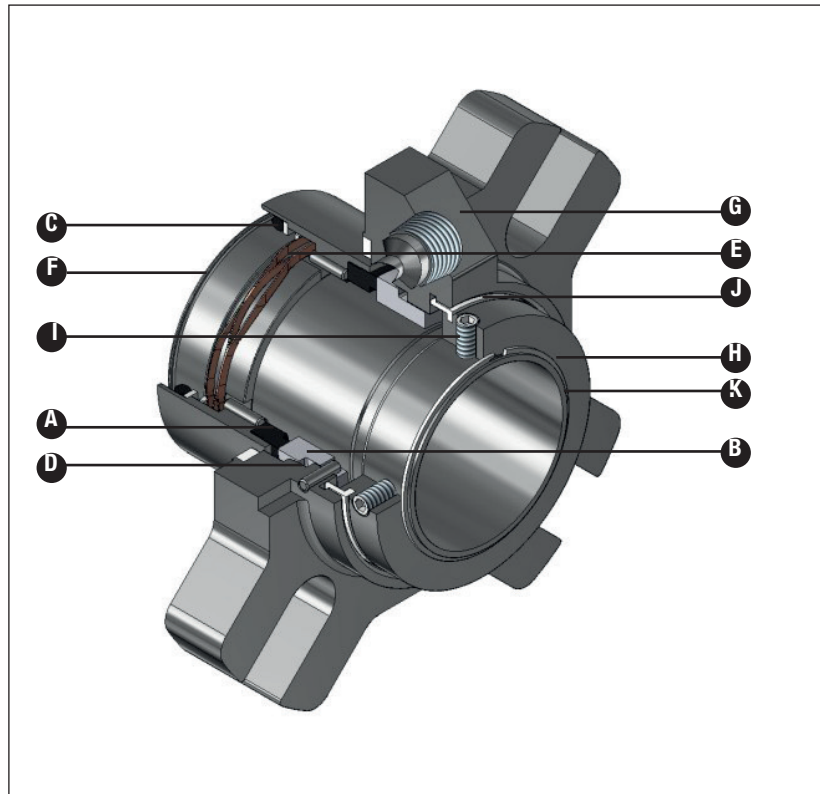


- A - Face/Primary Ring Ass'y
- B - Seat/Mating Ring
- C - Dynamic O-Ring
- D - Static O-Ring
- E - Nonclogging Wave Spring
- F - Sleeve
- G - Gland
- H - Collar
- I - Set Screws
- J - Centralizing Spacer Ring
- K - Retaining Ring



4610 shown

Product Description

The 4600 series cartridge seal is the complete, affordable and off-the-shelf sealing solution for industrial liquid applications.

Type 4600 series meets key industry pump standards, and is designed to permit use in rotating shaft equipment including ANSI/DIN pumps, close-coupled pumps, vertical pumps, and similar rotating shaft equipment.

Typical Applications

- Water and wastewater
- Pulp and paper
- Power generation
- Chemical
- Food and beverage
- Pharmaceutical
- Mining
- Steel production
- General industrial

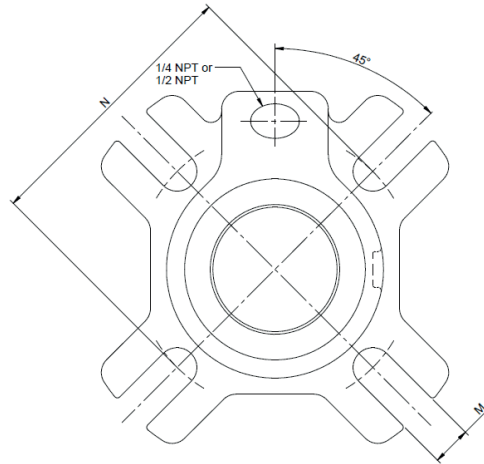
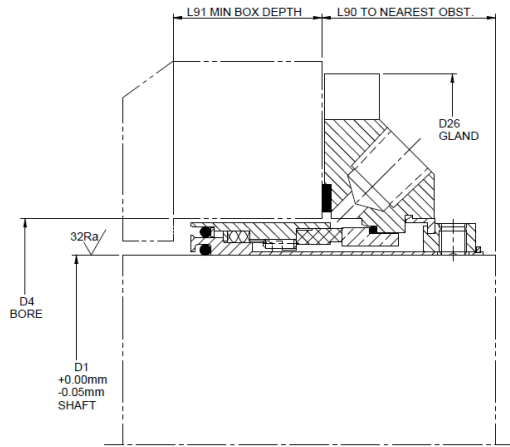
Design Features

