CoorsTek
Amazing Solutions.®

METAPLAST SPRING ENERGIZED SEALS

www.coorstek.com

Part Numbering System

EXAMPLE: TC1988 K - 119 - 902 C 801

TCXXXX X - XXX - XXX X XXX

- BASIC PART NUMBER
- DASH NUMBER
- JACKET MATERIAL
- EXPANDER MATERIAL
- BACK-UP RING MATERIAL

EXAMPLE: TC888 K - 119 - 902 C

TCXXX X - XXX - XXX X

- BASIC PART NUMBER
- DASH NUMBER
- JACKET MATERIAL
- EXPANDER MATERIAL

A Word About Metaplast Spring Seals

Tetrafluor®, now CoorsTek, Inc., developed Metaplast metallic spring-energized PTFE seals 35 years ago, and became one of the most recognized names in sealing. Metaplast seals are used in a multitude of applications where durability, resistance to chemicals, and functionality at temperature extremes is crucial. Metaplast high-performance, spring-actuated seals operate in harsh environments, reduce friction and downtime, and extend equipment service life. Our spring-seal designs are patented, widely recognized and used throughout a variety of industries. Metaplast seal products continue to be manufactured by CoorsTek El Segundo, California operation, under the brand name Tetrafluor.

Company History

In 1997, CoorsTek, Inc. acquired Tetrafluor Inc. the owner and producer of Metaplast seals. CoorsTek enjoys a rich tradition of excellence for over 100 years. Established in Golden, Colorado in 1910 as a pottery manufacturer under the name of "The Herold China and Pottery Company," CoorsTek continues, through extensive research, to develop new and innovative materials. Today it is one of the world's top 100 industrial corporations and a leader in the development and production of engineered materials. CoorsTek, Inc. is a global leader in each of its businesses: Ceramic medical devices and components, advanced ceramics, ceramics for oil & gas applications, emission technology for clean combustion, defense components and armor solutions, and Metaplast® seals for high-performance sealing systems.

Backed by a proud heritage of product innovation, technological expertise, and market leadership, CoorsTek Tetrafluor in El Segundo, California is dedicated to working with our customers to solve today's demanding seal application issues and the challenges that lie ahead. Our innovative Metaplast seals, originally designed and developed by Tetrafluor in Southern California, remain US-manufactured with sales offices located in North America, Europe, and Asia. This facility maintains an experienced design and engineering staff, a comprehensive testing laboratory, PTFE custom polymer formulations, isostatic pressing, compression molding, extrusion capabilities, and state-of-the-art machining and assembly capabilities.

The CoorsTek Tetrafluor facility in El Segundo, California formulates proprietary blends of engineered polymers which may be coupled with countless spring and jacket geometries offering superior seals capable in a variety of applications and markets, including:

- Aircraft, aerospace
- Transportation (heavy truck, automotive, marine, rail)
- Construction equipment
- High-performance racing
- Medical instrumentation
- Liquid chromatography
- Semiconductor manufacturing equipment
- Petroleum and chemical process equipment
- Pumps, valves, compressors, and mechanical seals

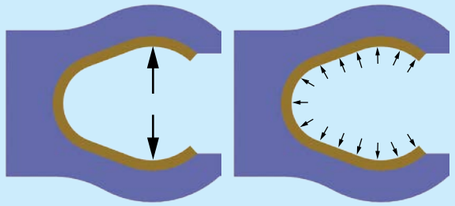
The acceptance of CoorsTek Metaplast seals across this wide range of market applications confirms their versatility and outstanding performance. Design engineers throughout the world

benefit from the opportunity to specify both superior design and a multiplicity of materials with every order.

How The Metaplast Seals Work

The Metaplast seal is a spring-actuated, pressure-assisted sealing device consisting of a PTFE (or other polymer) jacket partially encapsulating a corrosion-resistant metal spring energizer. When the Metaplast seal is seated in the gland, the spring is under compression, forcing the jacket lips against the gland walls and thereby creating a leak-tight seal. The spring provides permanent resilience to the seal jacket and compensates for material wear and hardware misalignment eccentricity. System pressure also assists in energizing the seal jacket. Spring loading assisted by system pressure provides effective positive sealing in both low and high-pressure operating environments.

Metaplast jackets are precision machined from virgin PTFE, filled PTFE and other high-performance polymers. Metaplast seals with PTFE jackets function at temperatures ranging from cryogenic to 600°F (316°C) and are inert to virtually all chemicals except molten alkali metals, fluorine gas at high temperature, and chlorine trifluoride (CIF3). Metaplast® seals are available with a variety of spring energizers, each with characteristics to meet specific requirements. Spring loading can be tailored to meet critical, low-friction requirements in dynamic applications, or the extremely high loading often required for cryogenic sealing. Springs are fabricated in house from corrosion-resistant metals such as 300 Series and 17-7 PH stainless steels, nickel-cobalt alloy, Hastelloy® and Inconel® metals. Metaplast seals with metal springs have unlimited shelf life and are not subject to age controls normally imposed on elastomeric seals. Metaplast seals with elastomer O-rings used as energizers (made from such materials as nitrile, silicone, and FKM) and flat ribbon coil spring are also available. Another advantage of the Metaplast seals includes a specialized seal geometry in the gland providing positive resistance to torsional or spiral failures often found in O-rings.



Load due to expander *Load due to system pressure*

About Rosette Springs

Some smaller-diameter seals or scrapers made by CoorsTek are furnished with a Rosette Spring which serves the same purpose as the regular Metaplast spring as explained earlier. CoorsTek Rosette Springs are offered on essentially the same standard materials and vary in thicknesses depending on application and customer's need for low-friction solutions.

Generally, the small-size seals requiring the use of a Rosette Spring will also need an open groove design (aka "two-piece groove" like the one shown on page 3.5) for effective installation – thus ensuring the integrity of the seal components remain in tact after installation. For the same reason, CoorsTek Engineering also recommends providing an open groove to the bigger cross section seals and diameter below 1" in such as the 4XX series (1/4" cross section) and up, regardless of seal diameter.

Metaplast® Spring Seals
General Information

Proper installation of seals is of utmost importance to ensure seal performance. CoorsTek provides installation tools upon request. We make tools for installation of both piston seals (located on piston head) and for rod seals (located on the housing); and since each installation tool set is especially designed for a particular groove, customers are asked to provide accurate groove location information. Please contact CoorsTek Engineering for details.

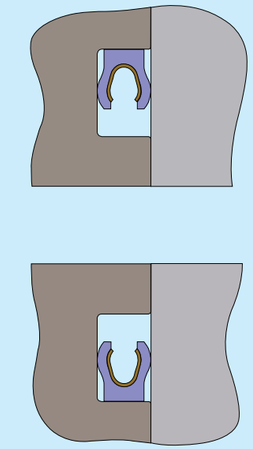
Metaplast Static and Dynamic Seals

Two basic types of sealing applications are static seals and dynamic seals. In static sealing there is essentially no relative motion between the seal and the hardware members. An example would be a seal clamped between bolted flanges. In dynamic sealing there is relative motion between the two sealing surfaces. A typical example would be the rod and piston seals in a hydraulic cylinder. There are two directions of motion in dynamic sealing: reciprocating or linear motion, and rotary (including oscillating) motion. Occasionally there may be a combination of both static and dynamic applications for which the Metaplast seals are well suited to perform.

An additional factor to be considered is the orientation of the seal in the hardware. Seals compressed in a radial direction are called radial seals, again using rod and piston seals as examples. Seals compressed in a direction parallel to the axis are called face seals – the flange gasket being a typical example. Face seals are usually, but not always, static. Examples of these basic seal types are shown on next column. Typical installations are also shown throughout the catalog.

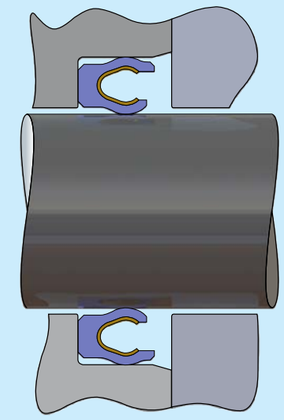
Metaplast Face Seal

Metaplast internal and external face seals (TC888F page 3.77 and TC888E 3.87) are generally the first choice for most static flange seal applications. This series utilizes a standard load spring capable of sealing effectively over a wide temperature and pressure range in flange-type applications.



Metaplast Radial Seal

Most of the Metaplast designs may be used as static radial seals. Moderate to high spring load provides positive sealing under most static sealing conditions.

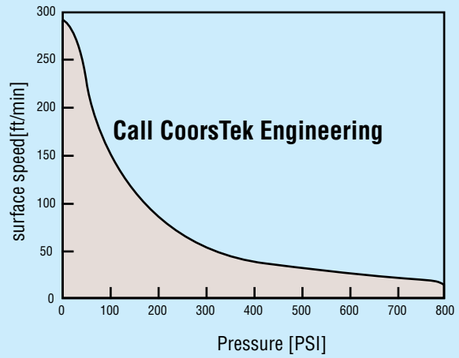


Radial Seals in Reciprocating Motion

Reciprocating radial seals are the most common Metaplast applications. For rod and piston sealing and similar applications, the Metaplast TC1288 series (page 3.60) is recommended for general purpose sealing at low to moderate pressures. This series features a standard-load, high-deflection spring providing low-friction sealing, long-wear life, and compensates for minor hardware eccentricity or misalignment.

Radial Seals in Rotary Motion

All of the Metaplast seals designs may be used in slow to moderate speed rotary or oscillatory applications at low pressure. In rotary shaft applications the flanged design is recommended. The flange is clamped in the hardware to prevent the seal from rotating with the shaft. Rotation can occur with the standard designs due to thermal and other effects. Flanged Metaplast seals (page 3.70) are recommended for most extreme rotary/oscillatory applications. The light spring load minimizes friction at pressures under 20 PSI, with surface speeds in the range of 200-300 ft./min. At higher pressures, reduced surface speeds are required to prolong seal wear life. The resilient Metaplast spring allows for minor shaft run out or misalignment. For very slow speeds—under 50 ft./min.—and intermittent rotary/oscillatory motion at higher pressures. For applications requiring ultra-low friction, high pressures or high surface speeds we suggest you contact CoorsTek Engineering for assistance (See inside back cover).



To calculate surface speed

$$\text{surface speed[ft/min]} = \frac{Ø\text{[in]} \times \pi \times \omega\text{[rpm]}}{12}$$

Where:
Ø is the dynamic surface diameter
ω is the angular speed of shaft

Friction

Friction, a measurement of the resistance to slide between a seal and hardware surfaces, is directly related to seal material coefficient of friction and the normal load. Some other factors affecting friction are lubrication, temperature, and hardware surface finishes. An approximate friction value for non-lubricated conditions can be calculated using the charts and formulas on this page. Lubrication provided by the media may produce lower friction results. It is difficult to predict how the running and break-out friction values will differ without testing under actual existing conditions. The CoorsTek Tetrafluor facility in El Segundo, California manufactures a variety of springs with lower or higher loads than shown on this page. Also, special springs can be developed when required. For assistance with applications where friction is critical, contact Technical Support (see inside back cover).

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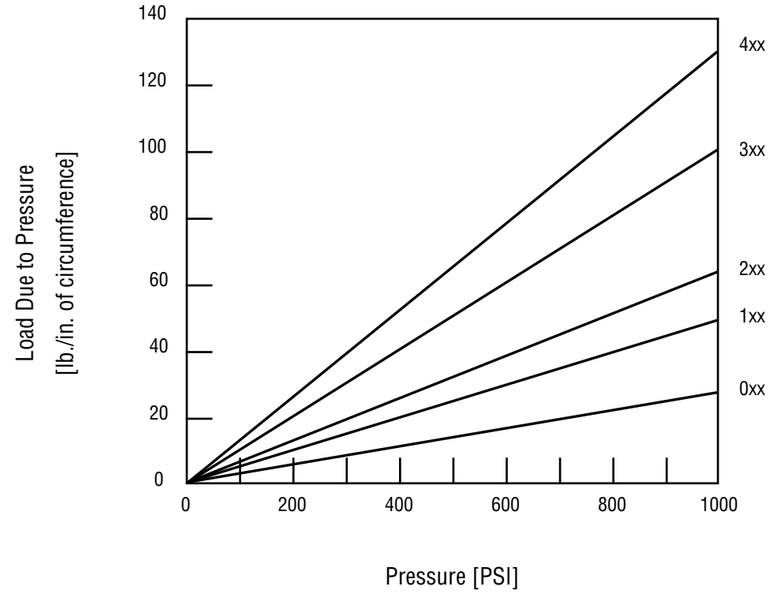

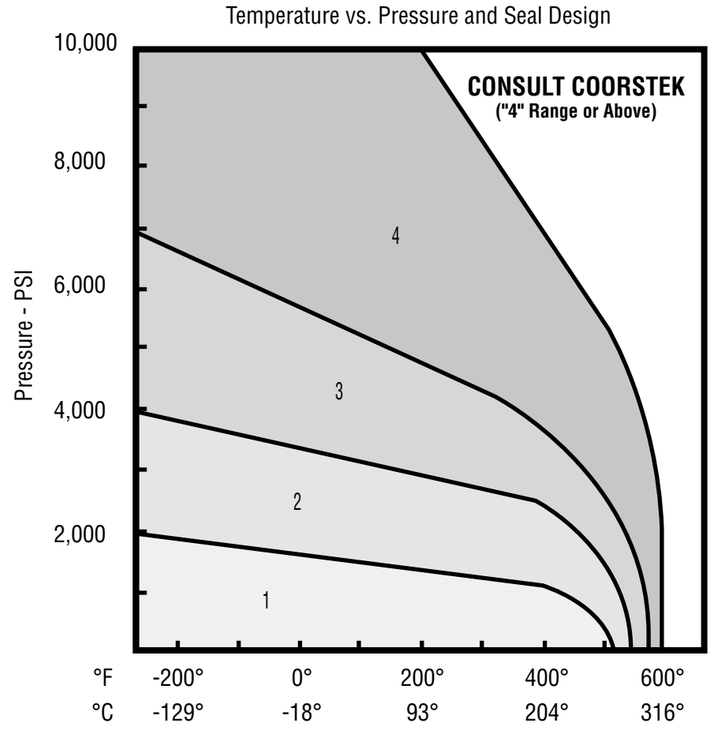

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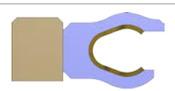
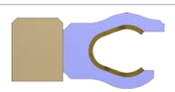
Suggested seal cross section and diametral extrusion gap based on system's temperature and pressure. Refer to diagram on page 3.7 for general guidelines, or call CoorsTek Engineering for details.

Seal Type	Cross Section View	1	2	3	4
TC888P		.004	.003	.002	Not Recommended
TC888R					
TC888K		.006	.004	.003	Not Recommended
TC888L					
TC1988P					.003
TC1988R					
TC1988K		.008	.006	.004	.003
TC1988L					
Special TC1988K		.010	.008	.006	.004
Special TC1988L					

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CoorsTek Tetralon® materials provide an array of properties for most sealing applications. The PTFE-based materials are chemically inert and compatible with most known chemical solutions except molten or dissolved alkali metals and fluorine gas, and certain fluorine compounds and complexes at elevated temperatures. The following list comprises some general characteristics of the PTFE compounds depending on the particular filler in question:

Tetralon Code No.	Application Details	Temperature Range	Coefficient of Friction	Specific Gravity	Elongation (%)	Tensile Strength (psi)
000	(White) Unfilled PTFE. The most corrosion-resistant material for general use at moderate speeds, pressures, and temperatures. It shows low permeability, limited wear, moderate heat resistance, excellent corrosion resistance, good self- lubrication, and good flexibility and elongation. FDA approved. Good performance in static, semi-static, moderate speed, pressure, and temperature; vacuum, cryogenics and chemical industry applications; gases, food and drugs; and all commercial and military hydraulics. Not recommended for combinations of high pressure and high temperature.	-420° F (-250° C) 450° F (232° C)	0.07	2.15 – 2.17	150, 300	3000
050	(Grayish Black) Bronze / Moly filled PTFE. Due to its low wear factor, it is good for dynamic applications with high PV factor. Its primary purpose is to seal hydraulic systems. Exhibits good compressive strength, excellent abrasion resistance, and superior extrusion resistance. Not recommended for use in water or rotary applications. (Dark Brown) Filled PTFE for higher strength and large temperature variations with greater dimension control.	-420° F (-250° C) 500° F (260° C)	0.15	2.90 - 4.0	150	2000
230	(White) UHMW-PE or Ultra High Molecular Weight Polyethylene. Very tough and long wearing at temperatures below 248° F (120° C). Excellent for sealing abrasive media (More abrasion resistant than PTFE-based materials). This material exhibits good cryogenic resistance, excellent resistance to impact loads, hysteresis, and chemicals. It is also FDA approved, injection moldable, extrudable, and less expensive than PTFE-based materials. With zero water absorption, it is ideal to in slurries, water-based fluids, food, medical, and corrosive environments.	-420° F (-250° C) 250° F (120° F)	0.15 - 0.20	0.94	300	5500
243	(B1000 BLACK) Pigmented UHMW-PE. Designed with lower friction and wear characteristics than Tetralon 230.	-400° F (-240° C) 250° F (120° F)	0.12 - 0.30	0.94	450	5700
300	(Brown) Ekonol filled PTFE. Composite material with excellent resistance to wear and thermal extremes. It does not wear metal or soft material surfaces as it runs against them in dynamic applications. The fillers allow for good thermal conductivity while maintaining low moisture absorption and high dielectric strength. Performs exceptionably well in environmentally tough applications. This material offers an impressive wear ratio of 1000:1 over unfilled PTFE. It has been qualified as the standard seal material on the B-1 aircraft as well as on many current aircraft systems.	-250° F (-155° C) 600° F (315° C)	0.15	2.04	250	2300

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Metaplast® Spring Seals

Jacket Materials

Tetralon Code No.	Application Details	Temperature Range	Coefficient of Friction	Specific Gravity	Elongation (%)	Tensile Strength (psi)
430	(Blue) Proprietary modified unfilled PTFE. Wear resistance property at least 10 to 100 times greater than unfilled PTFE. Very good chemical resistance, good dielectric properties, excellent wear and extrusion resistance in fluid-powered applications. Excellent option for very low friction applications. Average mechanical properties for almost all purposes including lubricating media. Good compressive strength and wear resistance. More resistance to thermal expansion and contraction than unfilled PTFE, it performs well in a larger range of temperatures.	-245° F (-155° C) 400° F (205° C)	0.06	2.15 - 2.21	250	2800
460	(Blue) Glass+ MoS2 filled PTFE. Tough, long wearing, excellent heat resistance. Recommended for high pressure hydraulic service, stream, and water. Can be abrasive running against soft metals, at high surface speeds. Not recommended for sliding soft metals, flash chrome plate or anodized aluminum. Extrusion resistance, good chemical resistance, good dielectric properties, good abrasion resistance, long-wearing excellent heat resistance. Water and oil hydraulic systems, pneumatic systems, lubricated conditions, non-lubricated conditions, high-pressure hydraulic steam, very good service life in combination with pressure, speed, and temperature extremes. It performs well in hydraulic, steam,and water applications involving high pressure (~40 000 psi).	-240° F (-150° C) 550° F (285° C)	0.16	2.20 - 2.26	200	2500
515, 521	(515 - White, 531 - Brown) Glass filled PTFE. The fillers added to PTFE increase the stiffness of the part, thus enhancing its load compression properties; they also improve wear resistance. Good for sealing low-pH solutions.	-40° F (-40° C) 220° F (105° F)	0.16	2.15 - 2.25	250	2840
548	(Dark gray) Mineral + MoS2 filled PTFE. Good wear resistance in poorly lubricated or even dry applications, good high-pressure and high-temperature seal material. Excellent general purpose material for use against smooth or rough dynamic surfaces. Particularly suitable for water and steam service. Good chemical resistance may run against mild surface. For use in oil or water hydraulic systems, pneumatic systems, rotary or reciprocating, and lubricated or non-lubricated conditions.	-290° F (-180° C) 545° F (285° F)		2.25 - 2.29	180	2850
558	(Black) Carbon / Graphite filled PTFE. May exhibit some electrical conductivity. It can be machined to tighter tolerances leaving smooth machined surfaces.			2.01	60	1800
570	(Gray) Graphite filled PTFE. Good resistance to chemical corrosion. Good wear characteristics for initial wear in dry and water applications.		0.09	2.14	275	3000

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Metaplast® Spring Seals

Spring Materials

Tetralon Code No.	Application Details	Temperature Range	Coefficient of Friction	Specific Gravity	Elongation (%)	Tensile Strength (psi)
591	(Gray) Molybdenum Disulfide (MoS2) filled PTFE. Enhanced wear resistance and deformation characteristics. MoS2, added in various amounts of 5% to 15%, increases hardness, stiffness, and wear resistance with a minimal effect on chemical, physical, and electrical properties.			2.17	250	3000
615	(Grayish Black) Carbon filled PTFE. Excellent material for use in reciprocating motion applications. Tests suggest seals made of this material may be used for velocities of up to 900 ft/m and 2000 psi when unlubricated, or 3500 psi when the application includes proper lubrication. The Carbon filler increases the hardness and reduces creep making it a good candidate for heavy loading. It possesses good thermal conductivity for longer seal life in extreme temperatures. Self lubricating material with very low coefficient of friction.	-180° F (-120° C) 260° F (125° F)	0.11	2.14	225	4000
649	(White) Modified PTFE. The advantages over virgin PTFE include: less permeation due to the reduction of material voids in the seal cross section, prevents entrapment of contaminants and debris, and possesses less creep and increased stiffness. FDA-compliant material. Higher dielectric strength, this material may be used for large-diameter sealing applications due to its weldability.			2.15	300	3200
901,902	(901 - White, 902 - Blue) Glass-filled PTFE. Ultra wear resistant, non-abrasive, suitable for non-lubricated applications, produces minimal wear debris, exhibits good compressive strength, and performs well in cryogenic use. Good option for seals or bearings running against soft metals such as brass or aluminum with or without hard anodizing.	-200° F (-130° C) 500° F (260° F)	0.12	2.5	280	2900

The following table contains the typical spring materials that CoorsTek carries; please call our facility to speak with an expert in the field if you have questions about chemical compatibility with the fluid being sealed.

Spring Code	Material	Description
A	301 Stainless Steel	Good corrosion resistance for general applications
B	Inconel® 718	For extreme temperatures – good resilience and properties
C	Nickel-Cobalt Alloy	The most resilient spring – excellent chemical compatibility and corrosion resistance. Meets N.A.C.E. MR-01-75
D	Hastelloy® C-276	High Nickel content for maximum corrosion resistance. Meets N.A.C.E. MR-01-75
E	304 Stainless Steel	Good for general applications requiring corrosion resistance and non-magnetic characteristics. Meets N.A.C.E. MR-01-75
F	17-7 PH Stainless Steel	Good for cryogenic applications. Used in many military aerospace requirements
G	316 Stainless Steel	A good corrosion resistant alloy for applications requiring higher chemical compatibility
H	302 Stainless Steel	Typical non-magnetic 300-series stainless steel

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Metaplast® Spring Seals

CoorsTek Standard Metaplast Seal Offerings

CoorsTek Standard Metaplast Seal Offerings

Seal	Groove Width				Configuration		Groove Standard	Catalog Page	Seal Cross Section View
	0 B/U	1 B/U	2 B/U	Other	Piston	Rod			
TC888P	✓				✓		AS4716P*	3.22	
TC888R	✓					✓	AS4716R*	3.31	
TC888K		✓			✓		AS4716P*	3.22	
TC888L		✓				✓	AS4716R*	3.31	
TC88NK		✓			✓		AS4716P*	3.22	
TC88NL		✓				✓	AS4716R*	3.31	
TC1988P		✓			✓		AS4716P*	3.22	
TC1988R		✓				✓	AS4716R*	3.31	
TC1988K			✓		✓		AS4716P*	3.22	
TC1988K6				✓	✓		AS4832P	3.104	
TC1988L			✓			✓	AS4716R*	3.31	
TC1988L6				✓		✓	AS4832R	3.104	
TC1988NK			✓		✓		AS4716P*	3.22	

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Metaplast® Spring Seals

CoorsTek Standard Metaplast Seal & Scraper Offerings

CoorsTek Standard Metaplast Seal Offerings

Seal	Groove Width				Configuration		Groove Standard	Catalog Page	Seal Cross Section View
	0 B/U	1 B/U	2 B/U	Other	Piston	Rod			
TC1988NL			✓			✓	AS4716R*	3.31	
TC1288				✓	✓	✓	COORSTEK	3.60	
TC888C				✓		✓	COORSTEK	3.70	
TC1488				✓			MS33656	3.107	
TC888F				✓			COORSTEK	3.77	
TC888E				✓			COORSTEK	3.87	

*** Metaplast seals have been designed to fit both AS4716 and MIL-G-5514**

CoorsTek Standard Metaplast Scraper Offerings

Scraper	Groove Standard	Catalog Page	Scraper Cross Section View
TC1388	COORSTEK	3.40	
TC2688	COORSTEK	3.40	
TC2188	COORSTEK + BACS34A (Boeing)	3.44	
TC2788	AS2052B	3.97, 3.100	
TC2288	AS4088	3.108	

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The following table lists the dash numbers specified in AS4716 along with those included by CoorsTek Engineering. It has been built as a guide for the user to easily know what standard size scraper type(s) and dash number(s) are available to use in a pneumatic/hydraulic system, given the rod diameter. Go down the left three columns until the rod diameter and primary seal dash number are found, the dash numbers to the right of the seal column correspond to the dash number for the scraper used in the system. Please contact CoorsTek Engineering for assistance in using this table and for those dash numbers without a standard size scraper and for any other type of request. CoorsTek prides itself to be able to provide seals and scrapers to appropriately fit existing grooves.

Seal			Scraper	Alternate Scraper			
			TC2688 or TC1388	TC2688 or TC1388	TC2788	TC2188	TC2288
			Page 3.40	Page 3.40	Page 3.97	Page 3.44	Page 3.108
ØA Rod Diameter							
Min.	Max.	Dash No.	Dash No.	Dash No.	Dash No.	Dash No.	Dash No.
0.075	0.076	004					
0.107	0.108	005					
0.122	0.123	006					
0.153	0.154	007					
0.184	0.185	008					
0.216	0.217	009					
0.247	0.248	010	1/4				108
0.309	0.310	011	5/16				109
0.372	0.373	012	3/8			3/8	110
0.433	0.435	013	7/16			7/16	111
0.496	0.498	014	01	501		1	206
0.558	0.560	015	02	502		2	207
0.621	0.623	016	03	503		3	208
0.683	0.685	017	04	504		4	209
0.746	0.748	018	05	505		5	210
0.808	0.810	019	06	506		6	211
0.871	0.873	020	07	507		7	212
0.933	0.935	021	08	508		8	213
0.996	0.998	022	09	509		9	214
1.058	1.060	023	10	510		10	215
1.121	1.123	024	11	511		11	216
1.183	1.185	025	12	512		12	217
1.246	1.248	026	13	513		13	218
1.308	1.310	027	14	514		14	219

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Metaplast® Spring Seals
Scraper Equivalents

Seal			Scraper	Alternate Scraper			
			TC2688 or TC1388	TC2688 or TC1388	TC2788	TC2188	TC2288
			Page 3.40	Page 3.40	Page 3.97	Page 3.44	Page 3.108
ØA Rod Diameter							
Min.	Max.	Dash No.	Dash No.	Dash No.	Dash No.	Dash No.	Dash No.
1.371	1.373	028	15	515		15	220
1.495	1.497	029	17		325	17	222
1.617	1.619	030	18		326	18	326
1.742	1.744	031	19		327	19	327
1.867	1.869	032	20		328	20	328
1.992	1.994	033	21		329	21	329
2.117	2.119	034	22		330	22	330
2.242	2.244	035	23		331	23	331
2.367	2.369	036	24		332	24	332
2.492	2.494	037	25		333	25	333
2.617	2.619	038	26		334	26	334
2.742	2.744	039	27		335	27	335
2.865	2.867	040	28		336	28	336
2.990	2.992	041	29		337	29	337
3.240	3.242	042	31		339	31	339
3.490	3.492	043	33		341	33	341
3.740	3.742	044	35		343	35	343
3.990	3.992	045	37		345	37	345
0.122	0.123	104					
0.153	0.154	105					
0.184	0.185	106					
0.216	0.217	107					
0.247	0.248	108	1/4				108
0.309	0.310	109	5/16				109
0.371	0.373	110	3/8			3/8	110
0.433	0.435	111	7/16			7/16	111
0.496	0.498	112	01	501		1	206
0.558	0.560	113	02	502		2	207
0.621	0.623	114	03	503		3	208
0.683	0.685	115	04	504		4	209
0.746	0.748	116	05	505		5	210
0.808	0.810	117	06	506		6	211
0.871	0.873	118	07	507		7	212
0.933	0.935	119	08	508		8	213

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Metaplast® Spring Seals

Scraper Equivalents

Seal			Scraper	Alternate Scraper			
			TC2688 or TC1388	TC2688 or TC1388	TC2788	TC2188	TC2288
			Page 3.40	Page 3.40	Page 3.97	Page 3.44	Page 3.108
ØA Rod Diameter							
Min.	Max.	Dash No.	Dash No.	Dash No.	Dash No.	Dash No.	Dash No.
0.996	0.998	120	09	509		9	214
1.058	1.060	121	10	510		10	215
1.121	1.123	122	11	511		11	216
1.183	1.185	123	12	512		12	217
1.246	1.248	124	13	513		13	218
1.308	1.310	125	14	514		14	219
1.371	1.373	126	15	515		15	220
1.433	1.435	127	16	516		16	221
1.496	1.498	128	17	517	325	17	222
1.558	1.560	129					325
1.621	1.623	130	18	518	326	18	326
1.683	1.685	131					
1.746	1.748	132	19	519	327	19	327
1.808	1.810	133					
1.871	1.873	134	20	520	328	20	328
1.934	1.936	135					
1.996	1.998	136	21	521	329	21	329
2.059	2.061	137					
2.121	2.123	138	22	522	330	22	330
2.184	2.186	139					
2.246	2.248	140	23	523	331	23	331
2.309	2.311	141					
2.371	2.373	142	24	524	332	24	332
2.434	2.436	143					
2.496	2.498	144	25	525	333	25	333
2.559	2.561	145					
2.621	2.623	146	26		334	26	334
2.684	2.686	147					
2.746	2.748	148	27		335	27	335
2.809	2.811	149					
2.869	2.871	150	28		336	28	336
2.994	2.996	151	29		337	29	337
3.244	3.246	152	31		339	31	339
3.494	3.496	153	33		341	33	341

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Metaplast® Spring Seals

Scraper Equivalents

Seal			Scraper	Alternate Scraper			
			TC2688 or TC1388	TC2688 or TC1388	TC2788	TC2188	TC2288
			Page 3.40	Page 3.40	Page 3.97	Page 3.44	Page 3.108
ØA Rod Diameter							
Min.	Max.	Dash No.	Dash No.	Dash No.	Dash No.	Dash No.	Dash No.
3.744	3.746	154	35		343	35	343
3.994	3.996	155	37		345	37	345
4.244	4.246	156	39		347	39	347
4.494	4.496	157	41		349	41	349
4.744	4.746	158	43		427	43	427
4.994	4.996	159	45		429	45	429
5.244	5.246	160	47		431	47	431
5.494	5.496	161	49		433	49	433
5.744	5.746	162	51		435	51	435
5.994	5.996	163	53			53	437
0.245	0.247	202	1/4				108
0.307	0.309	203	5/16				109
0.369	0.371	204	3/8			3/8	110
0.431	0.433	205	7/16			7/16	111
0.494	0.496	206	01			1	206
0.556	0.558	207	02			2	207
0.619	0.621	208	03			3	208
0.681	0.683	209	04			4	209
0.746	0.748	210	05			5	210
0.808	0.810	211	06			6	211
0.871	0.873	212	07			7	212
0.933	0.935	213	08			8	213
0.996	0.998	214	09			9	214
1.058	1.060	215	10			10	215
1.121	1.123	216	11			11	216
1.183	1.185	217	12			12	217
1.246	1.248	218	13			13	218
1.308	1.310	219	14			14	219
1.371	1.373	220	15			15	220
1.433	1.435	221	16			16	221
1.496	1.498	222	17		325	17	222
1.621	1.623	223	18		326	18	326
1.746	1.748	224	19		327	19	327
1.871	1.873	225	20		328	20	328

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Seal			Scraper	Alternate Scraper			
			TC2688 or TC1388	TC2688 or TC1388	TC2788	TC2188	TC2288
			Page 3.40	Page 3.40	Page 3.97	Page 3.44	Page 3.108
ØA Rod Diameter							
Min.	Max.	Dash No.	Dash No.	Dash No.	Dash No.	Dash No.	Dash No.
1.996	1.998	226	21		329	21	329
2.121	2.123	227	22		330	22	330
2.246	2.248	228	23		331	23	331
2.371	2.373	229	24		332	24	332
2.496	2.498	230	25		333	25	333
2.621	2.623	231	26		334	26	334
2.746	2.748	232	27		335	27	335
2.871	2.873	233	28		336	28	336
2.995	2.997	234	29		337	29	337
3.120	3.122	235	30		338	30	338
3.245	3.247	236	31		339	31	339
3.370	3.372	237	32		340	32	340
3.495	3.497	238	33		341	33	341
3.620	3.622	239	34		342	34	342
3.745	3.747	240	35		343	35	343
3.870	3.872	241	36		344	36	344
3.995	3.997	242	37		345	37	345
4.120	4.122	243	38		346	38	346
4.245	4.247	244	39		347	39	347
4.370	4.372	245	40		348	40	348
4.495	4.497	246	41		349	41	349
4.620	4.622	247	42		426	42	426
0.496	0.498	313	01	501		1	206
0.558	0.560	314	02	502		2	207
0.621	0.623	315	03	503		3	208
0.683	0.685	316	04	504		4	209
0.746	0.748	317	05	505		5	210
0.808	0.810	318	06	506		6	211
0.871	0.873	319	07	507		7	212
0.933	0.935	320	08	508		8	213
0.996	0.998	321	09	509		9	214
1.121	1.123	322	11	511		11	216
1.246	1.248	323	13	513		13	218
1.371	1.373	324	15	515		15	220

Metaplast® Spring Seals
Scraper Equivalents

Seal			Scraper	Alternate Scraper			
			TC2688 or TC1388	TC2688 or TC1388	TC2788	TC2188	TC2288
			Page 3.40	Page 3.40	Page 3.97	Page 3.44	Page 3.108
ØA Rod Diameter							
Min.	Max.	Dash No.	Dash No.	Dash No.	Dash No.	Dash No.	Dash No.
1.496	1.498	325	17	517	325	17	222
1.621	1.623	326	18	518	326	18	326
1.746	1.748	327	19	519	327	19	327
1.871	1.873	328	20	520	328	20	328
1.996	1.998	329	21	521	329	21	329
2.121	2.123	330	22	522	330	22	330
2.246	2.248	331	23	523	331	23	331
2.371	2.373	332	24	524	332	24	332
2.496	2.498	333	25	525	333	25	333
2.621	2.623	334	26		334	26	334
2.746	2.748	335	27		335	27	335
2.871	2.873	336	28		336	28	336
2.995	2.997	337	29		337	29	337
3.120	3.122	338	30		338	30	338
3.245	3.247	339	31		339	31	339
3.370	3.372	340	32		340	32	340
3.495	3.497	341	33		341	33	341
3.620	3.622	342	34		342	34	342
3.745	3.747	343	35		343	35	343
3.870	3.872	344	36		344	36	344
3.995	3.997	345	37		345	37	345
4.120	4.122	346	38		346	38	346
4.245	4.247	347	39		347	39	347
4.370	4.372	348	40		348	40	348
4.495	4.497	349	41		349	41	349
3.247	3.249	415	31		339	31	339
3.372	3.374	416	32		340	32	340
3.497	3.499	417	33		341	33	341
3.622	3.624	418	34		342	34	342
3.747	3.749	419	35		343	35	343
3.872	3.874	420	36		344	36	344
3.997	3.999	421	37		345	37	345
4.122	4.124	422	38		346	38	346
4.247	4.249	423	39		347	39	347

Seal			Scraper	Alternate Scraper			
			TC2688 or TC1388	TC2688 or TC1388	TC2788	TC2188	TC2288
			Page 3.40	Page 3.40	Page 3.97	Page 3.44	Page 3.108
ØA Rod Diameter							
Min.	Max.	Dash No.	Dash No.	Dash No.	Dash No.	Dash No.	Dash No.
4.372	4.374	424	40		348	40	348
4.494	4.497	425	41		349	41	349
4.619	4.622	426	42		426	42	426
4.744	4.747	427	43		427	43	427
4.869	4.872	428	44		428	44	428
4.994	4.997	429	45		429	45	429
5.119	5.122	430	46		430	46	430
5.244	5.247	431	47		431	47	431
5.369	5.372	432	48		432	48	432
5.494	5.497	433	49		433	49	433
5.619	5.622	434	50		434	50	434
5.744	5.747	435	51		435	51	435
5.869	5.872	436	52		436	52	436
5.994	5.997	437	53		437	53	437
6.244	6.247	438	54		438	54	438
6.494	6.497	439	55		439	55	439
6.744	6.747	440	56		440	56	440
6.994	6.997	441	57		441	57	441
7.244	7.247	442	58		442	58	442
7.494	7.497	443	59		443	59	443
7.744	7.747	444	60		444	60	444
7.994	7.997	445	61		445	61	445
8.494	8.497	446	62		446	62	446
8.994	8.997	447	63		447	63	447
9.494	9.497	448	64		448	64	448
9.994	9.997	449	65		449	65	449
10.494	10.497	450	66		450	66	450
10.994	10.997	451	67		451	67	451
11.494	11.497	452	68		452	68	452
11.994	11.997	453	69		453	69	453
12.494	12.497	454	70		454	70	454
12.994	12.997	455	71		455	71	455
13.494	13.497	456			456		456
13.994	13.997	457			457		457

Metaplast® Spring Seals
Scraper Equivalents

Seal			Scraper	Alternate Scraper			
			TC2688 or TC1388	TC2688 or TC1388	TC2788	TC2188	TC2288
			Page 3.40	Page 3.40	Page 3.97	Page 3.44	Page 3.108
ØA Rod Diameter							
Min.	Max.	Dash No.	Dash No.	Dash No.	Dash No.	Dash No.	Dash No.
14.494	14.497	458			458		458
14.994	14.997	459			459		459
15.494	15.497	460			460		460

Metaplast Piston Seals*

- Radial seals with components allow for successful installation in open and closed grooves
- No stick-slip contact in dynamic surfaces
- Unlimited shelf life
- Jacket and spring materials make these seals the best option for virtually all fluids
- Variable spring thickness and proprietary design ensure excellent sealing performance from cryogenic temperatures to ~600 °F
- Piston Seals are used primarily for dynamic reciprocating motion such as pumps, accumulators, fluid power, and fluid handling devices
- Metaplast seals are the first option for primary seals when used in tandem for redundant hydraulic systems in aerospace applications

