



Vulcan Balanced Diaphragm Type Seals



Introduction

The A1 to A5 range are elastomeric bellows, bi-directional, parallel spring mechanical seals, offering superior design and performance compared to market alternatives. This has been achieved by superior face materials and innovative (patent pending) design features. These seals are supplied with a boot mounted seat as standard and can also be supplied with an 'O'-Ring mounted alternative, if required.

Applications

These seals are suitable for pumps, mixers, compressors and other rotary equipment. They are often used for a diverse range of applications including; water, petrochemical, chemical, food processing, refrigeration and other arduous duties.

STANDARD VULCAN PARALLEL TYPES

Type A1

The A1 is a flexible seal, suitable for the narrower seal housing, due to the compact radial cross-sectional design and suits common European seal housing standards. The Type A1 has a long working length and is fitted with a seal head retainer backing plate

Type A2

The A2 Type coil fits over the seal head, reducing the overall working length, making this seal suitable for short gland depth applications, to common European seal housing standards.

Type A3

A thin, radial, cross sectioned, Type A4 variant designed to suit common American seal housing standards.

Type A4

As per the Type A2 seal but designed to suit common American standards, working length and seal housing dimensions.

Type A5

Spring profile as per the Type A1 seal but designed to suit common American standards and supplied without the seal head retainer backing plate, utilised on the Type A1.

VULCAN DESIGN ADVANTAGES

Mechanical Drive

The mechanical drive mechanism of the AX range incorporates a patent pending design. This innovative solution eliminates the problem of seal failure, due to excessive wear by the thin metal drive components cutting a groove into the retainer, common to competitors' seals.



The drive area has been increased by over 250%, to greatly reduce the contact drive pressure and consequent wear. The unique seal head design also retains the drive ring by a locking mechanism. This results in security and ease of assembly, due to the unitised design of the cartridge rotary unit.

Balanced

The Vulcan AX range seals are specially balanced to a recognised industry standard, to reduce heat and friction at the seal interface. This allows for higher operating parameters to be achieved and prolongs seal life. Many competitor's seals are not truly balanced throughout the range and therefore do not offer the full benefits of a balanced seal.

Bellows Disk

The Vulcan AX seal family includes a bellows disk, as a standard design feature. This component provides radial support to the bellows, ensuring no bellows/shaft contact, which could result in seal wear and possible hang-up. This component is routinely omitted in the Crane® USA designs but is included on UK/European Type 1A and 2. Without the disk, the bellows ID's are very close to the shaft and can be problematic, due to bellows extrusion and shaft contact/stiction.

Bellows Design

The flexible bellows compensates for primary seal face wear and machinery misalignment, such as shaft end float.

The Vulcan AX bellows contains an additional drive ring supporting lip, to ensure that the drive ring is held in a positive position, away from the bellows. This feature is not included in many alternative designs, which can result in possible bellows interference, affecting seal performance.

Seal Face Retaining

The Vulcan seal face is retained by inert grease and NOT glue. Some seal suppliers chose to utilise glue which can create a leakage path, and on chemical attack, the glue can migrate into seal components and product.

Seal Type	Crane® Equivalent
A1	1A (UK / EUROPEAN)
A2	Type 2 (UK / EUROPEAN)
A3	N/A
A4	Type 2 (US DIMENSIONS)
A5	Type 1 (US DIMENSIONS)

Base Plate Retaining

Vulcan A1 to A5 seal types retain the base plates on the coil as standard, providing support during seal fitting.

Seal Face Drive

Vulcan's designs include improved seal face/retainer engagement. The seal face slot is designed to achieve a positive drive from the retainer crimps and to eliminate chipping of the face.

It can be demonstrated, from the seal comparison diagram below, that the Vulcan seal has a superior drive location area and doesn't drive at the weakest point, as per the standard competitors design; which will be prone to chipping.