- Single and Dual O-ring Pusher Design
- Optimized running face design
- Non-clogging, crest-to-crest wave spring
- Pre-assembled unique centralizing spacer ring does not require removal before equipment startup
- Compact cartridge design
- Dual arrangement design can operate as tandem (unpressurized) or double (pressurized)
- Dual seal sleeve offers standard pumping vanes which improve flow and cooling
- Robust pin drive mechanism for both primary and mating ring

TYPE 4610/4620P

SINGLE AND DUAL COMPACT CARTRIDGE O-RING PUSHER SEALS

Type 4610 Standard Bore Arrangement



See Installation Instructions for piping arrangements

TYPE 4610/4620P

SINGLE AND DUAL COMPACT CARTRIDGE O-RING PUSHER SEALS

Type 4610 Standard Bore Dimensional Data

inches

Seal Size	Size Code	D1 Shaft Size	D4 Box Bore		D26	L90	L91	M	N
			Min.	Max.					
24	0240	0.945	1.575	1.937	4.126	1.476	1.260	0.437	2.626
25	0250	0.984	1.614	1.937	4.126	1.476	1.260	0.437	2.626
28	0280	1.102	1.732	2.063	4.252	1.476	1.260	0.437	2.752
30	0300	1.181	1.811	2.189	4.370	1.476	1.260	0.437	2.874
32	0320	1.260	1.874	2.189	4.370	1.476	1.260	0.437	2.874
33	0330	1.299	1.929	2.311	4.500	1.476	1.260	0.437	3.063
35	0350	1.378	2.000	2.311	4.500	1.476	1.260	0.437	3.063
38	0380	1.496	2.250	2.500	5.000	1.476	1.299	0.563	3.437
40	0400	1.575	2.362	2.500	5.000	1.516	1.299	0.563	3.437
43	0430	1.693	2.480	2.626	5.252	1.516	1.299	0.563	3.563
45	0450	1.772	2.500	2.626	5.252	1.516	1.299	0.563	3.563
48	0480	1.890	2.626	3.000	5.500	1.516	1.299	0.563	3.874
50	0500	1.969	2.750	3.000	5.500	1.516	1.299	0.563	3.874
53	0530	2.087	2.874	3.311	5.748	1.516	1.299	0.689	4.374
55	0550	2.165	2.874	3.311	5.748	1.516	1.299	0.689	4.374
58	0580	2.283	3.126	3.563	6.000	1.516	1.299	0.689	4.626
60	0600	2.362	3.126	3.563	6.000	1.516	1.299	0.689	4.626
63	0630	2.480	3.252	3.874	6.252	1.516	1.417	0.689	4.874
65	0650	2.559	3.500	3.874	6.252	1.516	1.417	0.689	4.874
70	0700	2.756	3.740	3.874	6.252	1.516	1.417	0.689	4.874
75	0750	2.953	4.000	4.500	8.110	1.811	1.673	0.811	5.709
80	0800	3.150	4.252	4.748	8.110	1.811	1.673	0.811	5.945
85	0850	3.346	4.370	4.874	8.110	1.811	1.673	0.811	6.063
90	0900	3.543	4.626	5.118	8.504	1.811	1.673	0.811	6.299
95	0950	3.740	4.752	5.252	9.685	1.811	1.673	0.811	6.457
100	1000	3.937	4.874	5.374	9.685	1.811	1.673	0.811	6.575
105	1050	4.134	5.252	5.906	9.685	2.441	1.732	0.811	7.126
110	1100	4.331	5.500	6.102	9.685	2.441	1.732	0.811	7.402
115	1150	4.528	5.500	6.102	9.685	2.441	1.732	0.811	7.402
120	1200	4.724	5.752	6.378	10.472	2.441	1.732	0.811	7.638
125	1250	4.921	6.299	6.929	10.472	2.441	1.732	0.811	8.268
130	1300	5.118	6.299	6.929	10.472	2.441	1.732	0.811	8.268
135	1350	5.315	6.850	7.480	11.654	2.441	1.732	0.937	8.898
140	1400	5.512	6.850	7.480	11.654	2.441	1.732	0.937	8.898
1428	1428	5.625	6.850	7.480	11.654	2.441	1.732	0.937	8.898

