.0	13.3	71.2
25	0250	34.9	38.1	48.0	101.6	69.6	34.4	49.6	13.5	50.8	23.1	20.0	13.3	71.2
28	0280	38.1	41.3	51.2	104.8	65.9	36.7	52.4	13.5	54.0	16.7	13.5	13.3	74.5
30	0300	42.8	46.0	56.5	108.0	69.0	36.7	52.4	13.5	54.0	19.8	16.7	13.3	81.6
32	0320	42.8	46.0	58.3	108.0	69.0	36.7	52.4	13.5	54.0	19.8	16.7	13.3	81.6
33	0330	46.0	49.2	61.5	111.1	66.7	36.7	52.4	13.5	54.0	17.5	14.3	13.3	84.8
35	0350	46.0	49.2	61.5	111.1	66.7	36.7	52.4	13.5	54.0	17.5	14.3	13.3	84.8
38	0380	50.8	54.0	68.1	123.8	75.2	37.8	54.0	15.1	55.6	24.4	21.2	13.3	91.4
40	0400	54.0	57.2	71.4	127.0	76.8	37.8	54.0	15.1	55.6	26.0	22.8	14.3	95.7
43	0430	57.2	60.3	74.1	133.4	77.2	37.8	54.0	15.1	55.6	26.4	23.2	14.3	98.4
45	0450	57.2	60.3	74.1	133.4	77.2	37.8	54.0	15.1	55.6	26.4	23.2	14.3	98.4
48	0480	60.3	63.5	74.1	133.4	77.2	37.8	54.0	15.1	55.6	26.4	23.2	14.3	98.4
50	0500	68.2	69.9	76.6	139.7	87.7	40.7	58.7	27.0	60.3	32.2	29.0	14.3	101.6
53	0530	71.4	73.0	85.3	148.8	87.7	40.7	58.7	15.1	60.3	32.2	29.0	17.4	113.5
55	0550	69.9	73.0	85.3	148.8	90.9	40.7	58.7	15.1	60.3	35.4	32.2	17.4	113.5
58	0580	69.9	75.0	88.5	165.1	90.9	40.7	58.7	15.1	60.3	35.4	32.2	17.4	116.0
60	0600	77.8	79.4	91.7	165.1	88.1	43.6	62.6	15.9	64.2	28.6	25.5	17.4	119.9
63	0630	82.6	85.7	98.8	171.5	97.3	43.6	65.1	15.9	66.7	35.4	32.2	17.4	127.0
65	0650	82.6	85.7	98.8	171.5	97.3	43.6	65.1	15.9	66.7	35.4	32.2	17.4	127.0
68	0680	88.9	92.1	103.2	171.5	101.0	41.2	63.5	15.9	65.1	40.7	37.5	17.4	131.3
70	0700	88.9	92.1	103.2	171.5	101.0	41.2	63.5	17.4	65.1	40.7	37.5	17.4	131.3
75	0750	100.0	101.6	113.5	196.9	106.0	45.4	65.1	*	66.7	44.1	40.9	20.6	145.3
80	800	103.2	104.8	116.8	188.9	106.4	40.5	63.8	*	66.9	45.8	42.6	20.6	148.5
85	850	109.5	111.1	123.2	206.4	111.1	40.5	65.1	*	68.3	49.2	46.1	20.6	154.8
90	900	115.9	117.5	129.5	212.7	117.5	40.5	65.1	*	68.3	55.6	52.4	17.4	158.8
95	950	117.7	120.0	132.1	222.3	112.7	40.5	65.1	*	68.3	50.8	47.6	17.4	172.0
100	1000	125.4	127.8	139.7	228.6	122.2	40.5	65.1	*	68.3	60.3	57.2	20.6	171.7
125	1250	165.1	167.5	184.4	304.8	146.0	41.4	77.3	*	80.5	71.9	68.8	20.6	254.0

*Not applicable. Refer to L23 for sizes over 3.000 mm.

Type 5611L/5611Q Typical Arrangement



Type 5611L/5611Q Dimensional Data (Inches)