VULCAN TYPE A4



COMMON COMPETITOR



Mechanical Face Loading

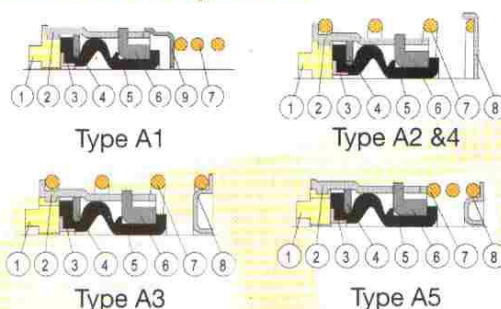
Face loading on the Vulcan Ax seal ranges has been designed to enhance seal life, whilst not affecting performance capabilities.

The linear progressive, Vulcan design, utilises proven values within the seal industry, which will result in less heat generation, less power consumption, less wear and therefore, increased seal performance, capability and life. Common competitor designs have wide variances in face loading, between shaft sizes.

Material Quality and Reliability

A wide selection of first-class face materials and elastomers are readily available as standard. These ensure excellent performance and have been verified through extensive testing.

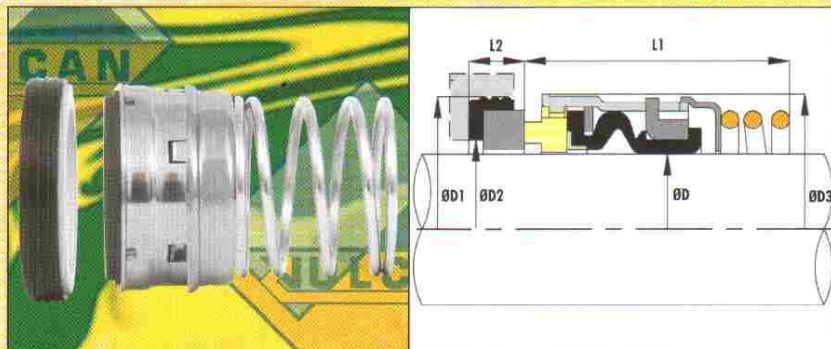
Standard Components



No	Description
1	Face
2	Retainer
3	Bellows Disk
4	Plate
5	Bellows
6	Drive Ring
7	Coil
8	Backing Plate
9	Sleeve



TYPE A1



Robust, long working length, highly accommodating and reliable, rubber diaphragm balanced seal, which provides enhanced seal capability, performance and life. Improved design features further enhance this popular seal. Suitable for common UK and Euro housing dimensions.

