Vulcan Parallel Spring Diaphragm Type Seals

Section 5

Introduction

Vulcan's Parallel Spring Type Seals are highly proficient and widely utilised, covering all standard pump shaft, working length and housing size ranges.

Applications

The parallel spring family range are ideal for a wide spectrum of application conditions, ranging from general water to food processing, petrochemical and other demanding applications.

The seals are highly effective and widely utilised in pumps, mixers, agitators, compressors and other rotary shaft equipment.

Standard Vulcan Parallel Types

Types 10 and 20

Parallel spring, rubber diaphragm seal to common industry standard dimensions. Usually fitted with boot mounted seats, or specify Type 21 'O'-Ring mounted seat.

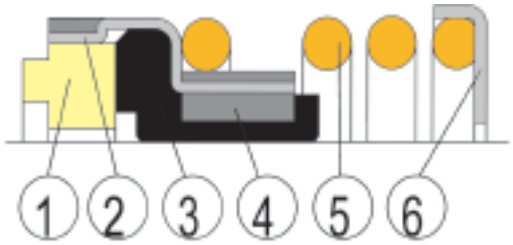
Types 11 and 22

As above, to American standard dimensions, fitted with boot mounted seats or alternatively, specify Type 31 'O'-Ring mounted seat.

Type 24

As above to DIN 24960 (EN12756) dimension, fitted with boot mounted seat, specify Type 24S if a Type 24 DINS seat is required and Type 24L for the seal to be fitted with a Type 24 DINL seat.

STANDARD COMPONENTS



No	Description
1	Seal Face
2	Retainer
3	Diaphragm
4	Drive Ring
5	Spring
6	Base Plate

Vulcan Design Advantages

Accommodating

The seal head automatically adjusts to accommodate misalignment and seal face wear, through the design and flexibility of the rubber diaphragm.

Improved

Vulcan's attention to detail and modern in-house design and manufacturing facilities, have enabled Vulcan to create Parallel Spring Seals, with additional improvements to the original designs, whilst still maintaining the main design features, such as self aligning, non fretting/clogging and vacuum application suitability. These improvements result in a superior Vulcan Mechanical Seal, to both the original replacement seal and their other direct market copies.

Retained Components

Faces and base plates are retained by adhesive and by mating components, respectively, making handling and fitting easier and more secure.

Customisable

The technically efficient and highly versatile, parallel spring, seal design can be readily customised to suit individual requirements; where a standard seal cannot be utilised.

Vulcan can assist in the design of special production runs to fully satisfy customer requirements.

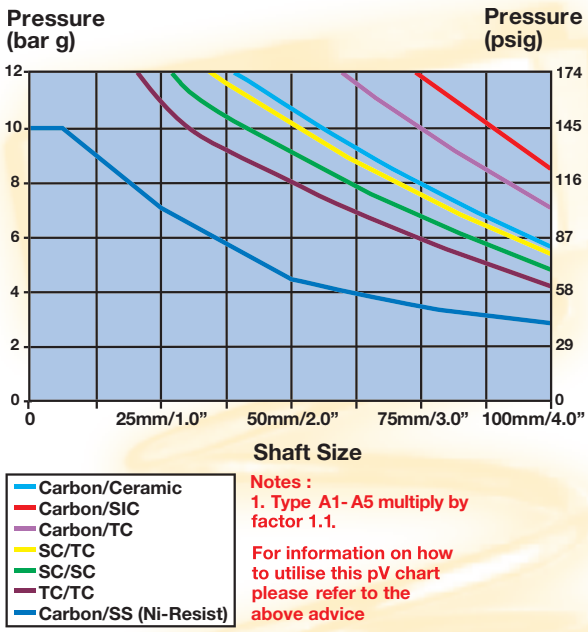
Material Quality

A wide selection of high quality face materials and elastomers are readily available as standard.

Reliability

The resulting Vulcan Quality Seal and the high strength and flexibility of the diaphragm, provide a very reliable and accommodating mechanical seal design.

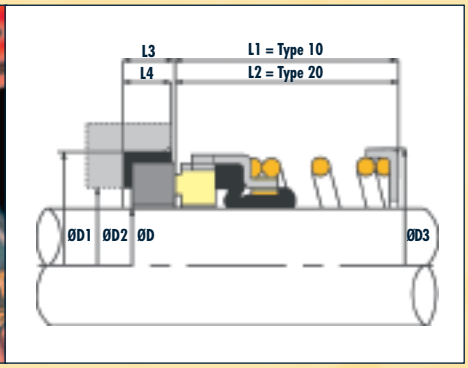
VULCAN PARALLEL SPRING DIAPHRAGM TYPE SEALS PV CHART



Notes :
1. Type A1- A5 multiply by factor 1.1.