Size D1	D2	D4		D26	L12	L23	L39	L56	L90	L91	L92	M	N
		Min.	Max.										
1.000	1.562	1.625	1.889	4.000	3.327	1.353	1.954	0.531	2.000	1.498	1.373	0.525	2.805
1.125	1.687	1.750	2.015	4.125	3.183	1.446	2.062	0.531	2.125	1.246	1.121	0.525	2.933
1.250	1.812	1.875	2.294	4.250	3.390	1.446	2.062	0.531	2.125	1.453	1.328	0.525	3.213
1.375	1.937	2.000	2.421	4.375	3.290	1.446	2.062	0.531	2.125	1.353	1.228	0.525	3.338
1.500	2.156	2.218	2.680	4.875	3.548	1.487	2.125	0.593	2.187	1.548	1.423	0.525	3.599
1.625	2.281	2.343	2.812	5.000	3.610	1.487	2.125	0.593	2.187	1.610	1.485	0.562	3.766
1.750	2.406	2.480	2.918	5.250	3.626	1.487	2.125	0.593	2.187	1.626	1.501	0.562	3.875
1.875	2.531	2.625	2.918	5.250	3.626	1.487	2.125	0.593	2.187	1.626	1.501	0.562	3.875
2.000	2.687	2.750	3.015	5.500	4.042	1.601	2.312	1.063	2.375	1.854	1.729	0.562	4.000
2.125	2.812	2.875	3.360	5.859	4.042	1.601	2.312	0.593	2.375	1.854	1.729	0.687	4.469
2.250	2.937	3.000	3.485	6.500	4.167	1.601	2.312	0.593	2.375	1.979	1.854	0.687	4.566
2.375	3.062	3.125	3.610	6.500	4.062	1.717	2.466	0.625	2.528	1.783	1.596	0.687	4.719
2.500	3.250	3.375	3.891	6.750	4.325	1.717	2.563	0.625	2.625	1.887	1.762	0.687	5.000
2.625	3.500	3.625	4.062	6.750	4.566	1.625	2.500	0.625	2.562	2.191	2.066	0.687	5.170
2.750	3.500	3.625	4.062	6.750	4.566	1.625	2.500	0.625	2.562	2.191	2.066	0.687	5.170
2.875	3.625	3.695	4.186	7.000	4.578	1.725	2.500	0.625	2.562	2.203	2.078	0.687	5.312
3.000	3.937	4.000	4.469	7.750	4.750	1.787	2.562	0.685	2.625	2.313	2.188	0.812	5.720
3.125	4.062	4.125	4.600	7.875	4.781	1.593	2.562	*	2.687	2.344	2.219	0.812	5.845
3.250	4.062	4.125	4.600	7.437	4.718	1.593	2.510	*	2.635	2.333	2.208	0.812	5.845
3.375	4.312	4.375	4.850	8.125	4.969	1.593	2.562	*	2.687	2.532	2.407	0.812	6.095
3.500	4.437	4.500	4.975	8.250	4.969	1.593	2.562	*	2.687	2.532	2.407	0.812	6.220
3.625	4.562	4.625	5.100	8.375	5.218	1.593	2.562	*	2.687	2.781	2.656	0.687	6.250
3.750	4.687	4.781	5.199	8.750	5.031	1.593	2.562	*	2.687	2.594	2.469	0.687	6.770
3.875	4.875	4.968	5.375	8.750	5.093	1.593	2.562	*	2.687	2.656	2.531	0.812	6.636
4.000	5.021	5.114	5.500	9.000	5.406	1.593	2.562	*	2.687	2.969	2.844	0.812	6.761

*Not applicable. Refer to L23 for sizes over 75mm.

TYPE 5611/5611L/5611Q

ELASTOMER METAL BELLOWS SEALS

Technical Specification

Type 5611L/5611Q Large Bore Dimensional Data (Inches)

Size D1	D2	D4		D26	L12	L23	L39	L56	L90	L91	L92	M	N	Min. Turn Dia.
		Min.	Max.											
1.375	1.937	2.875	3.023	5.375	3.290	1.446	2.062	0.625	2.125	1.353	1.228	0.562	4.062	3.268
1.750	2.406	3.500	3.925	6.500	3.626	1.487	2.125	0.656	2.187	1.626	1.501	0.687	5.093	3.885
1.875	2.530	3.625	3.734	6.500	3.626	1.316	1.954	0.485	2.017	1.797	1.672	0.687	5.093	**
2.125	2.812	3.875	4.250	7.156	4.042	1.570	2.282	0.749	2.407	1.885	1.760	0.687	5.687	4.264
2.500	3.250	4.750	4.875	8.000	4.325	1.697	2.407	0.656	2.532	2.043	1.918	0.687	6.062	5.139
2.625	3.625	4.625	4.740	8.000	4.566	1.617	2.329	0.578	2.454	2.362	2.237	0.687	6.062	***
2.750	3.500	4.750	4.875	8.000	4.566	1.697	2.407	0.656	2.532	2.284	2.159	0.687	6.062	5.139