VULCAN STANDARD SIZES

Shaft Size DØ			Shaft Size DØ			D1		D2		D3		L1		L2	
Inch	Metric	Size Code	Metric	Inch	Size Code	Metric	Inch	Metric	Inch	Metric	Inch	Metric	Inch	Metric	Inch
0.500	12.70	0127	12	0.472	0120	27.79	1.094	19.05	0.750	23.80	0.937	44.00	1.732	8.74	0.344
-	-	-	14	0.551	0140	30.95	1.219	22.23	0.875	27.76	1.093	44.00	1.732	10.32	0.406
0.625	15.88	0158	16	0.630	0160	30.95	1.219	22.23	0.875	27.76	1.093	44.00	1.732	10.32	0.406
0.750	19.05	0191	18	0.709	0180	34.15	1.344	25.40	1.000	30.94	1.218	44.00	1.732	10.32	0.406
-	-	-	20	0.787	0200	35.70	1.406	26.99	1.063	33.00	1.299	44.00	1.732	10.32	0.406
0.875	22.23	0222	22	0.866	0220	37.30	1.469	28.58	1.125	34.11	1.343	44.00	1.732	10.32	0.406
-	-	-	24	0.945	0240	40.50	1.594	31.75	1.250	38.10	1.500	44.00	1.732	10.32	0.406
1.000	25.40	0254	25	0.984	0250	40.50	1.594	31.75	1.250	38.10	1.500	44.00	1.732	10.32	0.406
1.125	28.58	0286	28	1.102	0280	47.63	1.875	35.72	1.406	41.28	1.625	60.00	2.362	11.99	0.472
-	-	-	30	1.181	0300	50.80	2.000	38.89	1.531	46.02	1.812	60.00	2.362	11.99	0.472
1.250	31.75	0317	32	1.260	0320	50.80	2.000	38.89	1.531	46.02	1.812	60.00	2.362	11.99	0.472
-	-	-	33	1.299	0330	53.98	2.125	42.07	1.656	47.63	1.875	60.00	2.362	11.99	0.472
1.375	34.93	0349	35	1.378	0350	53.98	2.125	42.07	1.656	47.63	1.875	60.00	2.362	11.99	0.472
1.500	38.10	0381	38	1.496	0380	57.15	2.250	45.24	1.781	50.80	2.000	60.00	2.362	11.99	0.472
1.625	41.28	0412	40	1.575	0400	60.35	2.376	48.82	1.922	57.15	2.250	60.00	2.362	11.99	0.472
-	-	-	43	1.693	0430	63.50	2.500	51.59	2.031	62.50	2.461	71.00	2.795	11.99	0.472
1.750	44.45	0444	45	1.772	0450	63.50	2.500	51.59	2.031	62.50	2.461	71.00	2.795	11.99	0.472
1.875	47.63	0476	48	1.890	0480	66.70	2.626	54.75	2.156	65.50	2.579	71.00	2.795	11.99	0.472
2.000	50.80	0508	50	1.969	0500	69.85	2.750	58.00	2.283	66.68	2.626	71.00	2.795	13.50	0.531
2.125	53.98	0539	53	2.087	0530	73.05	2.876	62.00	2.441	71.42	2.812	71.00	2.795	13.50	0.531
2.250	57.15	0571	55	2.165	0550	76.20	3.000	65.00	2.559	74.60	2.937	71.00	2.795	13.50	0.531
2.375	60.33	0603	60	2.362	0600	79.40	3.126	68.00	2.677	77.77	3.062	71.00	2.795	13.50	0.531
2.500	63.50	0635	63	2.480	0630	82.55	3.250	71.20	2.803	80.95	3.187	71.00	2.795	13.50	0.531
2.625	66.68	0666	65	2.559	0650	92.10	3.626	78.35	3.085	85.73	3.375	71.00	2.795	15.90	0.626
2.750	69.85	0698	70	2.756	0700	95.25	3.750	81.10	3.193	88.90	3.500	70.00	2.756	15.90	0.626
2.875	73.03	0730	73	2.874	0730	98.45	3.876	84.50	3.327	92.08	3.625	73.00	2.874	15.90	0.626
3.000	76.20	0762	75	2.953	0750	101.65	4.002	88.10	3.469	95.25	3.750	73.00	2.874	15.90	0.626

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 220psi

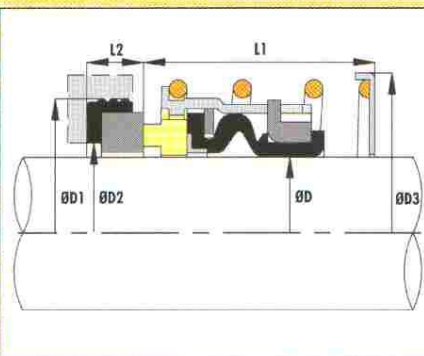
SPEED 18m/s

TEMPERATURE -40 +200°C

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



TYPE A2



Robust, short working length highly accommodating and reliable, rubber diaphragm balanced seal which provides enhanced seal capability, performance and life. Improved design features further enhance this popular seal. Suitable for common UK and Euro housing and working length dimensions.

