WARNING: These products can expose you to chemicals including carbon black (airborne and extracts), antimony trioxide, titanium dioxide, silica (crystalline), di(2-ethylhexyl)phthalate, ethylene thiourea, acrylonitrile, 1,3-butadiene, epichlorohydrin, toluenediisocyanate, tetrafluoroethylene, ethylbenzene, formaldehyde, furfuryl alcohol, glass fibers, methyl isobutyl ketone, nickel (metallic and compounds), lead and lead compounds which are known to the State of California to cause cancer; and 1,3-butadiene, epichlorohydrin, di(2-ethylhexyl)phthalate, di-isodecyl phthalate, ethylene thiourea, methyl isobutyl ketone, methanol, toluene, lead and lead compounds which are known to the State of California to cause birth defects and other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Custom Engineered S-Seals

Performance Sealing for Today's High Pressure High Temperature (HPHT) Oil & Gas Applications

Parker

ENGINEERING YOUR SUCCESS.

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If you have questions about the products contained in this catalog, or their applications, please contact:

Parker Hannifin Corporation
Engineered Polymer Systems Division
phone 800 233 3900
www.parker.com/eps

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Information in this catalog is only accurate as of the date of publication. For more current information, please consult the Parker EPS Division website at **www.parker.com/eps**

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To the extent that Parker or its subsidiaries or authorized distributors provide component or system options based upon data or specifications provided by the user, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the components or systems.

The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its related companies at any time without notice.

04/01/2018

Introduction

Performance sealing for high pressure, high temperature (HPHT) oil and gas applications

Parker Engineered Polymer Systems Division offers original equipment manufacturers and service & repair organizations high performance **S-Seals** (Spring Seals) designed for extreme oil and gas applications. Our PSS Profile S-Seals for rod and piston applications are specifically engineered for use in the oil & gas industry for down-hole, subsea, and wellhead equipment where exposure to well bore fluids at elevated pressures and temperatures demands a robust sealing solution.

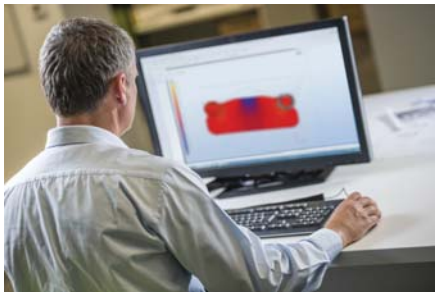
Parker is the premier manufacturer of S-Seals for oil & gas equipment – and the only one to offer S-Seals from 1-1/2" to over 60" in diameter Utilizing Parker's suite of elastomers certified to API, NORSOK, TOTAL and NACE standards, we design and manufacture complete sealing solutions for a wide range of applications and environments.

Custom Designs

In addition to this catalog of sizes and materials of construction, we can manufacture S-Seals in sizes not shown or in alternate materials. If required, we can collaborate with you to engineer custom designs to meet existing or new design envelopes.

Technical Assistance

If you need assistance, Parker's team of experienced application engineers is available to help with selection recommendations.



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Certified Materials

Parker's certified high performance materials meet the most demanding environments and industry specifications

Elastomers:

Parker S-Seal elastomers are qualified to API 6A FF/HH (10% sour gas) and meet additional certifications which may include ISO 23936-2, NORSOK M-710, API 16C, TOTAL and NACE TM0192-2003. S-Seals are available in the following materials:

- N4007A95 HNBR
- N4031A85 (KA183-85) HNBR
- **N4033A90 (KB163-90) HNBR***
- N4039A90 (RH1170-90) HNBR
- V1238-95 FKM
- **VG109-90 FKM***
- RV1121-90 FKM

**Preferred oilfield compounds*

Garter Springs:

Coiled garter springs function as non-extrusion devices on both sides of the elastomer sealing element, allowing large extrusion gaps to be bridged at high pressures. They are available in a variety of material options for S-Seals to meet the range of service requirements for oil and gas applications.

Available garter spring materials include:
- 300 Series Stainless Steel
- Inconel® (NACE MR-01-75)
- PEEK Monofilament
- PEEK Coated 300 Series Stainless Steel

Table 1. Elastomer Certifications ✓ = Pass

Material Type	Parker Material	Temperature Range (°F)		ISO 23936-2			NORSOK M-710		API 6A	API 16C
		Min	Max	RGD	H_2S 2%	H_2S 10%	RGD	H_2S		
HNBR	N4007A95	-20	320	✓		✓	✓	✓	✓	✓
	N4031A85 (KA183-85)	-40	320	✓		✓		✓		
	N4033A90 (KB163-90)	-25	320	✓		✓	✓	✓	✓	
	N4039A90 (RH1170-90)	-25	320						✓	
FKM	V1238A95	-15	400	✓	✓		✓		✓	
	VG109-90	-49	400	✓	✓	✓	✓	✓	✓	✓
	RV1121-90	-15	400						✓	

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Table 2. Typical Physical Properties — Thermoset Elastomers