TC888P

- General use seal in piston configuration
- Low-pressure positive seal for uni-directional static or dynamic applications
- Fits glands with 0 back-up groove width as specified in AS4716

TC888K

- General use seal in piston configuration
- Low-pressure positive seal for unidirec-tional static or dynamic applications
- Extended ID lip ensures seal performs as intended at all stages of dynamic transition (from extend to retract and vice versa)
- Fits glands with 1 back-up groove width as specified in AS4716

TC88NK

- General use seal in piston configuration
- Low-pressure positive seal for unidirec-tional static or dynamic applications
- Extended ID lip ensures seal performs as intended at all stages of dynamic transition (from extend to retract and vice versa)
- Notches on heel ensure there is no pres-sure trapping between primary and sec-ondary seals (when used in tandem with a Unilock seal, refer to section 4 of catalog)
- Fits glands with 1 back-up groove width as specified in AS4716

TC1988P

- High-pressure seal comprising a rigid back-up ring and a TC888P seal
- Allows for higher piston-bore misalignment
- Fits glands with 1 back-up groove width as specified in AS4716

TC1988K

- High-pressure seal comprising a rigid back-up ring and a TC888K seal
- Allows for higher piston-bore misalignment
- Fits glands with 2 back-up groove width as specified in AS4716

TC1988NK

- High-pressure seal comprising a rigid back-up ring and a TC88NK seal
- Allows for higher piston-bore misalignment
- Fits glands with 2 back-up groove width as specified in AS4716

*** Metaplast Piston Seals designed to fit AS4716 Piston standard grooves**

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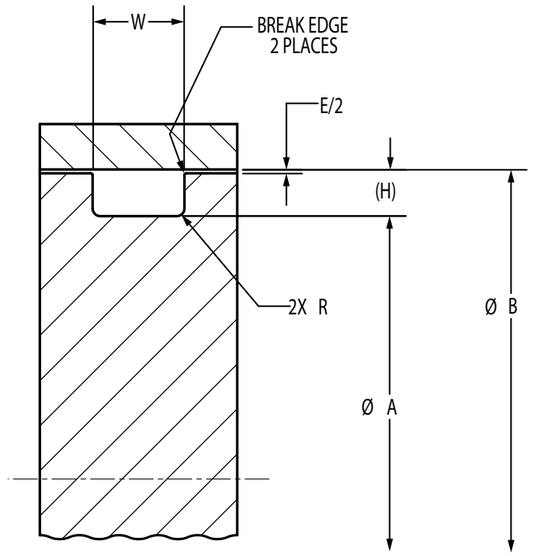
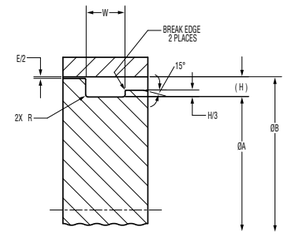
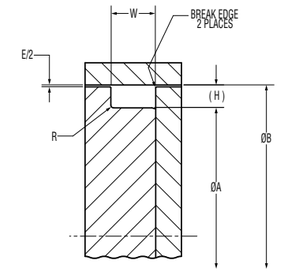
Metaplast® Spring Seals
AS4716, Piston





RETENTION-LIP GROOVE



OPEN GROOVE

Inches

Dash No.	W Gland Width						R Corner Radius	
	0 Back-Up		One Back-Up		Two Back-Up			
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
004 to 009	0.098	0.103	0.154	0.164	0.210	0.220	0.005	0.015
010 to 028	0.094	0.099	0.150	0.160	0.207	0.217		
110 to 149	0.141	0.151	0.183	0.193	0.245	0.255		
210 to 247	0.188	0.198	0.235	0.245	0.304	0.314	0.010	0.025
325 to 349	0.281	0.291	0.334	0.344	0.424	0.434	0.020	0.035
424 to 460	0.375	0.385	0.475	0.485	0.579	0.589		

Millimeters

Dash No.	W Gland Width						R Corner Radius	
	0 Back-Up		One Back-Up		Two Back-Up			
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
004 to 009	2.49	2.62	3.91	4.17	5.33	5.59	0.13	0.38
010 to 028	2.39	2.51	3.81	4.06	5.26	5.51		
110 to 149	3.58	3.84	4.65	4.90	6.22	6.48		
210 to 247	4.78	5.03	5.97	6.22	7.72	7.98	0.25	0.64
325 to 349	7.14	7.39	8.48	8.74	10.77	11.02	0.51	0.89
424 to 460	9.53	9.78	12.07	12.32	14.71	14.96		

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Metaplast® Spring Seals

AS4716, Piston

Dash No.	Inches						Millimeters					
	ØA Piston Groove		ØB Bore		H Groove Height	E Max Diametral Clearance	ØA Piston Groove		ØB Bore		H Groove Height	E Max Diametral Clearance
	Min.	Max	Min.	Max.			Min.	Max	Min.	Max.		
004	0.075	0.076	0.190	0.191			1.91	1.93	4.83	4.85		
005	0.107	0.108	0.221	0.222			2.72	2.74	5.61	5.64		
006	0.122	0.123	0.235	0.236			3.10	3.12	5.97	5.99		
007	0.153	0.154	0.266	0.267			3.89	3.91	6.76	6.78		
008	0.188	0.189	0.297	0.298		0.004	4.78	4.80	7.54	7.57		0.10
009	0.219	0.220	0.329	0.330			5.56	5.59	8.36	8.38		
010	0.249	0.250	0.360	0.361			6.32	6.35	9.14	9.17		
011	0.311	0.312	0.422	0.423			7.90	7.92	10.72	10.74		
012	0.374	0.375	0.485	0.486			9.50	9.53	12.32	12.34		
013	0.439	0.441	0.550	0.552			11.15	11.20	13.97	14.02		
014	0.502	0.504	0.613	0.615			12.75	12.80	15.57	15.62		
015	0.564	0.566	0.675	0.677			14.33	14.38	17.15	17.20		
016	0.627	0.629	0.738	0.740	0.056		15.93	15.98	18.75	18.80	1.42	
017	0.689	0.691	0.800	0.802			17.50	17.55	20.32	20.37		
018	0.751	0.753	0.863	0.865			19.08	19.13	21.92	21.97		
019	0.813	0.815	0.925	0.927			20.65	20.70	23.50	23.55		
020	0.879	0.881	0.991	0.993			22.33	22.38	25.17	25.22		
021	0.941	0.943	1.053	1.055		0.005	23.90	23.95	26.75	26.80		0.13
022	1.004	1.006	1.116	1.118			25.50	25.55	28.35	28.40		
023	1.066	1.068	1.178	1.180			27.08	27.13	29.92	29.97		
024	1.129	1.131	1.241	1.243			28.68	28.73	31.52	31.57		
025	1.191	1.193	1.303	1.305			30.25	30.30	33.10	33.15		
026	1.254	1.256	1.366	1.368			31.85	31.90	34.70	34.75		
027	1.316	1.318	1.428	1.430			33.43	33.48	36.27	36.32		
028	1.379	1.381	1.491	1.493			35.03	35.08	37.87	37.92		
***029**	1.503	1.505	1.615	1.617			38.18	38.23	41.02	41.07		
***030**	1.625	1.627	1.737	1.739			41.28	41.33	44.12	44.17		
***031**	1.750	1.752	1.862	1.864			44.45	44.50	47.29	47.35		
***032**	1.875	1.877	1.987	1.989			47.63	47.68	50.47	50.52		
***033**	2.000	2.002	2.112	2.114	0.056	0.006	50.80	50.85	53.64	53.70	1.42	0.15
***034**	2.125	2.127	2.237	2.239			53.98	54.03	56.82	56.87		
***035**	2.250	2.252	2.362	2.364			57.15	57.20	59.99	60.05		
***036**	2.375	2.377	2.487	2.489			60.33	60.38	63.17	63.22		

Depending on ordering quantities, some of the smaller size dash numbers will be furnished with Rosette Springs. Please refer to page 3.4 for more details.

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Metaplast® Spring Seals

AS4716, Piston

Dash No.	Inches						Millimeters					
	ØA Piston Groove		ØB Bore		H Groove Height	E Max Diametral Clearance	ØA Piston Groove		ØB Bore		H Groove Height	E Max Diametral Clearance
	Min.	Max	Min.	Max.			Min.	Max	Min.	Max.		
***037**	2.500	2.502	2.612	2.614			63.50	63.55	66.34	66.40		
***038**	2.625	2.627	2.737	2.739			66.68	66.73	69.52	69.57		
***039**	2.750	2.752	2.862	2.864			69.85	69.90	72.69	72.75		
***040**	2.873	2.875	2.985	2.987			72.97	73.03	75.82	75.87		
***041**	2.998	3.000	3.110	3.112	0.056	0.006	76.15	76.20	78.99	79.04	1.42	0.15
***042**	3.248	3.250	3.360	3.362			82.50	82.55	85.34	85.39		
***043**	3.498	3.500	3.610	3.612			88.85	88.90	91.69	91.74		
***044**	3.748	3.750	3.860	3.862			95.20	95.25	98.04	98.09		
***045**	3.998	4.000	4.110	4.112			101.55	101.60	104.39	104.44		
104	0.127	0.128	0.297	0.298			3.23	3.25	7.54	7.57		
105	0.157	0.158	0.329	0.330			3.99	4.01	8.36	8.38		
106	0.186	0.187	0.360	0.361		0.004	4.72	4.75	9.14	9.17		0.10
107	0.214	0.215	0.391	0.392			5.44	5.46	9.93	9.96		
108	0.245	0.246	0.422	0.423			6.22	6.25	10.72	10.74		
109	0.307	0.308	0.485	0.486			7.80	7.82	12.32	12.34		
110	0.377	0.379	0.550	0.552			9.58	9.63	13.97	14.02		
111	0.439	0.441	0.613	0.615			11.15	11.20	15.57	15.62		
112	0.500	0.502	0.675	0.677			12.70	12.75	17.15	17.20		
113	0.563	0.565	0.738	0.740			14.30	14.35	18.75	18.80		
114	0.625	0.627	0.800	0.802			15.88	15.93	20.32	20.37		
115	0.687	0.689	0.863	0.865			17.45	17.50	21.92	21.97		
116	0.749	0.751	0.925	0.927	0.088		19.02	19.08	23.50	23.55	2.24	
117	0.815	0.817	0.991	0.993			20.70	20.75	25.17	25.22		
118	0.877	0.879	1.053	1.055			22.28	22.33	26.75	26.80		
119	0.940	0.942	1.116	1.118		0.005	23.88	23.93	28.35	28.40		0.13
120	1.001	1.003	1.178	1.180			25.43	25.48	29.92	29.97		
121	1.064	1.066	1.241	1.243			27.03	27.08	31.52	31.57		
122	1.126	1.128	1.303	1.305			28.60	28.65	33.10	33.15		
123	1.189	1.191	1.366	1.368			30.20	30.25	34.70	34.75		
124	1.251	1.253	1.428	1.430			31.78	31.83	36.27	36.32		
125	1.314	1.316	1.491	1.493			33.38	33.43	37.87	37.92		
126	1.376	1.378	1.553	1.555			34.95	35.00	39.45	39.50		
127	1.439	1.441	1.616	1.618			36.55	36.60	41.05	41.10		

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Metaplast® Spring Seals

AS4716, Piston

Dash No.	ØA Piston Groove		ØB Bore		H Groove Height	E Max Diametral Clearance
	Min.	Max	Min.	Max.		
	Inches					
128	1.501	1.503	1.678	1.680		0.005
129	1.564	1.566	1.741	1.743		
130	1.629	1.631	1.805	1.807		
131	1.691	1.693	1.867	1.869		
132	1.754	1.756	1.930	1.932		
133	1.816	1.818	1.992	1.994		
134	1.879	1.881	2.055	2.057		
135	1.942	1.944	2.118	2.120		0.006
136	2.004	2.006	2.180	2.182		
137	2.067	2.069	2.243	2.245		
138	2.129	2.131	2.305	2.307		
139	2.192	2.194	2.368	2.370		
140	2.254	2.256	2.430	2.432		
141	2.317	2.319	2.493	2.495		
142	2.379	2.381	2.555	2.557		
143	2.442	2.444	2.618	2.620		
144	2.504	2.506	2.680	2.682	0.088	
145	2.567	2.569	2.743	2.745		
146	2.629	2.631	2.805	2.807		
147	2.692	2.694	2.868	2.870		
148	2.754	2.756	2.930	2.932		
149	2.817	2.819	2.993	2.995		
***150**	2.877	2.879	3.053	3.055		0.007
***151**	3.002	3.004	3.178	3.180		
***152**	3.252	3.254	3.428	3.430		
***153**	3.502	3.504	3.678	3.680		
***154**	3.752	3.754	3.928	3.930		
***155**	4.002	4.004	4.178	4.180		
***156**	4.252	4.254	4.428	4.430		
***157**	4.502	4.504	4.678	4.680		
***158**	4.752	4.754	4.928	4.930		
***159**	5.002	5.004	5.178	5.180		
***160**	5.252	5.254	5.428	5.430		

Dash No.	ØA Piston Groove		ØB Bore		H Groove Height	E Max Diametral Clearance
	Min.	Max	Min.	Max.		
	Millimeters					
128	38.13	38.18	42.62	42.67		0.13
129	39.73	39.78	44.22	44.27		
130	41.38	41.43	45.85	45.90		
131	42.95	43.00	47.42	47.47		
132	44.55	44.60	49.02	49.07		
133	46.13	46.18	50.60	50.65		
134	47.73	47.78	52.20	52.25		
135	49.33	49.38	53.80	53.85		0.15
136	50.90	50.95	55.37	55.42		
137	52.50	52.55	56.97	57.02		
138	54.08	54.13	58.55	58.60		
139	55.68	55.73	60.15	60.20		
140	57.25	57.30	61.72	61.77		
141	58.85	58.90	63.32	63.37		
142	60.43	60.48	64.90	64.95		
143	62.03	62.08	66.50	66.55		
144	63.60	63.65	68.07	68.12	2.24	
145	65.20	65.25	69.67	69.72		
146	66.78	66.83	71.25	71.30		
147	68.38	68.43	72.85	72.90		
148	69.95	70.00	74.42	74.47		
149	71.55	71.60	76.02	76.07		
***150**	73.08	73.13	77.55	77.60		0.18
***151**	76.25	76.30	80.72	80.77		
***152**	82.60	82.65	87.07	87.12		
***153**	88.95	89.00	93.42	93.47		
***154**	95.30	95.35	99.77	99.82		
***155**	101.65	101.70	106.12	106.17		
***156**	108.00	108.05	112.47	112.52		
***157**	114.35	114.40	118.82	118.87		
***158**	120.70	120.75	125.17	125.22		
***159**	127.05	127.10	131.52	131.57		
***160**	133.40	133.45	137.87	137.92		

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Metaplast® Spring Seals

AS4716, Piston

Dash No.	ØA Piston Groove		ØB Bore		H Groove Height	E Max Diametral Clearance
	Min.	Max	Min.	Max.		
	Inches					
***161**	5.502	5.504	5.678	5.680		
***162**	5.752	5.754	5.928	5.930	0.088	0.007
***163**	6.002	6.004	6.178	6.180		
***202**	0.247	0.249	0.491	0.493		
***203**	0.309	0.311	0.553	0.555		
***204**	0.371	0.373	0.615	0.617		
***205**	0.433	0.435	0.677	0.679		
***206**	0.496	0.498	0.740	0.742		
***207**	0.558	0.560	0.802	0.804		
***208**	0.621	0.623	0.865	0.867		
***209**	0.683	0.685	0.927	0.929		
210	0.748	0.750	0.991	0.993		
211	0.810	0.812	1.053	1.055		
212	0.872	0.874	1.116	1.118		0.005
213	0.934	0.936	1.178	1.180		
214	0.997	0.999	1.241	1.243		
215	1.062	1.064	1.303	1.305		
216	1.122	1.124	1.366	1.368	0.122	
217	1.184	1.186	1.428	1.430		
218	1.247	1.249	1.491	1.493		
219	1.309	1.311	1.553	1.555		
220	1.372	1.374	1.616	1.618		
221	1.434	1.436	1.678	1.680		
222	1.497	1.499	1.741	1.743		
223	1.623	1.625	1.867	1.869		
224	1.748	1.750	1.992	1.994		
225	1.874	1.876	2.118	2.120		0.006
226	1.999	2.001	2.243	2.245		
227	2.124	2.126	2.368	2.370		
228	2.249	2.251	2.493	2.495		
229	2.374	2.376	2.618	2.620		0.007
230	2.499	2.501	2.743	2.745		
231	2.624	2.626	2.868	2.870		

Dash No.	ØA Piston Groove		ØB Bore		H Groove Height	E Max Diametral Clearance
	Min.	Max	Min.	Max.		
	Millimeters					
***161**	139.75	139.80	144.22	144.27		
***162**	146.10	146.15	150.57	150.62	2.24	0.18
***163**	152.45	152.50	156.92	156.97		
***202**	6.27	6.32	12.47	12.52		
***203**	7.85	7.90	14.05	14.10		
***204**	9.42	9.47	15.62	15.67		
***205**	11.00	11.05	17.20	17.25		
***206**	12.60	12.65	18.80	18.85		
***207**	14.17	14.22	20.37	20.42		
***208**	15.77	15.82	21.97	22.02		
***209**	17.35	17.40	23.55	23.60		
210	19.00	19.05	25.17	25.22		
211	20.57	20.62	26.75	26.80		
212	22.15	22.20	28.35	28.40		0.13
213	23.72	23.77	29.92	29.97		
214	25.32	25.37	31.52	31.57		
215	26.97	27.03	33.10	33.15		
216	28.50	28.55	34.70	34.75	3.09	
217	30.07	30.12	36.27	36.32		
218	31.67	31.72	37.87	37.92		
219	33.25	33.30	39.45	39.50		
220	34.85	34.90	41.05	41.10		
221	36.42	36.47	42.62	42.67		
222	38.02	38.07	44.22	44.27		
223	41.22	41.28	47.42	47.47		0.15
224	44.40	44.45	50.60	50.65		
225	47.60	47.65	53.80	53.85		
226	50.77	50.83	56.97	57.02		
227	53.95	54.00	60.15	60.20		
228	57.12	57.18	63.32	63.37		0.18
229	60.30	60.35	66.50	66.55		
230	63.47	63.53	69.67	69.72		
231	66.65	66.70	72.85	72.90		

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Inches						
Dash No.	ØA Piston Groove		ØB Bore		H Groove Height	E Max Diametral Clearance
	Min.	Max	Min.	Max.		
232	2.749	2.751	2.993	2.995	0.122	0.007
233	2.874	2.876	3.118	3.120		
234	2.999	3.001	3.243	3.245		
235	3.124	3.126	3.368	3.370		
236	3.249	3.251	3.493	3.495		
237	3.374	3.376	3.618	3.620		
238	3.499	3.501	3.743	3.745		
239	3.624	3.626	3.868	3.870		
240	3.749	3.751	3.993	3.995		
241	3.874	3.876	4.118	4.120		
242	3.999	4.001	4.243	4.245		
243	4.124	4.126	4.368	4.370		
244	4.249	4.251	4.493	4.495		
245	4.374	4.376	4.618	4.620		0.008
246	4.499	4.501	4.743	4.745		
247	4.624	4.626	4.868	4.870		
*313	0.493	0.495	0.867	0.869	0.187	0.005
*314	0.555	0.557	0.929	0.931		
*315	0.618	0.620	0.992	0.994		
*316	0.680	0.682	1.054	1.056		
*317	0.743	0.745	1.117	1.119		
*318	0.805	0.807	1.179	1.181		
*319	0.868	0.870	1.242	1.244		
*320	0.930	0.932	1.304	1.306		
*321	0.993	0.995	1.367	1.369		
*322	1.118	1.120	1.492	1.494		
*323	1.243	1.245	1.617	1.619		
*324	1.368	1.370	1.742	1.744		
325	1.493	1.495	1.867	1.869		0.006
326	1.618	1.620	1.992	1.994		
327	1.744	1.746	2.118	2.120		
328	1.869	1.871	2.243	2.245		
329	1.994	1.996	2.368	2.370		

Millimeters						
Dash No.	ØA Piston Groove		ØB Bore		H Groove Height	E Max Diametral Clearance
	Min.	Max	Min.	Max.		
232	69.82	69.88	76.02	76.07	3.09	0.18
233	73.00	73.05	79.20	79.25		
234	76.17	76.23	82.37	82.42		
235	79.35	79.40	85.55	85.60		
236	82.52	82.58	88.72	88.77		
237	85.70	85.75	91.90	91.95		
238	88.87	88.93	95.07	95.12		
239	92.05	92.10	98.25	98.30		
240	95.22	95.28	101.42	101.47		
241	98.40	98.45	104.60	104.65		
242	101.57	101.63	107.77	107.82		
243	104.75	104.80	110.95	111.00		
244	107.92	107.98	114.12	114.17		
245	111.10	111.15	117.30	117.35		0.20
246	114.27	114.33	120.47	120.52		
247	117.45	117.50	123.65	123.70		
*313	12.52	12.57	22.02	22.07	4.75	0.13
*314	14.10	14.15	23.60	23.65		
*315	15.70	15.75	25.20	25.25		
*316	17.27	17.32	26.77	26.82		
*317	18.87	18.92	28.37	28.42		
*318	20.45	20.50	29.95	30.00		
*319	22.05	22.10	31.55	31.60		
*320	23.62	23.67	33.12	33.17		
*321	25.22	25.27	34.72	34.77		
*322	28.40	28.45	37.90	37.95		
*323	31.57	31.62	41.07	41.12		
*324	34.75	34.80	44.25	44.30		
325	37.92	37.97	47.42	47.47		0.15
326	41.10	41.15	50.60	50.65		
327	44.30	44.35	53.80	53.85		
328	47.47	47.52	56.97	57.02		
329	50.65	50.70	60.15	60.20		

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Metaplast® Spring Seals
AS4716, Piston

Inches						
Dash No.	ØA Piston Groove		ØB Bore		H Groove Height	E Max Diametral Clearance
	Min.	Max	Min.	Max.		
330	2.119	2.121	2.493	2.495	0.187	0.007
331	2.244	2.246	2.618	2.620		
332	2.369	2.371	2.743	2.745		
333	2.494	2.496	2.868	2.870		
334	2.619	2.621	2.993	2.995		
335	2.744	2.746	3.118	3.120		
336	2.869	2.871	3.243	3.245		
337	2.994	2.996	3.368	3.370		
338	3.119	3.121	3.493	3.495		
339	3.244	3.246	3.618	3.620		
340	3.369	3.371	3.743	3.745		
341	3.494	3.496	3.868	3.870		
342	3.619	3.621	3.993	3.995		
343	3.744	3.746	4.118	4.120		
344	3.869	3.871	4.243	4.245		
345	3.994	3.996	4.368	4.370		
346	4.119	4.121	4.493	4.495		0.008
347	4.244	4.246	4.618	4.620		
348	4.369	4.371	4.743	4.745		
349	4.494	4.496	4.868	4.870		
*415	3.247	3.250	3.727	3.730	0.240	0.008
*416	3.372	3.375	3.852	3.855		
*417	3.497	3.500	3.977	3.980		
*418	3.622	3.625	4.102	4.105		
*419	3.747	3.750	4.227	4.230		
*420	3.872	3.875	4.352	4.355		
*421	3.997	4.000	4.477	4.480		
*422	4.122	4.125	4.602	4.605		
*423	4.247	4.250	4.727	4.730		
*424	4.372	4.375	4.852	4.855		
425	4.494	4.497	4.974	4.977		0.009
426	4.619	4.622	5.099	5.102		
427	4.744	4.747	5.224	5.227		

Millimeters						
Dash No.	ØA Piston Groove		ØB Bore		H Groove Height	E Max Diametral Clearance
	Min.	Max	Min.	Max.		
330	53.82	53.87	63.32	63.37	4.75	0.18
331	57.00	57.05	66.50	66.55		
332	60.17	60.22	69.67	69.72		
333	63.35	63.40	72.85	72.90		
334	66.52	66.57	76.02	76.07		
335	69.70	69.75	79.20	79.25		
336	72.87	72.92	82.37	82.42		
337	76.05	76.10	85.55	85.60		
338	79.22	79.27	88.72	88.77		
339	82.40	82.45	91.90	91.95		
340	85.57	85.62	95.07	95.12		
341	88.75	88.80	98.25	98.30		
342	91.92	91.97	101.42	101.47		
343	95.10	95.15	104.60	104.65		
344	98.27	98.32	107.77	107.82		
345	101.45	101.50	110.95	111.00		
346	104.62	104.67	114.12	114.17		0.20
347	107.80	107.85	117.30	117.35		
348	110.97	111.02	120.47	120.52		
349	114.15	114.20	123.65	123.70		
*415	82.47	82.55	94.67	94.74	6.10	0.20
*416	85.65	85.73	97.84	97.92		
*417	88.82	88.90	101.02	101.09		
*418	92.00	92.08	104.19	104.27		
*419	95.17	95.25	107.37	107.44		
*420	98.35	98.43	110.54	110.62		
*421	101.52	101.60	113.72	113.79		
*422	104.70	104.78	116.89	116.97		
*423	107.87	107.95	120.07	120.14		
*424	111.05	111.13	123.24	123.32		
425	114.15	114.22	126.34	126.42		0.23
426	117.32	117.40	129.51	129.59		
427	120.50	120.57	132.69	132.77		

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Metaplast® Spring Seals

AS4716, Piston

Dash No.	ØA Piston Groove		ØB Bore		H Groove Height	E Max Diametral Clearance
	Min.	Max	Min.	Max.		
						Inches
428	4.869	4.872	5.349	5.352		
429	4.994	4.997	5.474	5.477		
430	5.119	5.122	5.599	5.602		
431	5.244	5.247	5.724	5.727		
432	5.369	5.372	5.849	5.852		
433	5.494	5.497	5.974	5.977		
434	5.619	5.622	6.099	6.102		
435	5.747	5.744	6.224	6.227		
436	5.869	5.872	6.349	6.352		
437	5.994	5.997	6.474	6.477		0.009
438	6.244	6.247	6.724	6.727		
439	6.494	6.497	6.974	6.977		
440	6.744	6.747	7.224	7.227		
441	6.994	6.997	7.474	7.477		
442	7.244	7.247	7.724	7.727		
443	7.494	7.497	7.974	7.977		
444	7.744	7.747	8.224	8.227	0.240	
445	7.994	7.997	8.474	8.477		
446	8.494	8.497	8.974	8.977		0.010
447	8.994	8.997	9.474	9.478		
448	9.494	9.497	9.974	9.978		
449	9.994	9.997	10.474	10.478		
450	10.494	10.497	10.974	10.978		
451	10.994	10.997	11.474	11.478		
452	11.494	11.497	11.974	11.978		
453	11.994	11.997	12.474	12.478		0.011
454	12.494	12.497	12.974	12.978		
455	12.994	12.997	13.474	13.478		
456	13.494	13.497	13.974	13.978		
457	13.994	13.997	14.474	14.478		
458	14.494	14.497	14.974	14.978		
459	14.994	14.997	15.474	15.478		
460	15.494	15.497	15.974	15.978		

Dash No.	ØA Piston Groove		ØB Bore		H Groove Height	E Max Diametral Clearance
	Min.	Max	Min.	Max.		
						Millimeters
428	123.67	123.75	135.86	135.94		
429	126.85	126.92	139.04	139.12		
430	130.02	130.10	142.21	142.29		
431	133.20	133.27	145.39	145.47		
432	136.37	136.45	148.56	148.64		
433	139.55	139.62	151.74	151.82		
434	142.72	142.80	154.91	154.99		
435	145.97	145.90	158.09	158.17		
436	149.07	149.15	161.26	161.34		
437	152.25	152.32	164.44	164.52		0.23
438	158.60	158.67	170.79	170.87		
439	164.95	165.02	177.14	177.22		
440	171.30	171.37	183.49	183.57		
441	177.65	177.72	189.84	189.92		
442	184.00	184.07	196.19	196.27		
443	190.35	190.42	202.54	202.62		
444	196.70	196.77	208.89	208.97	6.10	
445	203.05	203.12	215.24	215.32		
446	215.75	215.82	227.94	228.02		0.25
447	228.45	228.52	240.64	240.74		
448	241.15	241.22	253.34	253.44		
449	253.85	253.92	266.04	266.14		
450	266.55	266.62	278.74	278.84		
451	279.25	279.32	291.44	291.54		
452	291.95	292.02	304.14	304.24		
453	304.65	304.72	316.84	316.94		0.28
454	317.35	317.42	329.54	329.64		
455	330.05	330.12	342.24	342.34		
456	342.75	342.82	354.94	355.04		
457	355.45	355.52	367.64	367.74		
458	368.15	368.22	380.34	380.44		
459	380.85	380.92	393.04	393.14		
460	393.55	393.62	405.74	405.84		

Dash numbers marked with an asterisk (*) have been added by CoorsTek Engineering, not found in AS4716.

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Metaplast® Spring Seals

AS4716, Rod

Metaplast Rod Seals designed to fit AS4716 Rod Standard Groove Sizes

METAPLAST ROD SEALS

- Radial seals with components allow for successful installation in open and closed grooves
- No stick-slip contact in dynamic surfaces
- Unlimited shelf life
- Jacket and spring materials make these seals the best option for virtually all fluids
- Variable spring thickness and proprietary design ensure excellent sealing performance from cryogenic temperatures to ~600 °F
- Rod seals are widely used in aerospace in hydraulic power units such as flight control actuators, hydraulic power units, and in industrial applications such as drilling rig hydraulic systems and ram cylinder housing
- Metaplast seals are the first option for primary seals when used in tandem for redundant hydraulic systems in aerospace applications

TC888R

- General use seal in rod configuration
- Low-pressure positive seal for unidirectional static or dynamic applications
- Fits glands with 0 back-up groove width as specified in AS4716

TC888L

- General use seal in rod configuration
- Low-pressure positive seal for unidirectional static or dynamic applications
- Extended OD lip ensures seal performs as intended at all stages of dynamic transition (from extend to retract and vice versa)
- Fits glands with 1 back-up groove width as specified in AS4716

TC88NL

- General use seal in rod configuration
- Low-pressure positive seal for unidirectional static or dynamic applications
- Extended OD lip ensures seal performs as intended at all stages of dynamic transition (from extend to retract and vice versa)
- Notches on heel ensure there is no pressure trapping between primary and secondary seals (when used in tandem with a Unilock seal, refer to section 4 of catalog)
- Fits glands with 1 back-up groove width as specified in AS4716

TC1988R

- High-pressure seal comprising a rigid back-up ring and a TC888R seal
- Allows for higher shaft/rod-bore misalignment
- Fits glands with 1 back-up groove width as specified in AS4716

TC1988L

- High-pressure seal comprising a rigid back-up ring and a TC888L seal
- Allows for higher shaft/rod-bore misalignment
- Fits glands with 2 back-up groove width as specified in AS4716

TC1988NL

- High-pressure seal comprising a rigid back-up ring and a TC88NL seal
- Allows for higher shaft/rod-bore misalignment
- Fits glands with 2 back-up groove width as specified in AS4716

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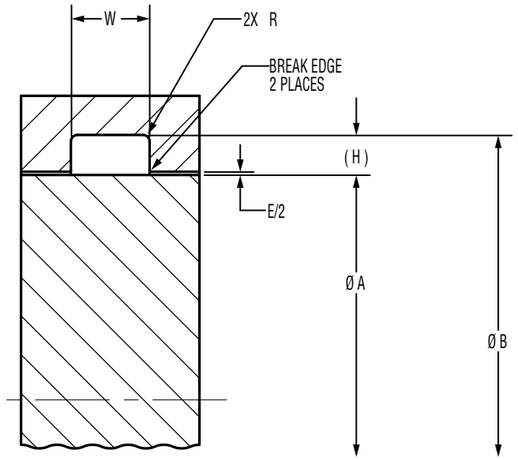

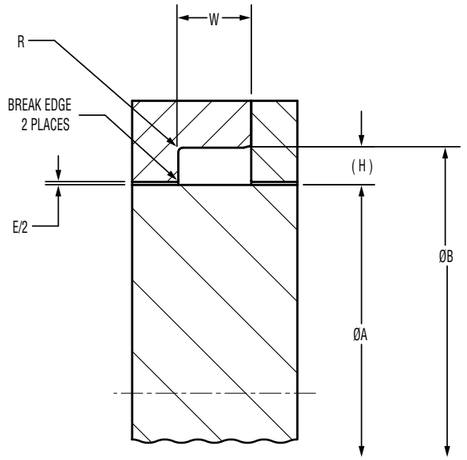

OPEN GROOVE

Inches

Dash No.	W Gland Width						R Corner Radius	
	0 Back-Up		One Back-Up		Two Back-Up			
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
004 to 009	0.098	0.103	0.154	0.164	0.210	0.220	0.005	0.015
010 to 028	0.094	0.099	0.150	0.160	0.207	0.217		
110 to 149	0.141	0.151	0.183	0.193	0.245	0.255		
210 to 247	0.188	0.198	0.235	0.245	0.304	0.314	0.010	0.025
325 to 349	0.281	0.291	0.334	0.344	0.424	0.434	0.020	0.035
424 to 460	0.375	0.385	0.475	0.485	0.579	0.589		

Millimeters

Dash No.	W Gland Width						R Corner Radius	
	0 Back-Up		One Back-Up		Two Back-Up			
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
004 to 009	2.49	2.62	3.91	4.17	5.33	5.59	0.13	0.38
010 to 028	2.39	2.51	3.81	4.06	5.26	5.51		
110 to 149	3.58	3.84	4.65	4.90	6.22	6.48		
210 to 247	4.78	5.03	5.97	6.22	7.72	7.98	0.25	0.64
325 to 349	7.14	7.39	8.48	8.74	10.77	11.02	0.51	0.89
424 to 460	9.53	9.78	12.07	12.32	14.71	14.96		

Metaplast® Spring Seals
AS4716, Rod

Inches

Dash No.	(ØA) Rod Dia.		(ØB) Groove Dia.		H Groove Height	E Max Diametral Clearance
	Min.	Max	Min.	Max.		
004	0.075	0.076	0.190	0.191		
005	0.107	0.108	0.221	0.222		
006	0.122	0.123	0.235	0.236		
007	0.153	0.154	0.266	0.267		
008	0.184	0.185	0.294	0.295		0.004
009	0.216	0.217	0.327	0.328		
010	0.247	0.248	0.359	0.360		
011	0.309	0.310	0.421	0.422	Depending on ordering quantities, some of the smaller size dash numbers will be furnished with Rosette Springs. Please refer to page 3.4 for more details.	
012	0.372	0.373	0.484	0.485		
013	0.433	0.435	0.545	0.547		
014	0.496	0.498	0.608	0.610		
015	0.558	0.560	0.670	0.672		
016	0.621	0.623	0.733	0.735		
017	0.683	0.685	0.795	0.797		
018	0.746	0.748	0.858	0.860		
019	0.808	0.810	0.920	0.922		
020	0.871	0.873	0.983	0.985	0.056	
021	0.933	0.935	1.045	1.047		
022	0.996	0.998	1.108	1.110		
023	1.058	1.060	1.170	1.172		
024	1.121	1.123	1.233	1.235		0.005
025	1.183	1.185	1.295	1.297		
026	1.246	1.248	1.358	1.360		
027	1.308	1.310	1.420	1.422		
028	1.371	1.373	1.483	1.485		
*029	1.495	1.497	1.607	1.609		
*030	1.617	1.619	1.729	1.731		
*031	1.742	1.744	1.854	1.856		
*032	1.867	1.869	1.979	1.981		
*033	1.992	1.994	2.104	2.106		
*034	2.117	2.119	2.229	2.231		
*035	2.242	2.244	2.354	2.356		
*036	2.367	2.369	2.479	2.481		

Millimeters

Dash No.	(ØA) Rod Dia.		(ØB) Groove Dia.		H Groove Height	E Max Diametral Clearance
	Min.	Max	Min.	Max.		
004	1.91	1.93	4.83	4.85		
005	2.72	2.74	5.61	5.64		
006	3.10	3.12	5.97	5.99		
007	3.89	3.91	6.76	6.78		
008	4.67	4.70	7.47	7.49		0.10
009	5.49	5.51	8.31	8.33		
010	6.27	6.30	9.12	9.14		
011	7.85	7.87	10.69	10.72		
012	9.45	9.47	12.29	12.32		
013	11.00	11.05	13.84	13.89		
014	12.60	12.65	15.44	15.49		
015	14.17	14.22	17.02	17.07		
016	15.77	15.82	18.62	18.67		
017	17.35	17.40	20.19	20.24		
018	18.95	19.00	21.79	21.84		
019	20.52	20.57	23.37	23.42		
020	22.12	22.17	24.97	25.02	1.42	
021	23.70	23.75	26.54	26.59		
022	25.30	25.35	28.14	28.19		
023	26.87	26.92	29.72	29.77		
024	28.47	28.52	31.32	31.37		0.13
025	30.05	30.10	32.89	32.94		
026	31.65	31.70	34.49	34.54		
027	33.22	33.27	36.07	36.12		
028	34.82	34.87	37.67	37.72		
*029	37.97	38.02	40.82	40.87		
*030	41.07	41.12	43.92	43.97		
*031	44.25	44.30	47.09	47.14		
*032	47.42	47.47	50.27	50.32		
*033	50.60	50.65	53.44	53.49		
*034	53.77	53.82	56.62	56.67		
*035	56.95	57.00	59.79	59.84		
*036	60.12	60.17	62.97	63.02		

Dash numbers marked with an asterisk (*) have been added by CoorsTek Engineering, not found in AS4716.