VULCAN STANDARD SIZES

Shaft Size DØ			Shaft Size DØ			D1		D2		D3		L1		L2	
Inch	Metric	Size Code	Metric	Inch	Size Code	Metric	Inch	Metric	Inch	Metric	Inch	Metric	Inch	Metric	Inch
-	-	-	12	0.472	0120	27.79	1.094	19.05	0.750	31.50	1.240	25.00	0.984	8.74	0.344
0.500	12.70	0127	13	0.512	0130	27.79	1.094	19.05	0.750	31.50	1.240	25.00	0.984	8.74	0.344
-	-	-	14	0.551	0140	30.95	1.219	22.23	0.875	35.00	1.378	25.00	0.984	10.32	0.406
-	-	-	15	0.591	0150	30.95	1.219	22.23	0.875	35.00	1.378	25.00	0.984	10.32	0.406
0.625	15.88	0158	16	0.630	0160	30.95	1.219	22.23	0.875	35.00	1.378	25.00	0.984	10.32	0.406
0.750	19.05	0191	18	0.709	0180	34.15	1.344	25.40	1.000	38.00	1.496	25.00	0.984	10.32	0.406
-	-	-	20	0.787	0200	35.70	1.406	26.99	1.063	42.50	1.673	25.00	0.984	10.32	0.406
0.875	22.23	0222	22	0.866	0220	37.30	1.469	28.58	1.125	41.00	1.614	25.00	0.984	10.32	0.406
-	-	-	24	0.945	0240	40.50	1.594	31.75	1.250	47.00	1.850	25.00	0.984	10.32	0.406
1.000	25.40	0254	25	0.984	0250	40.50	1.594	31.75	1.250	47.00	1.850	25.00	0.984	10.32	0.406
1.125	28.58	0286	28	1.102	0280	47.63	1.875	35.72	1.406	50.50	1.988	33.00	1.299	11.99	0.472
-	-	-	30	1.181	0300	50.80	2.000	38.89	1.531	54.50	2.146	33.00	1.299	11.99	0.472
1.250	31.75	0317	32	1.260	0320	50.80	2.000	38.89	1.531	54.50	2.146	33.00	1.299	11.99	0.472
-	-	-	33	1.299	0330	53.98	2.125	42.07	1.656	59.00	2.323	33.00	1.299	11.99	0.472
1.375	34.93	0349	35	1.378	0350	53.98	2.125	42.07	1.656	59.00	2.323	33.00	1.299	11.99	0.472
1.500	38.10	0381	38	1.496	0380	57.15	2.250	45.24	1.781	63.00	2.480	33.00	1.299	11.99	0.472
1.625	41.28	0412	40	1.575	0400	60.35	2.376	48.82	1.922	70.00	2.756	33.00	1.299	11.99	0.472
-	-	-	43	1.693	0430	63.50	2.500	51.59	2.031	73.50	2.894	41.00	1.614	11.99	0.472
1.750	44.45	0444	45	1.772	0450	63.50	2.500	51.59	2.031	73.50	2.894	41.00	1.614	11.99	0.472
1.875	47.63	0476	48	1.890	0480	66.70	2.626	54.75	2.156	76.50	3.012	41.00	1.614	11.99	0.472
2.000	50.80	0508	50	1.969	0500	69.85	2.750	58.00	2.283	79.50	3.130	41.00	1.614	13.50	0.531
2.125	53.98	0539	53	2.087	0530	73.05	2.876	62.00	2.441	84.00	3.307	41.00	1.614	13.50	0.531
2.250	57.15	0571	55	2.165	0550	76.20	3.000	65.00	2.559	88.00	3.465	41.00	1.614	13.50	0.531
2.375	60.33	0603	60	2.362	0600	79.40	3.126	68.00	2.677	91.00	3.583	41.00	1.614	13.50	0.531
2.500	63.50	0635	63	2.480	0630	82.55	3.250	71.20	2.803	94.50	3.720	41.00	1.614	13.50	0.531
2.625	66.68	0666	65	2.559	0650	92.10	3.626	78.35	3.085	99.50	3.917	49.00	1.929	15.90	0.626
2.750	69.85	0698	70	2.756	0700	95.25	3.750	81.10	3.193	102.50	4.035	49.00	1.929	15.90	0.626
2.875	73.03	0730	73	2.874	0730	98.45	3.876	84.50	3.327	106.50	4.193	52.00	2.047	15.90	0.626
3.000	76.20	0762	75	2.953	0750	101.65	4.002	88.10	3.469	110.00	4.331	52.00	2.047	15.90	0.626