Parker Compound	Part Numbering Material Code	Typical Applications and Description	Service Temperature Range°F (°C)	Tensile Strength at Break psi (MPa)	Ultimate Elonga-tion%	Shore A Hardness	100% Modulus psi (MPa)	Compression Set	
								% Set	70 hrs at °F (°C)
Hydrogenated Nitrile (HNBR)									
N4007A95	4007	Parker's toughest HNBR compound with excellent resistance to extrusion and rapid gas decompression	-20 to +320 (-29 to +160)	4639 (32.0)	185	93	2413 (16.6)	27	302 (150)
N4031A85 (KA183-85)	4031	Parker's low temperature HNBR oilfield compound	-40 to +320 (-40 to +160)	2551 (17.6)	139	88	1947 (13.4)	18.0	212 (100)
N4033A90* (KB163-90)	4033	**Parker's premiere HNBR compound for extreme oilfield applications. Excellent resistance to compression set and extrusion**	**-25 to +320 (-32 to +160)**	**3751 (25.9)**	**129**	**89**	**3204 (22.1)**	**14.4**	**302 (150)**
N4039A90 (RH1170-90)	4039	Parker's general purpose HNBR compound for API 6A applications	-25 to +320 (-32 to +160)	4197 (28.9)	151	92	2646 (18.2)	26.0	302 (150)
Fluorocarbon Elastomers (FKM)									
V1238A95	1238	Parker's toughest FKM compound with excellent resistance to rapid gas de-compression and extrusion	-15 to +400 (-29 to +204)	2900 (20.0)	95	93	3079 (21.2)	12.5	302 (150)
VG109-90*	**V109**	**Parker's premiere FKM compound for extreme oilfield applications. Excellent compression set resistance and broadest overall temperature range**	**-49 to +400 (-45 to +204)**	**2314 (16.0)**	**126**	**88**	**2014 (13.9)**	**9.0**	**392 (200)**
RV1121-90	1121	Parker's high strength, high-fluorine content compound for API 6A applications	-15 to +400 (-29 to +204)	3756 (25.9)	118	87	2981 (20.6)	18.0	392 (200)

**Preferred oilfield compounds*

Table 3. Typical Application Ranges and Recommendations — Anti-Extrusion Garter Spring Materials

Spring Code	Spring Material Description	Recommended Use
S	300 Series Stainless Steel	• Pressures to 20,000 psi • Static seals
I	Inconel®	• Pressures to 20,000 psi • Static seals • NACE MR-01-75
P	PEEK Monofilament	• Pressures to 15,000 psi • Dynamic applications
C	PEEK-coated 300 Series Stainless Steel	• Pressures to 20,000 psi + • Static and dynamic applications

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Rod & Piston Seal
PSS Profile

PSS Profile, Rod and Piston S-Seal (Spring Seal)

Parker's S-Seal is a compact, single piece seal design featuring an extrusion resistant elastomer with two anti-extrusion springs molded into the outer edges. Their unique design incorporates two non-extrusion devices and a sealing element in a single-piece construction, offering bi-directional sealing while incorporating a simple symmetric profile. The non-extrusion devices, utilizing an endless coiled spring on both sides of the sealing element, allow large extrusion gaps to be bridged at high pressures. The non-extrusion devices when made of metal limit the seal to static applications. They are designed to be used in o-ring grooves, allowing the upgrade of existing equipment.

Additional features of Parker's S-Seal:

- Designed to withstand pressures to 20,000 psi and temperatures to 350°F
- Single-piece design means easier installation, equipment assembly and maintenance
- Integrated anti-extrusion garter springs eliminate risk of incorrectly installed back-up rings
- Size range: 1-1/2" to 60" in diameter
- Engineered to fit existing Parker AS568 style and ISO 3601-2 style grooves
- Available for static and dynamic applications in materials suitable for demanding downhole environments

PSS (Rod) Cross-Section

Technical Data

Standard Materials	
Elastomers	**Temperature**
N4033A90 HNBR	-25°F to +320°F (-32C to +160°C)
VG109-90 FKM	-49°F to +400°F (-45°C to +204°C)

Springs	**Max Pressure Range**
300 Series Stainless Steel	20,000 psi* (1,379 bar)
PEEK Monofilament	15,000 psi† (1,034 bar)

*Static applications
†Dynamic applications

Alternate Materials: For applications that may require an alternate material, please contact your local Parker representative.