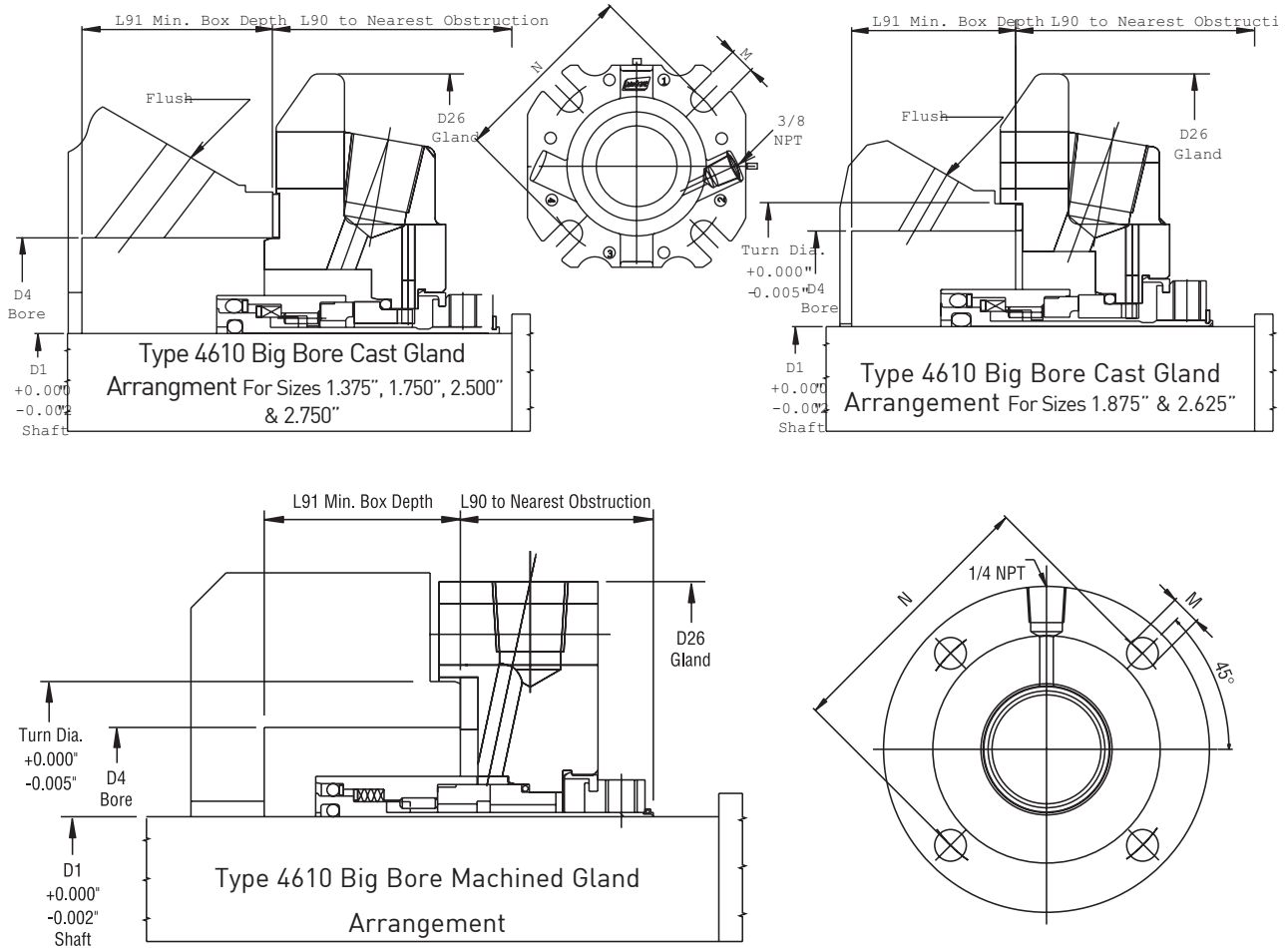
metric

Seal Size	Size Code	D1 Shaft Size	D4 Box Bore		D26	L90	L91	M	N
			Min.	Max.					
24	0240	24.00	40.00	49.20	104.80	37.50	32.00	11.10	66.70
25	0250	25.00	41.00	49.20	104.80	37.50	32.00	11.10	66.70
28	0280	28.00	44.00	52.40	108.00	37.50	32.00	11.10	69.90
30	0300	30.00	46.00	55.60	111.00	37.50	32.00	11.10	73.00
32	0320	32.00	47.60	55.60	111.00	37.50	32.00	11.10	73.00
33	0330	33.00	49.00	58.70	114.30	37.50	32.00	11.10	77.80
35	0350	35.00	50.80	58.70	114.30	37.50	32.00	11.10	77.80
38	0380	38.00	57.15	63.50	127.00	38.50	33.00	14.30	87.30
40	0400	40.00	60.00	63.50	127.00	38.50	33.00	14.30	87.30
43	0430	43.00	63.00	66.70	133.40	38.50	33.00	14.30	90.50
45	0450	45.00	63.50	66.70	133.40	38.50	33.00	14.30	90.50
48	0480	48.00	66.70	76.20	139.70	38.50	33.00	14.30	98.40
50	0500	50.00	69.85	76.20	139.70	38.50	33.00	14.30	98.40
53	0530	53.00	73.00	84.10	146.00	38.50	33.00	17.50	111.10
55	0550	55.00	73.00	84.10	146.00	38.50	33.00	17.50	111.10
58	0580	58.00	79.40	90.50	152.40	38.50	33.00	17.50	117.50
60	0600	60.00	79.40	90.50	152.40	38.50	33.00	17.50	117.50
63	0630	63.00	82.60	98.40	158.80	38.50	36.00	17.50	123.80
65	0650	65.00	88.90	98.40	158.80	38.50	36.00	17.50	123.80