Suggested Operating Limits

PRESSURE 220psi

SPEED 18m/s

TEMPERATURE -40 +200°C

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

STANDARD STOCK FACE MATERIALS

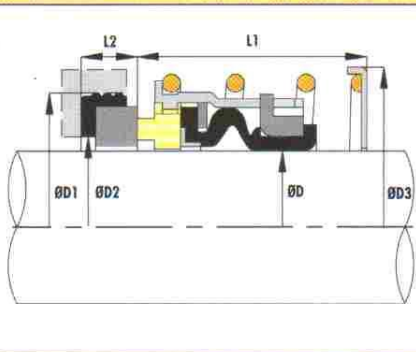
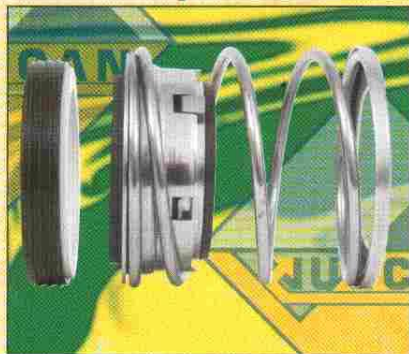
Rotary Face: Carbon, Silicon Carbide, Tungsten Carbide.

Stat Ring: Ceramic, Silicon Carbide, Tungsten Carbide.

OTHER FACE MATERIALS TO ORDER



TYPE A3/ TYPE A4



Robust, short working length highly accommodating and reliable rubber diaphragm balanced seal, which provides enhanced seal capability, performance and life. Improved design features further enhance this popular seal. Suitable for common US standard housing and working length dimensions.