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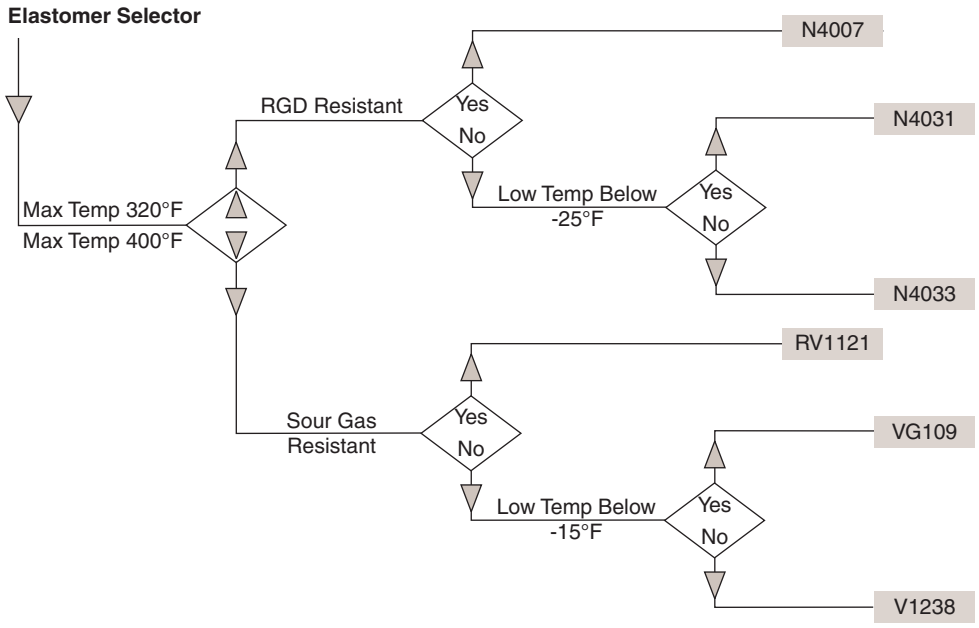
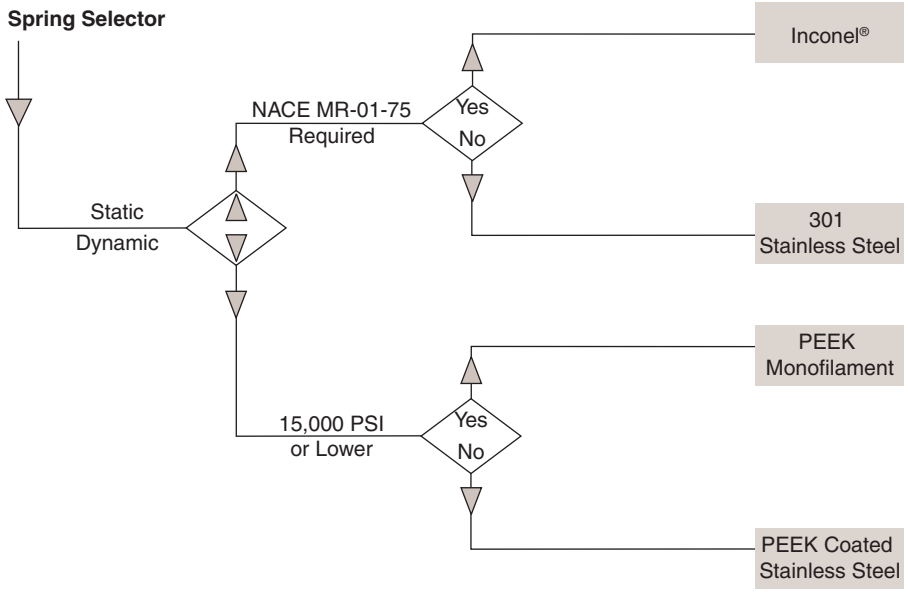
Decision Trees

Elastomer and Spring Selection Guide

The following decision trees are to be used as a selection guide only. Often several other parameters must be considered to optimize seal design.

Contact Parker's oil and gas application engineers for confirmation of your choice or for further recommendations. Parker also recommends that any seal be tested in the application conditions before releasing for production.





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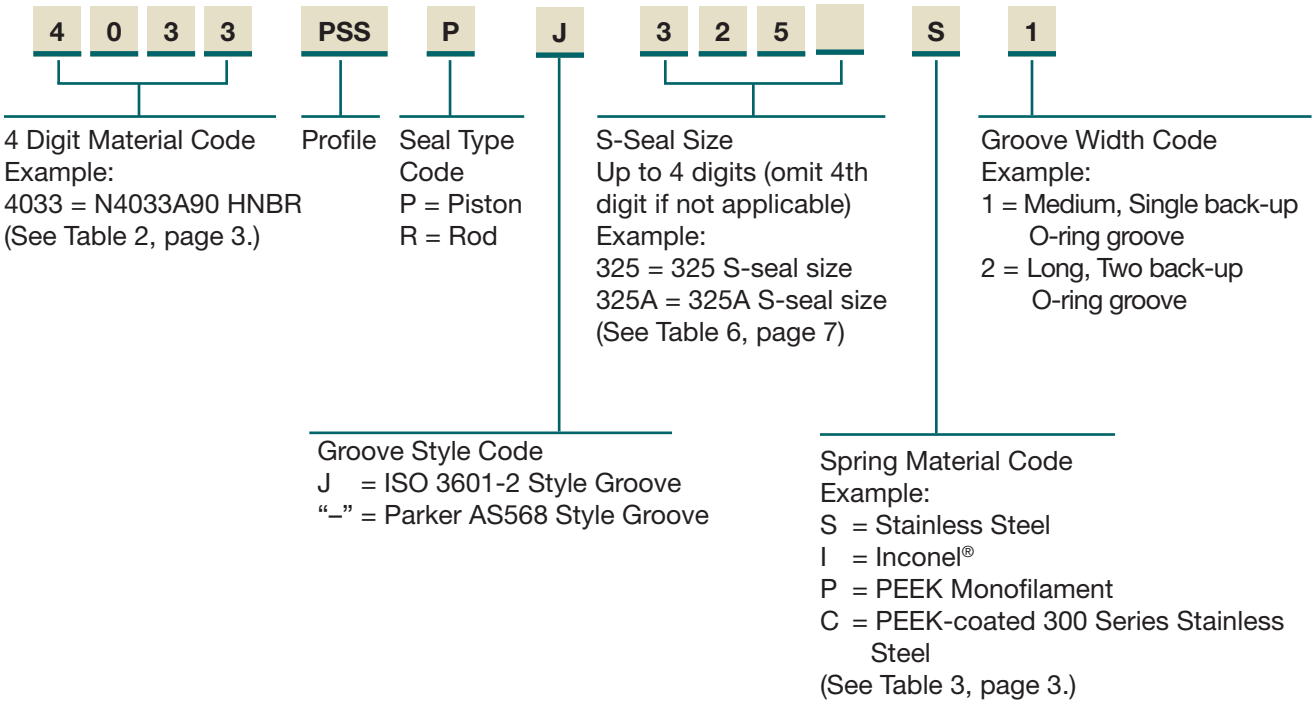
Part Numbering