For information on how to utilise this pV chart please refer to the above advice

TYPE 10/TYPE 20



Metric shaft size resilient, single spring, rubber diaphragm seal with boot mounted seat as standard. A widely specified and utilised seal Type, capable of long service life.

VULCAN STANDARD SIZES

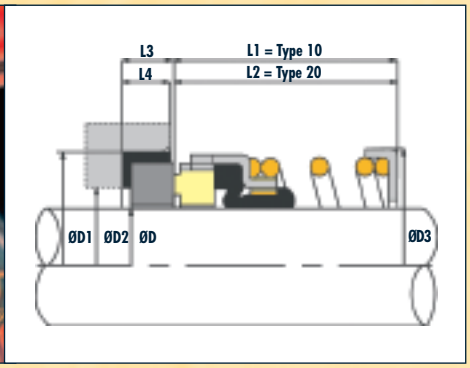
Metric Shaft Size D	Size Code	D1	D2	D3	L1	L2	L3	L4
10	0100	24.60	16.00	22.95	43.65	25.40	8.74	7.47
12	0120	27.79	19.05	23.90	43.65	25.40	8.74	7.47
13	0130	27.79	19.05	23.90	43.65	25.40	8.74	7.47
14	0140	30.95	22.23	26.70	43.65	25.40	10.32	8.97
15	0150	30.95	22.23	26.70	43.65	25.40	10.32	8.97
16	0160	30.95	22.23	26.70	43.65	25.40	10.32	8.97
18	0180	34.15	25.40	31.10	43.65	25.40	10.32	8.97
19	0190	34.15	25.40	31.10	43.65	25.40	10.32	8.97
20	0200	35.70	26.99	33.40	43.65	25.40	10.32	8.97
22	0220	37.30	28.58	33.40	43.65	25.40	10.32	8.97
24	0240	40.50	31.75	39.20	43.65	25.40	10.32	8.97
25	0250	40.50	31.75	39.20	43.65	25.40	10.32	8.97
28	0280	47.63	35.72	46.30	60.33	33.34	11.99	10.46
30	0300	50.80	38.89	49.40	60.33	33.34	11.99	10.46
32	0320	50.80	38.89	49.40	60.33	33.34	11.99	10.46
33	0330	53.98	42.07	52.60	60.33	33.34	11.99	10.46
34	0340	53.98	42.07	52.60	60.33	33.34	11.99	10.46
35	0350	53.98	42.07	52.60	60.33	33.34	11.99	10.46
38	0381	57.15	45.24	55.80	60.33	33.34	11.99	10.46
40	0400	60.35	48.82	59.20	60.33	33.34	11.99	10.46
42	0420	63.50	51.59	66.00	70.64	40.48	11.99	10.46
43	0430	63.50	51.59	66.00	70.64	40.48	11.99	10.46
44	0440	63.50	51.59	66.00	70.64	40.48	11.99	10.46
45	0450	63.50	51.59	66.00	70.64	40.48	11.99	10.46
48	0480	66.70	54.75	66.60	70.64	40.48	11.99	10.46
50	0500	69.85	58.00	71.65	70.64	40.48	13.50	11.96
53	0530	73.05	62.00	73.30	71.00	41.00	13.50	11.96
55	0550	76.20	65.00	78.40	71.00	41.00	13.50	11.96
58	0580	79.40	68.00	82.00	71.00	41.00	13.50	11.96
60	0600	79.40	68.00	82.00	71.00	41.00	13.50	11.96
63	0630	82.55	71.20	84.90	71.00	41.00	13.50	11.96
65	0650	92.10	78.35	88.40	70.00	49.00	15.90	14.50
70	0700	95.25	81.10	92.60	70.00	49.00	15.90	14.50
73	0730	98.45	84.50	94.85	73.00	49.00	15.90	14.50
75	0750	101.65	88.10	102.70	73.00	49.00	15.90	14.50
80	0800	114.30	97.00	104.00	79.00	56.00	20.00	18.50
85	0850	117.50	100.00	108.00	79.00	56.00	20.00	18.50
90	0900	123.85	107.00	112.00	83.00	59.00	20.00	18.50
95	0950	127.00	110.00	119.00	83.00	59.00	20.00	18.50
100	1000	133.35	116.00	124.00	86.00	62.00	20.00	18.50