Metaplast® Spring Seals

AS4716, Rod

Inches							Millimeters							
Dash No.	(ØA) Rod Dia.		(ØB) Groove Dia.		H Groove Height	E Max Diametral Clearance	Dash No.	(ØA) Rod Dia.		(ØB) Groove Dia.		H Groove Height	E Max Diametral Clearance
	Min.	Max	Min.	Max.				Min.	Max	Min.	Max.		
*037	2.492	2.494	2.604	2.606			037	63.30	63.35	66.14	66.19		
*038	2.617	2.619	2.729	2.731			038	66.47	66.52	69.32	69.37		
*039	2.742	2.744	2.854	2.856			039	69.65	69.70	72.49	72.54		
*040	2.865	2.867	2.977	2.979			040	72.77	72.82	75.62	75.67		
*041	2.990	2.992	3.102	3.104	0.056	0.005	041	75.95	76.00	78.79	78.84	1.42	0.13
*042	3.240	3.242	3.352	3.354			042	82.30	82.35	85.14	85.19		
*043	3.490	3.492	3.602	3.604			043	88.65	88.70	91.49	91.54		
*044	3.740	3.742	3.852	3.854			044	95.00	95.05	97.84	97.89		
*045	3.990	3.992	4.102	4.104			045	101.35	101.40	104.19	104.24		
104	0.122	0.123	0.295	0.296			104	3.10	3.12	7.49	7.52		
105	0.153	0.154	0.327	0.328			105	3.89	3.91	8.31	8.33		
106	0.184	0.185	0.359	0.360		0.004	106	4.67	4.70	9.12	9.14		0.10
107	0.216	0.217	0.392	0.393			107	5.49	5.51	9.96	9.98		
108	0.247	0.248	0.423	0.424			108	6.27	6.30	10.74	10.77		
109	0.309	0.310	0.486	0.487			109	7.85	7.87	12.34	12.37		
110	0.371	0.373	0.546	0.548			110	9.42	9.47	13.87	13.92		
111	0.433	0.435	0.609	0.611			111	11.00	11.05	15.47	15.52		
112	0.496	0.498	0.672	0.674			112	12.60	12.65	17.07	17.12		
113	0.558	0.560	0.734	0.736			113	14.17	14.22	18.64	18.69		
114	0.621	0.623	0.797	0.799			114	15.77	15.82	20.24	20.29		
115	0.683	0.685	0.859	0.861			115	17.35	17.40	21.82	21.87		
116	0.746	0.748	0.923	0.925	0.088		116	18.95	19.00	23.44	23.50	2.24	
117	0.808	0.810	0.985	0.987			117	20.52	20.57	25.02	25.07		
118	0.871	0.873	1.048	1.050		0.005	118	22.12	22.17	26.62	26.67		0.13
119	0.933	0.935	1.110	1.112			119	23.70	23.75	28.19	28.24		
120	0.996	0.998	1.173	1.175			120	25.30	25.35	29.79	29.85		
121	1.058	1.060	1.235	1.237			121	26.87	26.92	31.37	31.42		
122	1.121	1.123	1.298	1.300			122	28.47	28.52	32.97	33.02		
123	1.183	1.185	1.360	1.362			123	30.05	30.10	34.54	34.59		
124	1.246	1.248	1.423	1.425			124	31.65	31.70	36.14	36.20		
125	1.308	1.310	1.485	1.487			125	33.22	33.27	37.72	37.77		
126	1.371	1.373	1.548	1.550			126	34.82	34.87	39.32	39.37		
127	1.433	1.435	1.610	1.612		0.006	127	36.40	36.45	40.89	40.94		0.15

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Metaplast® Spring Seals

AS4716, Rod

Inches							Millimeters							
Dash No.	(ØA) Rod Dia.		(ØB) Groove Dia.		H Groove Height	E Max Diametral Clearance	Dash No.	(ØA) Rod Dia.		(ØB) Groove Dia.		H Groove Height	E Max Diametral Clearance
	Min.	Max	Min.	Max.				Min.	Max	Min.	Max.		
128	1.496	1.498	1.673	1.675			128	38.00	38.05	42.49	42.55		
129	1.558	1.560	1.735	1.737			129	39.57	39.62	44.07	44.12		
130	1.621	1.623	1.798	1.800		0.006	130	41.17	41.22	45.67	45.72		0.15
131	1.683	1.685	1.860	1.862			131	42.75	42.80	47.24	47.29		
132	1.746	1.748	1.923	1.925			132	44.35	44.40	48.84	48.90		
133	1.808	1.810	1.984	1.986			133	45.92	45.97	50.39	50.44		
134	1.871	1.873	2.047	2.049			134	47.52	47.57	51.99	52.04		
135	1.934	1.936	2.110	2.112			135	49.12	49.17	53.59	53.64		
136	1.996	1.998	2.172	2.174			136	50.70	50.75	55.17	55.22		
137	2.059	2.061	2.235	2.237			137	52.30	52.35	56.77	56.82		
138	2.121	2.123	2.297	2.299			138	53.87	53.92	58.34	58.39		
139	2.184	2.186	2.360	2.362			139	55.47	55.52	59.94	59.99		
140	2.246	2.248	2.422	2.424			140	57.05	57.10	61.52	61.57		
141	2.309	2.311	2.485	2.487			141	58.65	58.70	63.12	63.17		
142	2.371	2.373	2.547	2.549			142	60.22	60.27	64.69	64.74		
143	2.434	2.436	2.610	2.612			143	61.82	61.87	66.29	66.34		
144	2.496	2.498	2.672	2.674	0.088		144	63.40	63.45	67.87	67.92	2.24	
145	2.559	2.561	2.735	2.737			145	65.00	65.05	69.47	69.52		
146	2.621	2.623	2.797	2.799		0.007	146	66.57	66.62	71.04	71.09		0.18
147	2.684	2.686	2.860	2.862			147	68.17	68.22	72.64	72.69		
148	2.746	2.748	2.922	2.924			148	69.75	69.80	74.22	74.27		
149	2.809	2.811	2.985	2.987			149	71.35	71.40	75.82	75.87		
*150	2.869	2.871	3.045	3.047			*150	72.87	72.92	77.34	77.39		
*151	2.994	2.996	3.170	3.172			*151	76.05	76.10	80.52	80.57		
*152	3.244	3.246	3.420	3.422			*152	82.40	82.45	86.87	86.92		
*153	3.494	3.496	3.670	3.672			*153	88.75	88.80	93.22	93.27		
*154	3.744	3.746	3.920	3.922			*154	95.10	95.15	99.57	99.62		
*155	3.994	3.996	4.170	4.172			*155	101.45	101.50	105.92	105.97		
*156	4.244	4.246	4.420	4.422			*156	107.80	107.85	112.27	112.32		
*157	4.494	4.496	4.670	4.672			*157	114.15	114.20	118.62	118.67		
*158	4.744	4.746	4.920	4.922			*158	120.50	120.55	124.97	125.02		
*159	4.994	4.996	5.170	5.172			*159	126.85	126.90	131.32	131.37		
*160	5.244	5.246	5.420	5.422			*160	133.20	133.25	137.67	137.72		

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Metaplast® Spring Seals

AS4716, Rod

Inches							Millimeters							
Dash No.	(ØA) Rod Dia.		(ØB) Groove Dia.		H Groove Height	E Max Diametral Clearance	Dash No.	(ØA) Rod Dia.		(ØB) Groove Dia.		H Groove Height	E Max Diametral Clearance
	Min.	Max	Min.	Max.				Min.	Max	Min.	Max.		
*161	5.494	5.496	5.670	5.672	0.088	0.007	*161	139.55	139.60	144.02	144.07	2.24	0.18
*162	5.744	5.746	5.920	5.922			*162	145.90	145.95	150.37	150.42		
*163	5.994	5.996	6.170	6.172			*163	152.25	152.30	156.72	156.77		
*202	0.245	0.247	0.489	0.491	0.122	0.005	*202	6.22	6.27	12.42	12.47	3.09	0.13
*203	0.307	0.309	0.551	0.553			*203	7.80	7.85	14.00	14.05		
*204	0.369	0.371	0.613	0.615			*204	9.37	9.42	15.57	15.62		
*205	0.431	0.433	0.675	0.677			*205	10.95	11.00	17.15	17.20		
*206	0.494	0.496	0.738	0.740			*206	12.55	12.60	18.75	18.80		
*207	0.556	0.558	0.800	0.802			*207	14.12	14.17	20.32	20.37		
*208	0.619	0.621	0.863	0.865			*208	15.72	15.77	21.92	21.97		
*209	0.681	0.683	0.925	0.927			*209	17.30	17.35	23.50	23.55		
210	0.746	0.748	0.989	0.991			210	18.95	19.00	25.12	25.17		
211	0.808	0.810	1.051	1.053			211	20.52	20.57	26.70	26.75		
212	0.871	0.873	1.115	1.117			212	22.12	22.17	28.32	28.37		
213	0.933	0.935	1.177	1.179			213	23.70	23.75	29.90	29.95		
214	0.996	0.998	1.240	1.242			214	25.30	25.35	31.50	31.55		
215	1.058	1.060	1.302	1.304			215	26.87	26.92	33.07	33.12		
216	1.121	1.123	1.365	1.367			216	28.47	28.52	34.67	34.72		
217	1.183	1.185	1.427	1.429			217	30.05	30.10	36.25	36.30		
218	1.246	1.248	1.490	1.492			218	31.65	31.70	37.85	37.90		
219	1.308	1.310	1.552	1.554			219	33.22	33.27	39.42	39.47		
220	1.371	1.373	1.615	1.617			220	34.82	34.87	41.02	41.07		
221	1.433	1.435	1.677	1.679			221	36.40	36.45	42.60	42.65		
222	1.496	1.498	1.740	1.742			222	38.00	38.05	44.20	44.25		
223	1.621	1.623	1.865	1.867		0.006	223	41.17	41.22	47.37	47.42		0.15
224	1.746	1.748	1.990	1.992			224	44.35	44.40	50.55	50.60		
225	1.871	1.873	2.115	2.117		0.007	225	47.52	47.57	53.72	53.77		0.18
226	1.996	1.998	2.240	2.242			226	50.70	50.75	56.90	56.95		
227	2.121	2.123	2.365	2.367			227	53.87	53.92	60.07	60.12		
228	2.246	2.248	2.490	2.492			228	57.05	57.10	63.25	63.30		
229	2.371	2.373	2.615	2.617			229	60.22	60.27	66.42	66.47		
230	2.496	2.498	2.740	2.742			230	63.40	63.45	69.60	69.65		
231	2.621	2.623	2.865	2.867			231	66.57	66.62	72.77	72.82		

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Metaplast® Spring Seals

AS4716, Rod

Inches							Millimeters							
Dash No.	(ØA) Rod Dia.		(ØB) Groove Dia.		H Groove Height	E Max Diametral Clearance	Dash No.	(ØA) Rod Dia.		(ØB) Groove Dia.		H Groove Height	E Max Diametral Clearance
	Min.	Max	Min.	Max.				Min.	Max	Min.	Max.		
232	2.746	2.748	2.990	2.992	0.122	0.007	232	69.75	69.80	75.95	76.00	3.09	0.18
233	2.871	2.873	3.115	3.117			233	72.92	72.97	79.12	79.17		
234	2.995	2.997	3.239	3.241			234	76.07	76.12	82.27	82.32		
235	3.120	3.122	3.364	3.366			235	79.25	79.30	85.45	85.50		
236	3.245	3.247	3.489	3.491			236	82.42	82.47	88.62	88.67		
237	3.370	3.372	3.614	3.616			237	85.60	85.65	91.80	91.85		
238	3.495	3.497	3.739	3.741			238	88.77	88.82	94.97	95.02		
239	3.620	3.622	3.864	3.866			239	91.95	92.00	98.15	98.20		
240	3.745	3.747	3.989	3.991			240	95.12	95.17	101.32	101.37		
241	3.870	3.872	4.114	4.116			241	98.30	98.35	104.50	104.55		
242	3.995	3.997	4.239	4.241			242	101.47	101.52	107.67	107.72		
243	4.120	4.122	4.364	4.366			243	104.65	104.70	110.85	110.90		
244	4.245	4.247	4.489	4.491			244	107.82	107.87	114.02	114.07		
245	4.370	4.372	4.614	4.616			245	111.00	111.05	117.20	117.25		
246	4.495	4.497	4.739	4.741		0.008	246	114.17	114.22	120.37	120.42		0.20
247	4.620	4.622	4.864	4.866			247	117.35	117.40	123.55	123.60		
*313	0.496	0.498	0.870	0.872	0.187	0.006	*313	12.60	12.65	22.10	22.15	4.75	0.15
*314	0.558	0.560	0.932	0.934			*314	14.17	14.22	23.67	23.72		
*315	0.621	0.623	0.995	0.997			*315	15.77	15.82	25.27	25.32		
*316	0.683	0.685	1.057	1.059			*316	17.35	17.40	26.85	26.90		
*317	0.746	0.748	1.120	1.122			*317	18.95	19.00	28.45	28.50		
*318	0.808	0.810	1.182	1.184			*318	20.52	20.57	30.02	30.07		
*319	0.871	0.873	1.245	1.247			*319	22.12	22.17	31.62	31.67		
*320	0.933	0.935	1.307	1.309			*320	23.70	23.75	33.20	33.25		
*321	0.996	0.998	1.370	1.372			*321	25.30	25.35	34.80	34.85		
*322	1.121	1.123	1.495	1.497			*322	28.47	28.52	37.97	38.02		
*323	1.246	1.248	1.620	1.622			*323	31.65	31.70	41.15	41.20		
*324	1.371	1.373	1.745	1.747			*324	34.82	34.87	44.32	44.37		
325	1.496	1.498	1.870	1.872			325	38.00	38.05	47.50	47.55		
326	1.621	1.623	1.995	1.997			326	41.17	41.22	50.67	50.72		
327	1.746	1.748	2.120	2.122			327	44.35	44.40	53.85	53.90		
328	1.871	1.873	2.245	2.247		0.007	328	47.52	47.57	57.02	57.07		0.18
329	1.996	1.998	2.370	2.372			329	50.70	50.75	60.20	60.25		

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Metaplast® Spring Seals

AS4716, Rod

Inches						
Dash No.	(ØA) Rod Dia.		(ØB) Groove Dia.		H Groove Height	E Max Diametral Clearance
	Min.	Max	Min.	Max.		
330	2.121	2.123	2.495	2.497		
331	2.246	2.248	2.620	2.622		
332	2.371	2.373	2.745	2.747		
333	2.496	2.498	2.870	2.872		
334	2.621	2.623	2.995	2.997		
335	2.746	2.748	3.120	3.122		
336	2.871	2.873	3.245	3.247		
337	2.995	2.997	3.369	3.371		
338	3.120	3.122	3.494	3.496		
339	3.245	3.247	3.619	3.621	0.187	0.007
340	3.370	3.372	3.744	3.746		
341	3.495	3.497	3.869	3.871		
342	3.620	3.622	3.994	3.996		
343	3.745	3.747	4.119	4.121		
344	3.870	3.872	4.244	4.246		
345	3.995	3.997	4.369	4.371		
346	4.120	4.122	4.494	4.496		
347	4.245	4.247	4.619	4.621		
348	4.370	4.372	4.744	4.746		
349	4.495	4.497	4.869	4.871		
*415	3.247	3.249	3.727	3.730		
*416	3.372	3.374	3.852	3.855		
*417	3.497	3.499	3.977	3.980		
*418	3.622	3.624	4.102	4.105		
*419	3.747	3.749	4.227	4.230		0.008
*420	3.872	3.874	4.352	4.355		
*421	3.997	3.999	4.477	4.480	0.240	
*422	4.122	4.124	4.602	4.605		
*423	4.247	4.249	4.727	4.730		
*424	4.372	4.374	4.852	4.855		
425	4.494	4.497	4.974	4.977		
426	4.619	4.622	5.099	5.102		0.009
427	4.744	4.747	5.224	5.227		

Millimeters						
Dash No.	(ØA) Rod Dia.		(ØB) Groove Dia.		H Groove Height	E Max Diametral Clearance
	Min.	Max	Min.	Max.		
330	53.87	53.92	63.37	63.42		
331	57.05	57.10	66.55	66.60		
332	60.22	60.27	69.72	69.77		
333	63.40	63.45	72.90	72.95		
334	66.57	66.62	76.07	76.12		
335	69.75	69.80	79.25	79.30		
336	72.92	72.97	82.42	82.47		
337	76.07	76.12	85.57	85.62		
338	79.25	79.30	88.75	88.80		
339	82.42	82.47	91.92	91.97	4.75	0.18
340	85.60	85.65	95.10	95.15		
341	88.77	88.82	98.27	98.32		
342	91.95	92.00	101.45	101.50		
343	95.12	95.17	104.62	104.67		
344	98.30	98.35	107.80	107.85		
345	101.47	101.52	110.97	111.02		
346	104.65	104.70	114.15	114.20		
347	107.82	107.87	117.32	117.37		
348	111.00	111.05	120.50	120.55		
349	114.17	114.22	123.67	123.72		
*415	82.47	82.52	94.67	94.74		
*416	85.65	85.70	97.84	97.92		
*417	88.82	88.87	101.02	101.09		
*418	92.00	92.05	104.19	104.27		
*419	95.17	95.22	107.37	107.44		0.20
*420	98.35	98.40	110.54	110.62		
*421	101.52	101.57	113.72	113.79	6.10	
*422	104.70	104.75	116.89	116.97		
*423	107.87	107.92	120.07	120.14		
*424	111.05	111.10	123.24	123.32		
425	114.15	114.22	126.34	126.42		
426	117.32	117.40	129.51	129.59		0.23
427	120.50	120.57	132.69	132.77		

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Metaplast® Spring Seals

AS4716, Rod

Inches						
Dash No.	(ØA) Rod Dia.		(ØB) Groove Dia.		H Groove Height	E Max Diametral Clearance
	Min.	Max	Min.	Max.		
428	4.869	4.872	5.349	5.352		
429	4.994	4.997	5.474	5.477		
430	5.119	5.122	5.599	5.602		
431	5.244	5.247	5.724	5.727		
432	5.369	5.372	5.849	5.852		
433	5.494	5.497	5.974	5.977		0.009
434	5.619	5.622	6.099	6.102		
435	5.744	5.747	6.224	6.227		
436	5.869	5.872	6.349	6.352		
437	5.994	5.997	6.474	6.477		
438	6.244	6.247	6.724	6.727		
439	6.494	6.497	6.974	6.977		
440	6.744	6.747	7.224	7.227		
441	6.994	6.997	7.474	7.477		
442	7.244	7.247	7.724	7.727		
443	7.494	7.497	7.974	7.977		
444	7.744	7.747	8.224	8.227	0.240	
445	7.994	7.997	8.474	8.477		
446	8.494	8.497	8.977	8.974		
447	8.994	8.997	9.474	9.478		
448	9.494	9.497	9.974	9.978		
449	9.994	9.997	10.474	10.478		0.010
450	10.494	10.497	10.974	10.978		
451	10.994	10.997	11.474	11.478		
452	11.494	11.497	11.974	11.978		
453	11.994	11.997	12.474	12.478		
454	12.494	12.497	12.974	12.978		
455	12.994	12.997	13.474	13.478		
456	13.494	13.497	13.974	13.978		
457	13.994	13.997	14.474	14.478		
458	14.494	14.497	14.974	14.978		
459	14.994	14.997	15.474	15.478		
460	15.494	15.497	15.974	15.978		

Millimeters						
Dash No.	(ØA) Rod Dia.		(ØB) Groove Dia.		H Groove Height	E Max Diametral Clearance
	Min.	Max	Min.	Max.		
428	123.67	123.75	135.86	135.94		
429	126.85	126.92	139.04	139.12		
430	130.02	130.10	142.21	142.29		
431	133.20	133.27	145.39	145.47		
432	136.37	136.45	148.56	148.64		
433	139.55	139.62	151.74	151.82		0.23
434	142.72	142.80	154.91	154.99		
435	145.90	145.97	158.09	158.17		
436	149.07	149.15	161.26	161.34		
437	152.25	152.32	164.44	164.52		
438	158.60	158.67	170.79	170.87		
439	164.95	165.02	177.14	177.22		
440	171.30	171.37	183.49	183.57		
441	177.65	177.72	189.84	189.92		
442	184.00	184.07	196.19	196.27		
443	190.35	190.42	202.54	202.62		
444	196.70	196.77	208.89	208.97	6.10	
445	203.05	203.12	215.24	215.32		
446	215.75	215.82	228.02	227.94		
447	228.45	228.52	240.64	240.74		
448	241.15	241.22	253.34	253.44		
449	253.85	253.92	266.04	266.14		0.25
450	266.55	266.62	278.74	278.84		
451	279.25	279.32	291.44	291.54		
452	291.95	292.02	304.14	304.24		
453	304.65	304.72	316.84	316.94		
454	317.35	317.42	329.54	329.64		
455	330.05	330.12	342.24	342.34		
456	342.75	342.82	354.94	355.04		
457	355.45	355.52	367.64	367.74		
458	368.15	368.22	380.34	380.44		
459	380.85	380.92	393.04	393.14		
460	393.55	393.62	405.74	405.84		

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Metaplast Scrapers

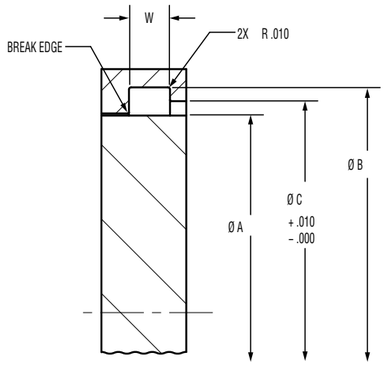
Metaplast® Scrapers Designed to fit AS4716 Standard Rod Sizes

TC2688

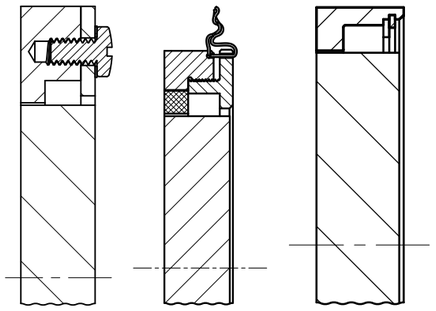
TC1388

- Scrapers are used to prevent foreign particles such as dirt and debris from penetrating inside seal housing, typically used in conjunction with rod seals
- No stick-slip contact in dynamic surfaces
- Unlimited shelf life
- Scraper jacket is generally made of stiffer material than ones used for seals
- Metallic energizer maximizes its ability to conform to minimal side loading and misalignment
- TC2688 geometry allows for release of residual pressure thus ensuring unidirectional seal performs as intended
- Refer to table on page 3.8 corresponding dash size to any given shaft diameter
- Please call CoorsTek Engineering if sealing fluid is at extreme low temperature or high viscosity

See page 3.14 for available scraper cross section based on rod sizes



TC2688 GROOVE



ALTERNATE GROOVES

Inches		
Dash No.	W Gland Width	
	Min.	Max.
¼ to 7/16	0.144	0.149
01 to 25	0.195	0.200
26 to 71	0.240	0.245
501 to 525	0.144	0.149

Millimeters		
Dash No.	W Gland Width	
	Min.	Max.
¼ to 7/16	3.66	3.78
01 to 25	4.95	5.08
26 to 71	6.10	6.22
501 to 525	3.66	3.78

Metaplast® Spring Seals

Scraper Standard TC2688 and TC1388

Inches						
Dash No.	ØA Rod Dia.		ØB Groove Dia.		ØC Lead In	H Groove Height
	Min.	Max.	Min.	Max.		
¼	0.247	0.248	0.436	0.438	0.354	0.095
5/16	0.309	0.310	0.498	0.500	0.416	
3/8	0.372	0.373	0.561	0.563	0.479	
7/16	0.434	0.435	0.623	0.625	0.541	
01	0.496	0.498	0.766	0.768	0.635	
02	0.558	0.560	0.828	0.830	0.697	
03	0.621	0.623	0.891	0.893	0.760	
04	0.683	0.685	0.953	0.955	0.822	
05	0.746	0.748	1.016	1.018	0.885	
06	0.808	0.810	1.078	1.080	0.947	
07	0.871	0.873	1.141	1.143	1.010	
08	0.933	0.935	1.203	1.205	1.072	
09	0.996	0.998	1.266	1.268	1.135	
10	1.058	1.060	1.328	1.330	1.197	
11	1.121	1.123	1.391	1.393	1.260	
12	1.183	1.185	1.453	1.455	1.322	
13	1.246	1.248	1.516	1.518	1.385	0.135
14	1.308	1.310	1.578	1.580	1.447	
15	1.371	1.373	1.641	1.643	1.510	
16	1.433	1.435	1.703	1.705	1.572	
17	1.496	1.498	1.766	1.768	1.635	
18	1.621	1.623	1.891	1.893	1.760	
19	1.746	1.748	2.016	2.018	1.885	
20	1.871	1.873	2.141	2.143	2.010	
21	1.996	1.998	2.266	2.268	2.135	
22	2.121	2.123	2.391	2.393	2.260	
23	2.246	2.248	2.516	2.518	2.385	
24	2.371	2.373	2.641	2.643	2.510	
25	2.496	2.498	2.766	2.768	2.635	
26	2.621	2.623	2.971	2.973	2.780	0.175
27	2.746	2.748	3.096	3.098	2.905	
28	2.871	2.873	3.221	3.223	3.030	
29	2.995	2.997	3.345	3.347	3.154	

Millimeters						
Dash No.	ØA Rod Dia.		ØB Groove Dia.		ØC Lead In	H Groove Height
	Min.	Max.	Min.	Max.		
¼	6.27	6.30	11.07	11.13	8.99	2.41
5/16	7.85	7.87	12.65	12.70	10.57	
3/8	9.45	9.47	14.25	14.30	12.17	
7/16	11.02	11.05	15.82	15.88	13.74	
01	12.60	12.65	19.46	19.51	16.13	
02	14.17	14.22	21.03	21.08	17.70	
03	15.77	15.82	22.63	22.68	19.30	
04	17.35	17.40	24.21	24.26	20.88	
05	18.95	19.00	25.81	25.86	22.48	
06	20.52	20.57	27.38	27.43	24.05	
07	22.12	22.17	28.98	29.03	25.65	
08	23.70	23.75	30.56	30.61	27.23	
09	25.30	25.35	32.16	32.21	28.83	
10	26.87	26.92	33.73	33.78	30.40	
11	28.47	28.52	35.33	35.38	32.00	
12	30.05	30.10	36.91	36.96	33.58	
13	31.65	31.70	38.51	38.56	35.18	3.43
14	33.22	33.27	40.08	40.13	36.75	
15	34.82	34.87	41.68	41.73	38.35	
16	36.40	36.45	43.26	43.31	39.93	
17	38.00	38.05	44.86	44.91	41.53	
18	41.17	41.22	48.03	48.08	44.70	
19	44.35	44.40	51.21	51.26	47.88	
20	47.52	47.57	54.38	54.43	51.05	
21	50.70	50.75	57.56	57.61	54.23	
22	53.87	53.92	60.73	60.78	57.40	
23	57.05	57.10	63.91	63.96	60.58	
24	60.22	60.27	67.08	67.13	63.75	
25	63.40	63.45	70.26	70.31	66.93	
26	66.57	66.62	75.46	75.51	70.61	4.45
27	69.75	69.80	78.64	78.69	73.79	
28	72.92	72.97	81.81	81.86	76.96	
29	76.07	76.12	84.96	85.01	80.11	

Metaplast® Spring Seals

Scraper Standard TC2688 and TC1388

Dash No.	ØA Rod Dia. Min.	ØA Rod Dia. Max.	ØB Groove Dia. Min.	ØB Groove Dia. Max.	ØC Lead In	H Groove Height
	Inches					
30	3.120	3.122	3.470	3.472	3.279	
31	3.245	3.247	3.595	3.597	3.404	
32	3.370	3.372	3.720	3.722	3.529	
33	3.495	3.497	3.845	3.847	3.654	
34	3.620	3.622	3.970	3.972	3.779	
35	3.745	3.747	4.095	4.097	3.904	0.175
36	3.870	3.872	4.220	4.222	4.029	
37	3.995	3.997	4.345	4.347	4.154	
38	4.120	4.122	4.470	4.472	4.279	
39	4.245	4.247	4.595	4.597	4.404	
40	4.370	4.372	4.720	4.722	4.529	
41	4.494	4.497	4.845	4.848	4.654	
42	4.619	4.622	4.970	4.973	4.779	
43	4.744	4.747	5.095	5.098	4.904	
44	4.869	4.872	5.220	5.223	5.029	
45	4.994	4.997	5.345	5.348	5.154	
46	5.119	5.122	5.470	5.473	5.279	
47	5.244	5.247	5.595	5.598	5.404	
48	5.369	5.372	5.720	5.723	5.529	
49	5.494	5.497	5.845	5.848	5.654	
50	5.619	5.622	5.970	5.973	5.779	
51	5.744	5.747	6.095	6.098	5.904	0.176
52	5.869	5.872	6.220	6.223	6.029	
53	5.994	5.997	6.345	6.348	6.154	
54	6.244	6.247	6.595	6.598	6.404	
55	6.494	6.497	6.845	6.848	6.654	
56	6.744	6.747	7.095	7.098	6.904	
57	6.994	6.997	7.345	7.348	7.154	
58	7.244	7.247	7.595	7.598	7.404	
59	7.494	7.497	7.845	7.848	7.654	
60	7.744	7.747	8.095	8.098	7.904	
61	7.994	7.997	8.345	8.350	8.154	
62	8.494	8.497	8.845	8.850	8.654	

Dash No.	ØA Rod Dia. Min.	ØA Rod Dia. Max.	ØB Groove Dia. Min.	ØB Groove Dia. Max.	ØC Lead In	H Groove Height
	Millimeters					
30	79.25	79.30	88.14	88.19	83.29	
31	82.42	82.47	91.31	91.36	86.46	
32	85.60	85.65	94.49	94.54	89.64	
33	88.77	88.82	97.66	97.71	92.81	
34	91.95	92.00	100.84	100.89	95.99	
35	95.12	95.17	104.01	104.06	99.16	4.45
36	98.30	98.35	107.19	107.24	102.34	
37	101.47	101.52	110.36	110.41	105.51	
38	104.65	104.70	113.54	113.59	108.69	
39	107.82	107.87	116.71	116.76	111.86	
40	111.00	111.05	119.89	119.94	115.04	
41	114.15	114.22	123.06	123.14	118.21	
42	117.32	117.40	126.24	126.31	121.39	
43	120.50	120.57	129.41	129.49	124.56	
44	123.67	123.75	132.59	132.66	127.74	
45	126.85	126.92	135.76	135.84	130.91	
46	130.02	130.10	138.94	139.01	134.09	
47	133.20	133.27	142.11	142.19	137.26	
48	136.37	136.45	145.29	145.36	140.44	
49	139.55	139.62	148.46	148.54	143.61	
50	142.72	142.80	151.64	151.71	146.79	
51	145.90	145.97	154.81	154.89	149.96	4.46
52	149.07	149.15	157.99	158.06	153.14	
53	152.25	152.32	161.16	161.24	156.31	
54	158.60	158.67	167.51	167.59	162.66	
55	164.95	165.02	173.86	173.94	169.01	
56	171.30	171.37	180.21	180.29	175.36	
57	177.65	177.72	186.56	186.64	181.71	
58	184.00	184.07	192.91	192.99	188.06	
59	190.35	190.42	199.26	199.34	194.41	
60	196.70	196.77	205.61	205.69	200.76	
61	203.05	203.12	211.96	212.09	207.11	
62	215.75	215.82	224.66	224.79	219.81	

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Metaplast® Spring Seals

Scraper Standard TC2688 and TC1388

Dash No.	ØA Rod Dia. Min.	ØA Rod Dia. Max.	ØB Groove Dia. Min.	ØB Groove Dia. Max.	ØC Lead In	H Groove Height
	Inches					
63	8.994	8.997	9.345	9.350	9.154	
64	9.494	9.497	9.845	9.850	9.654	
65	9.994	9.997	10.345	10.350	10.154	
66	10.494	10.497	10.845	10.850	10.654	
67	10.994	10.997	11.345	11.350	11.154	0.176
68	11.494	11.497	11.845	11.850	11.654	
69	11.994	11.997	12.345	12.350	12.154	
70	12.494	12.497	12.845	12.850	12.654	
71	12.994	12.997	13.345	13.350	13.154	
501	0.496	0.498	0.686	0.688	0.604	
502	0.558	0.560	0.748	0.750	0.666	
503	0.621	0.623	0.811	0.813	0.729	
504	0.683	0.685	0.873	0.875	0.791	
505	0.746	0.748	0.936	0.938	0.854	
506	0.808	0.810	0.998	1.000	0.916	
507	0.871	0.873	1.061	1.063	0.979	
508	0.933	0.935	1.123	1.125	1.041	
509	0.996	0.998	1.186	1.188	1.104	
510	1.058	1.060	1.248	1.250	1.166	
511	1.121	1.123	1.311	1.313	1.229	
512	1.183	1.185	1.373	1.375	1.291	
513	1.246	1.248	1.436	1.438	1.354	0.095
514	1.308	1.310	1.498	1.500	1.416	
515	1.371	1.373	1.561	1.563	1.479	
516	1.433	1.435	1.623	1.625	1.541	
517	1.496	1.498	1.686	1.688	1.604	
518	1.621	1.623	1.811	1.813	1.729	
519	1.746	1.748	1.936	1.938	1.854	
520	1.871	1.873	2.061	2.063	1.979	
521	1.996	1.998	2.186	2.188	2.104	
522	2.121	2.123	2.311	2.313	2.229	
523	2.246	2.248	2.436	2.438	2.354	
524	2.371	2.373	2.561	2.563	2.479	
525	2.496	2.498	2.686	2.688	2.604	

Dash No.	ØA Rod Dia. Min.	ØA Rod Dia. Max.	ØB Groove Dia. Min.	ØB Groove Dia. Max.	ØC Lead In	H Groove Height
	Millimeters					
63	228.45	228.52	237.36	237.49	232.51	
64	241.15	241.22	250.06	250.19	245.21	
65	253.85	253.92	262.76	262.89	257.91	
66	266.55	266.62	275.46	275.59	270.61	
67	279.25	279.32	288.16	288.29	283.31	4.46
68	291.95	292.02	300.86	300.99	296.01	
69	304.65	304.72	313.56	313.69	308.71	
70	317.35	317.42	326.26	326.39	321.41	
71	330.05	330.12	338.96	339.09	334.11	
501	12.60	12.65	17.42	17.48	15.34	
502	14.17	14.22	19.00	19.05	16.92	
503	15.77	15.82	20.60	20.65	18.52	
504	17.35	17.40	22.17	22.23	20.09	
505	18.95	19.00	23.77	23.83	21.69	
506	20.52	20.57	25.35	25.40	23.27	
507	22.12	22.17	26.95	27.00	24.87	
508	23.70	23.75	28.52	28.58	26.44	
509	25.30	25.35	30.12	30.18	28.04	
510	26.87	26.92	31.70	31.75	29.62	
511	28.47	28.52	33.30	33.35	31.22	
512	30.05	30.10	34.87	34.93	32.79	
513	31.65	31.70	36.47	36.53	34.39	2.41
514	33.22	33.27	38.05	38.10	35.97	
515	34.82	34.87	39.65	39.70	37.57	
516	36.40	36.45	41.22	41.28	39.14	
517	38.00	38.05	42.82	42.88	40.74	
518	41.17	41.22	46.00	46.05	43.92	
519	44.35	44.40	49.17	49.23	47.09	
520	47.52	47.57	52.35	52.40	50.27	
521	50.70	50.75	55.52	55.58	53.44	
522	53.87	53.92	58.70	58.75	56.62	
523	57.05	57.10	61.87	61.93	59.79	
524	60.22	60.27	65.05	65.10	62.97	
525	63.40	63.45	68.22	68.28	66.14	

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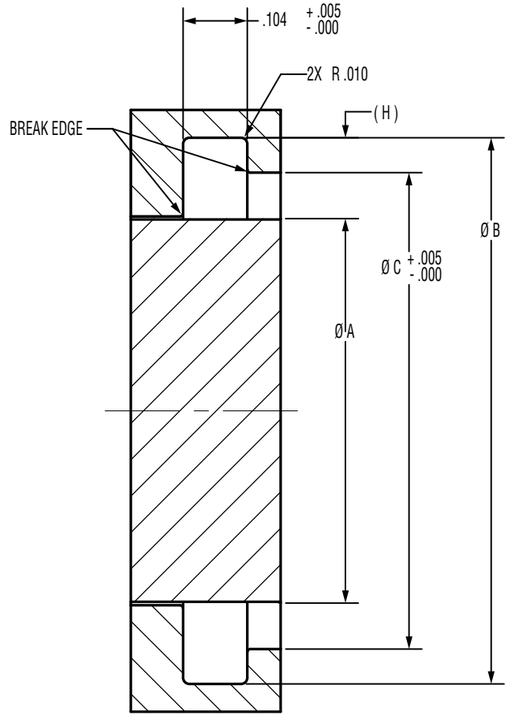
Metaplast Scrapers

TC2188

- General use scraper (wiper) effectively blocking contaminants from entering the pressure system
- TC2188 Type Scrapers are direct replacement for TF005 Type, and are equivalent to Boeing SCD BACS34A
- No stick-slip contact in dynamic surfaces
- Unlimited shelf life
- Scraper jacket is generally made of stiffer material than ones used for seals
- Metallic energizer maximizes its ability to conform to minimal side loading and misalignment
- TC2188 geometry has a higher cross section, hardware shall incorporate a retention lip of larger diameter than bore to ensure proper installation is achieved
- Refer to table on page 3.8 corresponding dash size to any given shaft diameter
- Please call CoorsTek Engineering if sealing fluid is at extreme low temperature or high viscosity

See page 3.14 for available scraper cross section based on rod sizes



Inches		
Dash No.	W Gland Width	
	Min.	Max.
3/8 to 25	0.104	0.109
26 to 36	0.119	0.124
37 to 49	0.135	0.140
50 to 67	0.151	0.156
68 to 71	0.166	0.171

Millimeters		
Dash No.	W Gland Width	
	Min.	Max.
3/8 to 25	2.64	2.88
26 to 36	3.02	3.27
37 to 49	3.43	3.70
50 to 67	3.84	4.12
68 to 71	4.22	4.51

Metaplast® Spring Seals
Scraper TC2188

Inches						
Dash No.	ØA Rod Diameter		ØB Groove Diameter		ØC Lead In	H Groove Height
	Min.	Max.	Min.	Max.		
3/8	0.371	0.373	0.636	0.640	0.523	
7/16	0.433	0.435	0.697	0.701	0.585	
1	0.496	0.498	0.760	0.764	0.647	
2	0.558	0.560	0.823	0.827	0.710	0.133
3	0.621	0.623	0.885	0.889	0.772	
4	0.683	0.685	0.948	0.952	0.834	
5	0.746	0.748	1.010	1.014	0.897	
6	0.808	0.810	1.086	1.090	0.949	
7	0.871	0.873	1.148	1.152	1.012	
8	0.933	0.935	1.210	1.214	1.074	
9	0.996	0.998	1.273	1.277	1.136	0.139
10	1.058	1.060	1.335	1.339	1.199	
11	1.121	1.123	1.398	1.402	1.262	
12	1.183	1.185	1.460	1.464	1.324	
13	1.246	1.248	1.523	1.527	1.386	
14	1.308	1.310	1.614	1.618	1.480	
15	1.371	1.373	1.677	1.681	1.542	
16	1.433	1.435	1.739	1.743	1.605	
17	1.496	1.498	1.802	1.806	1.668	
18	1.621	1.623	1.927	1.931	1.793	
19	1.746	1.748	2.052	2.056	1.918	
20	1.871	1.873	2.177	2.181	2.043	0.154
21	1.996	1.998	2.302	2.306	2.178	
22	2.121	2.123	2.427	2.431	2.303	
23	2.246	2.248	2.552	2.556	2.428	
24	2.371	2.373	2.677	2.681	2.553	
25	2.496	2.498	2.802	2.806	2.678	
26	2.621	2.623	2.989	2.993	2.834	
27	2.746	2.748	3.114	3.118	2.959	
28	2.871	2.873	3.239	3.243	3.084	0.185
29	2.995	2.997	3.364	3.368	3.209	
30	3.120	3.122	3.489	3.493	3.334	
31	3.245	3.247	3.614	3.618	3.459	