70	0700	70.00	95.00	98.40	158.80	38.50	36.00	17.50	123.80
75	0750	75.00	101.60	114.30	206.00	46.00	42.50	20.60	145.00
80	0800	80.00	108.00	120.60	206.00	46.00	42.50	20.60	151.00
85	0850	85.00	111.00	123.80	206.00	46.00	42.50	20.60	154.00
90	0900	90.00	117.50	130.00	216.00	46.00	42.50	20.60	160.00
95	0950	95.00	120.70	133.40	246.00	46.00	42.50	20.60	164.00
100	1000	100.00	127.00	140.00	246.00	46.00	42.50	20.60	171.00
105	1050	105.00	133.40	150.00	246.00	62.00	44.00	20.60	181.00
110	1100	110.00	139.70	155.00	246.00	62.00	44.00	20.60	188.00
115	1150	115.00	139.70	155.00	246.00	62.00	44.00	20.60	188.00
120	1200	120.00	146.10	162.00	266.00	62.00	44.00	20.60	194.00
125	1250	125.00	160.00	176.00	266.00	62.00	44.00	20.60	210.00
130	1300	130.00	160.00	176.00	266.00	62.00	44.00	20.60	210.00
135	1350	135.00	174.00	190.00	296.00	62.00	44.00	23.80	226.00
140	1400	140.00	174.00	190.00	296.00	62.00	44.00	23.80	226.00
1428	1428	142.87	174.00	190.00	296.00	62.00	44.00	23.80	226.00

TYPE 4610/4620P

SINGLE AND DUAL COMPACT CARTRIDGE O-RING PUSHER SEALS

Type 4610 Big Bore Typical Arrangement



Type 4610 Big Bore Dimensional Data

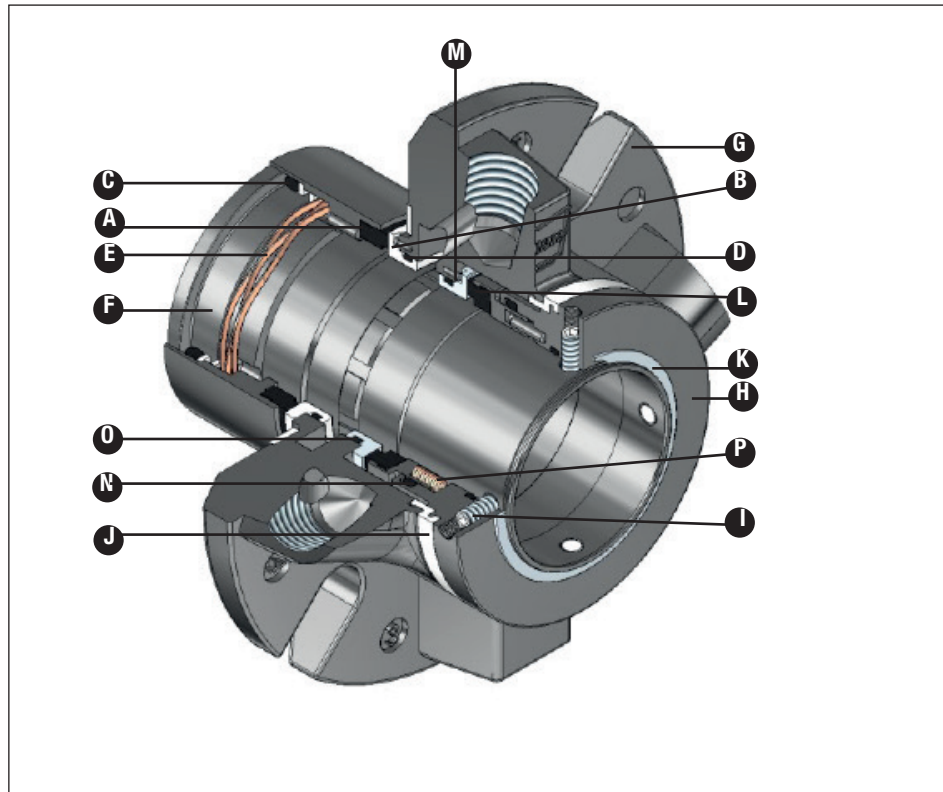
Big Bore Cast Gland (inches)