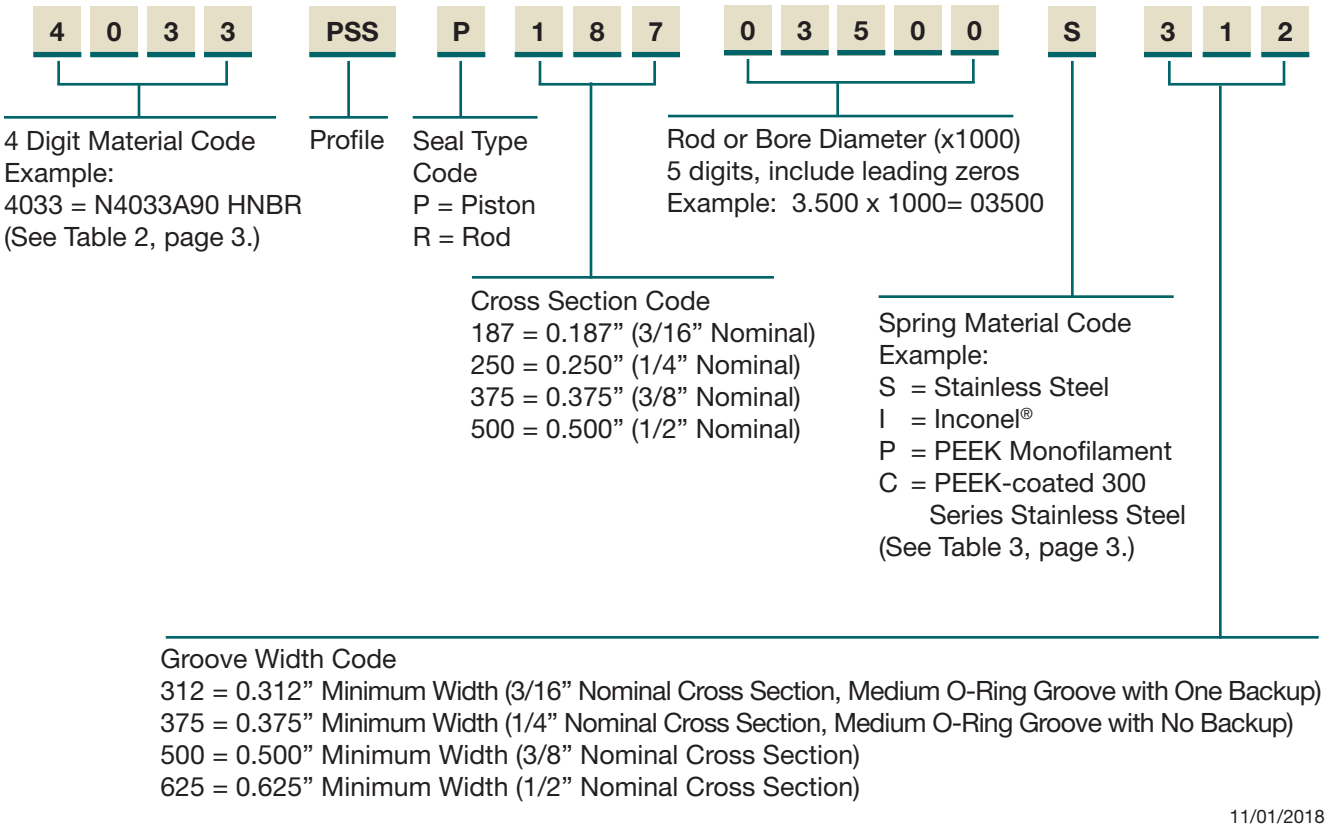
Part Number Nomenclature — Standard S-Seal