Millimeters						
Dash No.	ØA Rod Diameter		ØB Groove Diameter		ØC Lead In	H Groove Height
	Min.	Max.	Min.	Max.		
3/8	9.42	9.85	17.43	18.18	15.38	
7/16	11.00	11.48	19.10	19.91	17.20	
1	12.60	13.15	20.82	21.70	19.02	
2	14.17	14.78	22.55	23.49	20.87	124.12
3	15.77	16.45	24.25	25.25	22.70	
4	17.35	18.08	25.98	27.04	24.52	
5	18.95	19.75	27.67	28.80	26.37	
6	20.52	21.38	29.76	30.96	27.90	
7	22.12	23.05	31.46	32.72	29.75	
8	23.70	24.68	33.15	34.48	31.58	
9	25.30	26.35	34.88	36.27	33.40	144.41
10	26.87	27.98	36.58	38.03	35.25	
11	28.47	29.65	38.31	39.82	37.10	
12	30.05	31.28	40.00	41.58	38.93	
13	31.65	32.95	41.73	43.37	40.75	
14	33.22	34.58	44.22	45.95	43.51	
15	34.82	36.25	45.95	47.74	45.33	
16	36.40	37.88	47.65	49.50	47.19	
17	38.00	39.55	49.37	51.29	49.04	
18	41.17	42.85	52.80	54.84	52.71	
19	44.35	46.15	56.22	58.39	56.39	
20	47.52	49.45	59.65	61.94	60.06	169.99
21	50.70	52.75	63.07	65.49	64.03	
22	53.87	56.05	66.50	69.04	67.71	
23	57.05	59.35	69.92	72.59	71.38	
24	60.22	62.65	73.35	76.14	75.06	
25	63.40	65.95	76.77	79.69	78.73	
26	66.57	69.25	81.90	85.00	83.32	
27	69.75	72.55	85.32	88.55	86.99	
28	72.92	75.85	88.75	92.10	90.67	236.20
29	76.07	79.12	92.17	95.65	94.34	
30	79.25	82.42	95.60	99.20	98.02	
31	82.42	85.72	99.02	102.75	101.69	

Inches						
Dash No.	ØA Rod Diameter		ØB Groove Diameter		ØC Lead In	H Groove Height
	Min.	Max.	Min.	Max.		
32	3.370	3.372	3.739	3.743	3.584	
33	3.495	3.497	3.864	3.868	3.709	
34	3.620	3.622	3.989	3.993	3.834	0.185
35	3.745	3.747	4.114	4.118	3.959	
36	3.870	3.872	4.239	4.243	4.084	
37	3.995	3.997	4.427	4.431	4.240	
38	4.120	4.122	4.552	4.556	4.365	
39	4.245	4.247	4.677	4.681	4.490	
40	4.370	4.372	4.802	4.806	4.615	
41	4.494	4.497	4.927	4.932	4.740	
42	4.619	4.622	5.052	5.057	4.865	
43	4.744	4.747	5.177	5.182	4.990	0.217
44	4.869	4.872	5.302	5.307	5.115	
45	4.994	4.997	5.427	5.432	5.240	
46	5.119	5.122	5.552	5.557	5.365	
47	5.244	5.247	5.677	5.682	5.490	
48	5.369	5.372	5.802	5.807	5.615	
49	5.494	5.497	5.927	5.932	5.740	
50	5.619	5.622	6.114	6.119	5.896	
51	5.744	5.747	6.239	6.244	6.022	
52	5.869	5.872	6.364	6.369	6.146	
53	5.994	5.997	6.489	6.494	6.272	
54	6.244	6.247	6.739	6.744	6.522	
55	6.494	6.497	6.989	6.994	6.772	
56	6.744	6.747	7.239	7.244	7.022	
57	6.994	6.997	7.489	7.494	7.272	0.248
58	7.244	7.247	7.739	7.744	7.522	
59	7.494	7.497	7.989	7.994	7.772	
60	7.744	7.747	8.239	8.244	8.022	
61	7.994	7.997	8.489	8.494	8.272	
62	8.494	8.497	8.989	8.994	8.772	
63	8.994	8.997	9.489	9.494	9.272	
64	9.494	9.497	9.989	9.994	9.772	

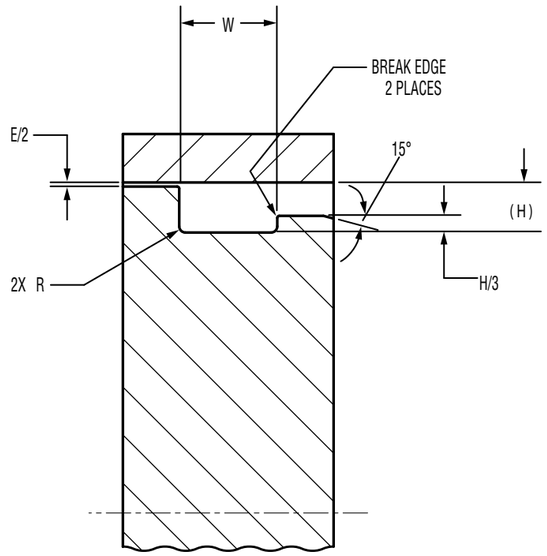
Millimeters						
Dash No.	ØA Rod Diameter		ØB Groove Diameter		ØC Lead In	H Groove Height
	Min.	Max.	Min.	Max.		
32	85.60	89.02	102.45	106.30	105.37	
33	88.77	92.32	105.87	109.85	109.04	
34	91.95	95.62	109.30	113.40	112.72	236.20
35	95.12	98.92	112.72	116.95	116.39	
36	98.30	102.22	116.15	120.50	120.07	
37	101.47	105.52	121.30	125.84	124.66	
38	104.65	108.82	124.72	129.39	128.33	
39	107.82	112.12	128.15	132.94	132.01	
40	111.00	115.42	131.57	136.49	135.68	
41	114.15	118.72	135.00	140.07	139.36	
42	117.32	122.02	138.42	143.62	143.03	
43	120.50	125.32	141.85	147.17	146.71	305.11
44	123.67	128.62	145.27	150.72	150.38	
45	126.85	131.92	148.70	154.27	154.06	
46	130.02	135.22	152.12	157.82	157.73	
47	133.20	138.52	155.55	161.37	161.41	
48	136.37	141.82	158.97	164.92	165.08	
49	139.55	145.12	162.40	168.47	168.76	
50	142.72	148.42	167.52	173.78	173.34	
51	145.90	151.72	170.95	177.33	177.05	
52	149.07	155.02	174.37	180.88	180.69	
53	152.25	158.32	177.80	184.43	184.40	
54	158.60	164.92	184.65	191.53	191.75	
55	164.95	171.52	191.50	198.63	199.10	
56	171.30	178.12	198.35	205.73	206.45	
57	177.65	184.72	205.20	212.83	213.80	381.21
58	184.00	191.32	212.05	219.93	221.15	
59	190.35	197.92	218.90	227.03	228.50	
60	196.70	204.52	225.75	234.13	235.85	
61	203.05	211.12	232.60	241.23	243.20	
62	215.75	224.32	246.30	255.43	257.90	
63	228.45	237.52	260.00	269.63	272.60	
64	241.15	250.72	273.70	283.83	287.30	

Metaplast® Spring Seals
Scraper TC2188

Inches						
Dash No.	ØA Rod Diameter		ØB Groove Diameter		ØC Lead In	H Groove Height
	Min.	Max.	Min.	Max.		
65	9.994	9.997	10.489	10.494	10.272	
66	10.494	10.497	10.989	10.994	10.772	
67	10.994	10.997	11.489	11.494	11.272	
68	11.494	11.497	11.989	11.994	11.772	0.248
69	11.994	11.997	12.489	12.494	12.272	
70	12.494	12.497	12.989	12.994	12.772	
71	12.994	12.997	13.489	13.494	13.272	

Millimeters						
Dash No.	ØA Rod Diameter		ØB Groove Diameter		ØC Lead In	H Groove Height
	Min.	Max.	Min.	Max.		
65	253.85	263.92	287.40	298.03	302.00	
66	266.55	277.12	301.10	312.23	316.70	
67	279.25	290.32	314.80	326.43	331.40	
68	291.95	303.52	328.50	340.63	346.10	381.21
69	304.65	316.72	342.20	354.83	360.80	
70	317.35	329.92	355.90	369.03	375.50	
71	330.05	343.12	369.60	383.23	390.20	

Depending on ordering quantities, some of the smaller size dash numbers will be furnished with Rosette Springs. Please refer to page 3.4 for more details.



Inches

Dash No.	W Gland Width						R Corner Radius	
	0 Back-Up		One Back-Up		Two Back-Up			
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
004 to 009	0.098	0.103	0.154	0.164	0.210	0.220	0.005	0.015
010 to 028	0.094	0.099	0.150	0.160	0.207	0.217		
110 to 149	0.141	0.151	0.183	0.193	0.245	0.255		
210 to 247	0.188	0.198	0.235	0.245	0.304	0.314	0.010	0.025
325 to 349	0.281	0.291	0.334	0.344	0.424	0.434	0.020	0.035
424 to 460	0.375	0.385	0.475	0.485	0.579	0.589		

Millimeters

Dash No.	W Gland Width						R Corner Radius	
	0 Back-Up		One Back-Up		Two Back-Up			
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
004 to 009	2.49	2.62	3.91	4.17	5.33	5.59	0.13	0.38
010 to 028	2.39	2.51	3.81	4.06	5.26	5.51		
110 to 149	3.58	3.84	4.65	4.90	6.22	6.48		
210 to 247	4.78	5.03	5.97	6.22	7.72	7.98	0.25	0.64
325 to 349	7.14	7.39	8.48	8.74	10.77	11.02	0.51	0.89
424 to 460	9.53	9.78	12.07	12.32	14.71	14.96		

Metaplast® Spring Seals
MIL-G-5514-F, Piston

Inches

Dash No.	ØA Piston Groove		ØB Bore		H Groove Height	E Max Diametral Clearance
	Min.	Max.	Min.	Max.		
004	0.075	0.076	0.190	0.191		
005	0.107	0.108	0.221	0.222		
006	0.122	0.123	0.235	0.236		
007	0.153	0.154	0.266	0.267		
008	0.184	0.185	0.297	0.298		0.004
009	0.216	0.217	0.329	0.330		
010	0.247	0.248	0.360	0.361		
011	0.309	0.310	0.422	0.423		
012	0.372	0.373	0.485	0.486		
013	0.436	0.438	0.550	0.552		
014	0.499	0.501	0.613	0.615		
015	0.561	0.563	0.675	0.677		
016	0.625	0.627	0.738	0.740	0.057	
017	0.686	0.688	0.800	0.802		
018	0.749	0.751	0.863	0.865		
019	0.811	0.813	0.925	0.927		
020	0.877	0.879	0.991	0.993		0.005
021	0.939	0.941	1.053	1.055		
022	1.002	1.004	1.116	1.118		
023	1.064	1.066	1.178	1.180		
024	1.127	1.129	1.241	1.243		
025	1.189	1.191	1.303	1.305		
026	1.252	1.254	1.366	1.368		
027	1.314	1.316	1.428	1.430		
028	1.377	1.379	1.491	1.493		
110	0.370	0.372	0.550	0.552	0.090	0.005
111	0.433	0.435	0.613	0.615		
112	0.495	0.497	0.675	0.677		
113	0.558	0.560	0.738	0.740		
114	0.620	0.622	0.800	0.802		
115	0.683	0.685	0.863	0.865		
116	0.745	0.747	0.925	0.927		
117	0.811	0.813	0.991	0.993		

Millimeters

Dash No.	ØA Piston Groove		ØB Bore		H Groove Height	E Max Diametral Clearance
	Min.	Max.	Min.	Max.		
004	1.91	1.93	4.83	4.85		
005	2.72	2.74	5.61	5.64		
006	3.10	3.12	5.97	5.99		
007	3.89	3.91	6.76	6.78		
008	4.67	4.70	7.54	7.57		0.10
009	5.49	5.51	8.36	8.38		
010	6.27	6.30	9.14	9.17		
011	7.85	7.87	10.72	10.74		
012	9.45	9.47	12.32	12.34		
013	11.07	11.13	13.97	14.02		
014	12.67	12.73	15.57	15.62		
015	14.25	14.30	17.15	17.20		
016	15.88	15.93	18.75	18.80	1.44	
017	17.42	17.48	20.32	20.37		
018	19.02	19.08	21.92	21.97		
019	20.60	20.65	23.50	23.55		
020	22.28	22.33	25.17	25.22		0.13
021	23.85	23.90	26.75	26.80		
022	25.45	25.50	28.35	28.40		
023	27.03	27.08	29.92	29.97		
024	28.63	28.68	31.52	31.57		
025	30.20	30.25	33.10	33.15		
026	31.80	31.85	34.70	34.75		
027	33.38	33.43	36.27	36.32		
028	34.98	35.03	37.87	37.92		
110	9.40	9.45	13.97	14.02	2.29	0.13
111	11.00	11.05	15.57	15.62		
112	12.57	12.62	17.15	17.20		
113	14.17	14.22	18.75	18.80		
114	15.75	15.80	20.32	20.37		
115	17.35	17.40	21.92	21.97		
116	18.92	18.97	23.50	23.55		
117	20.60	20.65	25.17	25.22		

Inches							Millimeters						
Dash No.	ØA Piston Groove		ØB Bore		H Groove Height	E Max Diametral Clearance	Dash No.	ØA Piston Groove		ØB Bore		H Groove Height	E Max Diametral Clearance
	Min.	Max.	Min.	Max.				Min.	Max.	Min.	Max.		
118	0.873	0.875	1.053	1.055		0.005	**118**	22.17	22.23	26.75	26.80		0.13
119	0.936	0.938	1.116	1.118			**119**	23.77	23.83	28.35	28.40		
120	0.998	1.000	1.178	1.180			**120**	25.35	25.40	29.92	29.97		
121	1.061	1.063	1.241	1.243			**121**	26.95	27.00	31.52	31.57		
122	1.123	1.125	1.303	1.305			**122**	28.52	28.58	33.10	33.15		
123	1.186	1.188	1.366	1.368			**123**	30.12	30.18	34.70	34.75		
124	1.248	1.250	1.428	1.430			**124**	31.70	31.75	36.27	36.32		
125	1.311	1.313	1.491	1.493			**125**	33.30	33.35	37.87	37.92		
126	1.373	1.375	1.553	1.555			**126**	34.87	34.93	39.45	39.50		
127	1.436	1.438	1.616	1.618			**127**	36.47	36.53	41.05	41.10		
128	1.498	1.500	1.678	1.680			**128**	38.05	38.10	42.62	42.67		
129	1.561	1.563	1.741	1.743			**129**	39.65	39.70	44.22	44.27		
130	1.625	1.627	1.805	1.807			**130**	41.28	41.33	45.85	45.90		
131	1.687	1.689	1.867	1.869			**131**	42.85	42.90	47.42	47.47		
132	1.750	1.752	1.930	1.932			**132**	44.45	44.50	49.02	49.07		
133	1.812	1.814	1.992	1.994	0.090		**133**	46.02	46.08	50.60	50.65	2.29	
134	1.875	1.877	2.055	2.057			**134**	47.63	47.68	52.20	52.25		
135	1.938	1.940	2.118	2.120		0.006	**135**	49.23	49.28	53.80	53.85		0.15
136	2.000	2.002	2.180	2.182			**136**	50.80	50.85	55.37	55.42		
137	2.063	2.065	2.243	2.245			**137**	52.40	52.45	56.97	57.02		
138	2.125	2.127	2.305	2.307			**138**	53.98	54.03	58.55	58.60		
139	2.188	2.190	2.368	2.370			**139**	55.58	55.63	60.15	60.20		
140	2.250	2.252	2.430	2.432			**140**	57.15	57.20	61.72	61.77		
141	2.313	2.315	2.493	2.495		0.007	**141**	58.75	58.80	63.32	63.37		0.18
142	2.375	2.377	2.555	2.557			**142**	60.33	60.38	64.90	64.95		
143	2.438	2.440	2.618	2.620			**143**	61.93	61.98	66.50	66.55		
144	2.500	2.502	2.680	2.682			**144**	63.50	63.55	68.07	68.12		
145	2.563	2.565	2.743	2.745			**145**	65.10	65.15	69.67	69.72		
146	2.625	2.627	2.805	2.807			**146**	66.68	66.73	71.25	71.30		
147	2.688	2.690	2.868	2.870			**147**	68.28	68.33	72.85	72.90		
148	2.750	2.752	2.930	2.932			**148**	69.85	69.90	74.42	74.47		
149	2.813	2.815	2.993	2.995			**149**	71.45	71.50	76.02	76.07		
210	0.746	0.748	0.991	0.993	0.123	0.005	**210**	18.95	19.00	25.17	25.22	3.11	0.13

Metaplast® Spring Seals
MIL-G-5514-F, Piston

Inches							Millimeters						
Dash No.	ØA Piston Groove		ØB Bore		H Groove Height	E Max Diametral Clearance	Dash No.	ØA Piston Groove		ØB Bore		H Groove Height	E Max Diametral Clearance
	Min.	Max.	Min.	Max.				Min.	Max.	Min.	Max.		
211	0.808	0.810	1.053	1.055		0.005	**211**	20.52	20.57	26.75	26.80		0.13
212	0.871	0.873	1.116	1.118			**212**	22.12	22.17	28.35	28.40		
213	0.933	0.935	1.178	1.180			**213**	23.70	23.75	29.92	29.97		
214	0.996	0.998	1.241	1.243			**214**	25.30	25.35	31.52	31.57		
215	1.058	1.060	1.303	1.305			**215**	26.87	26.92	33.10	33.15		
216	1.121	1.123	1.366	1.368			**216**	28.47	28.52	34.70	34.75		
217	1.183	1.185	1.428	1.430			**217**	30.05	30.10	36.27	36.32		
218	1.246	1.248	1.491	1.493			**218**	31.65	31.70	37.87	37.92		
219	1.308	1.310	1.553	1.555			**219**	33.22	33.27	39.45	39.50		
220	1.371	1.373	1.616	1.618			**220**	34.82	34.87	41.05	41.10		
221	1.433	1.435	1.678	1.680			**221**	36.40	36.45	42.62	42.67		
222	1.496	1.498	1.741	1.743			**222**	38.00	38.05	44.22	44.27		
223	1.622	1.624	1.867	1.869			**223**	41.20	41.25	47.42	47.47		
224	1.747	1.749	1.992	1.994			**224**	44.37	44.42	50.60	50.65		
225	1.873	1.875	2.118	2.120		0.006	**225**	47.57	47.63	53.80	53.85		0.15
226	1.998	2.000	2.243	2.245			**226**	50.75	50.80	56.97	57.02		
227	2.123	2.125	2.368	2.370			**227**	53.92	53.98	60.15	60.20	3.11	
228	2.248	2.250	2.493	2.495	0.123		**228**	57.10	57.15	63.32	63.37		
229	2.373	2.375	2.618	2.620			**229**	60.27	60.33	66.50	66.55		
230	2.498	2.500	2.743	2.745			**230**	63.45	63.50	69.67	69.72		
231	2.623	2.625	2.868	2.870			**231**	66.62	66.68	72.85	72.90		
232	2.748	2.750	2.993	2.995			**232**	69.80	69.85	76.02	76.07		
233	2.873	2.875	3.118	3.120			**233**	72.97	73.03	79.20	79.25		
234	2.998	3.000	3.243	3.245			**234**	76.15	76.20	82.37	82.42		
235	3.123	3.125	3.368	3.370		0.007	**235**	79.32	79.38	85.55	85.60		0.18
236	3.248	3.250	3.493	3.495			**236**	82.50	82.55	88.72	88.77		
237	3.373	3.375	3.618	3.620			**237**	85.67	85.73	91.90	91.95		
238	3.498	3.500	3.743	3.745			**238**	88.85	88.90	95.07	95.12		
239	3.623	3.625	3.868	3.870			**239**	92.02	92.08	98.25	98.30		
240	3.748	3.750	3.993	3.995			**240**	95.20	95.25	101.42	101.47		
241	3.873	3.875	4.118	4.120			**241**	98.37	98.43	104.60	104.65		
242	3.998	4.000	4.243	4.245			**242**	101.55	101.60	107.77	107.82		
243	4.123	4.125	4.368	4.370			**243**	104.72	104.78	110.95	111.00		

Metaplast® Spring Seals

MIL-G-5514-F, Piston

Inches						
Dash No.	ØA Piston Groove		ØB Bore		H Groove Height	E Max Diametral Clearance
	Min.	Max.	Min.	Max.		
244	4.248	4.250	4.493	4.495	0.123	0.008
245	4.373	4.375	4.618	4.620		
246	4.498	4.500	4.743	4.745		
247	4.623	4.625	4.868	4.870		
325	1.493	1.495	1.867	1.869	0.187	0.006
326	1.618	1.620	1.992	1.994		
327	1.744	1.746	2.118	2.120		
328	1.869	1.871	2.243	2.245		
329	1.994	1.996	2.368	2.370		
330	2.119	2.121	2.493	2.495		0.007
331	2.244	2.246	2.618	2.620		
332	2.369	2.371	2.743	2.745		
333	2.494	2.496	2.868	2.870		
334	2.619	2.621	2.993	2.995		
335	2.744	2.746	3.118	3.120		
336	2.869	2.871	3.243	3.245		
337	2.994	2.996	3.368	3.370		
338	3.119	3.121	3.493	3.495		
339	3.244	3.246	3.618	3.620		
340	3.369	3.371	3.743	3.745		
341	3.494	3.496	3.868	3.870		
342	3.619	3.621	3.993	3.995		
343	3.744	3.746	4.118	4.120		
344	3.869	3.871	4.243	4.245		
345	3.994	3.996	4.368	4.370		
346	4.119	4.121	4.493	4.495		0.008
347	4.244	4.246	4.618	4.620		
348	4.369	4.371	4.743	4.745		
349	4.494	4.496	4.868	4.870		
425	4.494	4.497	4.974	4.977	0.240	0.009
426	4.619	4.622	5.099	5.102		
427	4.744	4.747	5.224	5.227		
428	4.869	4.872	5.349	5.352		

Millimeters						
Dash No.	ØA Piston Groove		ØB Bore		H Groove Height	E Max Diametral Clearance
	Min.	Max.	Min.	Max.		
244	107.90	107.95	114.12	114.17	3.11	0.20
245	111.07	111.13	117.30	117.35		
246	114.25	114.30	120.47	120.52		
247	117.42	117.48	123.65	123.70		
325	37.92	37.97	47.42	47.47	4.75	0.15
326	41.10	41.15	50.60	50.65		
327	44.30	44.35	53.80	53.85		
328	47.47	47.52	56.97	57.02		
329	50.65	50.70	60.15	60.20		
330	53.82	53.87	63.32	63.37		0.18
331	57.00	57.05	66.50	66.55		
332	60.17	60.22	69.67	69.72		
333	63.35	63.40	72.85	72.90		
334	66.52	66.57	76.02	76.07		
335	69.70	69.75	79.20	79.25		
336	72.87	72.92	82.37	82.42		
337	76.05	76.10	85.55	85.60		
338	79.22	79.27	88.72	88.77		
339	82.40	82.45	91.90	91.95		
340	85.57	85.62	95.07	95.12		
341	88.75	88.80	98.25	98.30		
342	91.92	91.97	101.42	101.47		
343	95.10	95.15	104.60	104.65		
344	98.27	98.32	107.77	107.82		
345	101.45	101.50	110.95	111.00		
346	104.62	104.67	114.12	114.17		0.20
347	107.80	107.85	117.30	117.35		
348	110.97	111.02	120.47	120.52		
349	114.15	114.20	123.65	123.70		
425	114.15	114.22	126.34	126.42	6.10	0.23
426	117.32	117.40	129.51	129.59		
427	120.50	120.57	132.69	132.77		
428	123.67	123.75	135.86	135.94		

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Metaplast® Spring Seals

MIL-G-5514-F, Piston

Inches						
Dash No.	ØA Piston Groove		ØB Bore		H Groove Height	E Max Diametral Clearance
	Min.	Max.	Min.	Max.		
429	4.994	4.997	5.474	5.477	0.240	0.009
430	5.119	5.122	5.599	5.602		
431	5.244	5.247	5.724	5.727		
432	5.369	5.372	5.849	5.852		
433	5.494	5.497	5.974	5.977		
434	5.619	5.622	6.099	6.102		
435	5.744	5.747	6.224	6.227		
436	5.869	5.872	6.349	6.352		
437	5.994	5.997	6.474	6.477		
438	6.244	6.247	6.724	6.727		
439	6.494	6.497	6.974	6.977		
440	6.744	6.747	7.224	7.227		
441	6.994	6.997	7.474	7.477		
442	7.244	7.247	7.724	7.727		0.010
443	7.494	7.497	7.974	7.977		
444	7.744	7.747	8.224	8.227		
445	7.994	7.997	8.474	8.477		
446	8.494	8.497	8.974	8.977		
447	8.994	8.997	9.474	9.478		0.011
448	9.494	9.497	9.974	9.978		
449	9.994	9.997	10.474	10.478		
450	10.494	10.497	10.974	10.978		
451	10.994	10.997	11.474	11.478		
452	11.494	11.497	11.974	11.978		
453	11.994	11.997	12.474	12.478		
454	12.494	12.497	12.974	12.978		
455	12.994	12.997	13.474	13.478		
456	13.494	13.497	13.974	13.978		
457	13.994	13.997	14.474	14.478		
458	14.494	14.497	14.974	14.978		
459	14.994	14.997	15.474	15.478		
460	15.494	15.497	15.974	15.978		

Millimeters						
Dash No.	ØA Piston Groove		ØB Bore		H Groove Height	E Max Diametral Clearance
	Min.	Max.	Min.	Max.		
429	126.85	126.92	139.04	139.12	6.10	0.23
430	130.02	130.10	142.21	142.29		
431	133.20	133.27	145.39	145.47		
432	136.37	136.45	148.56	148.64		
433	139.55	139.62	151.74	151.82		
434	142.72	142.80	154.91	154.99		
435	145.90	145.97	158.09	158.17		
436	149.07	149.15	161.26	161.34		
437	152.25	152.32	164.44	164.52		
438	158.60	158.67	170.79	170.87		
439	164.95	165.02	177.14	177.22		
440	171.30	171.37	183.49	183.57		
441	177.65	177.72	189.84	189.92		
442	184.00	184.07	196.19	196.27		0.25
443	190.35	190.42	202.54	202.62		
444	196.70	196.77	208.89	208.97		
445	203.05	203.12	215.24	215.32		
446	215.75	215.82	227.94	228.02		
447	228.45	228.52	240.64	240.74		0.28
448	241.15	241.22	253.34	253.44		
449	253.85	253.92	266.04	266.14		
450	266.55	266.62	278.74	278.84		
451	279.25	279.32	291.44	291.54		
452	291.95	292.02	304.14	304.24		
453	304.65	304.72	316.84	316.94		
454	317.35	317.42	329.54	329.64		
455	330.05	330.12	342.24	342.34		
456	342.75	342.82	354.94	355.04		
457	355.45	355.52	367.64	367.74		
458	368.15	368.22	380.34	380.44		
459	380.85	380.92	393.04	393.14		
460	393.55	393.62	405.74	405.84		

Depending on ordering quantities, some of the smaller size dash numbers will be furnished with Rosette Springs. Please refer to page 3.4 for more details.

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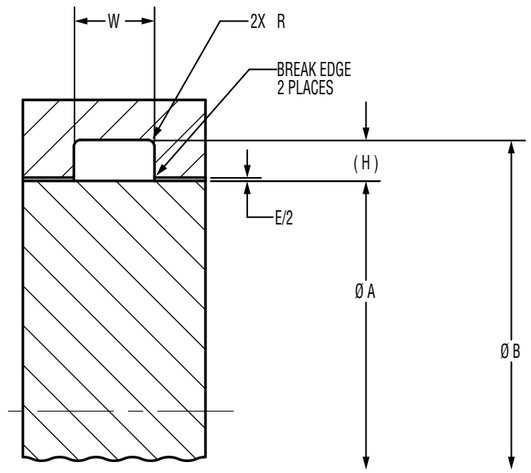

Inches

Dash No.	W Gland Width						R Corner Radius	
	0 Back-Up		One Back-Up		Two Back-Up			
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
004 to 009	0.098	0.103	0.154	0.164	0.210	0.220	0.005	0.015
010 to 028	0.094	0.099	0.150	0.160	0.207	0.217		
110 to 149	0.141	0.151	0.183	0.193	0.245	0.255		
210 to 247	0.188	0.198	0.235	0.245	0.304	0.314	0.010	0.025
325 to 349	0.281	0.291	0.334	0.344	0.424	0.434	0.020	0.035
424 to 460	0.375	0.385	0.475	0.485	0.579	0.589		

Millimeters

Dash No.	W Gland Width						R Corner Radius	
	0 Back-Up		One Back-Up		Two Back-Up			
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
004 to 009	2.49	2.62	3.91	4.17	5.33	5.59	0.13	0.38
010 to 028	2.39	2.51	3.81	4.06	5.26	5.51		
110 to 149	3.58	3.84	4.65	4.90	6.22	6.48		
210 to 247	4.78	5.03	5.97	6.22	7.72	7.98	0.25	0.64
325 to 349	7.14	7.39	8.48	8.74	10.77	11.02	0.51	0.89
424 to 460	9.53	9.78	12.07	12.32	14.71	14.96		

Metaplast® Spring Seals
MIL-G-5514-F, Rod

Inches

Dash No.	ØA Rod Dia.		ØB Groove Dia.		H Groove Height	E Max Diametral Clearance
	Min.	Max.	Min.	Max.		
004	0.075	0.076	0.190	0.191		
005	0.107	0.108	0.221	0.222		
006	0.122	0.123	0.235	0.236		
007	0.153	0.154	0.266	0.267		
008	0.184	0.185	0.297	0.298		0.004
009	0.216	0.217	0.329	0.330		
010	0.247	0.248	0.360	0.361		
011	0.309	0.310	0.422	0.423		
012	0.372	0.373	0.485	0.486		
013	0.433	0.435	0.547	0.549		
014	0.496	0.498	0.610	0.612		
015	0.558	0.560	0.672	0.674		
016	0.621	0.623	0.735	0.737	0.057	
017	0.683	0.685	0.797	0.799		
018	0.746	0.748	0.860	0.862		
019	0.808	0.810	0.922	0.924		
020	0.871	0.873	0.985	0.987		0.005
021	0.933	0.935	1.047	1.049		
022	0.996	0.998	1.110	1.112		
023	1.058	1.060	1.172	1.174		
024	1.121	1.123	1.235	1.237		
025	1.183	1.185	1.297	1.299		
026	1.246	1.248	1.360	1.362		
027	1.308	1.310	1.422	1.424		
028	1.371	1.373	1.485	1.487		
110	0.371	0.373	0.551	0.553		
111	0.433	0.435	0.613	0.615		
112	0.496	0.498	0.676	0.678		
113	0.558	0.560	0.738	0.740	0.090	0.005
114	0.621	0.623	0.801	0.803		
115	0.683	0.685	0.863	0.865		
116	0.746	0.748	0.926	0.928		
117	0.808	0.810	0.988	0.990		

Millimeters

Dash No.	ØA Rod Dia.		ØB Groove Dia.		H Groove Height	E Max Diametral Clearance
	Min.	Max.	Min.	Max.		
004	1.91	1.93	4.83	4.85		
005	2.72	2.74	5.61	5.64		
006	3.10	3.12	5.97	5.99		
007	3.89	3.91	6.76	6.78		
008	4.67	4.70	7.54	7.57		0.10
009	5.49	5.51	8.36	8.38		
010	6.27	6.30	9.14	9.17		
011	7.85	7.87	10.72	10.74		
012	9.45	9.47	12.32	12.34		
013	11.00	11.05	13.89	13.94		
014	12.60	12.65	15.49	15.54		
015	14.17	14.22	17.07	17.12		
016	15.77	15.82	18.67	18.72	1.44	
017	17.35	17.40	20.24	20.29		
018	18.95	19.00	21.84	21.89		
019	20.52	20.57	23.42	23.47		
020	22.12	22.17	25.02	25.07		0.13
021	23.70	23.75	26.59	26.64		
022	25.30	25.35	28.19	28.24		
023	26.87	26.92	29.77	29.82		
024	28.47	28.52	31.37	31.42		
025	30.05	30.10	32.94	32.99		
026	31.65	31.70	34.54	34.59		
027	33.22	33.27	36.12	36.17		
028	34.82	34.87	37.72	37.77		
110	9.42	9.47	14.00	14.05		
111	11.00	11.05	15.57	15.62		
112	12.60	12.65	17.17	17.22		
113	14.17	14.22	18.75	18.80	2.29	0.13
114	15.77	15.82	20.35	20.40		
115	17.35	17.40	21.92	21.97		
116	18.95	19.00	23.52	23.57		
117	20.52	20.57	25.10	25.15		

Inches						
Dash No.	ØA Rod Dia.		ØB Groove Dia.		H Groove Height	E Max Diametral Clearance
	Min.	Max.	Min.	Max.		
118	0.871	0.873	1.051	1.053		0.005
119	0.933	0.935	1.113	1.115		
120	0.996	0.998	1.176	1.178		
121	1.058	1.060	1.238	1.240		
122	1.121	1.123	1.301	1.303		
123	1.183	1.185	1.363	1.365		
124	1.246	1.248	1.426	1.428		
125	1.308	1.310	1.488	1.490		
126	1.371	1.373	1.551	1.553		
127	1.433	1.435	1.613	1.615		0.006
128	1.496	1.498	1.676	1.678		
129	1.558	1.560	1.738	1.740		
130	1.621	1.623	1.801	1.803		
131	1.683	1.685	1.863	1.865		
132	1.746	1.748	1.926	1.928		
133	1.808	1.810	1.988	1.990	0.090	
134	1.871	1.873	2.051	2.053		
135	1.934	1.936	2.114	2.116		
136	1.996	1.998	2.176	2.178		
137	2.059	2.061	2.239	2.241		
138	2.121	2.123	2.301	2.303		
139	2.184	2.186	2.364	2.366		
140	2.246	2.248	2.426	2.428		
141	2.309	2.311	2.489	2.491		0.007
142	2.371	2.373	2.551	2.553		
143	2.434	2.436	2.614	2.616		
144	2.496	2.498	2.676	2.678		
145	2.559	2.561	2.739	2.741		
146	2.621	2.623	2.801	2.803		
147	2.684	2.686	2.864	2.866		
148	2.746	2.748	2.926	2.928		
149	2.809	2.811	2.989	2.991		
210	0.746	0.748	0.991	0.993	0.123	0.005

Millimeters						
Dash No.	ØA Rod Dia.		ØB Groove Dia.		H Groove Height	E Max Diametral Clearance
	Min.	Max.	Min.	Max.		
118	22.12	22.17	26.70	26.75		0.13
119	23.70	23.75	28.27	28.32		
120	25.30	25.35	29.87	29.92		
121	26.87	26.92	31.45	31.50		
122	28.47	28.52	33.05	33.10		
123	30.05	30.10	34.62	34.67		
124	31.65	31.70	36.22	36.27		
125	33.22	33.27	37.80	37.85		
126	34.82	34.87	39.40	39.45		
127	36.40	36.45	40.97	41.02		0.15
128	38.00	38.05	42.57	42.62		
129	39.57	39.62	44.15	44.20		
130	41.17	41.22	45.75	45.80		
131	42.75	42.80	47.32	47.37		
132	44.35	44.40	48.92	48.97		
133	45.92	45.97	50.50	50.55	2.29	
134	47.52	47.57	52.10	52.15		
135	49.12	49.17	53.70	53.75		
136	50.70	50.75	55.27	55.32		
137	52.30	52.35	56.87	56.92		
138	53.87	53.92	58.45	58.50		
139	55.47	55.52	60.05	60.10		
140	57.05	57.10	61.62	61.67		
141	58.65	58.70	63.22	63.27		0.18
142	60.22	60.27	64.80	64.85		
143	61.82	61.87	66.40	66.45		
144	63.40	63.45	67.97	68.02		
145	65.00	65.05	69.57	69.62		
146	66.57	66.62	71.15	71.20		
147	68.17	68.22	72.75	72.80		
148	69.75	69.80	74.32	74.37		
149	71.35	71.40	75.92	75.97		
210	18.95	19.00	25.17	25.22	3.11	0.13

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Metaplast® Spring Seals
MIL-G-5514-F, Rod

Inches						
Dash No.	ØA Rod Dia.		ØB Groove Dia.		H Groove Height	E Max Diametral Clearance
	Min.	Max.	Min.	Max.		
211	0.808	0.810	1.053	1.055		0.005
212	0.871	0.873	1.116	1.118		
213	0.933	0.935	1.178	1.180		
214	0.996	0.998	1.241	1.243		
215	1.058	1.060	1.303	1.305		
216	1.121	1.123	1.366	1.368		
217	1.183	1.185	1.428	1.430		
218	1.246	1.248	1.491	1.493		
219	1.308	1.310	1.553	1.555		
220	1.371	1.373	1.616	1.618		
221	1.433	1.435	1.678	1.680		
222	1.496	1.498	1.741	1.743		
223	1.621	1.623	1.866	1.868		0.006
224	1.746	1.748	1.991	1.993		
225	1.871	1.873	2.116	2.118		
226	1.996	1.998	2.241	2.243		
227	2.121	2.123	2.366	2.368	0.123	
228	2.246	2.248	2.491	2.493		
229	2.371	2.373	2.616	2.618		
230	2.496	2.498	2.741	2.743		
231	2.621	2.623	2.866	2.868		
232	2.746	2.748	2.991	2.993		
233	2.871	2.873	3.116	3.118		
234	2.995	2.997	3.240	3.242		0.007
235	3.120	3.122	3.365	3.367		
236	3.245	3.247	3.490	3.492		
237	3.370	3.372	3.615	3.617		
238	3.495	3.497	3.740	3.742		
239	3.620	3.622	3.865	3.867		
240	3.745	3.747	3.990	3.992		
241	3.870	3.872	4.115	4.117		
242	3.995	3.997	4.240	4.242		
243	4.120	4.122	4.365	4.367		