Pump Manufacturer	D1 Shaft Size	D4 Box Bore		D26	L90	L91	M	N	Turn Dia.
		Min.	Max.						
Durco Mk III Group IK, Goulds 3196 STX, Sulzer ALB #1	1.375	2.875	3.023	5.375	2.059	0.600	0.562	4.062	—
Goulds 3196 MTX	1.750	3.500	3.925	6.500	2.100	0.638	0.687	5.093	—
Durco Mk III Group II	1.875	3.625	3.734	6.500	1.929	0.809	0.687	5.093	4.125
Goulds 3196 XLTX	2.500	4.750	4.875	8.000	2.479	0.377	0.687	6.062	—
Durco Mk III Group III	2.625	4.625	4.740	8.000	2.432	0.424	0.687	6.062	5.125
Goulds 3196 X-17	2.750	4.750	4.875	8.000	2.386	0.470	0.687	6.062	—

Big Bore Machined Gland (inches)

Durco Mk III Group IJ	1.125	1.730	2.750	4.500	1.422	1.180	0.437	3.750	3.125
Goulds 3196 LTX	2.125	2.875	4.336	7.125	1.462	1.220	0.687	6.000	4.711
Sulzer ALB #2	2.125	2.875	4.187	7.156	1.462	1.220	0.437	5.250	4.562
Sulzer ALB #3	2.500	3.250	4.750	8.000	1.462	1.220	0.562	6.000	5.125

- A- Inboard Face/ Primary Ring Ass'y
- B- Inboard Seat/ Mating Ring
- C- Inboard Dynamic O-Ring
- D- Inboard Static O-Ring
- E- Non-clogging Wave Spring
- F- Sleeve
- G- Gland
- H- Collar
- I- Set Screws
- J- Centralizing Spacer Ring
- K- Retaining Ring
- L- Outboard Face/ Primary Ring Ass'y
- M- Outboard Seat/ Mating Ring
- N- Outboard Dynamic O-Ring
- O- Outboard Static O-Ring
- P- Outboard Springs



4620P shown

Product Description

The 4600 series cartridge seal is the complete, affordable and off-the-shelf sealing solution for industrial liquid applications.

Type 4600 series meets key industry pump standards, and is designed to permit use in rotating shaft equipment including ANSI/DIN pumps, close-coupled pumps, vertical pumps, and similar rotating shaft equipment.

Typical Applications

- Water and wastewater
- Pulp and paper
- Power generation
- Chemical
- Food and beverage
- Pharmaceutical
- Mining
- Steel production
- General industrial