Table 4. Standard S-Seal



Part Number Nomenclature — Custom S-Seal

Table 5. Custom S-Seal



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Gland Dimensions — S-Seal Profile

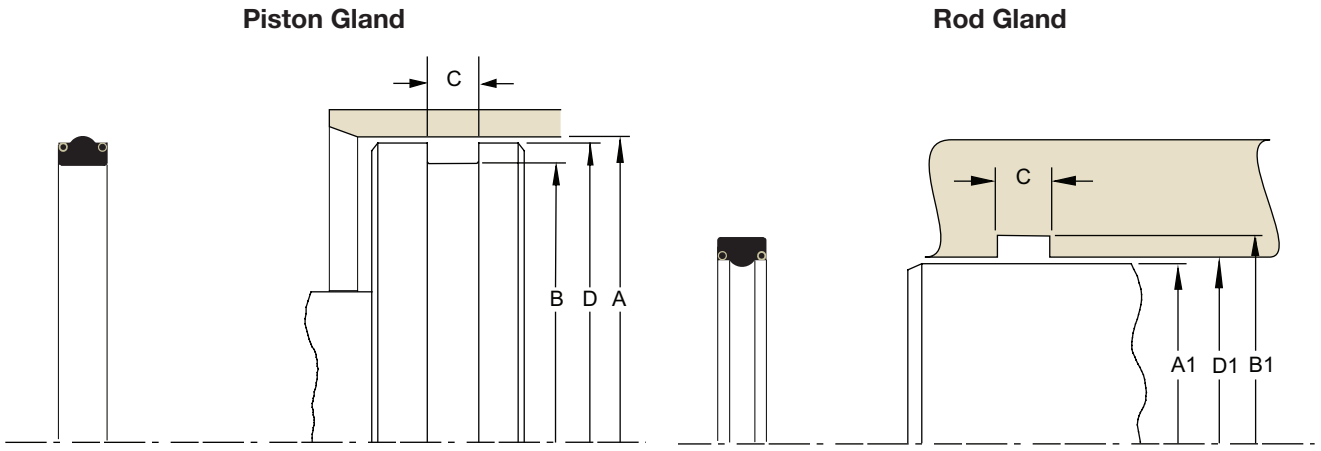

Table 6. Standard ISO3601-2 Style S-Seal — Sizes and Gland Dimensions

S-Seal Size	Piston Seal			Rod Seal			C Groove Width	
	A Bore Dia	B Groove Dia	D Piston Dia (Min)	A1 Rod Dia.	B1 Groove Dia.	D1 Throat Dia. (Max)	Medium Groove Width	Long Groove Width
ISO3601-2	+.002/-.000	+.000/-.004	+.000/-.002	+.000/-.002	+.004/-.000	+.002/-.000	+.008/-.000	+.008/-.000
325	1.875	1.503	1.859	1.500	1.872	1.516	0.346	0.417
325A	1.938	1.566	1.922	1.562	1.934	1.578	0.346	0.417
326	2.000	1.628	1.984	1.625	1.997	1.641	0.346	0.417
326A	2.063	1.691	2.047	1.688	2.060	1.704	0.346	0.417
327	2.125	1.753	2.109	1.750	2.122	1.766	0.346	0.417
327A	2.188	1.816	2.172	1.813	2.185	1.829	0.346	0.417
328	2.250	1.878	2.234	1.875	2.247	1.891	0.346	0.417
328A	2.313	1.941	2.297	1.938	2.310	1.954	0.346	0.417
329	2.375	2.003	2.359	2.000	2.372	2.016	0.346	0.417
329A	2.438	2.066	2.422	2.063	2.435	2.079	0.346	0.417
330	2.500	2.128	2.484	2.125	2.497	2.141	0.346	0.417
330A	2.563	2.191	2.547	2.188	2.560	2.204	0.346	0.417
331	2.625	2.253	2.609	2.250	2.622	2.266	0.346	0.417
331A	2.688	2.316	2.672	2.313	2.685	2.329	0.346	0.417
332	2.750	2.378	2.734	2.375	2.747	2.391	0.346	0.417
332A	2.813	2.441	2.797	2.438	2.810	2.454	0.346	0.417
333	2.875	2.503	2.859	2.500	2.872	2.516	0.346	0.417
333A	2.938	2.566	2.922	2.563	2.935	2.579	0.346	0.417
334	3.000	2.628	2.984	2.625	2.997	2.641	0.346	0.417
334A	3.063	2.691	3.047	2.688	3.060	2.704	0.346	0.417
335	3.125	2.753	3.109	2.750	3.122	2.766	0.346	0.417
335A	3.188	2.816	3.172	2.813	3.185	2.829	0.346	0.417

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Gland Dimensions

Table 6. Standard ISO3601-2 Style S-Seal — Sizes and Gland Dimensions (cont'd)