Millimeters						
Dash No.	ØA Rod Dia.		ØB Groove Dia.		H Groove Height	E Max Diametral Clearance
	Min.	Max.	Min.	Max.		
211	20.52	20.57	26.75	26.80		0.13
212	22.12	22.17	28.35	28.40		
213	23.70	23.75	29.92	29.97		
214	25.30	25.35	31.52	31.57		
215	26.87	26.92	33.10	33.15		
216	28.47	28.52	34.70	34.75		
217	30.05	30.10	36.27	36.32		
218	31.65	31.70	37.87	37.92		
219	33.22	33.27	39.45	39.50		
220	34.82	34.87	41.05	41.10		
221	36.40	36.45	42.62	42.67		
222	38.00	38.05	44.22	44.27		
223	41.17	41.22	47.40	47.45		0.15
224	44.35	44.40	50.57	50.62		
225	47.52	47.57	53.75	53.80		
226	50.70	50.75	56.92	56.97		
227	53.87	53.92	60.10	60.15	3.11	
228	57.05	57.10	63.27	63.32		
229	60.22	60.27	66.45	66.50		
230	63.40	63.45	69.62	69.67		
231	66.57	66.62	72.80	72.85		
232	69.75	69.80	75.97	76.02		
233	72.92	72.97	79.15	79.20		
234	76.07	76.12	82.30	82.35		0.18
235	79.25	79.30	85.47	85.52		
236	82.42	82.47	88.65	88.70		
237	85.60	85.65	91.82	91.87		
238	88.77	88.82	95.00	95.05		
239	91.95	92.00	98.17	98.22		
240	95.12	95.17	101.35	101.40		
241	98.30	98.35	104.52	104.57		
242	101.47	101.52	107.70	107.75		
243	104.65	104.70	110.87	110.92		

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Inches							Millimeters						
Dash No.	ØA Rod Dia.		ØB Groove Dia.		H Groove Height	E Max Diametral Clearance	Dash No.	ØA Rod Dia.		ØB Groove Dia.		H Groove Height	E Max Diametral Clearance
	Min.	Max.	Min.	Max.				Min.	Max.	Min.	Max.		
244	4.245	4.247	4.490	4.492	0.123	0.007	244	107.82	107.87	114.05	114.10	3.11	0.18
245	4.370	4.372	4.615	4.617			245	111.00	111.05	117.22	117.27		
246	4.495	4.497	4.740	4.742		0.008	246	114.17	114.22	120.40	120.45		0.20
247	4.620	4.622	4.865	4.867			247	117.35	117.40	123.57	123.62		
325	1.496	1.498	1.870	1.872		0.006	325	38.00	38.05	47.50	47.55		0.15
326	1.621	1.623	1.995	1.997			326	41.17	41.22	50.67	50.72		
327	1.746	1.748	2.120	2.122			327	44.35	44.40	53.85	53.90		
328	1.871	1.873	2.245	2.247			328	47.52	47.57	57.02	57.07		
329	1.996	1.998	2.370	2.372			329	50.70	50.75	60.20	60.25		
330	2.121	2.123	2.495	2.497			330	53.87	53.92	63.37	63.42		
331	2.246	2.248	2.620	2.622			331	57.05	57.10	66.55	66.60		
332	2.371	2.373	2.745	2.747			332	60.22	60.27	69.72	69.77		
333	2.496	2.498	2.870	2.872			333	63.40	63.45	72.90	72.95		
334	2.621	2.623	2.995	2.997			334	66.57	66.62	76.07	76.12		
335	2.746	2.748	3.120	3.122			335	69.75	69.80	79.25	79.30		
336	2.871	2.873	3.245	3.247			336	72.92	72.97	82.42	82.47		
337	2.995	2.997	3.369	3.371	0.187		337	76.07	76.12	85.57	85.62	4.75	
338	3.120	3.122	3.494	3.496			338	79.25	79.30	88.75	88.80		
339	3.245	3.247	3.619	3.621			339	82.42	82.47	91.92	91.97		
340	3.370	3.372	3.744	3.746			340	85.60	85.65	95.10	95.15		
341	3.495	3.497	3.869	3.871			341	88.77	88.82	98.27	98.32		
342	3.620	3.622	3.994	3.996			342	91.95	92.00	101.45	101.50		
343	3.745	3.747	4.119	4.121			343	95.12	95.17	104.62	104.67		
344	3.870	3.872	4.244	4.246			344	98.30	98.35	107.80	107.85		
345	3.995	3.997	4.369	4.371			345	101.47	101.52	110.97	111.02		
346	4.120	4.122	4.494	4.496			346	104.65	104.70	114.15	114.20		
347	4.245	4.247	4.619	4.621			347	107.82	107.87	117.32	117.37		
348	4.370	4.372	4.744	4.746			348	111.00	111.05	120.50	120.55		
349	4.495	4.497	4.869	4.871			349	114.17	114.22	123.67	123.72		
425	4.494	4.497	4.974	4.977			425	114.15	114.22	126.34	126.42		
426	4.619	4.622	5.099	5.102	0.240	0.009	426	117.32	117.40	129.51	129.59	6.10	0.23
427	4.744	4.747	5.224	5.227			427	120.50	120.57	132.69	132.77		

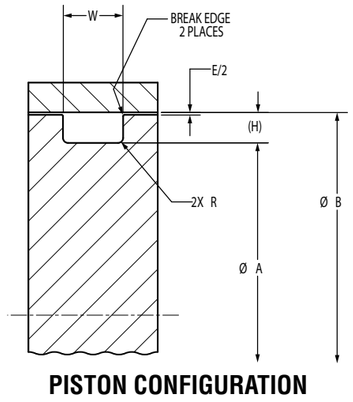
Metaplast® Spring Seals
MIL-G-5514-F, Rod

Inches							Millimeters						
Dash No.	ØA Rod Dia.		ØB Groove Dia.		H Groove Height	E Max Diametral Clearance	Dash No.	ØA Rod Dia.		ØB Groove Dia.		H Groove Height	E Max Diametral Clearance
	Min.	Max.	Min.	Max.				Min.	Max.	Min.	Max.		
428	4.869	4.872	5.349	5.352		0.009	428	123.67	123.75	135.86	135.94		0.23
429	4.994	4.997	5.474	5.477			429	126.85	126.92	139.04	139.12		
430	5.119	5.122	5.599	5.602			430	130.02	130.10	142.21	142.29		
431	5.244	5.247	5.724	5.727			431	133.20	133.27	145.39	145.47		
432	5.369	5.372	5.849	5.852			432	136.37	136.45	148.56	148.64		
433	5.494	5.497	5.974	5.977			433	139.55	139.62	151.74	151.82		
434	5.619	5.622	6.099	6.102			434	142.72	142.80	154.91	154.99		
435	5.744	5.747	6.224	6.227			435	145.90	145.97	158.09	158.17		
436	5.869	5.872	6.349	6.352			436	149.07	149.15	161.26	161.34		
437	5.994	5.997	6.474	6.477			437	152.25	152.32	164.44	164.52		
438	6.244	6.247	6.724	6.727			438	158.60	158.67	170.79	170.87		
439	6.494	6.497	6.974	6.977			439	164.95	165.02	177.14	177.22		
440	6.744	6.747	7.224	7.227			440	171.30	171.37	183.49	183.57		
441	6.994	6.997	7.474	7.477			441	177.65	177.72	189.84	189.92		
442	7.244	7.247	7.724	7.727			442	184.00	184.07	196.19	196.27		
443	7.494	7.497	7.974	7.977			443	190.35	190.42	202.54	202.62		
444	7.744	7.747	8.224	8.227	0.240		444	196.70	196.77	208.89	208.97	6.10	
445	7.994	7.997	8.474	8.477			445	203.05	203.12	215.24	215.32		
446	8.494	8.497	8.974	8.977			446	215.75	215.82	227.94	228.02		
447	8.994	8.997	9.474	9.478			447	228.45	228.52	240.64	240.74		
448	9.494	9.497	9.974	9.978			448	241.15	241.22	253.34	253.44		
449	9.994	9.997	10.474	10.478		0.010	449	253.85	253.92	266.04	266.14		0.25
450	10.494	10.497	10.974	10.978			450	266.55	266.62	278.74	278.84		
451	10.994	10.997	11.474	11.478			451	279.25	279.32	291.44	291.54		
452	11.494	11.497	11.974	11.978			452	291.95	292.02	304.14	304.24		
453	11.994	11.997	12.474	12.478			453	304.65	304.72	316.84	316.94		
454	12.494	12.497	12.974	12.978			454	317.35	317.42	329.54	329.64		
455	12.994	12.997	13.474	13.478			455	330.05	330.12	342.24	342.34		
456	13.494	13.497	13.974	13.978			456	342.75	342.82	354.94	355.04		
457	13.994	13.997	14.474	14.478			457	355.45	355.52	367.64	367.74		
458	14.494	14.497	14.974	14.978			458	368.15	368.22	380.34	380.44		
459	14.994	14.997	15.474	15.478			459	380.85	380.92	393.04	393.14		
460	15.494	15.497	15.974	15.978			460	393.55	393.62	405.74	405.84		

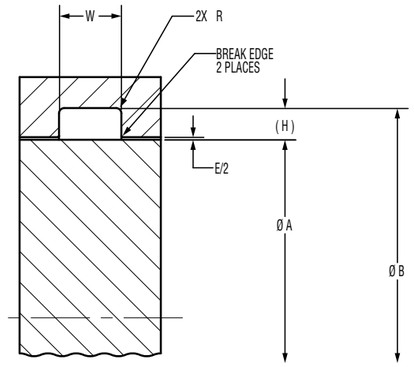
TC1288 Seals are designed for retrofitting Standard Industrial Gland Depth sizes

TC1288

- Radial seal components allow for successful installation in open and closed grooves
- Jacket and spring materials make these seals the best option for virtually all fluids
- Variable spring thickness and proprietary design ensure excellent sealing performance from cryogenic temperatures to ~600 °F
- No stick-slip contact in dynamic surfaces
- Unlimited shelf life
- General use seal for industrial applications
- Low-pressure positive seal for unidirectional static or dynamic applications
- Can be positioned in heel-to-heel sequence for bidirectional use
- The versatile seal TC1288 can be used in grooves in piston or rod configurations
- Can be effectively used in high pressure applications when used in combination with a high-modulus back-up ring. Call CoorsTek Engineering for appropriate groove width



PISTON CONFIGURATION



ROD CONFIGURATION

Dash No.	W Gland Width		R Corner Radius	
	Min.	Max.	Min.	Max.
006 to 046	0.094	0.104	0.005	0.015
106 to 141	0.141	0.151		
208 to 270	0.188	0.198	0.010	0.025
316 to 324	0.281	0.291	0.020	0.035
401 to 460	0.375	0.385		

Inches

Dash No.	W Gland Width		R Corner Radius	
	Min.	Max.	Min.	Max.
006 to 046	2.39	2.64	0.13	0.38
106 to 141	3.58	3.84		
208 to 270	4.78	5.03	0.25	0.64
316 to 324	7.14	7.39	0.51	0.89
401 to 460	9.53	9.78		

Millimeters

Millimeters

Dash No.	ØA Rod Dia./ Groove Dia.		ØB Groove Dia./ Bore Dia.		H Groove Height	E Max Diametral Clearance
	Min	Max	Min	Max		
006	0.124	0.124	0.126	0.249		
007	0.155	0.155	0.157	0.280		
008	0.186	0.186	0.188	0.311		
009	0.217	0.217	0.219	0.342		0.004
010	0.249	0.249	0.251	0.374		
011	0.311	0.311	0.313	0.436		
012	0.374	0.374	0.376	0.499		
013	0.436	0.436	0.438	0.561		
014	0.499	0.499	0.501	0.624		
015	0.561	0.561	0.563	0.686		
016	0.624	0.624	0.626	0.749		
017	0.686	0.686	0.688	0.811		
018	0.749	0.749	0.751	0.874		
019	0.811	0.811	0.813	0.936		
020	0.874	0.874	0.876	0.999		
021	0.936	0.936	0.938	1.061		
022	0.999	0.999	1.001	1.124	0.063	
023	1.061	1.061	1.063	1.186		
024	1.124	1.124	1.126	1.249		
025	1.186	1.186	1.188	1.311		0.005
026	1.249	1.249	1.251	1.374		
027	1.311	1.311	1.313	1.436		
028	1.374	1.374	1.376	1.499		
029	1.499	1.499	1.501	1.624		
030	1.624	1.624	1.626	1.749		
031	1.749	1.749	1.751	1.874		
032	1.874	1.874	1.876	1.999		
033	1.999	1.999	2.001	2.124		
034	2.124	2.124	2.126	2.249		
035	2.249	2.249	2.251	2.374		
036	2.374	2.374	2.376	2.499		
037	2.499	2.499	2.501	2.624		
038	2.624	2.624	2.626	2.749		

Millimeters

Dash No.	ØA Rod Dia./ Groove Dia.		ØB Groove Dia./ Bore Dia.		H Groove Height	E Max Diametral Clearance
	Min	Max	Min	Max		
006	3.15	3.20	6.32	6.38		
007	3.94	3.99	7.11	7.16		
008	4.72	4.78	7.90	7.95		
009	5.51	5.56	8.69	8.74		0.10
010	6.32	6.38	9.50	9.55		
011	7.90	7.95	11.07	11.13		
012	9.50	9.55	12.67	12.73		
013	11.07	11.13	14.25	14.30		
014	12.67	12.73	15.85	15.90		
015	14.25	14.30	17.42	17.48		
016	15.85	15.90	19.02	19.08		
017	17.42	17.48	20.60	20.65		
018	19.02	19.08	22.20	22.25		
019	20.60	20.65	23.77	23.83		
020	22.20	22.25	25.37	25.43		
021	23.77	23.83	26.95	27.00		
022	25.37	25.43	28.55	28.60	1.59	
023	26.95	27.00	30.12	30.18		
024	28.55	28.60	31.72	31.78		
025	30.12	30.18	33.30	33.35		0.13
026	31.72	31.78	34.90	34.95		
027	33.30	33.35	36.47	36.53		
028	34.90	34.95	38.07	38.13		
029	38.07	38.13	41.25	41.30		
030	41.25	41.30	44.42	44.48		
031	44.42	44.48	47.60	47.65		
032	47.60	47.65	50.77	50.83		
033	50.77	50.83	53.95	54.00		
034	53.95	54.00	57.12	57.18		
035	57.12	57.18	60.30	60.35		
036	60.30	60.35	63.47	63.53		
037	63.47	63.53	66.65	66.70		
038	66.65	66.70	69.82	69.88		

Dash No.	ØA Rod Dia./ Groove Dia. Min	ØA Rod Dia./ Groove Dia. Max	ØB Groove Dia./ Bore Dia. Min	ØB Groove Dia./ Bore Dia. Max	H Groove Height	E Max Diametral Clearance
						Millimeters
039	2.749	2.749	2.751	2.874	0.063	0.005
040	2.874	2.874	2.876	2.999		
041	2.999	2.999	3.001	3.124		
042	3.249	3.249	3.251	3.374		
043	3.499	3.499	3.501	3.624		
044	3.749	3.749	3.751	3.874		
045	3.999	3.999	4.001	4.124		
046	4.249	4.249	4.251	4.374		
106	0.186	0.188	0.374	0.376	0.094	0.005
107	0.218	0.220	0.405	0.407		
108	0.249	0.251	0.436	0.438		
109	0.311	0.313	0.499	0.501		
110	0.374	0.376	0.561	0.563		
111	0.436	0.438	0.624	0.626		
112	0.499	0.501	0.686	0.688		
113	0.561	0.563	0.749	0.751		
114	0.624	0.626	0.811	0.813		
115	0.686	0.688	0.874	0.876		
116	0.749	0.751	0.936	0.938		
117	0.811	0.813	0.999	1.001		
118	0.874	0.876	1.061	1.063		
119	0.936	0.938	1.124	1.126		
120	0.999	1.001	1.186	1.188		
121	1.061	1.063	1.249	1.251		
122	1.124	1.126	1.311	1.313		
123	1.186	1.188	1.374	1.376		
124	1.249	1.251	1.436	1.438		
125	1.311	1.313	1.499	1.501		
126	1.374	1.376	1.561	1.563		
127	1.436	1.438	1.624	1.626		
128	1.499	1.501	1.686	1.688		
129	1.561	1.563	1.749	1.751		
130	1.624	1.626	1.811	1.813		0.006

Dash No.	ØA Rod Dia./ Groove Dia. Min	ØA Rod Dia./ Groove Dia. Max	ØB Groove Dia./ Bore Dia. Min	ØB Groove Dia./ Bore Dia. Max	H Groove Height	E Max Diametral Clearance
						Millimeters
039	69.82	69.88	73.00	73.05	1.59	0.13
040	73.00	73.05	76.17	76.23		
041	76.17	76.23	79.35	79.40		
042	82.52	82.58	85.70	85.75		
043	88.87	88.93	92.05	92.10		
044	95.22	95.28	98.40	98.45		
045	101.57	101.63	104.75	104.80		
046	107.92	107.98	111.10	111.15		
106	4.72	4.78	9.50	9.55	2.39	0.13
107	5.54	5.59	10.29	10.34		
108	6.32	6.38	11.07	11.13		
109	7.90	7.95	12.67	12.73		
110	9.50	9.55	14.25	14.30		
111	11.07	11.13	15.85	15.90		
112	12.67	12.73	17.42	17.48		
113	14.25	14.30	19.02	19.08		
114	15.85	15.90	20.60	20.65		
115	17.42	17.48	22.20	22.25		
116	19.02	19.08	23.77	23.83		
117	20.60	20.65	25.37	25.43		
118	22.20	22.25	26.95	27.00		
119	23.77	23.83	28.55	28.60		
120	25.37	25.43	30.12	30.18		
121	26.95	27.00	31.72	31.78		
122	28.55	28.60	33.30	33.35		
123	30.12	30.18	34.90	34.95		
124	31.72	31.78	36.47	36.53		
125	33.30	33.35	38.07	38.13		
126	34.90	34.95	39.65	39.70		
127	36.47	36.53	41.25	41.30		
128	38.07	38.13	42.82	42.88		
129	39.65	39.70	44.42	44.48		
130	41.25	41.30	46.00	46.05		0.15

Metaplast® Spring Seals
Industrial, Piston and Rod

Dash No.	ØA Rod Dia./ Groove Dia. Min	ØA Rod Dia./ Groove Dia. Max	ØB Groove Dia./ Bore Dia. Min	ØB Groove Dia./ Bore Dia. Max	H Groove Height	E Max Diametral Clearance
						Millimeters
131	1.686	1.688	1.874	1.876	0.094	0.006
132	1.749	1.751	1.936	1.938		
133	1.811	1.813	1.999	2.001		
134	1.874	1.876	2.061	2.063		
135	1.936	1.938	2.124	2.126		
136	1.999	2.001	2.186	2.188		
137	2.061	2.063	2.249	2.251		
138	2.124	2.126	2.311	2.313		
139	2.186	2.188	2.374	2.376		
140	2.249	2.251	2.436	2.438		
141	2.311	2.313	2.499	2.501		
142	2.374	2.376	2.561	2.563		
143	2.436	2.438	2.624	2.626		
144	2.499	2.501	2.686	2.688		
145	2.561	2.563	2.749	2.751		
146	2.624	2.626	2.811	2.813		
147	2.686	2.688	2.874	2.876		
148	2.749	2.751	2.936	2.938		
149	2.811	2.813	2.999	3.001		
150	2.874	2.876	3.061	3.063		
151	2.999	3.001	3.186	3.188		
152	3.249	3.251	3.436	3.438		
153	3.499	3.501	3.686	3.688		
154	3.749	3.751	3.936	3.938		
155	3.999	4.001	4.186	4.188		
156	4.249	4.251	4.436	4.438		
157	4.499	4.501	4.686	4.688		
158	4.749	4.751	4.936	4.938		
159	4.999	5.001	5.186	5.188		
160	5.249	5.251	5.436	5.438		
161	5.499	5.501	5.686	5.688		
208	0.624	0.626	0.874	0.876	0.125	0.006
209	0.686	0.688	0.936	0.938		

Dash No.	ØA Rod Dia./ Groove Dia. Min	ØA Rod Dia./ Groove Dia. Max	ØB Groove Dia./ Bore Dia. Min	ØB Groove Dia./ Bore Dia. Max	H Groove Height	E Max Diametral Clearance
						Millimeters
131	42.82	42.88	47.60	47.65	2.39	0.15
132	44.42	44.48	49.17	49.23		
133	46.00	46.05	50.77	50.83		
134	47.60	47.65	52.35	52.40		
135	49.17	49.23	53.95	54.00		
136	50.77	50.83	55.52	55.58		
137	52.35	52.40	57.12	57.18		
138	53.95	54.00	58.70	58.75		
139	55.52	55.58	60.30	60.35		
140	57.12	57.18	61.87	61.93		
141	58.70	58.75	63.47	63.53		
142	60.30	60.35	65.05	65.10		
143	61.87	61.93	66.65	66.70		
144	63.47	63.53	68.22	68.28		
145	65.05	65.10	69.82	69.88		
146	66.65	66.70	71.40	71.45		
147	68.22	68.28	73.00	73.05		
148	69.82	69.88	74.57	74.63		
149	71.40	71.45	76.17	76.23		
150	73.00	73.05	77.75	77.80		
151	76.17	76.23	80.92	80.98		
152	82.52	82.58	87.27	87.33		
153	88.87	88.93	93.62	93.68		
154	95.22	95.28	99.97	100.03		
155	101.57	101.63	106.32	106.38		
156	107.92	107.98	112.67	112.73		
157	114.27	114.33	119.02	119.08		
158	120.62	120.68	125.37	125.43		
159	126.97	127.03	131.72	131.78		
160	133.32	133.38	138.07	138.13		
161	139.67	139.73	144.42	144.48		
208	15.85	15.90	22.20	22.25	3.18	0.15
209	17.42	17.48	23.77	23.83		

Millimeters

Dash No.	ØA Rod Dia./ Groove Dia.		ØB Groove Dia./ Bore Dia.		H Groove Height	E Max Diametral Clearance
	Min	Max	Min	Max		
210	0.749	0.751	0.999	1.001		
211	0.811	0.813	1.061	1.063		
212	0.874	0.876	1.124	1.126		
213	0.936	0.938	1.186	1.188		
214	0.999	1.001	1.249	1.251		
215	1.061	1.063	1.311	1.313		
216	1.124	1.126	1.374	1.376		
217	1.186	1.188	1.436	1.438		
218	1.249	1.251	1.499	1.501		
219	1.311	1.313	1.561	1.563		
220	1.374	1.376	1.624	1.626		
221	1.436	1.438	1.686	1.688		
222	1.499	1.501	1.749	1.751		
223	1.624	1.626	1.874	1.876		
224	1.749	1.751	1.999	2.001		
225	1.874	1.876	2.124	2.126		
226	1.999	2.001	2.249	2.251	0.125	0.006
227	2.124	2.126	2.374	2.376		
228	2.249	2.251	2.499	2.501		
229	2.374	2.376	2.624	2.626		
230	2.499	2.501	2.749	2.751		
231	2.624	2.626	2.874	2.876		
232	2.749	2.751	2.999	3.001		
233	2.874	2.876	3.124	3.126		
234	2.999	3.001	3.249	3.251		
235	3.124	3.126	3.374	3.376		
236	3.249	3.251	3.499	3.501		
237	3.374	3.376	3.624	3.626		
238	3.499	3.501	3.749	3.751		
239	3.624	3.626	3.874	3.876		
240	3.749	3.751	3.999	4.001		
241	3.874	3.876	4.124	4.126		
242	3.999	4.001	4.249	4.251		

Millimeters

Dash No.	ØA Rod Dia./ Groove Dia.		ØB Groove Dia./ Bore Dia.		H Groove Height	E Max Diametral Clearance
	Min	Max	Min	Max		
210	19.02	19.08	25.37	25.43		
211	20.60	20.65	26.95	27.00		
212	22.20	22.25	28.55	28.60		
213	23.77	23.83	30.12	30.18		
214	25.37	25.43	31.72	31.78		
215	26.95	27.00	33.30	33.35		
216	28.55	28.60	34.90	34.95		
217	30.12	30.18	36.47	36.53		
218	31.72	31.78	38.07	38.13		
219	33.30	33.35	39.65	39.70		
220	34.90	34.95	41.25	41.30		
221	36.47	36.53	42.82	42.88		
222	38.07	38.13	44.42	44.48		
223	41.25	41.30	47.60	47.65		
224	44.42	44.48	50.77	50.83		
225	47.60	47.65	53.95	54.00		
226	50.77	50.83	57.12	57.18	3.18	0.15
227	53.95	54.00	60.30	60.35		
228	57.12	57.18	63.47	63.53		
229	60.30	60.35	66.65	66.70		
230	63.47	63.53	69.82	69.88		
231	66.65	66.70	73.00	73.05		
232	69.82	69.88	76.17	76.23		
233	73.00	73.05	79.35	79.40		
234	76.17	76.23	82.52	82.58		
235	79.35	79.40	85.70	85.75		
236	82.52	82.58	88.87	88.93		
237	85.70	85.75	92.05	92.10		
238	88.87	88.93	95.22	95.28		
239	92.05	92.10	98.40	98.45		
240	95.22	95.28	101.57	101.63		
241	98.40	98.45	104.75	104.80		
242	101.57	101.63	107.92	107.98		

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Metaplast® Spring Seals
Industrial, Piston and Rod

Millimeters

Dash No.	ØA Rod Dia./ Groove Dia.		ØB Groove Dia./ Bore Dia.		H Groove Height	E Max Diametral Clearance
	Min	Max	Min	Max		
243	4.124	4.126	4.374	4.376		
244	4.249	4.251	4.499	4.501		
245	4.374	4.376	4.624	4.626		
246	4.499	4.501	4.749	4.751		
247	4.624	4.626	4.874	4.876		
248	4.749	4.751	4.999	5.001		
249	4.874	4.876	5.124	5.126		
250	4.999	5.001	5.249	5.251		
251	5.124	5.126	5.374	5.376		
252	5.249	5.251	5.499	5.501		
253	5.374	5.376	5.624	5.626		
254	5.499	5.501	5.749	5.751		
255	5.624	5.626	5.874	5.876		
256	5.749	5.751	5.999	6.001	0.125	0.006
257	5.874	5.876	6.124	6.126		
258	5.999	6.001	6.249	6.251		
259	6.249	6.251	6.499	6.501		
260	6.499	6.501	6.749	6.751		
261	6.749	6.751	6.999	7.001		
262	6.999	7.001	7.249	7.251		
263	7.249	7.251	7.499	7.501		
264	7.499	7.501	7.749	7.751		
265	7.749	7.751	7.999	8.001		
266	7.999	8.001	8.249	8.251		
267	8.249	8.251	8.499	8.501		
268	8.499	8.501	8.749	8.751		
269	8.749	8.751	8.999	9.001		
270	8.999	9.001	9.249	9.251		
316	0.874	0.876	1.249	1.251		
317	0.936	0.938	1.311	1.313		
318	0.999	1.001	1.374	1.376	0.188	0.006
319	1.061	1.063	1.436	1.438		
320	1.124	1.126	1.499	1.501		

Millimeters

Dash No.	ØA Rod Dia./ Groove Dia.		ØB Groove Dia./ Bore Dia.		H Groove Height	E Max Diametral Clearance
	Min	Max	Min	Max		
243	104.75	104.80	111.10	111.15		
244	107.92	107.98	114.27	114.33		
245	111.10	111.15	117.45	117.50		
246	114.27	114.33	120.62	120.68		
247	117.45	117.50	123.80	123.85		
248	120.62	120.68	126.97	127.03		
249	123.80	123.85	130.15	130.20		
250	126.97	127.03	133.32	133.38		
251	130.15	130.20	136.50	136.55		
252	133.32	133.38	139.67	139.73		
253	136.50	136.55	142.85	142.90		
254	139.67	139.73	146.02	146.08		
255	142.85	142.90	149.20	149.25		
256	146.02	146.08	152.37	152.43	3.18	0.15
257	149.20	149.25	155.55	155.60		
258	152.37	152.43	158.72	158.78		
259	158.72	158.78	165.07	165.13		
260	165.07	165.13	171.42	171.48		
261	171.42	171.48	177.77	177.83		
262	177.77	177.83	184.12	184.18		
263	184.12	184.18	190.47	190.53		
264	190.47	190.53	196.82	196.88		
265	196.82	196.88	203.17	203.23		
266	203.17	203.23	209.52	209.58		
267	209.52	209.58	215.87	215.93		
268	215.87	215.93	222.22	222.28		
269	222.22	222.28	228.57	228.63		
270	228.57	228.63	234.92	234.98		
316	22.20	22.25	31.72	31.78		
317	23.77	23.83	33.30	33.35		
318	25.37	25.43	34.90	34.95	4.76	0.15
319	26.95	27.00	36.47	36.53		
320	28.55	28.60	38.07	38.13		

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Millimeters

Dash No.	ØA Rod Dia./ Groove Dia.		ØB Groove Dia./ Bore Dia.		H Groove Height	E Max Diametral Clearance
	Min	Max	Min	Max		
321	1.186	1.188	1.561	1.563		0.006
322	1.249	1.251	1.624	1.626		
323	1.311	1.313	1.686	1.688		
324	1.374	1.376	1.749	1.751		
325	1.499	1.501	1.874	1.876		
326	1.623	1.626	1.999	2.002		
327	1.748	1.751	2.124	2.127		
328	1.873	1.876	2.249	2.252		
329	1.998	2.001	2.374	2.377		
330	2.123	2.126	2.499	2.502		
331	2.248	2.251	2.624	2.627		
332	2.373	2.376	2.749	2.752		
333	2.498	2.501	2.874	2.877		
334	2.623	2.626	2.999	3.002		
335	2.748	2.751	3.124	3.127		
336	2.873	2.876	3.249	3.252		
337	2.998	3.001	3.374	3.377	0.188	
338	3.123	3.126	3.499	3.502		
339	3.248	3.251	3.624	3.627		0.007
340	3.373	3.376	3.749	3.752		
341	3.498	3.501	3.874	3.877		
342	3.623	3.626	3.999	4.002		
343	3.748	3.751	4.124	4.127		
344	3.873	3.876	4.249	4.252		
345	3.998	4.001	4.374	4.377		
346	4.123	4.126	4.499	4.502		
347	4.248	4.251	4.624	4.627		
348	4.373	4.376	4.749	4.752		
349	4.498	4.501	4.874	4.877		
350	4.623	4.626	4.999	5.002		
351	4.748	4.751	5.124	5.127		
352	4.873	4.876	5.249	5.252		
353	4.998	5.001	5.374	5.377		

Millimeters

Dash No.	ØA Rod Dia./ Groove Dia.		ØB Groove Dia./ Bore Dia.		H Groove Height	E Max Diametral Clearance
	Min	Max	Min	Max		
321	30.12	30.18	39.65	39.70		0.15
322	31.72	31.78	41.25	41.30		
323	33.30	33.35	42.82	42.88		
324	34.90	34.95	44.42	44.48		
325	38.07	38.13	47.60	47.65		
326	41.22	41.30	50.77	50.85		
327	44.40	44.48	53.95	54.03		
328	47.57	47.65	57.12	57.20		
329	50.75	50.83	60.30	60.38		
330	53.92	54.00	63.47	63.55		
331	57.10	57.18	66.65	66.73		
332	60.27	60.35	69.82	69.90		
333	63.45	63.53	73.00	73.08		
334	66.62	66.70	76.17	76.25		
335	69.80	69.88	79.35	79.43		
336	72.97	73.05	82.52	82.60		
337	76.15	76.23	85.70	85.78	4.76	
338	79.32	79.40	88.87	88.95		
339	82.50	82.58	92.05	92.13		0.18
340	85.67	85.75	95.22	95.30		
341	88.85	88.93	98.40	98.48		
342	92.02	92.10	101.57	101.65		
343	95.20	95.28	104.75	104.83		
344	98.37	98.45	107.92	108.00		
345	101.55	101.63	111.10	111.18		
346	104.72	104.80	114.27	114.35		
347	107.90	107.98	117.45	117.53		
348	111.07	111.15	120.62	120.70		
349	114.25	114.33	123.80	123.88		
350	117.42	117.50	126.97	127.05		
351	120.60	120.68	130.15	130.23		
352	123.77	123.85	133.32	133.40		
353	126.95	127.03	136.50	136.58		

Metaplast® Spring Seals
Industrial, Piston and Rod

Millimeters

Dash No.	ØA Rod Dia./ Groove Dia.		ØB Groove Dia./ Bore Dia.		H Groove Height	E Max Diametral Clearance
	Min	Max	Min	Max		
354	5.123	5.126	5.499	5.502		
355	5.248	5.251	5.624	5.627		
356	5.373	5.376	5.749	5.752		
357	5.498	5.501	5.874	5.877		
358	5.623	5.626	5.999	6.002		
359	5.748	5.751	6.124	6.127		
360	5.873	5.876	6.249	6.252		
361	5.998	6.001	6.374	6.377		
362	6.248	6.251	6.624	6.627		
363	6.498	6.501	6.874	6.877		
364	6.748	6.751	7.124	7.127		
365	6.998	7.001	7.374	7.377		
366	7.248	7.251	7.624	7.627	0.188	0.007
367	7.498	7.501	7.874	7.877		
368	7.748	7.751	8.124	8.127		
369	7.998	8.001	8.374	8.377		
370	8.248	8.251	8.624	8.627		
371	8.498	8.501	8.874	8.877		
372	8.748	8.751	9.124	9.127		
373	8.998	9.001	9.374	9.377		
374	9.248	9.251	9.624	9.627		
375	9.498	9.501	9.874	9.877		
376	9.748	9.751	10.124	10.127		
377	9.998	10.001	10.374	10.377		
378	10.498	10.501	10.874	10.877		
401	1.498	1.501	1.999	2.002	0.251	0.010
402	1.623	1.626	2.124	2.127		
403	1.748	1.751	2.249	2.252		
404	1.873	1.876	2.374	2.377		
405	1.998	2.001	2.499	2.502		
406	2.123	2.126	2.624	2.627		
407	2.248	2.251	2.749	2.752		
408	2.373	2.376	2.874	2.877		

Millimeters

Dash No.	ØA Rod Dia./ Groove Dia.		ØB Groove Dia./ Bore Dia.		H Groove Height	E Max Diametral Clearance
	Min	Max	Min	Max		
354	130.12	130.20	139.67	139.75		
355	133.30	133.38	142.85	142.93		
356	136.47	136.55	146.02	146.10		
357	139.65	139.73	149.20	149.28		
358	142.82	142.90	152.37	152.45		
359	146.00	146.08	155.55	155.63		
360	149.17	149.25	158.72	158.80		
361	152.35	152.43	161.90	161.98		
362	158.70	158.78	168.25	168.33		
363	165.05	165.13	174.60	174.68		
364	171.40	171.48	180.95	181.03		
365	177.75	177.83	187.30	187.38		
366	184.10	184.18	193.65	193.73	4.76	0.18
367	190.45	190.53	200.00	200.08		
368	196.80	196.88	206.35	206.43		
369	203.15	203.23	212.70	212.78		
370	209.50	209.58	219.05	219.13		
371	215.85	215.93	225.40	225.48		
372	222.20	222.28	231.75	231.83		
373	228.55	228.63	238.10	238.18		
374	234.90	234.98	244.45	244.53		
375	241.25	241.33	250.80	250.88		
376	247.60	247.68	257.15	257.23		
377	253.95	254.03	263.50	263.58		
378	266.65	266.73	276.20	276.28		
401	38.05	38.13	50.77	50.85	6.36	0.25
402	41.22	41.30	53.95	54.03		
403	44.40	44.48	57.12	57.20		
404	47.57	47.65	60.30	60.38		
405	50.75	50.83	63.47	63.55		
406	53.92	54.00	66.65	66.73		
407	57.10	57.18	69.82	69.90		
408	60.27	60.35	73.00	73.08		

Dash No.	ØA Rod Dia./ Groove Dia.		ØB Groove Dia./ Bore Dia.		H Groove Height	E Max Diametral Clearance
	Millimeters					
	Min	Max	Min	Max		
409	2.498	2.501	2.999	3.002		
410	2.623	2.626	3.124	3.127		
411	2.748	2.751	3.249	3.252		
412	2.873	2.876	3.374	3.377		
413	2.998	3.001	3.499	3.502		
414	3.123	3.126	3.624	3.627		
415	3.248	3.251	3.749	3.752		
416	3.373	3.376	3.874	3.877		
417	3.498	3.501	3.999	4.002		
418	3.623	3.626	4.124	4.127		
419	3.748	3.751	4.249	4.252		
420	3.873	3.876	4.374	4.377		
421	3.998	4.001	4.499	4.502		
422	4.123	4.126	4.624	4.627		
423	4.248	4.251	4.749	4.752		
424	4.373	4.376	4.874	4.877		
425	4.498	4.501	4.999	5.002	0.251	0.010
426	4.623	4.626	5.124	5.127		
427	4.748	4.751	5.249	5.252		
428	4.873	4.876	5.374	5.377		
429	4.998	5.001	5.499	5.502		
430	5.123	5.126	5.624	5.627		
431	5.248	5.251	5.749	5.752		
432	5.373	5.376	5.874	5.877		
433	5.498	5.501	5.999	6.002		
434	5.623	5.626	6.124	6.127		
435	5.748	5.751	6.249	6.252		
436	5.872	5.876	6.374	6.378		
437	5.997	6.001	6.499	6.503		
438	6.247	6.251	6.749	6.753		
439	6.497	6.501	6.999	7.003		
440	6.747	6.751	7.249	7.253		
441	6.997	7.001	7.499	7.503		

Dash No.	ØA Rod Dia./ Groove Dia.		ØB Groove Dia./ Bore Dia.		H Groove Height	E Max Diametral Clearance
	Millimeters					
	Min	Max	Min	Max		
409	63.45	63.53	76.17	76.25		
410	66.62	66.70	79.35	79.43		
411	69.80	69.88	82.52	82.60		
412	72.97	73.05	85.70	85.78		
413	76.15	76.23	88.87	88.95		
414	79.32	79.40	92.05	92.13		
415	82.50	82.58	95.22	95.30		
416	85.67	85.75	98.40	98.48		
417	88.85	88.93	101.57	101.65		
418	92.02	92.10	104.75	104.83		
419	95.20	95.28	107.92	108.00		
420	98.37	98.45	111.10	111.18		
421	101.55	101.63	114.27	114.35		
422	104.72	104.80	117.45	117.53		
423	107.90	107.98	120.62	120.70		
424	111.07	111.15	123.80	123.88		
425	114.25	114.33	126.97	127.05	6.36	0.25
426	117.42	117.50	130.15	130.23		
427	120.60	120.68	133.32	133.40		
428	123.77	123.85	136.50	136.58		
429	126.95	127.03	139.67	139.75		
430	130.12	130.20	142.85	142.93		
431	133.30	133.38	146.02	146.10		
432	136.47	136.55	149.20	149.28		
433	139.65	139.73	152.37	152.45		
434	142.82	142.90	155.55	155.63		
435	146.00	146.08	158.72	158.80		
436	149.15	149.25	161.90	162.00		
437	152.32	152.43	165.07	165.18		
438	158.67	158.78	171.42	171.53		
439	165.02	165.13	177.77	177.88		
440	171.37	171.48	184.12	184.23		
441	177.72	177.83	190.47	190.58		

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Metaplast® Spring Seals
Industrial, Piston and Rod

Dash No.	ØA Rod Dia./ Groove Dia.		ØB Groove Dia./ Bore Dia.		H Groove Height	E Max Diametral Clearance
	Millimeters					
	Min	Max	Min	Max		
442	7.247	7.251	7.749	7.753		
443	7.497	7.501	7.999	8.003		
444	7.747	7.751	8.249	8.253		
445	7.997	8.001	8.499	8.503		
446	8.497	8.501	8.999	9.003		
447	8.997	9.001	9.499	9.503		
448	9.497	9.501	9.999	10.003		
449	9.997	10.001	10.499	10.503		
450	10.497	10.501	10.999	11.003		
451	10.997	11.001	11.499	11.503	0.251	0.010
452	11.497	11.501	11.999	12.003		
453	11.997	12.001	12.499	12.503		
454	12.497	12.501	12.999	13.003		
455	12.997	13.001	13.499	13.503		
456	13.497	13.501	13.999	14.003		
457	13.997	14.001	14.499	14.503		
458	14.497	14.501	14.999	15.003		
459	14.997	15.001	15.499	15.503		
460	15.497	15.501	15.999	16.003		

Dash No.	ØA Rod Dia./ Groove Dia.		ØB Groove Dia./ Bore Dia.		H Groove Height	E Max Diametral Clearance
	Millimeters					
	Min	Max	Min	Max		
442	184.07	184.18	196.82	196.93		
443	190.42	190.53	203.17	203.28		
444	196.77	196.88	209.52	209.63		
445	203.12	203.23	215.87	215.98		
446	215.82	215.93	228.57	228.68		
447	228.52	228.63	241.27	241.38		
448	241.22	241.33	253.97	254.08		
449	253.92	254.03	266.67	266.78		
450	266.62	266.73	279.37	279.48		
451	279.32	279.43	292.07	292.18	6.36	0.25
452	292.02	292.13	304.77	304.88		
453	304.72	304.83	317.47	317.58		
454	317.42	317.53	330.17	330.28		
455	330.12	330.23	342.87	342.98		
456	342.82	342.93	355.57	355.68		
457	355.52	355.63	368.27	368.38		
458	368.22	368.33	380.97	381.08		
459	380.92	381.03	393.67	393.78		
460	393.62	393.73	406.37	406.48		

Depending on ordering quantities, some of the smaller size dash numbers will be furnished with Rosette Springs. Please refer to page 3.4 for more details.