STANDARD STOCK FACE MATERIALS
Rotary Face: Carbon, Silicon Carbide, Tungsten Carbide.
Stat Ring: Ceramic, Silicon Carbide, Tungsten Carbide.
OTHER FACE MATERIALS TO ORDER

Suggested Operating Limits

PRESSURE 180psi SPEED 15m/s
TEMPERATURE -40 +200°C
Dependent upon shaft diameter and speed + Temperature and media to be sealed

TYPE 10/TYPE 20



Imperial shaft size rubber diaphragm seal with parallel single spring and boot mounted seat as standard. The most common, imperial shaft, single spring design, suitable for use in many applications.

VULCAN STANDARD SIZES

Shaft Size DØ			D1		D2		D3		L1		L2		L3		L4	
Inch	Metric	Code Size	Metric	Inch	Metric	Inch	Metric	Inch	Metric	Inch	Metric	Inch	Metric	Inch	Metric	Inch
0.375	9.53	0095	24.60	0.969	16.00	0.630	22.95	0.904	43.65	1.719	25.40	1.000	8.74	0.344	7.47	0.294
0.500	12.70	0127	27.79	1.094	19.05	0.750	23.90	0.941	43.65	1.719	25.40	1.000	8.74	0.344	7.47	0.294
0.625	15.88	0158	30.95	1.219	22.23	0.875	26.70	1.051	43.65	1.719	25.40	1.000	10.32	0.406	8.97	0.353
0.750	19.05	0191	34.15	1.344	25.40	1.000	31.10	1.224	43.65	1.719	25.40	1.000	10.32	0.406	8.97	0.353
0.875	22.23	0222	37.30	1.469	28.58	1.125	33.40	1.315	43.65	1.719	25.40	1.000	10.32	0.406	8.97	0.353
1.000	25.40	0254	40.50	1.594	31.75	1.250	43.20	1.701	43.65	1.719	25.40	1.000	10.32	0.406	8.97	0.353
1.125	28.58	0286	47.63	1.875	35.72	1.406	46.30	1.823	60.33	2.375	33.34	1.313	11.99	0.472	10.46	0.412
1.250	31.75	0317	50.80	2.000	38.89	1.531	49.40	1.945	60.33	2.375	33.34	1.313	11.99	0.472	10.46	0.412
1.375	34.93	0349	53.98	2.125	42.07	1.656	52.60	2.071	60.33	2.375	33.34	1.313	11.99	0.472	10.46	0.412
1.500	38.10	0381	57.15	2.250	45.24	1.781	55.80	2.197	60.33	2.375	33.34	1.313	11.99	0.472	10.46	0.412
1.625	41.28	0412	60.35	2.376	48.42	1.906	59.20	2.331	60.33	2.375	33.34	1.313	11.99	0.472	10.46	0.412
1.750	44.45	0444	63.50	2.500	51.59	2.031	66.00	2.598	70.64	2.781	40.48	1.594	11.99	0.472	10.46	0.412
1.875	47.63	0476	66.70	2.626	54.75	2.156	66.60	2.622	70.64	2.781	40.48	1.594	11.99	0.472	10.46	0.412
2.000	50.80	0508	69.85	2.750	58.00	2.283	73.00	2.874	70.64	2.781	40.48	1.594	13.50	0.531	11.96	0.471
2.125	53.98	0539	73.05	2.876	62.00	2.441	73.30	2.886	71.00	2.795	41.00	1.614	13.50	0.531	11.96	0.471
2.250	57.15	0571	76.20	3.000	65.00	2.559	78.40	3.087	71.00	2.795	41.00	1.614	13.50	0.531	11.96	0.471
2.375	60.33	0603	79.40	3.126	68.00	2.677	82.00	3.228	71.00	2.795	41.00	1.614	13.50	0.531	11.96	0.471
2.500	63.50	0635	82.55	3.250	71.20	2.803	84.90	3.343	71.00	2.795	41.00	1.614	13.50	0.531	11.96	0.471
2.625	66.68	0666	92.10	3.626	78.35	3.085	88.40	3.480	70.00	2.756	49.00	1.929	15.90	0.626	14.50	0.571
2.750	69.85	0698	95.25	3.750	81.10	3.193	92.60	3.646	70.00	2.756	49.00	1.929	15.90	0.626	14.50	0.571
2.875	73.03	0730	98.45	3.876	84.50	3.327	94.85	3.734	73.00	2.874	49.00	1.929	15.90	0.626	14.50	0.571
3.000	76.20	0762	101.65	4.002	88.10	3.469	102.70	4.043	73.00	2.874	49.00	1.929	15.90	0.626	14.50	0.571
3.125	79.38	0794	111.15	4.376	93.68	3.688	104.00	4.094	79.00	3.110	56.00	2.205	20.00	0.787	18.50	0.728
3.250	82.55	0826	114.30	4.500	96.85	3.813	104.00	4.094	79.00	3.110	56.00	2.205	20.00	0.787	18.50	0.728
3.375	85.73	0857	117.50	4.626	100.00	3.937	108.00	4.252	79.00	3.110	56.00	2.205	20.00	0.787	18.50	0.728
3.500	88.90	0889	120.65	4.750	103.18	4.062	112.00	4.409	79.00	3.110	56.00	2.205	20.00	0.787	18.50	0.728
3.625	92.08	0921	123.85	4.876	106.35	4.187	114.00	4.488	83.00	3.268	59.00	2.323	20.00	0.787	18.50	0.728
3.750	95.25	0953	127.00	5.000	109.52	4.312	119.00	4.685	83.00	3.268	59.00	2.323	20.00	0.787	18.50	0.728
3.875	98.43	0984	130.20	5.126	112.65	4.435	121.00	4.764	86.00	3.386	62.00	2.441	20.00	0.787	18.50	0.728
4.000	101.60	1016	133.35	5.250	115.88	4.562	124.00	4.882	86.00	3.386	62.00	2.441	20.00	0.787	18.50	0.728