VULCAN STANDARD SIZES

Shaft Size DØ			Shaft Size DØ			D1		D2		Type A4 D3		A3 Thin Profile D3		L1		L2	
Inch	Metric	Size Code	Metric	Inch	Size Code	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	30.14	1.187	28.58	1.125	20.64	0.813	7.93	0.312
-	-	-	14	0.551	0140	31.75	1.250	23.80	0.937	33.32	1.312	30.30	1.193	22.23	0.875	10.28	0.405
0.625	15.88	0158	16	0.630	0160	31.75	1.250	23.80	0.937	33.32	1.312	31.75	1.250	22.23	0.875	10.28	0.405
0.750	19.05	0191	18	0.709	0180	34.93	1.375	26.98	1.062	36.50	1.437	34.93	1.375	22.23	0.875	10.28	0.405
-	-	-	20	0.787	0200	38.10	1.500	30.15	1.187	39.67	1.562	36.95	1.455	23.80	0.937	10.28	0.405
0.875	22.23	0222	22	0.866	0222	38.10	1.500	30.15	1.187	39.67	1.562	38.10	1.500	23.80	0.937	10.28	0.405
-	-	-	24	0.945	0240	41.28	1.625	33.32	1.312	45.50	1.791	42.65	1.679	25.40	1.000	11.10	0.437
1.000	25.40	0254	25	0.984	0250	41.28	1.625	33.32	1.312	45.50	1.791	43.69	1.720	25.40	1.000	11.10	0.437
1.125	28.58	0286	28	1.102	0280	44.44	1.750	36.50	1.437	48.50	1.909	46.86	1.845	26.97	1.062	11.10	0.437
-	-	-	30	1.181	0300	47.63	1.875	37.90	1.492	52.37	2.062	48.80	1.921	26.97	1.062	11.10	0.437
1.250	31.75	0317	32	1.260	0320	47.63	1.875	37.90	1.492	52.37	2.062	51.21	2.016	26.97	1.062	11.10	0.437
-	-	-	33	1.299	0330	50.80	2.000	42.84	1.687	56.00	2.205	52.50	2.067	28.58	1.125	11.10	0.437
1.375	34.93	0349	35	1.378	0350	50.80	2.000	42.84	1.687	56.00	2.205	54.38	2.141	28.58	1.125	11.10	0.437
1.500	38.10	0381	38	1.496	0380	53.98	2.125	46.05	1.813	59.20	2.331	57.55	2.266	28.58	1.125	11.10	0.437
1.625	41.28	0412	40	1.575	0400	60.33	2.375	50.80	2.000	67.00	2.638	64.95	2.557	34.93	1.375	12.70	0.500
-	-	-	43	1.693	0430	63.50	2.500	53.97	2.125	69.85	2.750	66.30	2.610	34.93	1.375	12.70	0.500
1.750	44.45	0444	45	1.772	0450	63.50	2.500	53.97	2.125	69.85	2.750	68.12	2.682	34.93	1.375	12.70	0.500
1.875	47.63	0476	-	-	-	66.68	2.625	57.15	2.250	73.03	2.875	71.17	2.802	38.10	1.500	12.70	0.500
-	-	-	48	1.890	0480	69.85	2.750	57.15	2.250	73.03	2.875	71.17	2.802	38.10	1.500	12.70	0.500
2.000	50.80	0508	50	1.969	0500	69.85	2.750	60.32	2.375	76.20	3.000	74.47	2.932	38.10	1.500	12.70	0.500
2.125	53.98	0539	53	2.087	0530	76.20	3.000	60.32	2.375	82.55	3.250	80.72	3.178	42.85	1.687	14.28	0.562
2.250	57.15	0571	55	2.165	0550	79.38	3.125	61.90	2.437	85.73	3.375	83.90	3.303	42.85	1.687	14.28	0.562
2.375	60.33	0603	60	2.362	0600	82.55	3.250	67.39	2.653	88.90	3.500	87.07	3.428	46.02	1.812	14.28	0.562
2.500	63.50	0635	63	2.480	0630	85.73	3.375	68.25	2.687	92.08	3.625	90.25	3.553	46.02	1.812	14.28	0.562
2.625	66.68	0666	65	2.559	0650	85.73	3.375	71.24	2.805	98.43	3.875	96.42	3.796	49.20	1.937	15.90	0.626
2.750	69.85	0698	70	2.756	0700	88.90	3.500	74.60	2.937	101.60	4.000	99.60	3.921	49.20	1.937	15.90	0.626
2.875	73.03	0730	73	2.874	0730	95.25	3.750	77.77	3.062	104.78	4.125	102.77	4.046	52.37	2.062	15.90	0.626
3.000	76.20	0762	75	2.953	0750	98.43	3.875	80.95	3.187	107.95	4.250	105.94	4.171	52.37	2.062	15.90	0.626

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 220psi

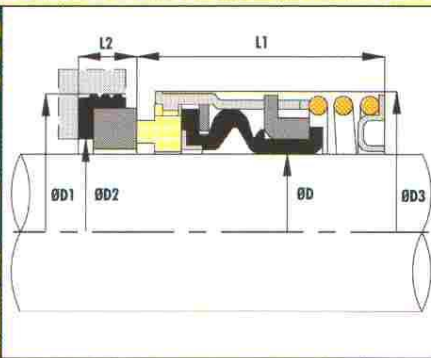
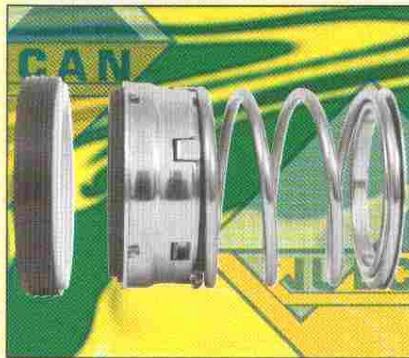
SPEED 18m/s

TEMPERATURE -40 +200°C

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



TYPE A5



Robust, long working length highly accommodating and reliable rubber diaphragm balanced seal, which provides enhanced seal capability, performance and life. Improved design features further enhance this popular seal. Suitable for common US standard housing and working length dimensions.