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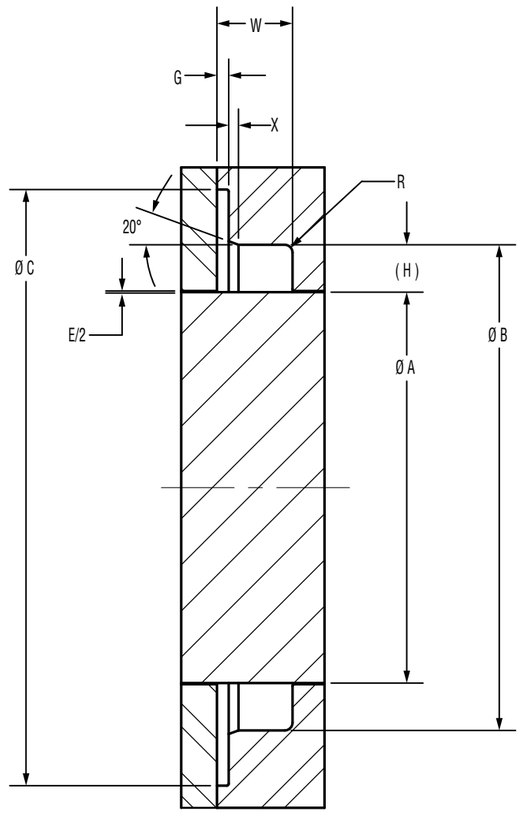
Metaplast Flange Seals

TC888C

- General use unidirectional seal for rotary applications
- Flange type seals are used for static and dynamic applications, mostly used for cryogenic temperatures, typical usage in gate valves, ball valves and globe valves
- Flange design ensures seal does not rotate with shaft and hence premature failure
- Flange geometry allows for material cold flow during assembly without interference with mating hardware
- Consult with CoorsTek Engineering to ensure proper jacket and spring material use for your application's PV value
- Installation requires open groove with generous lead in chamfer – refer to groove sketch
- No stick-slip contact in dynamic surfaces
- Unlimited shelf life
- Flange seal TC888C designed to fit AS4716 rod diameters and extended dash sizes included in catalog



Inches

Dash No.	W Gland Width		G Flange Groove Width		R Corner Radius		X Chamfer
	Min.	Max.	Min.	Max.	Min.	Max.	
004 to 009	0.098	0.103	0.022	0.025	0.005	0.015	0.025
010 to 028	0.094	0.099					
110 to 149	0.141	0.151					
210 to 247	0.188	0.198	0.027	0.030	0.010	0.025	
325 to 349	0.281	0.291	0.037	0.040	0.020	0.035	0.040
424 to 460	0.375	0.385	0.047	0.050			0.050

Millimeters

Dash No.	W Gland Width		G Flange Groove Width		R Corner Radius		X Chamfer
	Min.	Max.	Min.	Max.	Min.	Max.	
004 to 009	2.49	2.62	0.56	0.64	0.13	0.38	0.64
010 to 028	2.39	2.51					
110 to 149	3.58	3.84					
210 to 247	4.78	5.03	0.69	0.76	0.25	0.64	
325 to 349	7.14	7.39	0.94	1.02	0.51	0.89	1.02
424 to 460	9.53	9.78	1.19	1.27			1.27

Inches

Dash No.	ØA Rod Diameter		ØB Groove Diameter		ØC Flange Diameter		H Groove Height	E Max Diametral Clearance
	Min.	Max.	Min.	Max.	Min.	Max.		
004	0.075	0.076	0.190	0.191	0.340	0.360	0.056	0.004
005	0.107	0.108	0.221	0.222	0.372	0.392		
006	0.122	0.123	0.235	0.236	0.387	0.407		
007	0.153	0.154	0.266	0.267	0.418	0.438		
008	0.184	0.185	0.294	0.295	0.449	0.469		
009	0.216	0.217	0.327	0.328	0.481	0.501		
010	0.247	0.248	0.359	0.360	0.512	0.532		
011	0.309	0.310	0.421	0.422	0.574	0.594		
012	0.372	0.373	0.484	0.485	0.637	0.657		
013	0.433	0.435	0.545	0.547	0.699	0.719		0.005
014	0.496	0.498	0.608	0.610	0.762	0.782		
015	0.558	0.560	0.670	0.672	0.824	0.844		
016	0.621	0.623	0.733	0.735	0.887	0.907		
017	0.683	0.685	0.795	0.797	0.949	0.969		
018	0.746	0.748	0.858	0.860	1.012	1.032		
019	0.808	0.810	0.920	0.922	1.074	1.094		

Millimeters

Dash No.	ØA Rod Diameter		ØB Groove Diameter		ØC Flange Diameter		H Groove Height	E Max Diametral Clearance
	Min.	Max.	Min.	Max.	Min.	Max.		
004	1.91	1.93	4.83	4.85	8.64	9.14	1.42	0.10
005	2.72	2.74	5.61	5.64	9.45	9.96		
006	3.10	3.12	5.97	5.99	9.83	10.34		
007	3.89	3.91	6.76	6.78	10.62	11.13		
008	4.67	4.70	7.47	7.49	11.40	11.91		
009	5.49	5.51	8.31	8.33	12.22	12.73		
010	6.27	6.30	9.12	9.14	13.00	13.51		
011	7.85	7.87	10.69	10.72	14.58	15.09		
012	9.45	9.47	12.29	12.32	16.18	16.69		
013	11.00	11.05	13.84	13.89	17.75	18.26		0.13
014	12.60	12.65	15.44	15.49	19.35	19.86		
015	14.17	14.22	17.02	17.07	20.93	21.44		
016	15.77	15.82	18.62	18.67	22.53	23.04		
017	17.35	17.40	20.19	20.24	24.10	24.61		
018	18.95	19.00	21.79	21.84	25.70	26.21		
019	20.52	20.57	23.37	23.42	27.28	27.79		

Inches

Dash No.	ØA Rod Diameter Min.	ØA Rod Diameter Max.	ØB Groove Diameter Min.	ØB Groove Diameter Max.	ØC Flange Diameter Min.	ØC Flange Diameter Max.	H Groove Height	E Max Diametral Clearance
020	0.871	0.873	0.983	0.985	1.137	1.157		
021	0.933	0.935	1.045	1.047	1.199	1.219		
022	0.996	0.998	1.108	1.110	1.262	1.282		
023	1.058	1.060	1.170	1.172	1.324	1.344		
024	1.121	1.123	1.233	1.235	1.387	1.407	0.056	0.005
025	1.183	1.185	1.295	1.297	1.449	1.469		
026	1.246	1.248	1.358	1.360	1.512	1.532		
027	1.308	1.310	1.420	1.422	1.574	1.594		
028	1.371	1.373	1.483	1.485	1.637	1.657		
104	0.12	0.12	0.3	0.3	0.513	0.533		
105	0.15	0.15	0.33	0.33	0.544	0.564		
106	0.18	0.19	0.36	0.36	0.575	0.595		0.004
107	0.22	0.22	0.39	0.39	0.607	0.627		
108	0.25	0.25	0.42	0.42	0.638	0.658		
109	0.31	0.31	0.49	0.49	0.700	0.720		
110	0.371	0.373	0.546	0.548	0.763	0.783		
111	0.433	0.435	0.609	0.611	0.825	0.845		
112	0.496	0.498	0.672	0.674	0.888	0.908		
113	0.558	0.560	0.734	0.736	0.950	0.970		
114	0.621	0.623	0.797	0.799	1.013	1.033		
115	0.683	0.685	0.859	0.861	1.075	1.095		
116	0.746	0.748	0.923	0.925	1.138	1.158	0.088	
117	0.808	0.810	0.985	0.987	1.200	1.220		
118	0.871	0.873	1.048	1.050	1.263	1.283		0.005
119	0.933	0.935	1.110	1.112	1.325	1.345		
120	0.996	0.998	1.173	1.175	1.388	1.408		
121	1.058	1.060	1.235	1.237	1.450	1.470		
122	1.121	1.123	1.298	1.300	1.513	1.533		
123	1.183	1.185	1.360	1.362	1.575	1.595		
124	1.246	1.248	1.423	1.425	1.638	1.658		
125	1.308	1.310	1.485	1.487	1.700	1.720		
126	1.371	1.373	1.548	1.550	1.763	1.783		
127	1.433	1.435	1.610	1.612	1.825	1.845		0.006

Millimeters

Dash No.	ØA Rod Diameter Min.	ØA Rod Diameter Max.	ØB Groove Diameter Min.	ØB Groove Diameter Max.	ØC Flange Diameter Min.	ØC Flange Diameter Max.	H Groove Height	E Max Diametral Clearance
020	22.12	22.17	24.97	25.02	28.88	29.39		
021	23.70	23.75	26.54	26.59	30.45	30.96		
022	25.30	25.35	28.14	28.19	32.05	32.56		
023	26.87	26.92	29.72	29.77	33.63	34.14		
024	28.47	28.52	31.32	31.37	35.23	35.74	1.42	0.13
025	30.05	30.10	32.89	32.94	36.80	37.31		
026	31.65	31.70	34.49	34.54	38.40	38.91		
027	33.22	33.27	36.07	36.12	39.98	40.49		
028	34.82	34.87	37.67	37.72	41.58	42.09		
104	3.10	3.12	7.49	7.52	13.03	13.54		
105	3.89	3.91	8.31	8.33	13.82	14.33		
106	4.67	4.70	9.12	9.14	14.61	15.11		0.10
107	5.49	5.51	9.96	9.98	15.42	15.93		
108	6.27	6.30	10.74	10.77	16.21	16.71		
109	7.85	7.87	12.34	12.37	17.78	18.29		
110	9.42	9.47	13.87	13.92	19.38	19.89		
111	11.00	11.05	15.47	15.52	20.96	21.46		
112	12.60	12.65	17.07	17.12	22.56	23.06		
113	14.17	14.22	18.64	18.69	24.13	24.64		
114	15.77	15.82	20.24	20.29	25.73	26.24		
115	17.35	17.40	21.82	21.87	27.31	27.81		
116	18.95	19.00	23.44	23.50	28.91	29.41	2.24	
117	20.52	20.57	25.02	25.07	30.48	30.99		
118	22.12	22.17	26.62	26.67	32.08	32.59		0.13
119	23.70	23.75	28.19	28.24	33.66	34.16		
120	25.30	25.35	29.79	29.85	35.26	35.76		
121	26.87	26.92	31.37	31.42	36.83	37.34		
122	28.47	28.52	32.97	33.02	38.43	38.94		
123	30.05	30.10	34.54	34.59	40.01	40.51		
124	31.65	31.70	36.14	36.20	41.61	42.11		
125	33.22	33.27	37.72	37.77	43.18	43.69		
126	34.82	34.87	39.32	39.37	44.78	45.29		
127	36.40	36.45	40.89	40.94	46.36	46.86		0.15

Metaplast® Spring Seals
Flange

Inches

Dash No.	ØA Rod Diameter Min.	ØA Rod Diameter Max.	ØB Groove Diameter Min.	ØB Groove Diameter Max.	ØC Flange Diameter Min.	ØC Flange Diameter Max.	H Groove Height	E Max Diametral Clearance
128	1.496	1.498	1.673	1.675	1.888	1.908		
129	1.558	1.560	1.735	1.737	1.950	1.970		
130	1.621	1.623	1.798	1.800	2.013	2.033		0.006
131	1.683	1.685	1.860	1.862	2.075	2.095		
132	1.746	1.748	1.923	1.925	2.138	2.158		
133	1.808	1.810	1.984	1.986	2.200	2.220		
134	1.871	1.873	2.047	2.049	2.263	2.283		
135	1.934	1.936	2.110	2.112	2.326	2.346		
136	1.996	1.998	2.172	2.174	2.388	2.408		
137	2.059	2.061	2.235	2.237	2.451	2.471		
138	2.121	2.123	2.297	2.299	2.513	2.533	0.088	0.007
139	2.184	2.186	2.360	2.362	2.576	2.596		
140	2.246	2.248	2.422	2.424	2.638	2.658		
141	2.309	2.311	2.485	2.487	2.701	2.721		
142	2.371	2.373	2.547	2.549	2.763	2.783		
143	2.434	2.436	2.610	2.612	2.826	2.846		
144	2.496	2.498	2.672	2.674	2.888	2.908		
145	2.559	2.561	2.735	2.737	2.951	2.971		
146	2.621	2.623	2.797	2.799	3.013	3.033		
147	2.684	2.686	2.860	2.862	3.076	3.096		0.007
148	2.746	2.748	2.922	2.924	3.138	3.158		
149	2.809	2.811	2.985	2.987	3.201	3.221		
210	0.746	0.748	0.989	0.991	1.272	1.292		
211	0.808	0.810	1.051	1.053	1.334	1.354		
212	0.871	0.873	1.115	1.117	1.397	1.417		
213	0.933	0.935	1.177	1.179	1.459	1.479		
214	0.996	0.998	1.240	1.242	1.522	1.542		
215	1.058	1.060	1.302	1.304	1.584	1.604	0.122	0.005
216	1.121	1.123	1.365	1.367	1.647	1.667		
217	1.183	1.185	1.427	1.429	1.709	1.729		
218	1.246	1.248	1.490	1.492	1.772	1.792		
219	1.308	1.310	1.552	1.554	1.834	1.854		
220	1.371	1.373	1.615	1.617	1.897	1.917		

Millimeters

Dash No.	ØA Rod Diameter Min.	ØA Rod Diameter Max.	ØB Groove Diameter Min.	ØB Groove Diameter Max.	ØC Flange Diameter Min.	ØC Flange Diameter Max.	H Groove Height	E Max Diametral Clearance
128	38.00	38.05	42.49	42.55	47.96	48.46		
129	39.57	39.62	44.07	44.12	49.53	50.04		
130	41.17	41.22	45.67	45.72	51.13	51.64		0.15
131	42.75	42.80	47.24	47.29	52.71	53.21		
132	44.35	44.40	48.84	48.90	54.31	54.81		
133	45.92	45.97	50.39	50.44	55.88	56.39		
134	47.52	47.57	51.99	52.04	57.48	57.99		
135	49.12	49.17	53.59	53.64	59.08	59.59		
136	50.70	50.75	55.17	55.22	60.66	61.16		
137	52.30	52.35	56.77	56.82	62.26	62.76		
138	53.87	53.92	58.34	58.39	63.83	64.34	2.24	0.18
139	55.47	55.52	59.94	59.99	65.43	65.94		
140	57.05	57.10	61.52	61.57	67.01	67.51		
141	58.65	58.70	63.12	63.17	68.61	69.11		
142	60.22	60.27	64.69	64.74	70.18	70.69		
143	61.82	61.87	66.29	66.34	71.78	72.29		
144	63.40	63.45	67.87	67.92	73.36	73.86		
145	65.00	65.05	69.47	69.52	74.96	75.46		
146	66.57	66.62	71.04	71.09	76.53	77.04		
147	68.17	68.22	72.64	72.69	78.13	78.64		0.18
148	69.75	69.80	74.22	74.27	79.71	80.21		
149	71.35	71.40	75.82	75.87	81.31	81.81		
210	18.95	19.00	25.12	25.17	32.31	32.82		
211	20.52	20.57	26.70	26.75	33.88	34.39		
212	22.12	22.17	28.32	28.37	35.48	35.99		
213	23.70	23.75	29.90	29.95	37.06	37.57		
214	25.30	25.35	31.50	31.55	38.66	39.17		
215	26.87	26.92	33.07	33.12	40.23	40.74	3.09	0.13
216	28.47	28.52	34.67	34.72	41.83	42.34		
217	30.05	30.10	36.25	36.30	43.41	43.92		
218	31.65	31.70	37.85	37.90	45.01	45.52		
219	33.22	33.27	39.42	39.47	46.58	47.09		
220	34.82	34.87	41.02	41.07	48.18	48.69		

Flange

Dash No.	ØA Rod Diameter		ØB Groove Diameter		ØC Flange Diameter		H Groove Height	E Max Diametral Clearance
	Min.	Max.	Min.	Max.	Min.	Max.		
221	1.433	1.435	1.677	1.679	1.959	1.979		0.005
222	1.496	1.498	1.740	1.742	2.022	2.042		
223	1.621	1.623	1.865	1.867	2.147	2.167		0.006
224	1.746	1.748	1.990	1.992	2.272	2.292		
225	1.871	1.873	2.115	2.117	2.397	2.417		
226	1.996	1.998	2.240	2.242	2.522	2.542		
227	2.121	2.123	2.365	2.367	2.647	2.667		
228	2.246	2.248	2.490	2.492	2.772	2.792		
229	2.371	2.373	2.615	2.617	2.897	2.917		
230	2.496	2.498	2.740	2.742	3.022	3.042		
231	2.621	2.623	2.865	2.867	3.147	3.167		0.007
232	2.746	2.748	2.990	2.992	3.272	3.292		
233	2.871	2.873	3.115	3.117	3.397	3.417		
234	2.995	2.997	3.239	3.241	3.521	3.541	0.122	
235	3.120	3.122	3.364	3.366	3.646	3.666		
236	3.245	3.247	3.489	3.491	3.771	3.791		
237	3.370	3.372	3.614	3.616	3.896	3.916		
238	3.495	3.497	3.739	3.741	4.021	4.041		
239	3.620	3.622	3.864	3.866	4.146	4.166		
240	3.745	3.747	3.989	3.991	4.271	4.291		
241	3.870	3.872	4.114	4.116	4.396	4.416		0.007
242	3.995	3.997	4.239	4.241	4.521	4.541		
243	4.120	4.122	4.364	4.366	4.646	4.666		
244	4.245	4.247	4.489	4.491	4.771	4.791		
245	4.370	4.372	4.614	4.616	4.896	4.916		
246	4.495	4.497	4.739	4.741	5.021	5.041		0.008
247	4.620	4.622	4.864	4.866	5.146	5.166		
325	1.496	1.498	1.870	1.872	2.274	2.294		0.006
326	1.621	1.623	1.995	1.997	2.399	2.419		
327	1.746	1.748	2.120	2.122	2.524	2.544	0.187	
328	1.871	1.873	2.245	2.247	2.649	2.669		0.007
329	1.996	1.998	2.370	2.372	2.774	2.794		
330	2.121	2.123	2.495	2.497	2.899	2.919		

Inches

Dash No.	ØA Rod Diameter		ØB Groove Diameter		ØC Flange Diameter		H Groove Height	E Max Diametral Clearance
	Min.	Max.	Min.	Max.	Min.	Max.		
221	36.40	36.45	42.60	42.65	49.76	50.27		0.13
222	38.00	38.05	44.20	44.25	51.36	51.87		
223	41.17	41.22	47.37	47.42	54.53	55.04		0.15
224	44.35	44.40	50.55	50.60	57.71	58.22		
225	47.52	47.57	53.72	53.77	60.88	61.39		
226	50.70	50.75	56.90	56.95	64.06	64.57		
227	53.87	53.92	60.07	60.12	67.23	67.74		
228	57.05	57.10	63.25	63.30	70.41	70.92		
229	60.22	60.27	66.42	66.47	73.58	74.09		
230	63.40	63.45	69.60	69.65	76.76	77.27		
231	66.57	66.62	72.77	72.82	79.93	80.44		0.18
232	69.75	69.80	75.95	76.00	83.11	83.62		
233	72.92	72.97	79.12	79.17	86.28	86.79		
234	76.07	76.12	82.27	82.32	89.43	89.94	3.09	
235	79.25	79.30	85.45	85.50	92.61	93.12		
236	82.42	82.47	88.62	88.67	95.78	96.29		
237	85.60	85.65	91.80	91.85	98.96	99.47		
238	88.77	88.82	94.97	95.02	102.13	102.64		
239	91.95	92.00	98.15	98.20	105.31	105.82		
240	95.12	95.17	101.32	101.37	108.48	108.99		
241	98.30	98.35	104.50	104.55	111.66	112.17		0.18
242	101.47	101.52	107.67	107.72	114.83	115.34		
243	104.65	104.70	110.85	110.90	118.01	118.52		
244	107.82	107.87	114.02	114.07	121.18	121.69		
245	111.00	111.05	117.20	117.25	124.36	124.87		
246	114.17	114.22	120.37	120.42	127.53	128.04		0.20
247	117.35	117.40	123.55	123.60	130.71	131.22		
325	38.00	38.05	47.50	47.55	57.76	58.27		
326	41.17	41.22	50.67	50.72	60.93	61.44		0.15
327	44.35	44.40	53.85	53.90	64.11	64.62	4.75	
328	47.52	47.57	57.02	57.07	67.28	67.79		0.18
329	50.70	50.75	60.20	60.25	70.46	70.97		
330	53.87	53.92	63.37	63.42	73.63	74.14		

Millimeters

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Metaplast® Spring Seals

Flange

Dash No.	ØA Rod Diameter		ØB Groove Diameter		ØC Flange Diameter		H Groove Height	E Max Diametral Clearance
	Min.	Max.	Min.	Max.	Min.	Max.		
331	2.246	2.248	2.620	2.622	3.024	3.044		
332	2.371	2.373	2.745	2.747	3.149	3.169		
333	2.496	2.498	2.870	2.872	3.274	3.294		
334	2.621	2.623	2.995	2.997	3.399	3.419		
335	2.746	2.748	3.120	3.122	3.524	3.544		
336	2.871	2.873	3.245	3.247	3.649	3.669		
337	2.995	2.997	3.369	3.371	3.773	3.793		
338	3.120	3.122	3.494	3.496	3.898	3.918		
339	3.245	3.247	3.619	3.621	4.023	4.043		
340	3.370	3.372	3.744	3.746	4.148	4.168	0.187	0.007
341	3.495	3.497	3.869	3.871	4.273	4.293		
342	3.620	3.622	3.994	3.996	4.398	4.418		
343	3.745	3.747	4.119	4.121	4.523	4.543		
344	3.870	3.872	4.244	4.246	4.648	4.668		
345	3.995	3.997	4.369	4.371	4.773	4.793		
346	4.120	4.122	4.494	4.496	4.898	4.918		
347	4.245	4.247	4.619	4.621	5.023	5.043		
348	4.370	4.372	4.744	4.746	5.148	5.168		
349	4.495	4.497	4.869	4.871	5.273	5.293		
425	4.494	4.497	4.974	4.977	5.517	5.537		
426	4.619	4.622	5.099	5.102	5.642	5.662		
427	4.744	4.747	5.224	5.227	5.767	5.787		
428	4.869	4.872	5.349	5.352	5.892	5.912		
429	4.994	4.997	5.474	5.477	6.017	6.037		
430	5.119	5.122	5.599	5.602	6.142	6.162		
431	5.244	5.247	5.724	5.727	6.267	6.287	0.240	0.009
432	5.369	5.372	5.849	5.852	6.392	6.412		
433	5.494	5.497	5.974	5.977	6.517	6.537		
434	5.619	5.622	6.099	6.102	6.642	6.662		
435	5.744	5.747	6.224	6.227	6.767	6.787		
436	5.869	5.872	6.349	6.352	6.892	6.912		
437	5.994	5.997	6.474	6.477	7.017	7.037		
438	6.244	6.247	6.724	6.727	7.267	7.287		

Inches

Dash No.	ØA Rod Diameter		ØB Groove Diameter		ØC Flange Diameter		H Groove Height	E Max Diametral Clearance
	Min.	Max.	Min.	Max.	Min.	Max.		
331	57.05	57.10	66.55	66.60	76.81	77.32		
332	60.22	60.27	69.72	69.77	79.98	80.49		
333	63.40	63.45	72.90	72.95	83.16	83.67		
334	66.57	66.62	76.07	76.12	86.33	86.84		
335	69.75	69.80	79.25	79.30	89.51	90.02		
336	72.92	72.97	82.42	82.47	92.68	93.19		
337	76.07	76.12	85.57	85.62	95.83	96.34		
338	79.25	79.30	88.75	88.80	99.01	99.52		
339	82.42	82.47	91.92	91.97	102.18	102.69		
340	85.60	85.65	95.10	95.15	105.36	105.87	4.75	0.18
341	88.77	88.82	98.27	98.32	108.53	109.04		
342	91.95	92.00	101.45	101.50	111.71	112.22		
343	95.12	95.17	104.62	104.67	114.88	115.39		
344	98.30	98.35	107.80	107.85	118.06	118.57		
345	101.47	101.52	110.97	111.02	121.23	121.74		
346	104.65	104.70	114.15	114.20	124.41	124.92		
347	107.82	107.87	117.32	117.37	127.58	128.09		
348	111.00	111.05	120.50	120.55	130.76	131.27		
349	114.17	114.22	123.67	123.72	133.93	134.44		
425	114.15	114.22	126.34	126.42	140.13	140.64		
426	117.32	117.40	129.51	129.59	143.31	143.81		
427	120.50	120.57	132.69	132.77	146.48	146.99		
428	123.67	123.75	135.86	135.94	149.66	150.16		
429	126.85	126.92	139.04	139.12	152.83	153.34		
430	130.02	130.10	142.21	142.29	156.01	156.51		
431	133.20	133.27	145.39	145.47	159.18	159.69		
432	136.37	136.45	148.56	148.64	162.36	162.86	6.10	0.23
433	139.55	139.62	151.74	151.82	165.53	166.04		
434	142.72	142.80	154.91	154.99	168.71	169.21		
435	145.90	145.97	158.09	158.17	171.88	172.39		
436	149.07	149.15	161.26	161.34	175.06	175.56		
437	152.25	152.32	164.44	164.52	178.23	178.74		
438	158.60	158.67	170.79	170.87	184.58	185.09		

Millimeters

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Dash No.	ØA Rod Diameter		ØB Groove Diameter		ØC Flange Diameter		H Groove Height	E Max Diametral Clearance
	Min.	Max.	Min.	Max.	Min.	Max.		
439	6.494	6.497	6.974	6.977	7.517	7.537		
440	6.744	6.747	7.224	7.227	7.767	7.787		
441	6.994	6.997	7.474	7.477	8.017	8.037		
442	7.244	7.247	7.724	7.727	8.267	8.287		
443	7.494	7.497	7.974	7.977	8.517	8.537		
444	7.744	7.747	8.224	8.227	8.767	8.787		
445	7.994	7.997	8.474	8.477	9.017	9.037		
446	8.494	8.497	8.977	8.974	9.517	9.537		
447	8.994	8.997	9.474	9.478	10.017	10.037		
448	9.494	9.497	9.974	9.978	10.517	10.537		
449	9.994	9.997	10.474	10.478	11.017	11.037	0.240	0.010
450	10.494	10.497	10.974	10.978	11.517	11.537		
451	10.994	10.997	11.474	11.478	12.017	12.037		
452	11.494	11.497	11.974	11.978	12.517	12.537		
453	11.994	11.997	12.474	12.478	13.017	13.037		
454	12.494	12.497	12.974	12.978	13.517	13.537		
455	12.994	12.997	13.474	13.478	14.017	14.037		
456	13.494	13.497	13.974	13.978	14.517	14.537		
457	13.994	13.997	14.474	14.478	15.017	15.037		
458	14.494	14.497	14.974	14.978	15.517	15.537		
459	14.994	14.997	15.474	15.478	16.017	16.037		
460	15.494	15.497	15.974	15.978	16.517	16.537		

Inches

Dash No.	ØA Rod Diameter		ØB Groove Diameter		ØC Flange Diameter		H Groove Height	E Max Diametral Clearance
	Min.	Max.	Min.	Max.	Min.	Max.		
439	164.95	165.02	177.14	177.22	190.93	191.44		
440	171.30	171.37	183.49	183.57	197.28	197.79		
441	177.65	177.72	189.84	189.92	203.63	204.14		
442	184.00	184.07	196.19	196.27	209.98	210.49		
443	190.35	190.42	202.54	202.62	216.33	216.84		
444	196.70	196.77	208.89	208.97	222.68	223.19		
445	203.05	203.12	215.24	215.32	229.03	229.54		
446	215.75	215.82	228.02	227.94	241.73	242.24		
447	228.45	228.52	240.64	240.74	254.43	254.94		
448	241.15	241.22	253.34	253.44	267.13	267.64		
449	253.85	253.92	266.04	266.14	279.83	280.34	6.10	0.25
450	266.55	266.62	278.74	278.84	292.53	293.04		
451	279.25	279.32	291.44	291.54	305.23	305.74		
452	291.95	292.02	304.14	304.24	317.93	318.44		
453	304.65	304.72	316.84	316.94	330.63	331.14		
454	317.35	317.42	329.54	329.64	343.33	343.84		
455	330.05	330.12	342.24	342.34	356.03	356.54		
456	342.75	342.82	354.94	355.04	368.73	369.24		
457	355.45	355.52	367.64	367.74	381.43	381.94		
458	368.15	368.22	380.34	380.44	394.13	394.64		
459	380.85	380.92	393.04	393.14	406.83	407.34		
460	393.55	393.62	405.74	405.84	419.53	420.04		

Millimeters

Depending on ordering quantities, some of the smaller size dash numbers will be furnished with Rosette Springs. Please refer to page 3.4 for more details.

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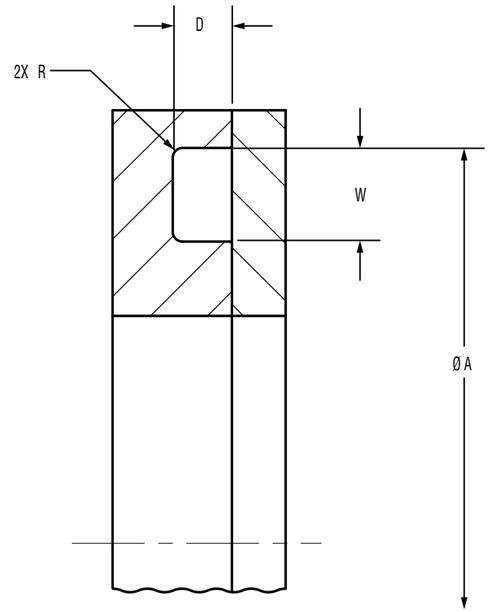
Metaplast Face Seals

TC888F

- Inside pressure face seals are used for sealing flange face to face glands where pressure is internal
- Can be used in conjunction with a back-up ring, please contact CoorsTek Engineering
- Jacket and spring materials make these seals the best option for virtually all fluids
- Unlimited shelf life
- Variable spring thickness and proprietary design ensure excellent sealing performance from cryogenic temperatures to ~600 °F
- Extremely simple installation in open groove hardware
- No stick-slip contact in dynamic surfaces



Dash No.	W Gland Width		D Gland Depth		R Corner Radius	
	Min.	Max.	Min.	Max.	Min.	Max.
008 to 045	0.094	0.104	0.056	0.058	0.005	0.015
110 to 163	0.141	0.151	0.089	0.091		
210 to 281	0.188	0.198	0.121	0.123	0.010	0.025
325 to 384	0.281	0.291	0.186	0.188	0.020	0.030
417 to 460	0.375	0.385	0.238	0.241		

Inches

Dash No.	W Gland Width		D Gland Depth		R Corner Radius	
	Min.	Max.	Min.	Max.	Min.	Max.
008 to 045	2.30	2.55	1.37	1.42	0.12	0.37
110 to 163	3.45	3.70	2.18	2.23		
210 to 281	4.61	4.85	2.96	3.01	0.25	0.61
325 to 384	6.88	7.13	4.56	4.61	0.49	0.74
417 to 460	9.19	9.43	5.83	5.90		

Millimeters

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Metaplast® Spring Seals

Face, Internal Pressure

Inches		
Dash No.	ØA Groove Dia.	
	Min.	Max.
008	0.312	0.322
009	0.343	0.353
010	0.375	0.385
011	0.437	0.447
012	0.500	0.510
013	0.562	0.572
014	0.625	0.635
015	0.687	0.697
016	0.750	0.760
017	0.812	0.822
018	0.875	0.885
019	0.937	0.947
020	1.000	1.010
021	1.062	1.072
022	1.125	1.135
023	1.187	1.197
024	1.250	1.260
025	1.312	1.322
026	1.375	1.385
027	1.437	1.447
028	1.500	1.510
029	1.625	1.635
030	1.750	1.760
031	1.875	1.885
032	2.000	2.010
033	2.125	2.135
034	2.250	2.260
035	2.375	2.385
036	2.500	2.510
037	2.625	2.635
038	2.750	2.760
039	2.875	2.885
040	3.000	3.010

Millimeters		
Dash No.	ØA Groove Dia.	
	Min.	Max.
008	7.92	8.18
009	8.71	8.97
010	9.53	9.78
011	11.10	11.35
012	12.70	12.95
013	14.27	14.53
014	15.88	16.13
015	17.45	17.70
016	19.05	19.30
017	20.62	20.88
018	22.23	22.48
019	23.80	24.05
020	25.40	25.65
021	26.97	27.23
022	28.58	28.83
023	30.15	30.40
024	31.75	32.00
025	33.32	33.58
026	34.93	35.18
027	36.50	36.75
028	38.10	38.35
029	41.28	41.53
030	44.45	44.70
031	47.63	47.88
032	50.80	51.05
033	53.98	54.23
034	57.15	57.40
035	60.33	60.58
036	63.50	63.75
037	66.68	66.93
038	69.85	70.10
039	73.03	73.28
040	76.20	76.45

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Face, Internal Pressure

Inches		
Dash No.	ØA Groove Dia.	
	Min.	Max.
041	3.125	3.135
042	3.375	3.385
043	3.625	3.635
044	3.875	3.885
045	4.125	4.135
110	0.562	0.572
111	0.625	0.635
112	0.687	0.697
113	0.750	0.760
114	0.812	0.822
115	0.875	0.885
116	0.937	0.947
117	1.000	1.010
118	1.062	1.072
119	1.125	1.135
120	1.187	1.197
121	1.250	1.260
122	1.312	1.322
123	1.375	1.385
124	1.437	1.447
125	1.500	1.510
126	1.562	1.572
127	1.625	1.635
128	1.687	1.697
129	1.750	1.760
130	1.812	1.822
131	1.875	1.885
132	1.937	1.947
133	2.000	2.010
134	2.062	2.072
135	2.125	2.135
136	2.187	2.197
137	2.250	2.260

Millimeters		
Dash No.	ØA Groove Dia.	
	Min.	Max.
041	79.38	79.63
042	85.73	85.98
043	92.08	92.33
044	98.43	98.68
045	104.78	105.03
110	14.27	14.53
111	15.88	16.13
112	17.45	17.70
113	19.05	19.30
114	20.62	20.88
115	22.23	22.48
116	23.80	24.05
117	25.40	25.65
118	26.97	27.23
119	28.58	28.83
120	30.15	30.40
121	31.75	32.00
122	33.32	33.58
123	34.93	35.18
124	36.50	36.75
125	38.10	38.35
126	39.67	39.93
127	41.28	41.53
128	42.85	43.10
129	44.45	44.70
130	46.02	46.28
131	47.63	47.88
132	49.20	49.45
133	50.80	51.05
134	52.37	52.63
135	53.98	54.23
136	55.55	55.80
137	57.15	57.40

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Metaplast® Spring Seals

Face, Internal Pressure

Inches		
Dash No.	ØA Groove Dia.	
	Min.	Max.
138	2.312	2.322
139	2.375	2.385
140	2.437	2.447
141	2.500	2.510
142	2.562	2.572
143	2.625	2.635
144	2.687	2.697
145	2.750	2.760
146	2.812	2.822
147	2.875	2.885
148	2.937	2.947
149	3.000	3.010
150	3.062	3.072
151	3.187	3.197
152	3.437	3.447
153	3.687	3.697
154	3.937	3.947
155	4.187	4.197
156	4.437	4.447
157	4.687	4.697
158	4.937	4.947
159	5.187	5.197
160	5.437	5.447
161	5.687	5.697
162	5.937	5.947
163	6.187	6.197
210	1.000	1.010
211	1.062	1.072
212	1.125	1.135
213	1.187	1.197
214	1.250	1.260
215	1.312	1.322
216	1.375	1.385

Millimeters		
Dash No.	ØA Groove Dia.	
	Min.	Max.
138	58.72	58.98
139	60.33	60.58
140	61.90	62.15
141	63.50	63.75
142	65.07	65.33
143	66.68	66.93
144	68.25	68.50
145	69.85	70.10
146	71.42	71.68
147	73.03	73.28
148	74.60	74.85
149	76.20	76.45
150	77.77	78.03
151	80.95	81.20
152	87.30	87.55
153	93.65	93.90
154	100.00	100.25
155	106.35	106.60
156	112.70	112.95
157	119.05	119.30
158	125.40	125.65
159	131.75	132.00
160	138.10	138.35
161	144.45	144.70
162	150.80	151.05
163	157.15	157.40
210	25.40	25.65
211	26.97	27.23
212	28.58	28.83
213	30.15	30.40
214	31.75	32.00
215	33.32	33.58
216	34.93	35.18