S-Seal Size	Piston Seal			Rod Seal			C Groove Width	
	A Bore Dia	B Groove Dia	D Piston Dia (Min)	A1 Rod Dia.	B1 Groove Dia.	D1 Throat Dia. (Max)	Medium Groove Width	Long Groove Width
ISO3601-2	+.002/-.000	+.000/-.004	+.000/-.002	+.000/-.002	+.004/-.000	+.002/-.000	+.008/-.000	+.008/-.000
336	3.250	2.878	3.234	2.875	3.247	2.891	0.346	0.417
336A	3.313	2.941	3.297	2.938	3.310	2.954	0.346	0.417
337	3.375	3.003	3.359	3.000	3.372	3.016	0.346	0.417
337A	3.438	3.066	3.422	3.063	3.435	3.079	0.346	0.417
338	3.500	3.128	3.484	3.125	3.497	3.141	0.346	0.417
338A	3.563	3.191	3.547	3.188	3.560	3.204	0.346	0.417
339	3.625	3.253	3.609	3.250	3.622	3.266	0.346	0.417
339A	3.688	3.316	3.672	3.313	3.685	3.329	0.346	0.417
340	3.750	3.378	3.734	3.375	3.747	3.391	0.346	0.417
340A	3.813	3.441	3.797	3.438	3.810	3.454	0.346	0.417
341	3.875	3.503	3.859	3.500	3.872	3.516	0.346	0.417
341A	3.938	3.566	3.922	3.563	3.935	3.579	0.346	0.417
342	4.000	3.628	3.984	3.625	3.997	3.641	0.346	0.417
342A	4.063	3.691	4.047	3.688	4.060	3.704	0.346	0.417
343	4.125	3.753	4.109	3.750	4.122	3.766	0.346	0.417
343A	4.188	3.816	4.172	3.813	4.185	3.829	0.346	0.417
344	4.250	3.878	4.234	3.875	4.247	3.891	0.346	0.417
344A	4.313	3.941	4.297	3.938	4.310	3.954	0.346	0.417
345	4.375	4.003	4.359	4.000	4.372	4.016	0.346	0.417
345A	4.438	4.066	4.422	4.063	4.435	4.079	0.346	0.417
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348	4.750	4.378	4.734	4.375	4.747	4.391	0.346	0.417
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349A	4.938	4.566	4.922	4.563	4.935	4.579	0.346	0.417
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350A	5.063	4.691	5.047	4.688	5.060	4.704	0.346	0.417
351	5.125	4.753	5.109	4.750	5.122	4.766	0.346	0.417
861	5.188	4.816	5.172	4.813	5.185	4.829	0.346	0.417
352	5.250	4.878	5.234	4.875	5.247	4.891	0.346	0.417
862	5.313	4.941	5.297	4.938	5.310	4.954	0.346	0.417
353	5.375	5.003	5.359	5.000	5.372	5.016	0.346	0.417
863	5.438	5.066	5.422	5.063	5.435	5.079	0.346	0.417
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864	5.563	5.191	5.547	5.188	5.560	5.204	0.346	0.417

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Table 6. Standard ISO3601-2 Style S-Seal — Sizes and Gland Dimensions (cont'd)

S-Seal Size	Piston Seal			Rod Seal			C Groove Width	
	A Bore Dia	B Groove Dia	D Piston Dia (Min)	A1 Rod Dia.	B1 Groove Dia.	D1 Throat Dia. (Max)	Medium Groove Width	Long Groove Width
ISO3601-2	+.002/-.000	+.000/-.004	+.000/-.002	+.000/-.002	+.004/-.000	+.002/-.000	+.008/-.000	+.008/-.000
355	5.625	5.253	5.609	5.250	5.622	5.266	0.346	0.417
865	5.688	5.316	5.672	5.313	5.685	5.329	0.346	0.417
356	5.750	5.378	5.734	5.375	5.747	5.391	0.346	0.417
866	5.813	5.441	5.797	5.438	5.810	5.454	0.346	0.417
357	5.875	5.503	5.859	5.500	5.872	5.516	0.346	0.417
867	5.938	5.566	5.922	5.563	5.935	5.579	0.346	0.417
358	6.000	5.628	5.984	5.625	5.997	5.641	0.346	0.417
868	6.063	5.691	6.047	5.688	6.060	5.704	0.346	0.417
359	6.125	5.753	6.109	5.750	6.122	5.766	0.346	0.417
869	6.188	5.816	6.172	5.813	6.185	5.829	0.346	0.417
360	6.250	5.878	6.234	5.875	6.247	5.891	0.346	0.417
870	6.313	5.941	6.297	5.938	6.310	5.954	0.346	0.417
361	6.375	6.003	6.359	6.000	6.372	6.016	0.346	0.417
644	6.500	6.128	6.484	6.125	6.497	6.141	0.346	0.417
362	6.625	6.253	6.609	6.250	6.622	6.266	0.346	0.417
645	6.750	6.378	6.734	6.375	6.747	6.391	0.346	0.417
363	6.875	6.503	6.859	6.500	6.872	6.516	0.346	0.417
646	7.000	6.628	6.984	6.625	6.997	6.641	0.346	0.417
364	7.125	6.753	7.109	6.750	7.122	6.766	0.346	0.417
647	7.250	6.878	7.234	6.875	7.247	6.891	0.346	0.417
365	7.375	7.003	7.359	7.000	7.372	7.016	0.346	0.417
366	7.625	7.253	7.609	7.250	7.622	7.266	0.346	0.417
367	7.875	7.503	7.859	7.500	7.872	7.516	0.346	0.417
368	8.125	7.753	8.109	7.750	8.122	7.766	0.346	0.417
369	8.375	8.003	8.359	8.000	8.372	8.016	0.346	0.417