VULCAN STANDARD SIZES

Shaft Size D0			Shaft Size D0			D1		D2		D3		L1		L2	
Inch	Metric	Size Code	Metric	Inch	Size Code	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	23.80	0.937	30.16	1.187	7.93	0.312
-	-	-	14	0.551	0140	31.75	1.250	23.80	0.937	27.76	1.093	33.32	1.312	10.28	0.405
0.625	15.88	0158	16	0.630	0160	31.75	1.250	23.80	0.937	27.76	1.093	33.32	1.312	10.28	0.405
0.750	19.05	0191	18	0.709	0180	34.93	1.375	26.98	1.062	30.94	1.218	33.32	1.312	10.28	0.405
-	-	-	20	0.787	0200	38.10	1.500	30.15	1.187	34.11	1.343	34.93	1.375	10.28	0.405
0.875	22.23	0222	22	0.866	0220	38.10	1.500	30.15	1.187	34.11	1.343	34.93	1.375	10.28	0.405
-	-	-	24	0.945	0240	41.28	1.625	33.32	1.312	38.10	1.500	39.67	1.562	11.10	0.437
1.000	25.40	0254	25	0.984	0250	41.28	1.625	33.32	1.312	38.10	1.500	39.67	1.562	11.10	0.437
1.125	28.58	0286	28	1.102	0280	44.44	1.750	36.50	1.437	41.28	1.625	41.28	1.625	11.10	0.437
-	-	-	30	1.181	0300	47.63	1.875	37.90	1.492	46.02	1.812	41.28	1.625	11.10	0.437
1.250	31.75	0317	32	1.260	0320	47.63	1.875	37.90	1.492	46.02	1.812	41.28	1.625	11.10	0.437
-	-	-	33	1.299	0330	50.80	2.000	42.84	1.687	48.68	1.917	42.85	1.687	11.10	0.437
1.375	34.93	0349	35	1.378	0350	50.80	2.000	42.84	1.687	48.68	1.917	42.85	1.687	11.10	0.437
1.500	38.10	0381	38	1.496	0380	53.98	2.125	46.05	1.813	51.85	2.041	42.85	1.687	11.10	0.437
1.625	41.28	0412	40	1.575	0400	60.38	2.377	50.80	2.000	58.10	2.287	50.80	2.000	12.70	0.500
-	-	-	43	1.693	0430	63.50	2.500	53.97	2.125	61.27	2.412	50.80	2.000	12.70	0.500
1.750	44.45	0444	45	1.772	0450	63.50	2.500	53.97	2.125	61.27	2.412	50.80	2.000	12.70	0.500
1.875	47.63	0476	-	-	-	66.68	2.625	57.15	2.250	64.44	2.537	53.98	2.125	12.70	0.500
-	-	-	48	1.890	0480	69.85	2.750	60.32	2.375	67.21	2.646	53.98	2.125	12.70	0.500
2.000	50.80	0508	50	1.969	0500	69.85	2.750	60.32	2.375	67.21	2.646	53.98	2.125	12.70	0.500
2.125	53.98	0539	53	2.087	0530	76.20	3.000	60.32	2.375	72.02	2.835	60.33	2.375	14.28	0.562
2.250	57.15	0571	55	2.165	0550	79.38	3.125	61.90	2.437	75.30	2.965	60.33	2.375	14.28	0.562
2.375	60.33	0603	60	2.362	0600	82.55	3.250	67.39	2.653	78.30	3.083	63.50	2.500	14.28	0.562
2.500	63.50	0635	63	2.480	0630	85.73	3.375	68.25	2.687	81.54	3.210	63.50	2.500	14.28	0.562
2.625	66.68	0666	65	2.559	0650	85.73	3.375	71.24	2.805	86.22	3.394	69.85	2.750	15.90	0.626
2.750	69.85	0698	70	2.756	0700	88.90	3.500	74.60	2.937	89.40	3.520	73.03	2.875	15.90	0.626
2.875	73.03	0730	73	2.874	0730	95.25	3.750	77.77	3.062	92.57	3.644	73.03	2.875	15.90	0.626
3.000	76.20	0762	75	2.953	0750	98.43	3.875	80.95	3.187	95.75	3.770	73.03	2.875	15.90	0.626

Suggested Operating Limits

PRESSURE 220psi

SPEED 18m/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