Design Features

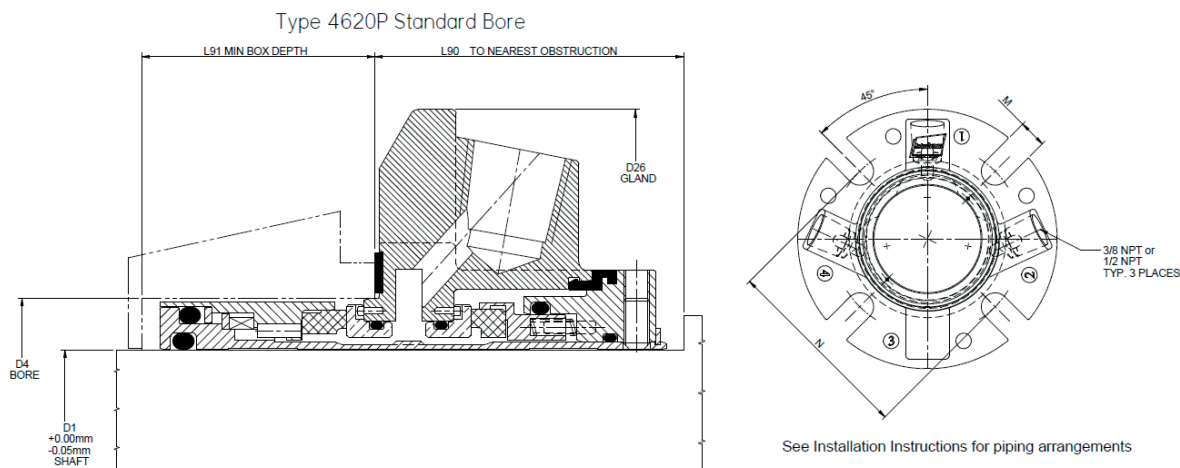
- Single and Dual O-ring Pusher Design
- Optimized running face design
- Non-clogging, crest-to-crest wave spring
- Pre-assembled unique centralizing spacer ring does not require removal before equipment startup
- Compact cartridge design
- Dual arrangement design can operate as tandem (unpressurized) or double (pressurized)
- Dual seal sleeve offers standard pumping vanes which improve flow and cooling
- Robust pin drive mechanism for both primary and mating ring

TYPE 4610/4620P

SINGLE AND DUAL COMPACT CARTRIDGE O-RING PUSHER SEALS

Technical Specification

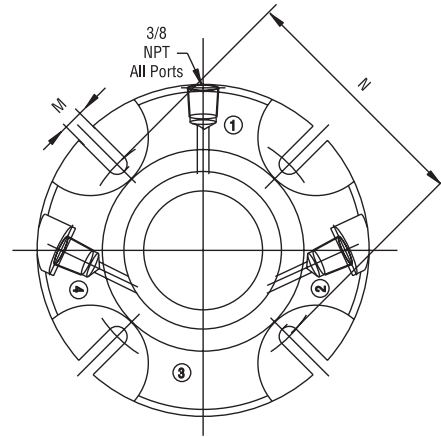
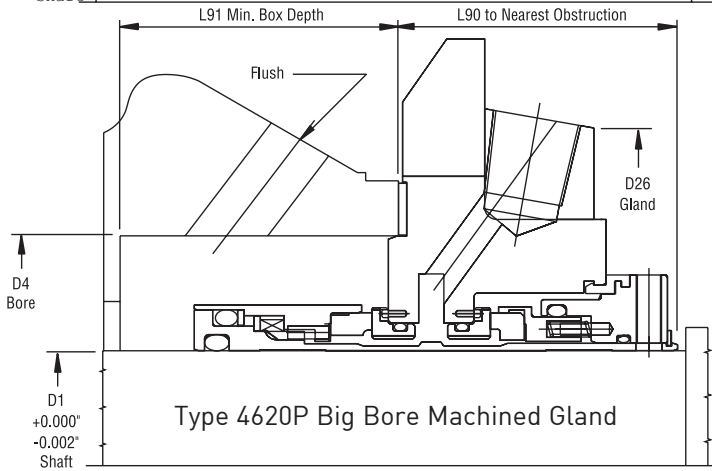
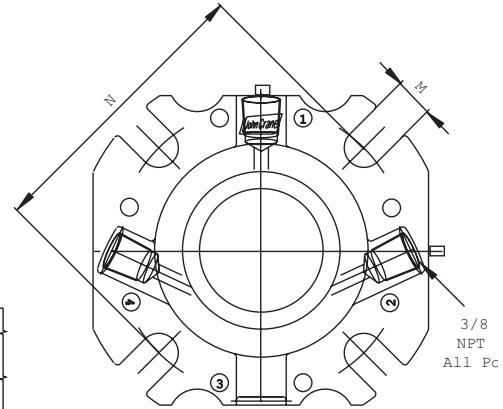
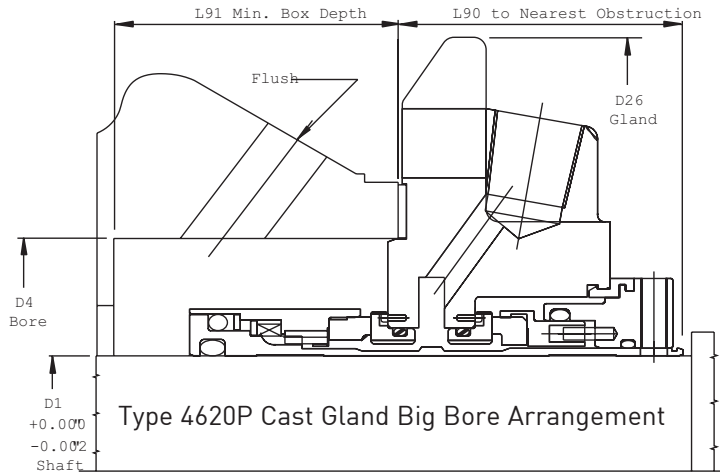
Type 4620P Standard Bore Arrangement