S-Seal Size	Piston Seal			Rod Seal			C Groove Width	
	A Bore Dia	B Groove Dia	D Piston Dia (Min)	A1 Rod Dia.	B1 Groove Dia.	D1 Throat Dia. (Max)	Medium Groove Width	Long Groove Width
ISO3601-2	+.002/-.000	+.000/-.004	+.000/-.002	+.000/-.002	+.004/-.000	+.002/-.000	+.008/-.000	+.008/-.000
425	5.000	4.505	4.977	4.500	4.995	4.523	0.472	0.575
426	5.125	4.630	5.102	4.625	5.120	4.648	0.472	0.575
427	5.250	4.755	5.227	4.750	5.245	4.773	0.472	0.575
428	5.375	4.880	5.352	4.875	5.370	4.898	0.472	0.575
429	5.500	5.005	5.477	5.000	5.495	5.023	0.472	0.575
430	5.625	5.130	5.602	5.125	5.620	5.148	0.472	0.575
431	5.750	5.255	5.727	5.250	5.745	5.273	0.472	0.575

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Gland Dimensions

Table 6. Standard ISO3601-2 Style S-Seal — Sizes and Gland Dimensions (cont'd)

S-Seal Size	Piston Seal			Rod Seal			C Groove Width	
	A Bore Dia	B Groove Dia	D Piston Dia (Min)	A1 Rod Dia.	B1 Groove Dia.	D1 Throat Dia. (Max)	Medium Groove Width	Long Groove Width
ISO3601-2	+.002/-.000	+.000/-.004	+.000/-.002	+.000/-.002	+.004/-.000	+.002/-.000	+.008/-.000	+.008/-.000
432	5.875	5.380	5.852	5.375	5.870	5.398	0.472	0.575
433	6.000	5.505	5.977	5.500	5.995	5.523	0.472	0.575
434	6.125	5.630	6.102	5.625	6.120	5.648	0.472	0.575
435	6.250	5.755	6.227	5.750	6.245	5.773	0.472	0.575
436	6.375	5.880	6.352	5.875	6.370	5.898	0.472	0.575
437	6.500	6.005	6.477	6.000	6.495	6.023	0.472	0.575
872	6.625	6.130	6.602	6.125	6.620	6.148	0.472	0.575
438	6.750	6.255	6.727	6.250	6.745	6.273	0.472	0.575
874	6.875	6.380	6.852	6.375	6.870	6.398	0.472	0.575
439	7.000	6.505	6.977	6.500	6.995	6.523	0.472	0.575
876	7.125	6.630	7.102	6.625	7.120	6.648	0.472	0.575
440	7.250	6.755	7.227	6.750	7.245	6.773	0.472	0.575
878	7.375	6.880	7.352	6.875	7.370	6.898	0.472	0.575
441	7.500	7.005	7.477	7.000	7.495	7.023	0.472	0.575
880	7.625	7.130	7.602	7.125	7.620	7.148	0.472	0.575
442	7.750	7.255	7.727	7.250	7.745	7.273	0.472	0.575
882	7.625	7.130	7.602	7.375	7.870	7.398	0.472	0.575
443	8.000	7.505	7.977	7.500	7.995	7.523	0.472	0.575
884	8.125	7.630	8.102	7.625	8.120	7.648	0.472	0.575
444	8.250	7.755	8.227	7.750	8.245	7.773	0.472	0.575
886	8.375	7.880	8.352	7.375	7.870	7.398	0.472	0.575
445	8.500	8.005	8.477	8.000	8.495	8.023	0.472	0.575
445A	8.750	8.255	8.727	8.250	8.745	8.273	0.472	0.575
446	9.000	8.505	8.977	8.500	8.995	8.523	0.472	0.575
446M	9.125	8.630	9.102	8.625	9.120	8.648	0.472	0.575
446A	9.250	8.755	9.227	8.750	9.245	8.773	0.472	0.575
446B	9.375	8.880	9.352	8.875	9.370	8.898	0.472	0.575
447	9.500	9.005	9.477	9.000	9.495	9.023	0.472	0.575
447M	9.625	9.130	9.602	9.125	9.620	9.148	0.472	0.575
447A	9.750	9.255	9.727	9.250	9.745	9.273	0.472	0.575
447B	9.875	9.380	9.852	9.375	9.870	9.398	0.472	0.575
448	10.000	9.505	9.977	9.500	9.995	9.523	0.472	0.575
448A	10.250	9.755	10.227	9.750	10.245	9.773	0.472	0.575
449	10.500	10.005	10.477	10.000	10.495	10.023	0.472	0.575
449A	10.750	10.255	10.727	10.250	10.745	10.273	0.472	0.575
450	11.000	10.505	10.977	10.500	10.995	10.523	0.472	0.575
450A	11.250	10.755	11.227	10.750	11.245	10.773	0.472	0.575
451	11.500	11.005	11.477	11.000	11.495	11.023	0.472	0.575