Suggested Operating Limits

PRESSURE 180psi SPEED 15m/s

TEMPERATURE -40 +200°C

Dependent upon shaft diameter and speed + Temperature and media to be sealed

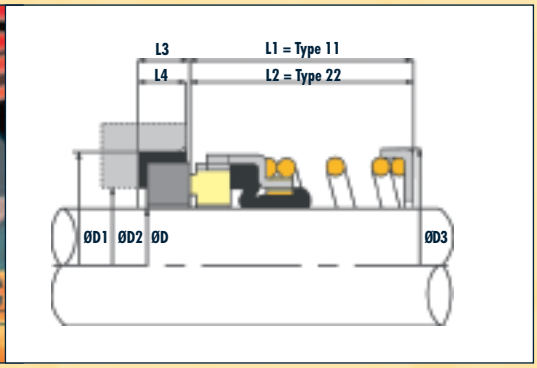
STANDARD STOCK FACE MATERIALS

Rotary Face: Carbon, Silicon Carbide, Tungsten Carbide

Stat Ring: Ceramic, Silicon Carbide, Tungsten Carbide

OTHER FACE MATERIALS TO ORDER

TYPE 11/TYPE 22



Single spring, rubber diaphragm seal, designed for different sized seat housings and seal working lengths to the Types 10/20. The imperial sizes are most commonly found on American equipment.