**Seal cartridge is OD registered on the turn diam. of 4.125".

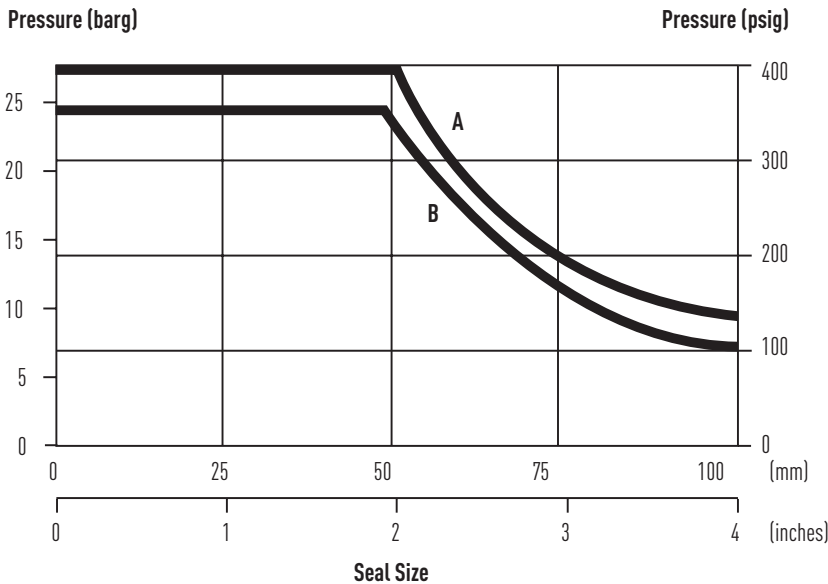
***Seal cartridge is OD registered on the turn diam. of 5.125".

Type 5611L/5611Q Dimensional Data (mm)

Size D1	Size Code	D2	D4		D26	L12	L23	L39	L56	L90	L91	L92	M	N
			Min.	Max.										
24	0240	39.7	41.3	48.0	101.6	84.5	34.4	49.6	13.5	50.8	38.0	34.9	13.3	71.2
25	0250	39.7	41.3	48.0	101.6	84.5	34.4	49.6	13.5	50.8	38.0	34.9	13.3	71.2
28	0280	42.9	44.5	51.2	104.8	80.8	36.7	52.4	13.5	54.0	31.6	28.5	13.3	74.5
30	0300	44.5	46.1	56.5	108.0	81.7	36.7	52.4	13.5	54.0	32.5	29.4	13.3	81.6
32	0320	45.0	47.6	58.3	108.0	86.1	36.7	52.4	13.5	54.0	36.9	33.7	13.3	81.6
33	0330	49.2	50.8	61.5	111.1	83.6	36.7	52.4	13.5	54.0	34.4	31.2	13.3	84.8
35	0350	49.2	50.8	61.5	111.1	83.6	36.7	52.4	13.5	54.0	34.4	31.2	13.3	84.8
38	0380	54.8	56.3	68.1	123.8	90.1	37.8	54.0	15.1	55.6	39.3	36.1	13.3	91.4
40	0400	57.9	59.5	71.4	127.0	91.7	37.8	54.0	15.1	55.6	40.9	37.7	14.3	95.7
43	0430	61.1	63.0	74.1	133.4	92.1	37.8	54.0	15.1	55.6	41.3	38.1	14.3	98.4
45	0450	61.1	63.0	74.1	133.4	92.1	37.8	54.0	15.1	55.6	41.3	38.1	14.3	98.4
48	0480	64.3	66.7	74.1	133.4	92.1	37.8	54.0	15.1	55.6	41.3	38.1	14.3	98.4
50	0500	68.2	70.0	76.6	139.7	102.7	40.7	58.7	27.0	60.3	47.1	43.9	14.3	101.6
53	0530	71.4	73.0	85.3	148.8	102.7	40.7	58.7	15.1	60.3	47.1	43.9	17.4	113.5
55	0550	74.6	76.7	85.3	148.8	105.8	40.7	58.7	15.1	60.3	50.3	47.1	17.4	113.5
58	0580	74.6	76.2	88.5	165.1	105.8	40.7	58.7	15.1	60.3	50.3	47.1	17.4	116.0
60	0600	77.8	79.4	91.7	165.1	103.2	43.6	62.6	15.9	64.2	43.7	40.5	17.4	119.9
63	0630	82.6	85.7	98.8	171.5	109.9	43.6	65.1	15.9	66.7	48.0	44.8	17.4	127.0
65	0650	82.6	85.7	98.8	171.5	109.9	43.6	65.1	15.9	66.7	48.0	44.8	17.4	127.0
68	0680	88.9	92.1	103.2	171.5	116.0	41.2	63.5	15.9	65.1	55.7	52.5	17.4	131.3
70	0700	88.9	92.1	103.2	171.5	116.0	41.2	63.5	15.9	65.1	55.7	52.5	17.4	131.3
75	0750	100.0	101.6	113.5	196.9	120.7	45.4	65.1	17.4	66.7	58.8	55.6	20.6	145.3
80	800	103.2	104.8	116.8	188.9	119.8	40.5	63.8	*	66.9	59.3	56.1	20.6	148.4
85	850	109.5	111.1	123.2	206.4	126.2	40.5	65.1	*	68.3	64.3	61.1	20.6	154.8
90	900	115.9	117.5	129.5	212.7	132.5	40.5	65.1	*	68.3	70.6	67.5	17.4	158.8
95	950	119.1	121.4	132.1	222.3	127.8	40.5	65.1	*	68.3	65.9	62.7	17.4	172.0
100	1000	127.5	129.9	139.7	228.6	137.3	40.5	65.1	*	68.3	75.4	72.2	20.6	171.7
125	1250	165.1	167.5	184.4	304.8	162.7	44.4	77.2	*	80.5	88.5	88.4	20.6	254.0