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Table 6. Standard ISO3601-2 Style S-Seal — Sizes and Gland Dimensionss (cont'd)

S-Seal Size	Piston Seal			Rod Seal			C Groove Width	
	A Bore Dia	B Groove Dia	D Piston Dia (Min)	A1 Rod Dia.	B1 Groove Dia.	D1 Throat Dia. (Max)	Medium Groove Width	Long Groove Width
ISO3601-2	+.002/-.000	+.000/-.004	+.000/-.002	+.000/-.002	+.004/-.000	+.002/-.000	+.008/-.000	+.008/-.000
451A	11.750	11.255	11.727	11.250	11.745	11.273	0.472	0.575
452	12.000	11.505	11.977	11.500	11.995	11.523	0.472	0.575
452A	12.250	11.755	12.227	11.750	12.245	11.773	0.472	0.575
453	12.500	12.005	12.477	12.000	12.495	12.023	0.472	0.575
648	12.750	12.255	12.727	12.250	12.745	12.273	0.472	0.575
454	13.000	12.505	12.977	12.500	12.995	12.523	0.472	0.575
649	13.250	12.755	13.227	12.750	13.245	12.773	0.472	0.575
455	13.500	13.005	13.477	13.000	13.495	13.023	0.472	0.575
650	13.750	13.255	13.727	13.250	13.745	13.273	0.472	0.575
456	14.000	13.505	13.977	13.500	13.995	13.523	0.472	0.575
456A	14.250	13.755	14.227	13.750	14.245	13.773	0.472	0.575
457	14.500	14.005	14.477	14.000	14.495	14.023	0.472	0.575
457A	14.750	14.255	14.727	14.250	14.745	14.273	0.472	0.575
458	15.000	14.505	14.977	14.500	14.995	14.523	0.472	0.575
458A	15.250	14.755	15.227	14.750	15.245	14.773	0.472	0.575
459	15.500	15.005	15.477	15.000	15.495	15.023	0.472	0.575
459M	15.750	15.255	15.727	15.250	15.745	15.273	0.472	0.575
460	16.000	15.505	15.977	15.500	15.995	15.523	0.472	0.575
460A	16.250	15.755	16.227	15.750	16.245	15.773	0.472	0.575
461	16.500	16.005	16.477	16.000	16.495	16.023	0.472	0.575
461M	16.750	16.255	16.727	16.250	16.745	16.273	0.472	0.575
462	17.000	16.505	16.977	16.500	16.995	16.523	0.472	0.575
463	17.500	17.005	17.477	17.000	17.495	17.023	0.472	0.575
464	18.000	17.505	17.977	17.500	17.995	17.523	0.472	0.575
465	18.500	18.005	18.477	18.000	18.495	18.023	0.472	0.575
466	19.000	18.505	18.977	18.500	18.995	18.523	0.472	0.575
467	19.500	19.005	19.477	19.000	19.495	19.023	0.472	0.575
468	20.000	19.505	19.977	19.500	19.995	19.523	0.472	0.575
469	20.500	20.005	20.477	20.000	20.495	20.023	0.472	0.575
470	21.500	21.005	21.477	21.000	21.495	21.023	0.472	0.575
471	22.500	22.005	22.477	22.000	22.495	22.023	0.472	0.575
472	23.500	23.005	23.477	23.000	23.495	23.023	0.472	0.575
473	24.500	24.005	24.477	24.000	24.495	24.023	0.472	0.575
474	25.500	25.005	25.477	25.000	25.495	25.023	0.472	0.575
475	26.500	26.005	26.477	26.000	26.495	26.023	0.472	0.575

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WARNING: These products can expose you to chemicals including carbon black (airborne and extracts), antimony trioxide, titanium dioxide, silica (crystalline), di(2-ethylhexyl)phthalate, ethylene thiourea, acrylonitrile, 1,3-butadiene, epichlorohydrin, toluenediisocyanate, tetrafluoroethylene, ethylbenzene, formaldehyde, furfuryl alcohol, glass fibers, methyl isobutyl ketone, nickel (metallic and compounds), lead and lead compounds which are known to the State of California to cause cancer; and 1,3-butadiene, epichlorohydrin, di(2-ethylhexyl)phthalate, di-isodecyl phthalate, ethylene thiourea, methyl isobutyl ketone, methanol, toluene, lead and lead compounds which are known to the State of California to cause birth defects and other reproductive harm. For more information go to www.P65Warnings.ca.gov.

EPS5277 TMR/POD 11/2018

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