VULCAN STANDARD SIZES

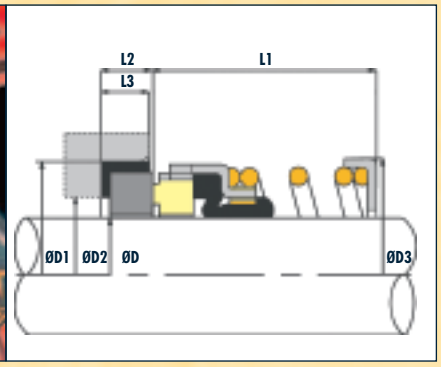
Shaft Size DØ			Shaft Size DØ			D1		D2		D3		L1		L2		L3		L4	
Inch	Metric	Code Size	Metric	Inch	Code Size	Metric	Inch	Metric	Inch	Metric	Inch	Metric	Inch	Metric	Inch	Metric	Inch	Metric	Inch
0.500	12.70	0127	12	0.472	0120	25.40	1.000	19.05	0.750	22.00	0.866	20.62	0.812	31.75	1.250	7.93	0.312	6.35	0.250
-	-	-	14	0.551	0140	31.75	1.250	23.80	0.937	24.00	0.945	22.22	0.875	34.93	1.375	10.28	0.405	8.71	0.343
0.625	15.88	0158	16	0.630	0160	31.75	1.250	23.80	0.937	26.00	1.024	22.22	0.875	34.93	1.375	10.28	0.405	8.71	0.343
0.750	19.05	0191	18	0.709	0180	34.93	1.375	26.98	1.062	32.00	1.260	22.22	0.875	34.93	1.375	10.28	0.405	8.71	0.343
-	-	-	20	0.787	0200	38.10	1.500	30.15	1.187	34.00	1.339	23.80	0.937	36.50	1.437	10.28	0.405	8.71	0.343
0.875	22.23	0222	22	0.866	0220	38.10	1.500	30.15	1.187	36.00	1.417	23.80	0.937	36.50	1.437	10.28	0.405	8.71	0.343
-	-	-	24	0.945	0240	41.28	1.625	33.32	1.312	38.00	1.496	25.40	1.000	41.28	1.625	11.10	0.437	9.53	0.375
1.000	25.40	0254	25	0.984	0250	41.28	1.625	33.32	1.312	39.00	1.535	25.40	1.000	41.28	1.625	11.10	0.437	9.53	0.375
1.125	28.58	0286	28	1.102	0280	44.44	1.750	36.50	1.437	42.00	1.654	26.97	1.062	42.85	1.687	11.10	0.437	9.53	0.375
-	-	-	30	1.181	0300	47.63	1.875	37.90	1.492	44.00	1.732	26.97	1.062	42.85	1.687	11.10	0.437	9.53	0.375
1.250	31.75	0317	32	1.260	0320	47.63	1.875	37.90	1.492	46.00	1.811	26.97	1.062	42.85	1.687	11.10	0.437	9.53	0.375
-	-	-	33	1.299	0330	50.80	2.000	42.84	1.687	47.00	1.850	28.58	1.125	42.85	1.687	11.10	0.437	9.53	0.375
1.375	34.93	0349	35	1.378	0350	50.80	2.000	42.84	1.687	49.00	1.929	28.58	1.125	42.85	1.687	11.10	0.437	9.53	0.375
1.500	38.10	0381	38	1.496	0380	53.98	2.125	46.05	1.813	54.00	2.126	28.58	1.125	42.85	1.687	11.10	0.437	9.53	0.375
1.625	41.28	0412	40	1.575	0400	60.33	2.375	50.80	2.000	56.00	2.205	34.93	1.375	50.80	2.000	12.70	0.500	11.10	0.437
-	-	-	43	1.693	0430	63.50	2.500	53.97	2.125	59.00	2.323	34.93	1.375	50.80	2.000	12.70	0.500	11.10	0.437
1.750	44.45	0444	44	1.732	0440	63.50	2.500	53.97	2.125	61.00	2.402	34.93	1.375	50.80	2.000	12.70	0.500	11.10	0.437
1.875	47.63	0476	45	1.772	0450	66.68	2.625	57.15	2.250	61.00	2.402	38.10	1.500	53.98	2.125	12.70	0.500	11.10	0.437
-	-	-	48	1.890	0480	69.85	2.750	60.32	2.375	64.00	2.520	38.10	1.500	53.98	2.125	12.70	0.500	11.10	0.437
2.000	50.80	0508	50	1.969	0500	69.85	2.750	60.32	2.375	66.00	2.598	38.10	1.500	53.98	2.125	12.70	0.500	11.10	0.437
2.125	53.98	0539	53	2.087	0530	76.20	3.000	60.32	2.375	69.00	2.717	42.88	1.688	60.32	2.375	14.28	0.562	12.70	0.500
2.250	57.15	0571	55	2.165	0550	79.38	3.125	61.90	2.437	78.00	3.071	42.88	1.688	60.32	2.375	14.28	0.562	12.70	0.500
-	-	-	58	2.283	0580	82.55	3.250	67.39	2.653	78.00	3.071	46.02	1.812	63.50	2.500	14.28	0.562	12.70	0.500
2.375	60.33	0603	60	2.362	0600	82.55	3.250	67.39	2.653	80.00	3.150	46.02	1.812	63.50	2.500	14.28	0.562	12.70	0.500
2.500	63.50	0635	63	2.480	0630	85.73	3.375	68.25	2.687	83.00	3.268	46.02	1.812	63.50	2.500	14.28	0.562	12.70	0.500
2.625	66.68	0666	65	2.559	0650	85.73	3.375	71.24	2.805	85.00	3.346	49.20	1.937	69.85	2.750	15.90	0.626	14.50	0.571
-	-	-	68	2.677	0680	88.90	3.500	74.60	2.937	88.00	3.465	49.20	1.937	69.85	2.750	15.90	0.626	14.50	0.571
2.750	69.85	0698	70	2.756	0700	88.90	3.500	74.60	2.937	90.00	3.543	49.20	1.937	69.85	2.750	15.90	0.626	14.50	0.571
2.875	73.03	0730	73	2.874	0730	95.25	3.750	77.77	3.062	96.00	3.780	52.37	2.062	73.03	2.875	15.90	0.626	14.50	0.571
3.000	76.20	0762	75	2.953	0750	98.43	3.875	80.95	3.187	99.00	3.898	52.37	2.062	73.03	2.875	15.90	0.626	14.50	0.571