*Not applicable. Refer to L23 for sizes over 75mm.

Pressure Rating Limits



- A Carbon vs. silicon carbide (1,800 rpm)
- B Silicon carbide vs. silicon carbide (1,800 rpm)

1. Lubricating liquid is defined as having lubricating properties of gasoline or better.
2. Pressure capabilities to 28 barg/400 psig are based on lubricating oil service, carbon vs. silicon carbide.
3. For sizes above 100 mm/4", consult John Crane.

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 1,800 rpm in a clean, cool, lubricating, nonvolatile 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.

Multiplier Factors

	Selection Considerations	Multiplier Factor
Speed	1,800 rpm	x 1.00
	Other speeds	*
Sealed fluid lubricity	Petrol/Gasoline, kerosene or better	x 1.00
	Water and aqueous solutions (<80°C/176°F)	x 0.75
	Flashing hydrocarbons**	x 0.60
Sealed fluid temperature (for carbon only)	Up to 80°C/175°F	x 1.00
	80°C to 120°C/ 175°F to 250°F	x 0.90
	120°C to 180°C/ 250°F to 355°F	x 0.80
	Above 180°C/350°F	x 0.65

Example of determining pressure rating limits:

Seal: 50.8 mm/2.0" diameter Type 5611

Product: Water

Face materials: Carbon vs. silicon carbide

Temperature: 10°C/50°F

Shaft speed: 1,800 rpm

Using the pressure rating limits graph, the maximum pressure would be 28 barg/400 psig.

From the Multiplier Factors table on the left, apply the multipliers for the specific service requirements to determine the maximum operating pressure for the application:

$$28 \text{ barg/400 psig} \times 0.75 \times 1 = 21 \text{ barg/300 psig}$$

The maximum operating pressure for this 50.8mm/2" Type 5611 seal is 21 barg/300 psig.

* Multiplier = 1,800/new speed

** The ratio of sealed pressure to vapor pressure must be greater than 1.5, otherwise consult John Crane. If the specific gravity is less than 0.60, consult John Crane.

Example: If new speed = 2,700 rpm
Multiplier = 1,800/2,700 = 0.67

Materials of Construction		
SEAL COMPONENTS	MATERIALS	
Description	Standard	Options
Face/Primary ring	Resin-impregnated carbon	John Crane Diamond® Sintered silicon carbide Nickel binder tungsten carbide
Seat/Mating ring	Sintered silicon carbide	John Crane Diamond® Nickel binder tungsten carbide
Sleeve Gland plate Collar Retainer Disc Drive band Spring holder	316 stainless steel	—
Bellows/O-rings	Flouroelastomer Ethylene Propylene	Nitrile Neoprene Aflas™*
Gasket	Glass-filled PTFE	—
Spring	316 stainless steel	—
Quench bushing (5611Q)	Resin-impregnated carbon	—

* Aflas is a trademark of Asahi Glass Co. Ltd.

Application Criteria

The Type 5611 cartridge seals may be customized for specific installations after review and evaluation by John Crane. The following data is needed to evaluate the proposed service:

- Make and model of equipment
- Shaft or sleeve OD
- Seal cavity dimensions
- Speed
- Process fluid
 - Specific gravity
 - Box pressure
 - Vapor pressure
 - Temperature
 - Viscosity
- Quench fluid (if applicable)



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If the products featured will be used in a potentially dangerous and/or hazardous process, your John Crane representative should be consulted prior to their selection and use. In the interest of continuous development, John Crane Companies reserve the right to alter designs and specifications without prior notice. It is dangerous to smoke while handling products made from PTFE. Old and new PTFE products must not be incinerated. ISO 9001 and ISO14001 Certified, details available on request.