TYPE 4610/4620P

SINGLE AND DUAL COMPACT CARTRIDGE O-RING PUSHER SEALS

Type 4620P Big Bore Typical Arrangement



Type 4620P Big Bore Dimensional Data

Big Bore Cast Gland (inches)

Pump Manufacturer	D1 Shaft Size	D4 Box Bore		D26	L90	L91	M	N
		Min.	Max.					
Durco Mk III Group IK, Goulds 3196 STX, Sulzer ALB #1	1.375	2.875	3.023	5.375	2.125	1.603	0.562	4.062
Goulds 3196 MTX	1.750	3.500	3.925	6.500	2.187	1.680	0.687	5.093
Durco Mk III Group II	1.875	3.625	3.734	6.500	2.187	1.680	0.687	5.093
Goulds 3196 XLTX	2.500	4.750	4.875	8.000	2.532	1.859	0.687	6.062
Durco Mk III Group III	2.625	4.625	4.740	8.000	2.562	1.727	0.687	6.062
Goulds 3196 X-17	2.750	4.750	4.875	8.000	2.532	1.820	0.687	6.062

Big Bore Machined Gland (inches)

Goulds 3196 LTX	2.125	3.875	4.250	7.156	2.408	1.742	0.687	5.687
Sulzer ALB #2	2.125	4.125	4.250	7.156	2.407	1.742	0.437	5.250
Sulzer ALB #3	2.500	4.750	4.875	8.000	2.532	1.859	0.687	6.062

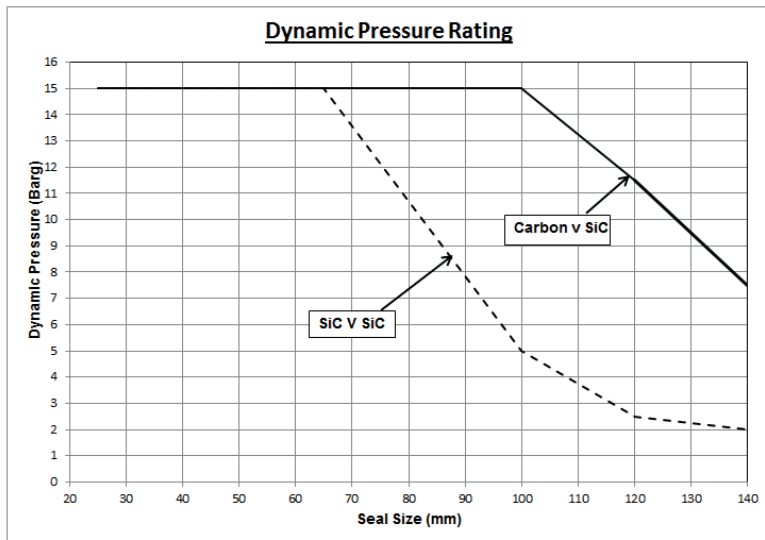
TYPE 4610/4620P

SINGLE AND DUAL COMPACT CARTRIDGE O-RING PUSHER SEALS

Materials of Construction

SEAL COMPONENTS	MATERIALS	
	Description	Standard
Face/Primary Ring	Carbon Graphite	Silicon Carbide (Inboard Only)
Seat/Mating Ring	Silicon Carbide	—
O-ring	Fluoroelastomer	EPDM TFE Propylene Perfluoroelastomer
Springs	Alloy-C-276	—
Gasket, Centering Ring	Glass-filled PTFE Note: Some sizes have Sint. 316SS Spacers	—
Hardware	316SS or better	
Inboard Primary Ring Adaptor	Duplex SS	—
Outboard Primary Ring Adaptor	Alloy 20	—

Basic Pressure Rating



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 industrial practices. The basic pressure rating assumes stable operation at the speeds indicated on the above chart 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.