STANDARD STOCK FACE MATERIALS
Rotary Face: Carbon, Silicon Carbide, Tungsten Carbide.
Stat Ring: Ceramic, Silicon Carbide, Tungsten Carbide.
OTHER FACE MATERIALS TO ORDER

Suggested Operating Limits

PRESSURE 180psi SPEED 15m/s
TEMPERATURE -40 +200°C
Dependent upon shaft diameter and speed + Temperature and media to be sealed

TYPE 24



Compact single spring, rubber diaphragm seal specifically designed to comply with DIN 24960 (EN12756) housings. Shown with boot mounted seat, but is also often specified with a Type 24 'O'-Ring mounted DIN Long or Short seat (Types 24L or 24S respectively)

VULCAN STANDARD SIZES

Metric Shaft Size D	Size Code	D1	D2	D3	L1	L2	L3
12	0120	23.00	19.00	21.70	23.90	8.60	5.50
14	0140	25.00	21.00	23.90	26.40	8.60	5.50
16	0160	27.00	23.00	26.70	26.40	8.60	5.50
18	0180	33.00	27.00	30.40	27.50	10.00	7.00
20	0200	35.00	29.00	33.40	27.50	10.00	7.00
22	0220	37.00	31.00	33.40	27.50	10.00	7.00
24	0240	39.00	33.00	38.00	30.00	10.00	7.00
25	0250	40.00	34.00	39.30	30.00	10.00	7.00
28	0280	43.00	37.00	42.00	32.50	10.00	7.00
30	0300	45.00	39.00	43.95	32.50	10.00	7.00
32	0320	48.00	42.00	45.80	32.50	10.00	7.00
33	0330	48.00	42.00	45.80	32.50	10.00	7.00
35	0350	50.00	44.00	49.00	32.50	10.00	7.00
38	0380	56.00	49.00	52.80	34.00	11.00	8.00
40	0400	58.00	51.00	55.80	34.00	11.00	8.00
43	0430	61.00	54.00	58.80	34.00	11.00	8.00
45	0450	63.00	56.00	61.00	34.00	11.00	8.00
48	0480	66.00	59.00	64.00	34.00	11.00	8.00
50	0500	70.00	62.00	66.00	34.50	13.00	8.50
53	0530	73.00	65.00	70.65	34.50	13.00	8.50
55	0550	75.00	67.00	71.65	34.50	13.00	8.50
58	0580	78.00	70.00	78.40	39.50	13.00	8.50
60	0600	80.00	72.00	78.40	39.50	13.00	8.50
63	0630	83.00	75.00	81.50	39.50	13.00	8.50
65	0650	85.00	77.00	84.30	39.50	13.00	8.50
68	0680	90.00	81.00	89.65	37.20	15.30	9.50
70	0700	92.00	83.00	89.65	37.20	15.30	9.50
75	0750	97.00	88.00	96.80	44.70	15.30	9.50
80	0800	105.00	95.00	104.00	44.30	15.70	10.00
85	0850	110.00	100.00	107.95	44.30	15.70	10.00
90	0900	115.00	105.00	111.10	49.30	15.70	10.00
95	0950	120.00	110.00	119.00	49.30	15.70	10.00
100	1000	125.00	115.00	124.00	49.30	15.70	10.00

Suggested Operating Limits

PRESSURE 180psi SPEED 15m/s

TEMPERATURE -40 +200°C

Dependent upon shaft diameter and speed + Temperature and media to be sealed

STANDARD STOCK FACE MATERIALS

Rotary Face: Carbon, Silicon Carbide, Tungsten Carbide.

Stat Ring: Ceramic, Silicon Carbide, Tungsten Carbide.

OTHER FACE MATERIALS TO ORDER