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Face, Internal Pressure

Inches		
Dash No.	ØA Groove Dia.	
	Min.	Max.
217	1.437	1.447
218	1.500	1.510
219	1.562	1.572
220	1.625	1.635
221	1.687	1.697
222	1.750	1.760
223	1.875	1.885
224	2.000	2.010
225	2.125	2.135
226	2.250	2.260
227	2.375	2.385
228	2.500	2.510
229	2.625	2.635
230	2.750	2.760
231	2.875	2.885
232	3.000	3.010
233	3.125	3.135
234	3.250	3.260
235	3.375	3.385
236	3.500	3.510
237	3.625	3.635
238	3.750	3.760
239	3.875	3.885
240	4.000	4.010
241	4.125	4.135
242	4.250	4.260
243	4.375	4.385
244	4.500	4.510
245	4.625	4.635
246	4.750	4.760
247	4.875	4.885
248	5.000	5.010
249	5.125	5.135

Millimeters		
Dash No.	ØA Groove Dia.	
	Min.	Max.
217	36.50	36.75
218	38.10	38.35
219	39.67	39.93
220	41.28	41.53
221	42.85	43.10
222	44.45	44.70
223	47.63	47.88
224	50.80	51.05
225	53.98	54.23
226	57.15	57.40
227	60.33	60.58
228	63.50	63.75
229	66.68	66.93
230	69.85	70.10
231	73.03	73.28
232	76.20	76.45
233	79.38	79.63
234	82.55	82.80
235	85.73	85.98
236	88.90	89.15
237	92.08	92.33
238	95.25	95.50
239	98.43	98.68
240	101.60	101.85
241	104.78	105.03
242	107.95	108.20
243	111.13	111.38
244	114.30	114.55
245	117.48	117.73
246	120.65	120.90
247	123.83	124.08
248	127.00	127.25
249	130.18	130.43

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Metaplast® Spring Seals

Face, Internal Pressure

Inches			Millimeters		
Dash No.	ØA Groove Dia.		Dash No.	ØA Groove Dia.	
	Min.	Max.		Min.	Max.
250	5.250	5.260	**250**	133.35	133.60
251	5.375	5.385	**251**	136.53	136.78
252	5.500	5.510	**252**	139.70	139.95
253	5.625	5.635	**253**	142.88	143.13
254	5.750	5.760	**254**	146.05	146.30
255	5.875	5.885	**255**	149.23	149.48
256	6.000	6.010	**256**	152.40	152.65
257	6.125	6.135	**257**	155.58	155.83
258	6.250	6.260	**258**	158.75	159.00
259	6.500	6.510	**259**	165.10	165.35
260	6.750	6.760	**260**	171.45	171.70
261	7.000	7.010	**261**	177.80	178.05
262	7.250	7.260	**262**	184.15	184.40
263	7.500	7.510	**263**	190.50	190.75
264	7.750	7.760	**264**	196.85	197.10
265	8.000	8.010	**265**	203.20	203.45
266	8.250	8.260	**266**	209.55	209.80
267	8.500	8.510	**267**	215.90	216.15
268	8.750	8.760	**268**	222.25	222.50
269	9.000	9.010	**269**	228.60	228.85
270	9.250	9.260	**270**	234.95	235.20
271	9.500	9.510	**271**	241.30	241.55
272	9.750	9.760	**272**	247.65	247.90
273	10.000	10.010	**273**	254.00	254.25
274	10.250	10.260	**274**	260.35	260.60
275	10.750	10.760	**275**	273.05	273.30
276	11.250	11.260	**276**	285.75	286.00
277	11.750	11.760	**277**	298.45	298.70
278	12.250	12.260	**278**	311.15	311.40
279	12.750	12.760	**279**	323.85	324.10
280	13.250	13.260	**280**	336.55	336.80
281	13.750	13.760	**281**	349.25	349.50
325	1.875	1.885	**325**	47.63	47.88

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Metaplast® Spring Seals

Face, Internal Pressure

Inches			Millimeters		
Dash No.	ØA Groove Dia.		Dash No.	ØA Groove Dia.	
	Min.	Max.		Min.	Max.
326	2.000	2.010	**326**	50.80	51.05
327	2.125	2.135	**327**	53.98	54.23
328	2.250	2.260	**328**	57.15	57.40
329	2.375	2.385	**329**	60.33	60.58
330	2.500	2.510	**330**	63.50	63.75
331	2.625	2.635	**331**	66.68	66.93
332	2.750	2.760	**332**	69.85	70.10
333	2.875	2.885	**333**	73.03	73.28
334	3.000	3.010	**334**	76.20	76.45
335	3.125	3.135	**335**	79.38	79.63
336	3.250	3.260	**336**	82.55	82.80
337	3.375	3.385	**337**	85.73	85.98
338	3.500	3.510	**338**	88.90	89.15
339	3.625	3.635	**339**	92.08	92.33
340	3.750	3.760	**340**	95.25	95.50
341	3.875	3.885	**341**	98.43	98.68
342	4.000	4.010	**342**	101.60	101.85
343	4.125	4.135	**343**	104.78	105.03
344	4.250	4.260	**344**	107.95	108.20
345	4.375	4.385	**345**	111.13	111.38
346	4.500	4.510	**346**	114.30	114.55
347	4.625	4.635	**347**	117.48	117.73
348	4.750	4.760	**348**	120.65	120.90
349	4.875	4.885	**349**	123.83	124.08
350	5.000	5.010	**350**	127.00	127.25
351	5.125	5.135	**351**	130.18	130.43
352	5.250	5.260	**352**	133.35	133.60
353	5.375	5.385	**353**	136.53	136.78
354	5.500	5.510	**354**	139.70	139.95
355	5.625	5.635	**355**	142.88	143.13
356	5.750	5.760	**356**	146.05	146.30
357	5.875	5.885	**357**	149.23	149.48
358	6.000	6.010	**358**	152.40	152.65

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Metaplast® Spring Seals

Face, Internal Pressure

Inches		
Dash No.	ØA Groove Dia.	
	Min.	Max.
359	6.125	6.135
360	6.250	6.260
361	6.500	6.510
362	6.750	6.760
363	7.000	7.010
364	7.250	7.260
365	7.500	7.510
366	7.750	7.760
367	8.000	8.010
368	8.250	8.260
369	8.500	8.510
370	8.750	8.760
371	9.000	9.010
372	9.250	9.260
373	9.500	9.510
374	9.750	9.760
375	10.000	10.010
376	10.250	10.260
377	10.500	10.510
378	10.750	10.760
379	11.000	11.010
380	11.500	11.510
381	12.000	12.010
382	12.500	12.510
383	13.000	13.010
384	13.500	13.510
417	4.000	4.010
418	4.125	4.135
419	4.250	4.260
420	4.375	4.385
421	4.500	4.510
422	4.625	4.635
423	4.750	4.760

Millimeters		
Dash No.	ØA Groove Dia.	
	Min.	Max.
359	155.58	155.83
360	158.75	159.00
361	165.10	165.35
362	171.45	171.70
363	177.80	178.05
364	184.15	184.40
365	190.50	190.75
366	196.85	197.10
367	203.20	203.45
368	209.55	209.80
369	215.90	216.15
370	222.25	222.50
371	228.60	228.85
372	234.95	235.20
373	241.30	241.55
374	247.65	247.90
375	254.00	254.25
376	260.35	260.60
377	266.70	266.95
378	273.05	273.30
379	279.40	279.65
380	292.10	292.35
381	304.80	305.05
382	317.50	317.75
383	330.20	330.45
384	342.90	343.15
417	101.60	101.85
418	104.78	105.03
419	107.95	108.20
420	111.13	111.38
421	114.30	114.55
422	117.48	117.73
423	120.65	120.90

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Metaplast® Spring Seals

Face, Internal Pressure

Inches		
Dash No.	ØA Groove Dia.	
	Min.	Max.
424	4.875	4.885
425	5.000	5.010
426	5.125	5.135
427	5.250	5.260
428	5.375	5.385
429	5.500	5.510
430	5.625	5.635
431	5.750	5.760
432	5.875	5.885
433	6.000	6.010
434	6.125	6.135
435	6.250	6.260
436	6.375	6.385
437	6.500	6.510
438	6.750	6.760
439	7.000	7.010
440	7.250	7.260
441	7.500	7.510
442	7.750	7.760
443	8.000	8.010
444	8.250	8.260
445	8.500	8.510
446	9.000	9.010
447	9.500	9.510
448	10.000	10.010
449	10.500	10.510
450	11.000	11.010
451	11.500	11.510
452	12.000	12.010
453	12.500	12.510
454	13.000	13.010
455	13.500	13.510
456	14.000	14.010

Millimeters		
Dash No.	ØA Groove Dia.	
	Min.	Max.
424	123.83	124.08
425	127.00	127.25
426	130.18	130.43
427	133.35	133.60
428	136.53	136.78
429	139.70	139.95
430	142.88	143.13
431	146.05	146.30
432	149.23	149.48
433	152.40	152.65
434	155.58	155.83
435	158.75	159.00
436	161.93	162.18
437	165.10	165.35
438	171.45	171.70
439	177.80	178.05
440	184.15	184.40
441	190.50	190.75
442	196.85	197.10
443	203.20	203.45
444	209.55	209.80
445	215.90	216.15
446	228.60	228.85
447	241.30	241.55
448	254.00	254.25
449	266.70	266.95
450	279.40	279.65
451	292.10	292.35
452	304.80	305.05
453	317.50	317.75
454	330.20	330.45
455	342.90	343.15
456	355.60	355.85

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Metaplast® Spring Seals

Face, Internal Pressure

Inches			Millimeters		
Dash No.	ØA Groove Dia.		Dash No.	ØA Groove Dia.	
	Min.	Max.		Min.	Max.
457	14.500	14.510	**457**	368.30	368.55
458	15.000	15.010	**458**	381.00	381.25
459	15.500	15.510	**459**	393.70	393.95
460	16.000	16.010	**460**	406.40	406.65

Depending on ordering quantities, some of the smaller size dash numbers will be furnished with Rosette Springs. Please refer to page 3.4 for more details.

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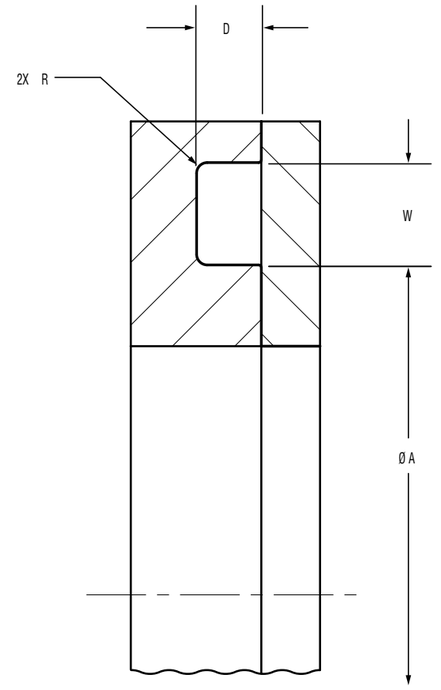
Metaplast Face Seals

TC888E

- Outside face type flange seals are used for sealing external pressure, as in internal vacuum chambers
- Unlimited shelf life
- Can be used in conjunction with a back-up ring, please contact CoorsTek Engineering
- Jacket and spring materials make these seals the best option for virtually all fluids
- Variable spring thickness and proprietary design ensure excellent sealing performance from cryogenic temperatures to ~600 °F
- Extremely simple installation in open groove hardware
- No stick-slip contact in dynamic surfaces



Inches						
Dash No.	W Gland Width		D Gland Depth		R Corner Radius	
	Min.	Max.	Min.	Max.	Min.	Max.
008 to 045	0.094	0.104	0.056	0.058	0.005	0.015
110 to 163	0.141	0.151	0.089	0.091		
210 to 281	0.188	0.198	0.121	0.123	0.010	0.025
325 to 384	0.281	0.291	0.186	0.188	0.020	0.030
417 to 460	0.375	0.385	0.238	0.241		

Millimeters						
Dash No.	W Gland Width		D Gland Depth		R Corner Radius	
	Min.	Max.	Min.	Max.	Min.	Max.
008 to 045	2.39	2.64	1.42	1.47	0.13	0.38
110 to 163	3.58	3.84	2.26	2.31		
210 to 281	4.78	5.03	3.07	3.12	0.25	0.64
325 to 384	7.14	7.39	4.72	4.78	0.51	0.76
417 to 460	9.53	9.78	6.05	6.12		

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Metaplast® Spring Seals

Face, External Pressure

Inches		
Dash No.	ØA Groove Dia.	
	Min.	Max.
008	0.177	0.187
009	0.208	0.218
010	0.240	0.250
011	0.302	0.312
012	0.365	0.375
013	0.427	0.437
014	0.490	0.500
015	0.552	0.562
016	0.615	0.625
017	0.677	0.687
018	0.740	0.750
019	0.802	0.812
020	0.865	0.875
021	0.927	0.937
022	0.990	1.000
023	1.052	1.062
024	1.115	1.125
025	1.177	1.187
026	1.240	1.250
027	1.302	1.312
028	1.365	1.375
029	1.490	1.500
030	1.615	1.625
031	1.740	1.750
032	1.865	1.875
033	1.990	2.000
034	2.115	2.125
035	2.240	2.250
036	2.365	2.375
037	2.490	2.500
038	2.615	2.625
039	2.740	2.750
040	2.865	2.875

Millimeters		
Dash No.	ØA Groove Dia.	
	Min.	Max.
008	4.50	4.75
009	5.28	5.54
010	6.10	6.35
011	7.67	7.92
012	9.27	9.53
013	10.85	11.10
014	12.45	12.70
015	14.02	14.27
016	15.62	15.88
017	17.20	17.45
018	18.80	19.05
019	20.37	20.62
020	21.97	22.23
021	23.55	23.80
022	25.15	25.40
023	26.72	26.97
024	28.32	28.58
025	29.90	30.15
026	31.50	31.75
027	33.07	33.32
028	34.67	34.93
029	37.85	38.10
030	41.02	41.28
031	44.20	44.45
032	47.37	47.63
033	50.55	50.80
034	53.72	53.98
035	56.90	57.15
036	60.07	60.33
037	63.25	63.50
038	66.42	66.68
039	69.60	69.85
040	72.77	73.03

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Metaplast® Spring Seals

Face, External Pressure

Inches		
Dash No.	ØA Groove Dia.	
	Min.	Max.
041	2.990	3.000
042	3.240	3.250
043	3.490	3.500
044	3.740	3.750
045	3.990	4.000
110	0.365	0.375
111	0.427	0.437
112	0.490	0.500
113	0.552	0.562
114	0.615	0.625
115	0.677	0.687
116	0.740	0.750
117	0.802	0.812
118	0.865	0.875
119	0.927	0.937
120	0.990	1.000
121	1.052	1.062
122	1.115	1.125
123	1.177	1.187
124	1.240	1.250
125	1.302	1.312
126	1.365	1.375
127	1.427	1.437
128	1.490	1.500
129	1.552	1.562
130	1.615	1.625
131	1.677	1.687
132	1.740	1.750
133	1.802	1.812
134	1.865	1.875
135	1.927	1.937
136	1.990	2.000
137	2.052	2.062

Millimeters		
Dash No.	ØA Groove Dia.	
	Min.	Max.
041	75.95	76.20
042	82.30	82.55
043	88.65	88.90
044	95.00	95.25
045	101.35	101.60
110	9.27	9.53
111	10.85	11.10
112	12.45	12.70
113	14.02	14.27
114	15.62	15.88
115	17.20	17.45
116	18.80	19.05
117	20.37	20.62
118	21.97	22.23
119	23.55	23.80
120	25.15	25.40
121	26.72	26.97
122	28.32	28.58
123	29.90	30.15
124	31.50	31.75
125	33.07	33.32
126	34.67	34.93
127	36.25	36.50
128	37.85	38.10
129	39.42	39.67
130	41.02	41.28
131	42.60	42.85
132	44.20	44.45
133	45.77	46.02
134	47.37	47.63
135	48.95	49.20
136	50.55	50.80
137	52.12	52.37

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Metaplast® Spring Seals

Face, External Pressure

Inches		
Dash No.	ØA Groove Dia.	
	Min.	Max.
138	2.115	2.125
139	2.177	2.187
140	2.240	2.250
141	2.302	2.312
142	2.365	2.375
143	2.427	2.437
144	2.490	2.500
145	2.552	2.562
146	2.615	2.625
147	2.677	2.687
148	2.740	2.750
149	2.802	2.812
150	2.865	2.875
151	2.990	3.000
152	3.240	3.250
153	3.490	3.500
154	3.740	3.750
155	3.990	4.000
156	4.240	4.250
157	4.490	4.500
158	4.740	4.750
159	4.990	5.000
160	5.240	5.250
161	5.490	5.500
162	5.740	5.750
163	5.990	6.000
210	0.740	0.750
211	0.802	0.812
212	0.865	0.875
213	0.927	0.937
214	0.990	1.000
215	1.052	1.062
216	1.115	1.125

Millimeters		
Dash No.	ØA Groove Dia.	
	Min.	Max.
138	53.72	53.98
139	55.30	55.55
140	56.90	57.15
141	58.47	58.72
142	60.07	60.33
143	61.65	61.90
144	63.25	63.50
145	64.82	65.07
146	66.42	66.68
147	68.00	68.25
148	69.60	69.85
149	71.17	71.42
150	72.77	73.03
151	75.95	76.20
152	82.30	82.55
153	88.65	88.90
154	95.00	95.25
155	101.35	101.60
156	107.70	107.95
157	114.05	114.30
158	120.40	120.65
159	126.75	127.00
160	133.10	133.35
161	139.45	139.70
162	145.80	146.05
163	152.15	152.40
210	18.80	19.05
211	20.37	20.62
212	21.97	22.23
213	23.55	23.80
214	25.15	25.40
215	26.72	26.97
216	28.32	28.58

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Face, External Pressure

Inches		
Dash No.	ØA Groove Dia.	
	Min.	Max.
217	1.177	1.187
218	1.240	1.250
219	1.302	1.312
220	1.365	1.375
221	1.427	1.437
222	1.490	1.500
223	1.615	1.625
224	1.740	1.750
225	1.865	1.875
226	1.990	2.000
227	2.115	2.125
228	2.240	2.250
229	2.365	2.375
230	2.490	2.500
231	2.615	2.625
232	2.740	2.750
233	2.865	2.875
234	2.990	3.000
235	3.115	3.125
236	3.240	3.250
237	3.365	3.375
238	3.490	3.500
239	3.615	3.625
240	3.740	3.750
241	3.865	3.875
242	3.990	4.000
243	4.115	4.125
244	4.240	4.250
245	4.365	4.375
246	4.490	4.500
247	4.615	4.625
248	4.740	4.750
249	4.865	4.875

Millimeters		
Dash No.	ØA Groove Dia.	
	Min.	Max.
217	29.90	30.15
218	31.50	31.75
219	33.07	33.32
220	34.67	34.93
221	36.25	36.50
222	37.85	38.10
223	41.02	41.28
224	44.20	44.45
225	47.37	47.63
226	50.55	50.80
227	53.72	53.98
228	56.90	57.15
229	60.07	60.33
230	63.25	63.50
231	66.42	66.68
232	69.60	69.85
233	72.77	73.03
234	75.95	76.20
235	79.12	79.38
236	82.30	82.55
237	85.47	85.73
238	88.65	88.90
239	91.82	92.08
240	95.00	95.25
241	98.17	98.43
242	101.35	101.60
243	104.52	104.78
244	107.70	107.95
245	110.87	111.13
246	114.05	114.30
247	117.22	117.48
248	120.40	120.65
249	123.57	123.83

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Face, External Pressure

Inches		
Dash No.	ØA Groove Dia.	
	Min.	Max.
250	4.990	5.000
251	5.115	5.125
252	5.240	5.250
253	5.365	5.375
254	5.490	5.500
255	5.615	5.625
256	5.740	5.750
257	5.865	5.875
258	5.990	6.000
259	6.240	6.250
260	6.490	6.500
261	6.740	6.750
262	6.990	7.000
263	7.240	7.250
264	7.490	7.500
265	7.740	7.750
266	7.990	8.000
267	8.240	8.250
268	8.490	8.500
269	8.740	8.750
270	8.990	9.000
271	9.240	9.250
272	9.490	9.500
273	9.740	9.750
274	9.990	10.000
275	10.490	10.500
276	10.990	11.000
277	11.490	11.500
278	11.990	12.000
279	12.490	12.500
280	12.990	13.000
281	13.490	13.500
325	1.490	1.500

Millimeters		
Dash No.	ØA Groove Dia.	
	Min.	Max.
250	126.75	127.00
251	129.92	130.18
252	133.10	133.35
253	136.27	136.53
254	139.45	139.70
255	142.62	142.88
256	145.80	146.05
257	148.97	149.23
258	152.15	152.40
259	158.50	158.75
260	164.85	165.10
261	171.20	171.45
262	177.55	177.80
263	183.90	184.15
264	190.25	190.50
265	196.60	196.85
266	202.95	203.20
267	209.30	209.55
268	215.65	215.90
269	222.00	222.25
270	228.35	228.60
271	234.70	234.95
272	241.05	241.30
273	247.40	247.65
274	253.75	254.00
275	266.45	266.70
276	279.15	279.40
277	291.85	292.10
278	304.55	304.80
279	317.25	317.50
280	329.95	330.20
281	342.65	342.90
325	37.85	38.10

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Metaplast® Spring Seals

Face, External Pressure

Inches		
Dash No.	ØA Groove Dia.	
	Min.	Max.
326	1.615	1.625
327	1.740	1.750
328	1.865	1.875
329	1.990	2.000
330	2.115	2.125
331	2.240	2.250
332	2.365	2.375
333	2.490	2.500
334	2.615	2.625
335	2.740	2.750
336	2.865	2.875
337	2.990	3.000
338	3.115	3.125
339	3.240	3.250
340	3.365	3.375
341	3.490	3.500
342	3.615	3.625
343	3.740	3.750
344	3.865	3.875
345	3.990	4.000
346	4.115	4.125
347	4.240	4.250
348	4.365	4.375
349	4.490	4.500
350	4.615	4.625
351	4.740	4.750
352	4.865	4.875
353	4.990	5.000
354	5.115	5.125
355	5.240	5.250
356	5.365	5.375
357	5.490	5.500
358	5.615	5.625

Millimeters		
Dash No.	ØA Groove Dia.	
	Min.	Max.
326	41.02	41.28
327	44.20	44.45
328	47.37	47.63
329	50.55	50.80
330	53.72	53.98
331	56.90	57.15
332	60.07	60.33
333	63.25	63.50
334	66.42	66.68
335	69.60	69.85
336	72.77	73.03
337	75.95	76.20
338	79.12	79.38
339	82.30	82.55
340	85.47	85.73
341	88.65	88.90
342	91.82	92.08
343	95.00	95.25
344	98.17	98.43
345	101.35	101.60
346	104.52	104.78
347	107.70	107.95
348	110.87	111.13
349	114.05	114.30
350	117.22	117.48
351	120.40	120.65
352	123.57	123.83
353	126.75	127.00
354	129.92	130.18
355	133.10	133.35
356	136.27	136.53
357	139.45	139.70
358	142.62	142.88

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Inches		
Dash No.	ØA Groove Dia.	
	Min.	Max.
359	5.740	5.750
360	5.865	5.875
361	5.990	6.000
362	6.115	6.125
363	6.240	6.250
364	6.490	6.500
365	6.740	6.750
366	6.990	7.000
367	7.240	7.250
368	7.490	7.500
369	7.740	7.750
370	7.990	8.000
371	8.240	8.250
372	8.490	8.500
373	8.740	8.750
374	8.990	9.000
375	9.240	9.250
376	9.490	9.500
377	9.740	9.750
378	9.990	10.000
379	10.240	10.250
380	10.490	10.500
381	10.740	10.750
382	10.990	11.000
383	11.490	11.500
384	11.990	12.000
417	3.490	3.500
418	3.615	3.625
419	3.740	3.750
420	3.865	3.875
421	3.990	4.000
422	4.115	4.125
423	4.240	4.250

Millimeters		
Dash No.	ØA Groove Dia.	
	Min.	Max.
359	145.80	146.05
360	148.97	149.23
361	152.15	152.40
362	155.32	155.58
363	158.50	158.75
364	164.85	165.10
365	171.20	171.45
366	177.55	177.80
367	183.90	184.15
368	190.25	190.50
369	196.60	196.85
370	202.95	203.20
371	209.30	209.55
372	215.65	215.90
373	222.00	222.25
374	228.35	228.60
375	234.70	234.95
376	241.05	241.30
377	247.40	247.65
378	253.75	254.00
379	260.10	260.35
380	266.45	266.70
381	272.80	273.05
382	279.15	279.40
383	291.85	292.10
384	304.55	304.80
417	88.65	88.90
418	91.82	92.08
419	95.00	95.25
420	98.17	98.43
421	101.35	101.60
422	104.52	104.78
423	107.70	107.95

Metaplast® Spring Seals
Face, External Pressure

Inches		
Dash No.	ØA Groove Dia.	
	Min.	Max.
424	4.365	4.375
425	4.490	4.500
426	4.615	4.625
427	4.740	4.750
428	4.865	4.875
429	4.990	5.000
430	5.115	5.125
431	5.240	5.250
432	5.365	5.375
433	5.490	5.500
434	5.615	5.625
435	5.740	5.750
436	5.865	5.875
437	5.990	6.000
438	6.240	6.250
439	6.490	6.500
440	6.740	6.750
441	6.990	7.000
442	7.240	7.250
443	7.490	7.500
444	7.740	7.750
445	7.990	8.000
446	8.490	8.500
447	8.990	9.000
448	9.490	9.500
449	9.990	10.000
450	10.490	10.500
451	10.990	11.000
452	11.490	11.500
453	11.990	12.000
454	12.490	12.500
455	12.990	13.000
456	13.490	13.500

Millimeters		
Dash No.	ØA Groove Dia.	
	Min.	Max.
424	110.87	111.13
425	114.05	114.30
426	117.22	117.48
427	120.40	120.65
428	123.57	123.83
429	126.75	127.00
430	129.92	130.18
431	133.10	133.35
432	136.27	136.53
433	139.45	139.70
434	142.62	142.88
435	145.80	146.05
436	148.97	149.23
437	152.15	152.40
438	158.50	158.75
439	164.85	165.10
440	171.20	171.45
441	177.55	177.80
442	183.90	184.15
443	190.25	190.50
444	196.60	196.85
445	202.95	203.20
446	215.65	215.90
447	228.35	228.60
448	241.05	241.30
449	253.75	254.00
450	266.45	266.70
451	279.15	279.40
452	291.85	292.10
453	304.55	304.80
454	317.25	317.50
455	329.95	330.20
456	342.65	342.90

Inches		
Dash No.	ØA Groove Dia.	
	Min.	Max.
457	13.990	14.000
458	14.490	14.500
459	14.990	15.000
460	15.490	15.500

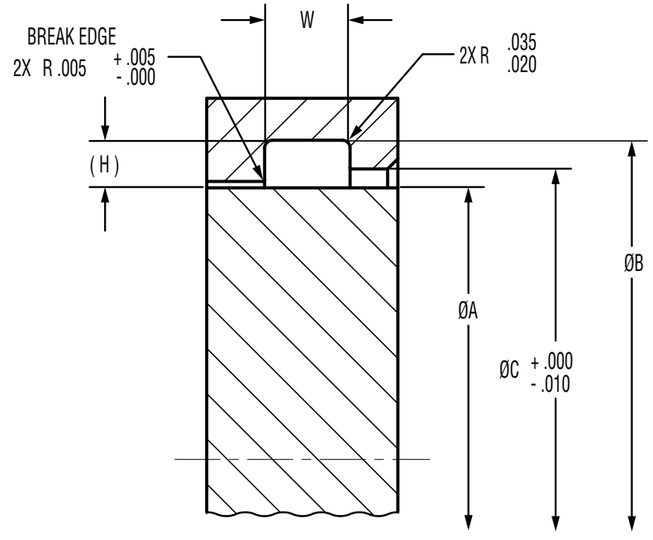
Millimeters		
Dash No.	ØA Groove Dia.	
	Min.	Max.
457	355.35	355.60
458	368.05	368.30
459	380.75	381.00
460	393.45	393.70

Metaplast Scraper

TC2788

- General use scraper (wiper) effectively blocks contaminants from entering the pressure system
- No stick-slip contact in dynamic surfaces
- Unlimited shelf life
- Scraper jacket is generally made of stiffer material than ones used for seals
- Metallic energizer maximizes its ability to conform to minimal side loading and misalignment
- TC2788 geometry designed to fit AS4052B type 1 standard groove dimensions
- Please call CoorsTek Engineering if sealing fluid is at extreme low temperature or high viscosity

See page 3.14 for available scraper cross section based on rod sizes



AS4052B GROOVE TYPE 1

Type 1 Inches		
Dash No.	W Gland Width	
	Min.	Max.
325 to 349	0.334	0.344
425 to 460	0.475	0.485

Type 1 Millimeters		
Dash No.	W Gland Width	
	Min.	Max.
325 to 349	8.48	8.74
425 to 460	12.07	12.32

Metaplast® Spring Seals

AS4052B Standard Type 1 Gland

Inches							Millimeters							
Dash No.	ØA Rod Dia.		ØB Groove Dia.		ØC Lead In	H Groove Height	Dash No.	ØA Rod Dia.		ØB Groove Dia.		ØC Lead In	H Groove Height
	Min.	Max.	Min.	Max.				Min.	Max.	Min.	Max.		
325	1.496	1.498	1.870	1.872	1.646		**325**	38.00	38.05	47.50	47.55	41.81	
326	1.621	1.623	1.995	1.997	1.771		**326**	41.17	41.22	50.67	50.72	44.98	
327	1.746	1.748	2.120	2.122	1.896		**327**	44.35	44.40	53.85	53.90	48.16	
328	1.871	1.873	2.245	2.247	2.021		**328**	47.52	47.57	57.02	57.07	51.33	
329	1.996	1.998	2.370	2.372	2.146		**329**	50.70	50.75	60.20	60.25	54.51	
330	2.121	2.123	2.495	2.497	2.271		**330**	53.87	53.92	63.37	63.42	57.68	
331	2.246	2.248	2.620	2.622	2.396		**331**	57.05	57.10	66.55	66.60	60.86	
332	2.371	2.373	2.745	2.747	2.521		**332**	60.22	60.27	69.72	69.77	64.03	
333	2.496	2.498	2.870	2.872	2.646		**333**	63.40	63.45	72.90	72.95	67.21	
334	2.621	2.623	2.995	2.997	2.771		**334**	66.57	66.62	76.07	76.12	70.38	
335	2.746	2.748	3.120	3.122	2.896		**335**	69.75	69.80	79.25	79.30	73.56	
336	2.871	2.873	3.245	3.247	3.021		**336**	72.92	72.97	82.42	82.47	76.73	
337	2.995	2.997	3.369	3.371	3.145	0.187	**337**	76.07	76.12	85.57	85.62	79.88	4.75
338	3.120	3.122	3.494	3.496	3.270		**338**	79.25	79.30	88.75	88.80	83.06	
339	3.245	3.247	3.619	3.621	3.395		**339**	82.42	82.47	91.92	91.97	86.23	
340	3.370	3.372	3.744	3.746	3.520		**340**	85.60	85.65	95.10	95.15	89.41	
341	3.495	3.497	3.869	3.871	3.645		**341**	88.77	88.82	98.27	98.32	92.58	
342	3.620	3.622	3.994	3.996	3.770		**342**	91.95	92.00	101.45	101.50	95.76	
343	3.745	3.747	4.119	4.121	3.895		**343**	95.12	95.17	104.62	104.67	98.93	
344	3.870	3.872	4.244	4.246	4.020		**344**	98.30	98.35	107.80	107.85	102.11	
345	3.995	3.997	4.369	4.371	4.145		**345**	101.47	101.52	110.97	111.02	105.28	
346	4.120	4.122	4.494	4.496	4.270		**346**	104.65	104.70	114.15	114.20	108.46	
347	4.245	4.247	4.619	4.621	4.395		**347**	107.82	107.87	117.32	117.37	111.63	
348	4.370	4.372	4.744	4.746	4.520		**348**	111.00	111.05	120.50	120.55	114.81	
349	4.495	4.497	4.869	4.871	4.645		**349**	114.17	114.22	123.67	123.72	117.98	
425	4.494	4.497	4.974	4.977	4.686		**425**	114.15	114.22	126.34	126.42	119.02	
426	4.619	4.622	5.099	5.102	4.811		**426**	117.32	117.40	129.51	129.59	122.20	
427	4.744	4.747	5.224	5.227	4.936		**427**	120.50	120.57	132.69	132.77	125.37	
428	4.869	4.872	5.349	5.352	5.061		**428**	123.67	123.75	135.86	135.94	128.55	
429	4.994	4.997	5.474	5.477	5.186	0.240	**429**	126.85	126.92	139.04	139.12	131.72	6.10
430	5.119	5.122	5.599	5.602	5.311		**430**	130.02	130.10	142.21	142.29	134.90	
431	5.244	5.247	5.724	5.727	5.436		**431**	133.20	133.27	145.39	145.47	138.07	
432	5.369	5.372	5.849	5.852	5.561		**432**	136.37	136.45	148.56	148.64	141.25	

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Metaplast® Spring Seals

AS4052B Standard Type 1 Gland

Inches							Millimeters							
Dash No.	ØA Rod Dia.		ØB Groove Dia.		ØC Lead In	H Groove Height	Dash No.	ØA Rod Dia.		ØB Groove Dia.		ØC Lead In	H Groove Height
	Min.	Max.	Min.	Max.				Min.	Max.	Min.	Max.		
433	5.494	5.497	5.974	5.977	5.686		**433**	139.55	139.62	151.74	151.82	144.42	
434	5.619	5.622	6.099	6.102	5.811		**434**	142.72	142.80	154.91	154.99	147.60	
435	5.744	5.747	6.224	6.227	5.936		**435**	145.90	145.97	158.09	158.17	150.77	
436	5.869	5.872	6.349	6.352	6.061		**436**	149.07	149.15	161.26	161.34	153.95	
437	5.994	5.997	6.474	6.477	6.186		**437**	152.25	152.32	164.44	164.52	157.12	
438	6.244	6.247	6.724	6.727	6.436		**438**	158.60	158.67	170.79	170.87	163.47	
439	6.494	6.497	6.974	6.977	6.686		**439**	164.95	165.02	177.14	177.22	169.82	
440	6.744	6.747	7.224	7.227	6.936		**440**	171.30	171.37	183.49	183.57	176.17	
441	6.994	6.997	7.474	7.477	7.186		**441**	177.65	177.72	189.84	189.92	182.52	
442	7.244	7.247	7.724	7.727	7.436		**442**	184.00	184.07	196.19	196.27	188.87	
443	7.494	7.497	7.974	7.977	7.686		**443**	190.35	190.42	202.54	202.62	195.22	
444	7.744	7.747	8.224	8.227	7.936		**444**	196.70	196.77	208.89	208.97	201.57	
445	7.994	7.997	8.474	8.477	8.186		**445**	203.05	203.12	215.24	215.32	207.92	
446	8.494	8.497	8.974	8.977	8.686		**446**	215.75	215.82	227.94	228.02	220.62	
447	8.994	8.997	9.474	9.477	9.186	0.240	**447**	228.45	228.52	240.64	240.72	233.32	6.10
448	9.494	9.497	9.974	9.977	9.686		**448**	241.15	241.22	253.34	253.42	246.02	
449	9.994	9.997	10.474	10.477	10.186		**449**	253.85	253.92	266.04	266.12	258.72	
450	10.494	10.497	10.974	10.977	10.686		**450**	266.55	266.62	278.74	278.82	271.42	
451	10.994	10.997	11.474	11.477	11.186		**451**	279.25	279.32	291.44	291.52	284.12	
452	11.494	11.497	11.974	11.977	11.686		**452**	291.95	292.02	304.14	304.22	296.82	
453	11.994	11.997	12.474	12.477	12.186		**453**	304.65	304.72	316.84	316.92	309.52	
454	12.494	12.497	12.974	12.977	12.686		**454**	317.35	317.42	329.54	329.62	322.22	
455	12.994	12.997	13.474	13.477	13.186		**455**	330.05	330.12	342.24	342.32	334.92	
456	13.494	13.497	13.974	13.977	13.686		**456**	342.75	342.82	354.94	355.02	347.62	
457	13.994	13.997	14.474	14.477	14.186		**457**	355.45	355.52	367.64	367.72	360.32	
458	14.494	14.497	14.974	14.977	14.686		**458**	368.15	368.22	380.34	380.42	373.02	
459	14.994	14.997	15.474	15.477	15.186		**459**	380.85	380.92	393.04	393.12	385.72	
460	15.494	15.497	15.974	15.977	15.686		**460**	393.55	393.62	405.74	405.82	398.42	

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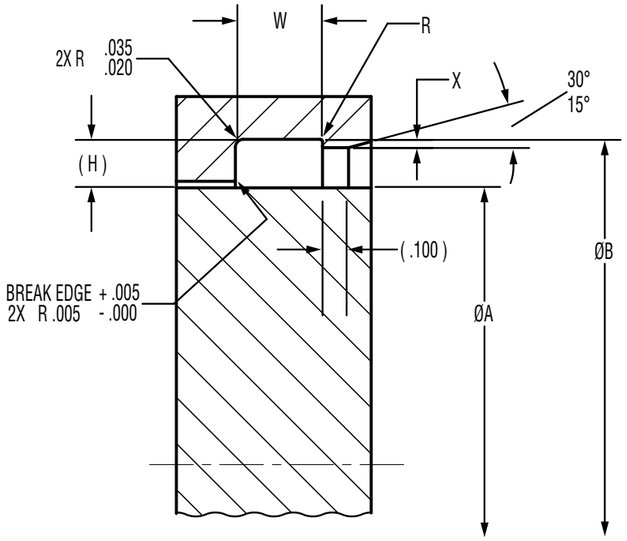
Metaplast Scraper

TC2788

- General use scraper (wiper) effectively blocks contaminants from entering the pressure system
- No stick-slip contact in dynamic surfaces
- Unlimited shelf life
- Scraper jacket is generally made of stiffer material than ones used for seals
- Metallic energizer maximizes its ability to conform to minimal side loading and misalignment
- TC2788 geometry designed to fit AS4052B type 2 standard groove dimensions
- Please call CoorsTek Engineering if sealing fluid is at extreme low temperature or high viscosity

See page 3.14 for available scraper cross section based on rod sizes



AS4052B GROOVE TYPE 2

Type 2 Inches				
Dash No.	W Gland Width		X Retaining Lip	R Max
	Min.	Max.		
325 to 349	0.334	0.344	0.032	0.009
425 to 460	0.475	0.485	0.042	0.012