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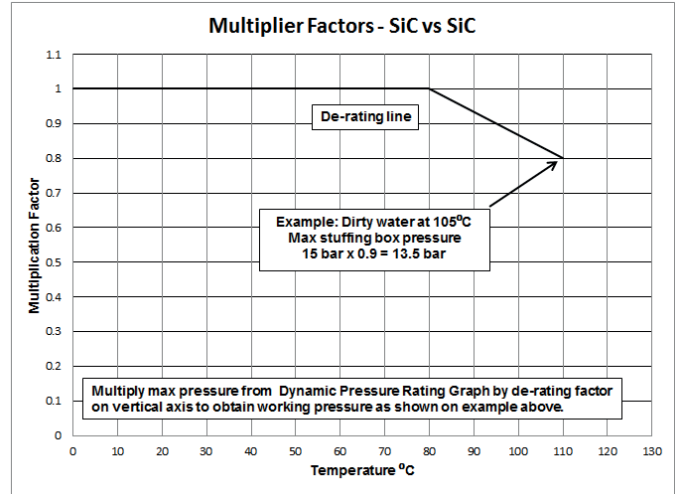
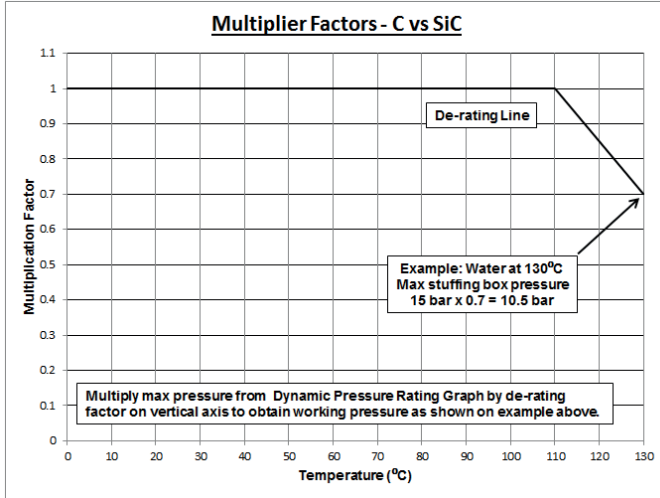
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Fax: 971-488-62830

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

Multiplier Factors



Single Type 4610 and Tandem ¹ Type 4620P
Process Pressure
Up to 15 barg or 220 psig Seal size and material dependent See Dynamic Pressure Rating Graph

Double ² Type 4620P	
Barrier Fluid Pressure ²	Inboard Seal Internal Pressure Rating ³
Up to 15 barg or 220 psig Seal Size, Material & Barrier Fluid dependent ² See Dynamic Pressure Rating Graph	1-2 barg or 15-30 psig

¹Tandem (Unpressurized) : Uses a “buffer” with pressure lower than process seal chamber or stuffing box pressure (Plan 52). Pressure rating is same as Single.

²Double (Pressurized): Uses a “barrier” fluid with pressure higher than process seal chamber fluid or stuffing box pressure (Plan 53).

As a Double (Pressurized) Arrangement, maximum barrier fluid pressure is same as Dynamic Pressure Rating for Type 4620P carbon vs. SiC inboard seal (see Figure 3).

Maximum barrier fluid pressure is 9 barg or 130 psig for 3.000” (75mm) and larger sizes when barrier fluid is oil and shaft speed is greater than 1800 rpm.

³Inboard Seal Internal Pressure Rating = Barrier Pressure – Process Pressure

When using as a Double Pressurized Arrangement, set the barrier fluid pressure at 15-30 psig / 1-2 barg above process fluid.

It is not recommended to operate at higher pressure differential due to the inboard seal internal pressure limit.

Additional Notes:

*Barrier fluid must have a viscosity less than 15 cSt/65 SSU and fluid lubricity equal or better than water at 40°C. It is recommended that the barrier temperature be maintained below 65°C.

**The ratio of sealed pressure to vapor pressure must be greater than 1.5, otherwise contact Engineering. If the specific gravity is less than 0.6, contact Engineering.