Type 2 Millimeters				
Dash No.	W Gland Width		X Retaining Lip	R Max
	Min.	Max.		
325 to 349	8.48	8.74	0.81	0.23
425 to 460	12.07	12.32	1.07	0.30

Metaplast® Spring Seals

AS4052B Standard Type 2 Gland

Inches						
Dash No.	ØA Rod Dia.		ØB Groove Dia.		ØC Lead In	H Groove Height
	Min.	Max.	Min.	Max.		
325	1.496	1.498	1.870	1.872	1.888	
326	1.621	1.623	1.995	1.997	2.013	
327	1.746	1.748	2.120	2.122	2.138	
328	1.871	1.873	2.245	2.247	2.263	
329	1.996	1.998	2.370	2.372	2.388	
330	2.121	2.123	2.495	2.497	2.513	
331	2.246	2.248	2.620	2.622	2.638	
332	2.371	2.373	2.745	2.747	2.763	
333	2.496	2.498	2.870	2.872	2.888	
334	2.621	2.623	2.995	2.997	3.013	
335	2.746	2.748	3.120	3.122	3.138	
336	2.871	2.873	3.245	3.247	3.263	
337	2.995	2.997	3.369	3.371	3.387	0.187
338	3.120	3.122	3.494	3.496	3.512	
339	3.245	3.247	3.619	3.621	3.637	
340	3.370	3.372	3.744	3.746	3.762	
341	3.495	3.497	3.869	3.871	3.887	
342	3.620	3.622	3.994	3.996	4.012	
343	3.745	3.747	4.119	4.121	4.137	
344	3.870	3.872	4.244	4.246	4.262	
345	3.995	3.997	4.369	4.371	4.387	
346	4.120	4.122	4.494	4.496	4.512	
347	4.245	4.247	4.619	4.621	4.637	
348	4.370	4.372	4.744	4.746	4.762	
349	4.495	4.497	4.869	4.871	4.887	
425	4.494	4.497	4.974	4.977	5.017	
426	4.619	4.622	5.099	5.102	5.142	
427	4.744	4.747	5.224	5.227	5.267	
428	4.869	4.872	5.349	5.352	5.392	0.240
429	4.994	4.997	5.474	5.477	5.517	
430	5.119	5.122	5.599	5.602	5.642	
431	5.244	5.247	5.724	5.727	5.767	
432	5.369	5.372	5.849	5.852	5.892	

Millimeters						
Dash No.	ØA Rod Dia.		ØB Groove Dia.		ØC Lead In	H Groove Height
	Min.	Max.	Min.	Max.		
325	38.00	38.05	47.50	47.55	47.96	
326	41.17	41.22	50.67	50.72	51.13	
327	44.35	44.40	53.85	53.90	54.31	
328	47.52	47.57	57.02	57.07	57.48	
329	50.70	50.75	60.20	60.25	60.66	
330	53.87	53.92	63.37	63.42	63.83	
331	57.05	57.10	66.55	66.60	67.01	
332	60.22	60.27	69.72	69.77	70.18	
333	63.40	63.45	72.90	72.95	73.36	
334	66.57	66.62	76.07	76.12	76.53	
335	69.75	69.80	79.25	79.30	79.71	
336	72.92	72.97	82.42	82.47	82.88	
337	76.07	76.12	85.57	85.62	86.03	4.75
338	79.25	79.30	88.75	88.80	89.20	
339	82.42	82.47	91.92	91.97	92.38	
340	85.60	85.65	95.10	95.15	95.55	
341	88.77	88.82	98.27	98.32	98.73	
342	91.95	92.00	101.45	101.50	101.90	
343	95.12	95.17	104.62	104.67	105.08	
344	98.30	98.35	107.80	107.85	108.25	
345	101.47	101.52	110.97	111.02	111.43	
346	104.65	104.70	114.15	114.20	114.60	
347	107.82	107.87	117.32	117.37	117.78	
348	111.00	111.05	120.50	120.55	120.95	
349	114.17	114.22	123.67	123.72	124.13	
425	114.15	114.22	126.34	126.42	127.43	
426	117.32	117.40	129.51	129.59	130.61	
427	120.50	120.57	132.69	132.77	133.78	
428	123.67	123.75	135.86	135.94	136.96	6.10
429	126.85	126.92	139.04	139.12	140.13	
430	130.02	130.10	142.21	142.29	143.31	
431	133.20	133.27	145.39	145.47	146.48	
432	136.37	136.45	148.56	148.64	149.66	

Dash No.	ØA Rod Dia.		ØB Groove Dia.		ØC Lead In	H Groove Height
	Min.	Max.	Min.	Max.		Inches
433	5.494	5.497	5.974	5.977	6.017	
434	5.619	5.622	6.099	6.102	6.142	
435	5.744	5.747	6.224	6.227	6.267	
436	5.869	5.872	6.349	6.352	6.392	
437	5.994	5.997	6.474	6.477	6.517	
438	6.244	6.247	6.724	6.727	6.767	
439	6.494	6.497	6.974	6.977	7.017	
440	6.744	6.747	7.224	7.227	7.267	
441	6.994	6.997	7.474	7.477	7.517	
442	7.244	7.247	7.724	7.727	7.767	
443	7.494	7.497	7.974	7.977	8.017	
444	7.744	7.747	8.224	8.227	8.267	
445	7.994	7.997	8.474	8.477	8.517	
446	8.494	8.497	8.974	8.977	9.017	0.240
447	8.994	8.997	9.474	9.477	9.517	
448	9.494	9.497	9.974	9.977	10.017	
449	9.994	9.997	10.474	10.477	10.517	
450	10.494	10.497	10.974	10.977	11.017	
451	10.994	10.997	11.474	11.477	11.517	
452	11.494	11.497	11.974	11.977	12.017	
453	11.994	11.997	12.474	12.477	12.517	
454	12.494	12.497	12.974	12.977	13.017	
455	12.994	12.997	13.474	13.477	13.517	
456	13.494	13.497	13.974	13.977	14.017	
457	13.994	13.997	14.474	14.477	14.517	
458	14.494	14.497	14.974	14.977	15.017	
459	14.994	14.997	15.474	15.477	15.517	
460	15.494	15.497	15.974	15.977	16.017	

Dash No.	ØA Rod Dia.		ØB Groove Dia.		ØC Lead In	H Groove Height
	Min.	Max.	Min.	Max.		Millimeters
433	139.55	139.62	151.74	151.82	152.83	
434	142.72	142.80	154.91	154.99	156.01	
435	145.90	145.97	158.09	158.17	159.18	
436	149.07	149.15	161.26	161.34	162.36	
437	152.25	152.32	164.44	164.52	165.53	
438	158.60	158.67	170.79	170.87	171.88	
439	164.95	165.02	177.14	177.22	178.23	
440	171.30	171.37	183.49	183.57	184.58	
441	177.65	177.72	189.84	189.92	190.93	
442	184.00	184.07	196.19	196.27	197.28	
443	190.35	190.42	202.54	202.62	203.63	
444	196.70	196.77	208.89	208.97	209.98	
445	203.05	203.12	215.24	215.32	216.33	
446	215.75	215.82	227.94	228.02	229.03	6.10
447	228.45	228.52	240.64	240.72	241.73	
448	241.15	241.22	253.34	253.42	254.43	
449	253.85	253.92	266.04	266.12	267.13	
450	266.55	266.62	278.74	278.82	279.83	
451	279.25	279.32	291.44	291.52	292.53	
452	291.95	292.02	304.14	304.22	305.23	
453	304.65	304.72	316.84	316.92	317.93	
454	317.35	317.42	329.54	329.62	330.63	
455	330.05	330.12	342.24	342.32	343.33	
456	342.75	342.82	354.94	355.02	356.03	
457	355.45	355.52	367.64	367.72	368.73	
458	368.15	368.22	380.34	380.42	381.43	
459	380.85	380.92	393.04	393.12	394.13	
460	393.55	393.62	405.74	405.82	406.83	

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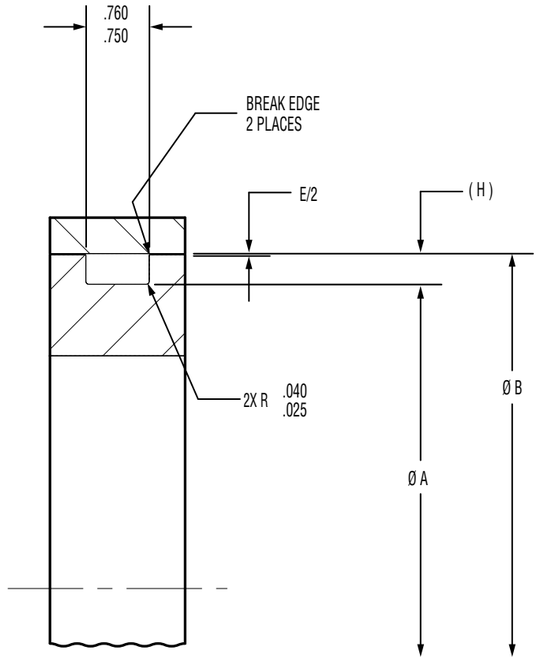
Metaplast Rod/Piston Seal

Piston	Rod
	
TC1988K6XX	TC1988L6XX

- No stick-slip contact in dynamic surfaces
- Unlimited shelf life
- Jacket and spring materials make these seals the best option for virtually all fluids
- Variable spring thickness and proprietary design ensure excellent sealing performance from cryogenic temperatures to ~600 °F
- High-pressure seal comprising a rigid back-up ring and a TC888K6 or TC888L6 seal
- Allows for higher piston-bore misalignment
- TC1988K6 and TC1988L6 designed to fit standard AS4832 grooves



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Metaplast® Spring Seals

AS4832, Piston and Rod

Dash No.	ØA Rod Dia./ Groove Dia. (Inches)		ØB Groove Dia./ Bore Dia. (Inches)		H Groove Height (Inches)	E Max Diametrical Clearance (Inches)	ØA Rod Dia./ Groove Dia (Millimeters)		ØB Groove Dia./ Bore Dia. (Millimeters)		H Groove Height (Millimeters)	E Max Diametrical Clearance (Millimeters)
	Min.	Max.	Min.	Max.			Min.	Max.	Min.	Max.		
625	7.244	7.247	7.974	7.977			184.00	184.07	202.54	202.62		
626	7.494	7.497	8.224	8.227			190.35	190.42	208.89	208.97		
627	7.744	7.747	8.474	8.477			196.70	196.77	215.24	215.32		
628	7.994	7.997	8.724	8.727			203.05	203.12	221.59	221.67		
629	8.244	8.247	8.974	8.977			209.40	209.47	227.94	228.02		
630	8.494	8.497	9.224	9.227			215.75	215.82	234.29	234.37		
631	8.744	8.747	9.474	9.478			222.10	222.17	240.64	240.74		
632	8.994	8.997	9.724	9.728			228.45	228.52	246.99	247.09		
633	9.244	9.247	9.974	9.978			234.80	234.87	253.34	253.44		
634	9.494	9.497	10.224	10.228			241.15	241.22	259.69	259.79		
635	9.744	9.747	10.474	10.478			247.50	247.57	266.04	266.14		
636	9.994	9.997	10.724	10.728			253.85	253.92	272.39	272.49		
637	10.244	10.247	10.974	10.978			260.20	260.27	278.74	278.84		
636	10.494	10.497	11.224	11.228			266.55	266.62	285.09	285.19		
639	10.744	10.747	11.474	11.478			272.90	272.97	291.44	291.54		
640	10.994	10.997	11.724	11.728			279.25	279.32	297.79	297.89		
641	11.244	11.247	11.974	11.978	0.365	0.025	285.60	285.67	304.14	304.24	9.27	0.64
642	11.494	11.497	12.224	12.228			291.95	292.02	310.49	310.59		
643	11.744	11.747	12.474	12.478			298.30	298.37	316.84	316.94		
644	11.994	11.997	12.724	12.728			304.65	304.72	323.19	323.29		
645	12.244	12.247	12.974	12.978			311.00	311.07	329.54	329.64		
646	12.494	12.497	13.224	13.228			317.35	317.42	335.89	335.99		
647	12.744	12.747	13.474	13.478			323.70	323.77	342.24	342.34		
648	12.994	12.997	13.724	13.728			330.05	330.12	348.59	348.69		
649	13.244	13.247	13.974	13.978			336.40	336.47	354.94	355.04		
650	13.494	13.497	14.224	14.228			342.75	342.82	361.29	361.39		
651	13.744	13.747	14.474	14.478			349.10	349.17	367.64	367.74		
652	13.994	13.997	14.724	14.728			355.45	355.52	373.99	374.09		
653	14.244	14.247	14.974	14.978			361.80	361.87	380.34	380.44		
654	14.494	14.497	15.224	15.228			368.15	368.22	386.69	386.79		
655	14.744	14.747	15.474	15.478			374.50	374.57	393.04	393.14		
656	14.994	14.997	15.724	15.728			380.85	380.92	399.39	399.49		
657	15.244	15.247	15.974	15.978			387.20	387.27	405.74	405.84		

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Metaplast® Spring Seals

AS4832, Piston, and Rod

Dash No.	ØA Rod Dia./ Groove Dia. (Inches)		ØB Groove Dia./ Bore Dia. (Inches)		H Groove Height (Inches)	E Max Diametrical Clearance (Inches)	ØA Rod Dia./ Groove Dia (Millimeters)		ØB Groove Dia./ Bore Dia. (Millimeters)		H Groove Height (Millimeters)	E Max Diametrical Clearance (Millimeters)
	Min.	Max.	Min.	Max.			Min.	Max.	Min.	Max.		
658	15.494	15.497	16.224	16.228			393.55	393.62	412.09	412.19		
659	15.744	15.747	16.474	16.478			399.90	399.97	418.44	418.54		
660	15.994	15.997	16.724	16.728			406.25	406.32	424.79	424.89		
661	16.244	16.247	16.974	16.978			412.60	412.67	431.14	431.24		
662	16.494	16.497	17.224	17.228			418.95	419.02	437.49	437.59		
663	16.744	16.747	17.474	17.478			425.30	425.37	443.84	443.94		
664	16.994	16.997	17.724	17.728			431.65	431.72	450.19	450.29		
665	17.244	17.247	17.974	17.978			438.00	438.07	456.54	456.64		
666	17.494	17.497	18.224	18.228			444.35	444.42	462.89	462.99		
667	17.744	17.747	18.474	18.478	0.365	0.025	450.70	450.77	469.24	469.34	9.27	0.64
668	17.994	17.997	18.724	18.728			457.05	457.12	475.59	475.69		
669	18.244	18.247	18.974	18.978			463.40	463.47	481.94	482.04		
670	18.494	18.497	19.224	19.228			469.75	469.82	488.29	488.39		
671	18.744	18.747	19.474	19.478			476.10	476.17	494.64	494.74		
672	18.994	18.997	19.724	19.728			482.45	482.52	500.99	501.09		
673	19.244	19.247	19.974	19.978			488.80	488.87	507.34	507.44		
674	19.744	19.747	20.474	20.478			501.50	501.57	520.04	520.14		
675	19.994	19.997	20.724	20.728			507.85	507.92	526.39	526.49		

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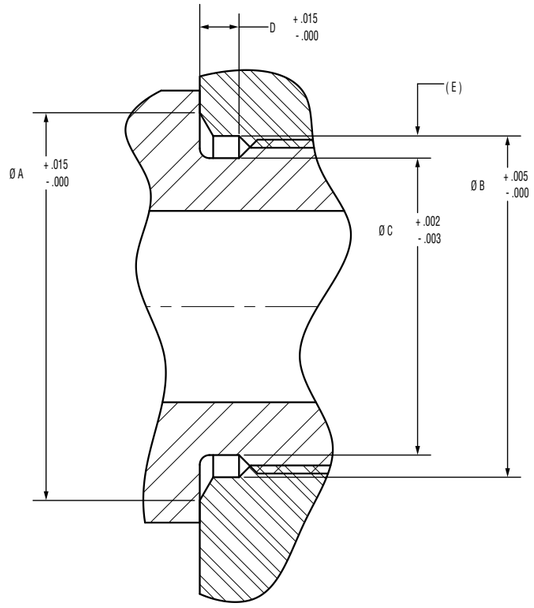
Metaplast Flange Seal

TC1488

- TC1488 seals designed to fit standard MS33656 threaded fittings
- Unlimited shelf life
- Jacket and spring materials make these seals the best option for virtually all fluids
- Variable spring thickness and proprietary design ensure excellent sealing performance from cryogenic temperatures to ~600 °F
- Installation over threads requires specially designed installation tools, contact CoorsTek Engineering for proper use



Dash No.	ØA Flat Land Diameter		ØB Groove Diameter		ØC Body Diameter		D Groove Width		E Groove Height
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
02	0.438	0.453	0.328	0.333	0.247	0.252	0.063	0.078	0.041
03	0.500	0.515	0.390	0.395	0.309	0.314	0.063	0.078	0.041
04	0.562	0.577	0.454	0.459	0.361	0.366	0.075	0.090	0.047
05	0.625	0.640	0.517	0.522	0.423	0.428	0.075	0.090	0.047
06	0.688	0.703	0.580	0.585	0.478	0.483	0.083	0.098	0.051
08	0.875	0.890	0.769	0.774	0.657	0.662	0.094	0.109	0.056
10	1.000	1.015	0.896	0.901	0.770	0.775	0.107	0.122	0.063
12	1.234	1.249	1.086	1.091	0.942	0.947	0.125	0.140	0.072
16	1.487	1.502	1.336	1.341	1.192	1.197	0.125	0.140	0.072
20	1.800	1.815	1.648	1.653	1.504	1.509	0.125	0.140	0.072
24	2.050	2.065	1.898	1.903	1.753	1.758	0.125	0.140	0.073
28	2.425	2.440	2.273	2.278	2.128	2.133	0.125	0.140	0.073
32	2.675	2.690	2.524	2.529	2.378	2.383	0.125	0.140	0.073

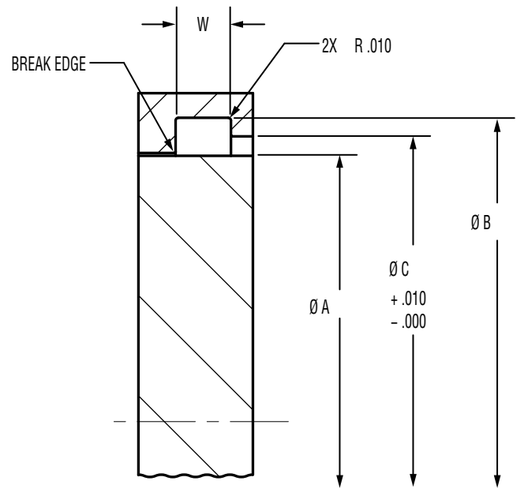
The smaller dash sizes energized by Coil or Rosette Spring

Metaplast Scraper

TC2288

- General use scraper (wiper) effectively blocks contaminants from entering the pressure system
- No stick-slip contact in dynamic surfaces
- Unlimited shelf life
- Scraper jacket is generally made of stiffer material than the ones used for seals
- Metallic energizer maximizes its ability to conform to minimal side loading and misalignment
- TC2288 designed to fit standard AS4832 grooves
- Please call CoorsTek Engineering if sealing fluid is at extreme low temperature or high viscosity dynamic surfaces

See page 3.14 for available scraper cross section based on rod sizes



Dash No.	W Gland Width		R Corner Radius	
	Min.	Max.	Min.	Max.
108 to 111	0.18	0.19	0.005	0.015
206 to 222	0.24	0.25	0.010	0.025
325 to 349	0.33	0.34	0.020	0.035
425 to 460	0.48	0.49		

Inches

Dash No.	W Gland Width		R Corner Radius	
	Min.	Max.	Min.	Max.
108 to 111	4.65	4.90	0.13	0.38
206 to 222	5.97	6.22	0.25	0.64
325 to 349	8.48	8.74	0.51	0.89
425 to 460	12.07	12.32		

Millimeters

Metaplast® Spring Seals

AS4088

Inches

Dash No.	ØA Rod Diameter		ØB Groove Diameter		ØC Lead In Diameter	
	Min.	Max.	Min.	Max.	Min.	Max.
108	0.247	0.248	0.423	0.424	0.278	0.288
109	0.308	0.310	0.486	0.487	0.340	0.350
110	0.371	0.373	0.546	0.548	0.403	0.413
111	0.433	0.435	0.609	0.611	0.465	0.475
206	0.496	0.498	0.741	0.743	0.528	0.538
207	0.558	0.560	0.803	0.805	0.590	0.600
208	0.621	0.623	0.866	0.868	0.653	0.663
209	0.683	0.685	0.928	0.930	0.715	0.725
210	0.746	0.748	0.989	0.991	0.778	0.788
211	0.808	0.810	1.051	1.053	0.852	0.862
212	0.871	0.873	1.115	1.117	0.915	0.925
213	0.933	0.935	1.177	1.179	0.977	0.987
214	0.996	0.998	1.240	1.242	1.040	1.050
215	1.058	1.060	1.302	1.304	1.102	1.112
216	1.121	1.123	1.365	1.367	1.165	1.175
217	1.183	1.185	1.427	1.429	1.227	1.237
218	1.246	1.248	1.490	1.492	1.290	1.300
219	1.308	1.310	1.552	1.554	1.352	1.362
220	1.371	1.373	1.615	1.617	1.415	1.425
221	1.433	1.435	1.677	1.679	1.477	1.487
222	1.496	1.498	1.740	1.742	1.540	1.550
325	1.496	1.498	1.870	1.872	1.540	1.550
326	1.621	1.623	1.995	1.997	1.665	1.675
327	1.746	1.748	2.120	2.122	1.790	1.800
328	1.871	1.873	2.245	2.247	1.915	1.925
329	1.996	1.998	2.370	2.372	2.040	2.050
330	2.121	2.123	2.495	2.497	2.165	2.175
331	2.246	2.248	2.620	2.622	2.290	2.300
332	2.371	2.373	2.745	2.747	2.415	2.425
333	2.496	2.498	2.870	2.872	2.540	2.550
334	2.621	2.623	2.995	2.997	2.665	2.675
335	2.746	2.748	3.120	3.122	2.790	2.800
336	2.871	2.873	3.245	3.247	2.915	2.925
337	2.995	2.997	3.369	3.371	3.039	3.049
338	3.120	3.122	3.494	3.496	3.164	3.174
339	3.245	3.247	3.619	3.621	3.289	3.299
340	3.370	3.372	3.744	3.746	3.414	3.424
341	3.495	3.497	3.869	3.871	3.539	3.549

Millimeters

Dash No.	ØA Rod Diameter		ØB Groove Diameter		ØC Lead In Diameter	
	Min.	Max.	Min.	Max.	Min.	Max.
108	6.27	6.30	10.74	10.77	7.06	7.32
109	7.82	7.87	12.34	12.37	8.64	8.89
110	9.42	9.47	13.87	13.92	10.24	10.49
111	11.00	11.05	15.47	15.52	11.81	12.07
206	12.60	12.65	18.82	18.87	13.41	13.67
207	14.17	14.22	20.40	20.45	14.99	15.24
208	15.77	15.82	22.00	22.05	16.59	16.84
209	17.35	17.40	23.57	23.62	18.16	18.42
210	18.95	19.00	25.12	25.17	19.76	20.02
211	20.52	20.57	26.70	26.75	21.64	21.89
212	22.12	22.17	28.32	28.37	23.24	23.50
213	23.70	23.75	29.90	29.95	24.82	25.07
214	25.30	25.35	31.50	31.55	26.42	26.67
215	26.87	26.92	33.07	33.12	27.99	28.24
216	28.47	28.52	34.67	34.72	29.59	29.85
217	30.05	30.10	36.25	36.30	31.17	31.42
218	31.65	31.70	37.85	37.90	32.77	33.02
219	33.22	33.27	39.42	39.47	34.34	34.59
220	34.82	34.87	41.02	41.07	35.94	36.20
221	36.40	36.45	42.60	42.65	37.52	37.77
222	38.00	38.05	44.20	44.25	39.12	39.37
325	38.00	38.05	47.50	47.55	39.12	39.37
326	41.17	41.22	50.67	50.72	42.29	42.55
327	44.35	44.40	53.85	53.90	45.47	45.72
328	47.52	47.57	57.02	57.07	48.64	48.90
329	50.70	50.75	60.20	60.25	51.82	52.07
330	53.87	53.92	63.37	63.42	54.99	55.25
331	57.05	57.10	66.55	66.60	58.17	58.42
332	60.22	60.27	69.72	69.77	61.34	61.60
333	63.40	63.45	72.90	72.95	64.52	64.77
334	66.57	66.62	76.07	76.12	67.69	67.95
335	69.75	69.80	79.25	79.30	70.87	71.12
336	72.92	72.97	82.42	82.47	74.04	74.30
337	76.07	76.12	85.57	85.62	77.19	77.44
338	79.25	79.30	88.75	88.80	80.37	80.62
339	82.42	82.47	91.92	91.97	83.54	83.79
340	85.60	85.65	95.10	95.15	86.72	86.97
341	88.77	88.82	98.27	98.32	89.89	90.14

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Metaplast® Spring Seals

AS4088

Inches

Dash No.	ØA Rod Diameter		ØB Groove Diameter		ØC Lead In Diameter	
	Min.	Max.	Min.	Max.	Min.	Max.
342	3.620	3.622	3.994	3.996	3.664	3.674
343	3.745	3.747	4.119	4.121	3.789	3.799
344	3.870	3.872	4.244	4.246	3.914	3.924
345	3.995	3.997	4.369	4.371	4.039	4.049
346	4.120	4.122	4.494	4.496	4.164	4.174
347	4.245	4.247	4.619	4.621	4.289	4.299
348	4.370	4.372	4.744	4.746	4.414	4.424
349	4.495	4.497	4.869	4.871	4.539	4.549
425	4.494	4.5	4.97	4.98	4.54	4.549
426	4.619	4.62	5.1	5.1	4.66	4.674
427	4.744	4.75	5.22	5.23	4.79	4.799
428	4.869	4.87	5.35	5.35	4.91	4.924
429	4.994	5	5.47	5.48	5.04	5.049
430	5.119	5.12	5.6	5.6	5.16	5.174
431	5.244	5.25	5.72	5.73	5.29	5.299
432	5.369	5.37	5.85	5.85	5.41	5.424
433	5.494	5.5	5.97	5.98	5.54	5.549
434	5.619	5.62	6.1	6.1	5.66	5.674
435	5.744	5.75	6.22	6.23	5.79	5.799
436	5.869	5.87	6.35	6.35	5.91	5.924
437	5.994	6	6.47	6.48	6.04	6.049
438	6.244	6.25	6.72	6.73	6.29	6.299
439	6.494	6.5	6.97	6.98	6.54	6.549
440	6.744	6.75	7.22	7.23	6.79	6.799
441	6.994	7	7.47	7.48	7.04	7.049
442	7.244	7.25	7.72	7.73	7.29	7.299
443	7.494	7.5	7.97	7.98	7.54	7.549
444	7.744	7.75	8.22	8.23	7.79	7.799
445	7.994	8	8.47	8.48	8.34	8.349
446	8.494	8.5	8.97	8.98	8.54	8.549
447	8.994	9	9.47	9.48	9.04	9.049
448	9.494	9.5	9.97	9.98	9.54	9.549
449	9.994	10	10.47	10.48	10.04	10.049
450	10.494	10.5	10.97	10.98	10.54	10.549
451	10.994	11	11.47	11.48	11.04	11.049
452	11.494	11.5	11.97	11.98	11.54	11.549
453	11.994	12	12.47	12.48	12.04	12.049
454	12.494	12.5	12.97	12.98	12.54	12.549

Millimeters

Dash No.	ØA Rod Diameter		ØB Groove Diameter		ØC Lead In Diameter	
	Min.	Max.	Min.	Max.	Min.	Max.
342	91.95	92.00	101.45	101.50	93.07	93.32
343	95.12	95.17	104.62	104.67	96.24	96.49
344	98.30	98.35	107.80	107.85	99.42	99.67
345	101.47	101.52	110.97	111.02	102.59	102.84
346	104.65	104.70	114.15	114.20	105.77	106.02
347	107.82	107.87	117.32	117.37	108.94	109.19
348	111.00	111.05	120.50	120.55	112.12	112.37
349	114.17	114.22	123.67	123.72	115.29	115.54
425	114.15	114.22	126.34	126.42	115.29	115.54
426	117.32	117.40	129.51	129.59	118.47	118.72
427	120.50	120.57	132.69	132.77	121.64	121.89
428	123.67	123.75	135.86	135.94	124.82	125.07
429	126.85	126.92	139.04	139.12	127.99	128.24
430	130.02	130.10	142.21	142.29	131.17	131.42
431	133.20	133.27	145.39	145.47	134.34	134.59
432	136.37	136.45	148.56	148.64	137.52	137.77
433	139.55	139.62	151.74	151.82	140.69	140.94
434	142.72	142.80	154.91	154.99	143.87	144.12
435	145.90	145.97	158.09	158.17	147.04	147.29
436	149.07	149.15	161.26	161.34	150.22	150.47
437	152.25	152.32	164.44	164.52	153.39	153.64
438	158.60	158.67	170.79	170.87	159.74	159.99
439	164.95	165.02	177.14	177.22	166.09	166.34
440	171.30	171.37	183.49	183.57	172.44	172.69
441	177.65	177.72	189.84	189.92	178.79	179.04
442	184.00	184.07	196.19	196.27	185.14	185.39
443	190.35	190.42	202.54	202.62	191.49	191.74
444	196.70	196.77	208.89	208.97	197.84	198.09
445	203.05	203.12	215.24	215.32	211.81	212.06
446	215.75	215.82	227.94	228.02	216.89	217.14
447	228.45	228.52	240.64	240.72	229.59	229.84
448	241.15	241.22	253.34	253.42	242.29	242.54
449	253.85	253.92	266.04	266.12	254.99	255.24
450	266.55	266.62	278.74	278.82	267.69	267.94
451	279.25	279.32	291.44	291.52	280.39	280.64
452	291.95	292.02	304.14	304.22	293.09	293.34
453	304.65	304.72	316.84	316.92	305.79	306.04
454	317.35	317.42	329.54	329.62	318.49	318.74

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Dash No.	ØA Rod Diameter		ØB Groove Diameter		ØC Lead In Diameter	
	Min.	Max.	Min.	Max.	Min.	Max.
455	12.994	13	13.47	13.48	13.04	13.049
456	13.494	13.5	13.97	13.98	13.54	13.549
457	13.994	14	14.47	14.48	14.04	14.049
458	14.494	14.5	14.97	14.98	14.54	14.549
459	14.994	15	15.47	15.48	15.04	15.049
460	15.494	15.5	15.97	15.98	15.54	15.549

Inches

Dash No.	ØA Rod Diameter		ØB Groove Diameter		ØC Lead In Diameter	
	Min.	Max.	Min.	Max.	Min.	Max.
455	330.05	330.12	342.24	342.32	331.19	331.44
456	342.75	342.82	354.94	355.02	343.89	344.14
457	355.45	355.52	367.64	367.72	356.59	356.84
458	368.15	368.22	380.34	380.42	369.29	369.54
459	380.85	380.92	393.04	393.12	381.99	382.24
460	393.55	393.62	405.74	405.82	394.69	394.94

Millimeters

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CoorsTek
Engineering Action Request - Seals Division

CUSTOMER DATA

Company Name _____ Date Submitted _____

Address _____ Date Required _____

City, State, Zip, Country _____

Telephone _____ Fax _____ ☐ OEM

Contact Person _____ Title _____ ☐ Distributor

E-Mail _____ ☐ Rebuilder

Products Mfgd/Sold/Serviced _____ ☐ Consultant

_____

INTERNAL USE
EAR # _____
Territory # _____
Territory Mgr _____

APPLICATION DATA

1. Is this application: New Design ☐ Retrofit ☐
2. Pressure Direction: In ☐ Out ☐
3. Temperature: Min. _____ Normal _____ Max. _____ °C ☐ °F ☐
4. Pressure: Min. _____ Normal _____ Max. _____ Bar ☐ PSI ☐ Proof_____
5. Media being sealed: _____
6. If retrofit, please describe why customer wants to consider a new seal _____
   _____
7. If this is a change, is there a source ☐ spec ☐ control drawing? Dwg # _____
8. Disposition of existing parts: _____

HARDWARE DATA

All Dimensions are in: Millimeters ☐ Inches ☐

Groove: Dia _____ + _____ - _____ Finish _____ Groove Height _____

Groove: Width _____ + _____ - _____ Groove Sidewall Finish _____

Maximum Extrusion Gap: Radial _____ Diametral _____

1. Is hardware plated/coated? No ☐ Yes ☐ Specify _____
2. Is seal installation tooling required? No ☐ Yes ☐ Not Sure ☐
3. Can hardware design be changed? No ☐ Yes ☐ How? _____
   _____
4. Reference design specifications: _____
5. Indicate applicable hardware design requirements in sketch below while showing pressure magnitude and directions (with arrows)

Please see following page for sketches

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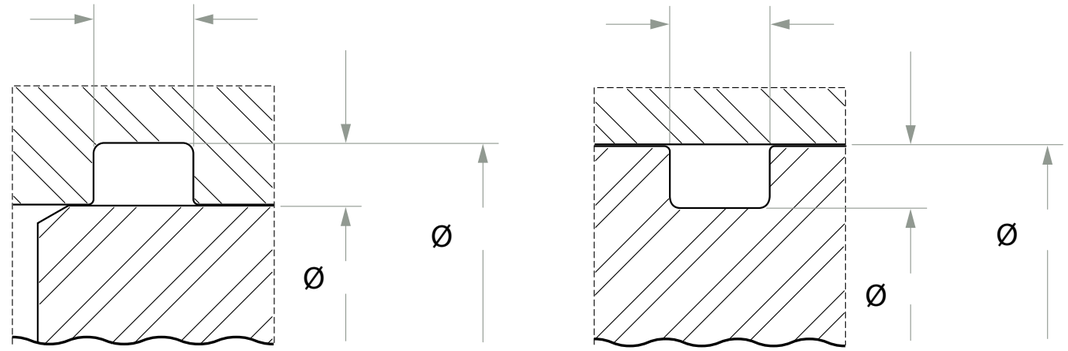
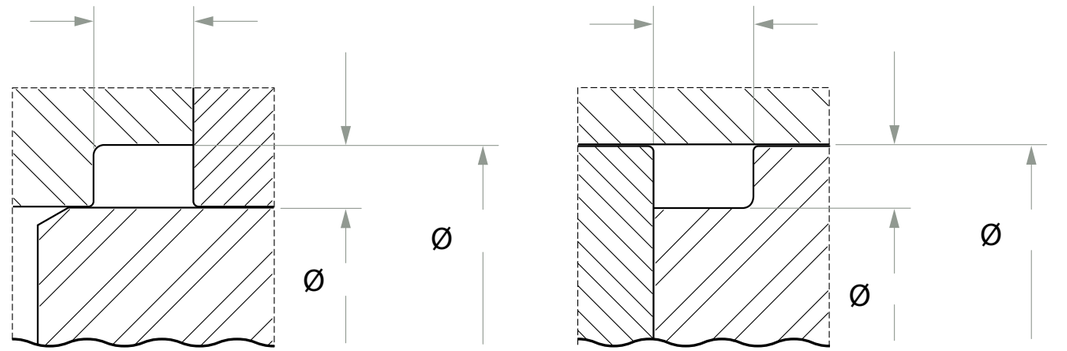
CoorsTek
Engineering Action Request - Seals Division

Closed groove configuration



Split groove configuration, optional



PERFORMANCE DATA

1. Allowable leakage (units): _____ Per _____
2. Desired service life: _____
3. Any special requirements? _____
   _____
   _____
4. Type of evaluation: Bench ☐ Field ☐ Both ☐ Start Date _____ Duration _____
5. Comments: _____
   _____
   _____

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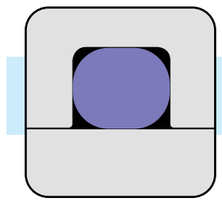
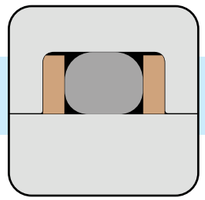
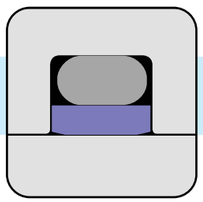


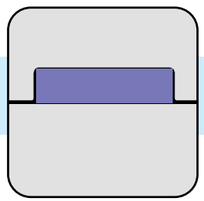
O-RING



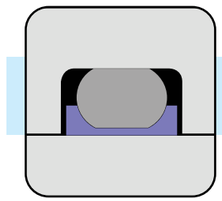
O-RING + BACK UP



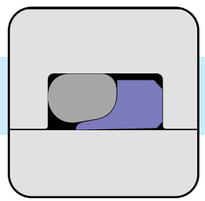
DUORING



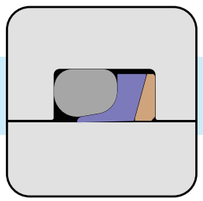
WEARRING



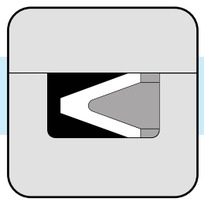
TETRACAP



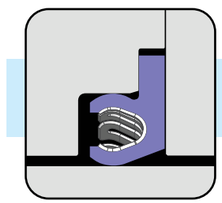
UNILOCK



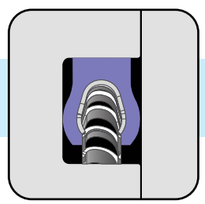
UNILOCK + BACK UP



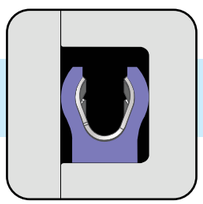
METALLIC SEALS



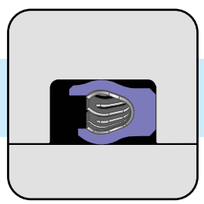
METAPLAST II ROTARY



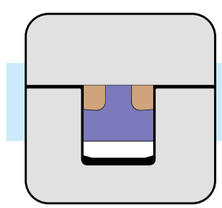
METAPLAST II FACE



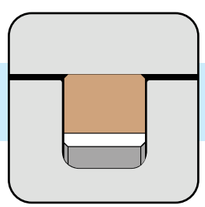
METAPLAST II OUTSIDE FACE



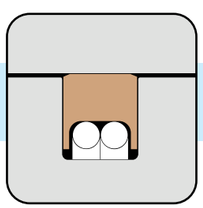
METAPLAST II RADIAL



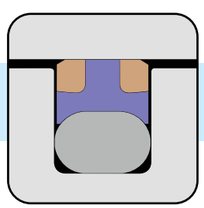
REINFORCED TETRAFLEX I



TETRAFLEX I



TETRAFLEX II



REINFORCED PISTON

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