

# Metal Seals

Standard Cross Sections for a  
Wide Range of Industries



## Highest Integrity Sealing Solutions

The most extreme environments demand metal seal sealing solutions. Parker's resilient metal seals meet the challenges of high temperatures or cryogenics, high pressures or hard vacuum, corrosive chemicals and intense levels of radiation, performing dependably year after year.

Metal seals are used in industry in temperature, pressure, and media conditions which are outside the range of elastomers.

Standard designs and custom engineered solutions available.



## Contact Information:

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[www.parker.com/css](http://www.parker.com/css)

## Product Features:

- Cryogenic applications
- High temperature applications
- Vacuum applications
- High pressure applications
- Corrosive media
- Many standard cross-sections
- Multiple plating options
- Custom engineered solutions available



ENGINEERING YOUR SUCCESS.

														
	<b>C-Ring</b>		<b>Spring Energized C-Ring</b>		<b>E-Ring (W-Ring)</b>		<b>Metal O-Ring</b>		<b>U-Ring (V-Ring)</b>		<b>Wire Ring</b>		<b>Axial Seal</b>	
<b>Seal Type Options</b>	ECI: Internal Pressure ECE: External Pressure		ESI: Internal Pressure ESE: External Pressure		EEI: Internal Pressure EEE: External Pressure		EOI: ID Vented, Internal Pressure EON: Plain, Internal Pressure EOP: Pressure Filled, Internal Pressure EOE: OD Vented, External Pressure EOM: Plain, External Pressure EOR: Pressure Filled, External Pressure		EUI: Internal Pressure EUE: External Pressure		EWI: Internal Pressure EWE: External Pressure		ECA: Internal Pressure External Pressure	
<b>Recommended Materials</b>  <i>Alternate materials available upon request</i>	Alloy 718 Waspaloy	Alloy X-750 Rene 41	Alloy 718 Alloy 625 Rene 41	Alloy X-750 Waspaloy Haynes 188	Alloy 718 Waspaloy	Alloy X-750 Rene 41	Alloy 718 304 SS 321 SS Monel 400 Haynes 25	Alloy X-750 316 SS 347 SS Alloy 600	Alloy 718 Waspaloy Haynes 188	Alloy X-750 Rene 41	304 SS 321 SS Monel 400 Gold Copper	316 SS 347 SS AL Alloy 1100 Silver Nickel	Alloy 718 Waspaloy	Alloy X-750 Rene 41
<b>Springback Range</b>	Min: 0.001" Max: 0.025"		Min: 0.003" Max: 0.022"		Min: 0.001" Max: 0.048"		Min: 0.001" Max: 0.006"		Min: 0.001" Max: 0.025"		Min: 0.001" Max: 0.002"		Min: N/A Max: N/A	
<b>Diameter Range</b>  <i>Contact us for larger sizes</i>	Min: 0.185" Max: 120.000"		Min: 0.425" Max: 120.000"		Min: 1.000" Max: 60.000"		Min: 0.250" Max: 48.000"		Min: 1.750" Max: 48.000"		Min: 0.250" Max: 24.000"		Min: 0.219" Max: 9.000"	
<b>Free Height Range</b>	Min: 1/32" Max: 1/2"		Min: 1/16" Max: 1/2"		Min: 1/16" Max: 1/4"		Min: 1/32" Max: 1/4"		Min: 1/32" Max: 1/4"		Min: 1/32" Max: 1/8"		Min: N/A Max: N/A	
<b>Seating Load Range</b>	Min: 80 lbs/in circumference Max: 1700 lbs/in circumference		Min: 500 lbs/in circumference Max: 2900 lbs/in circumference		Min: 300 lbs/in circumference Max: 90 lbs/in circumference		Min: 100 lbs/in circumference Max: 1500 lbs/in circumference		Min: 45 lbs/in circumference Max: 70 lbs/in circumference		Min: 4200 lbs/in circumference Max: 6000 lbs/in circumference		Min: N/A Max: N/A	
<b>Temperature Range</b>	Min: Cryogenic Max: ~1450° F		Min: Cryogenic Max: ~1450° F		Min: Cryogenic Max: ~1450° F		Min: Cryogenic Max: ~1450° F		Min: Cryogenic Max: ~1450° F		Min: Cryogenic Max: ~2000° F		Min: Cryogenic Max: ~1450° F	
<b>Working Pressure Range</b>	Min: Vacuum Max: 99,000 psi		Min: Vacuum Max: 38,000 psi		Min: Atmosphere Max: 5,500 psi		Min: Vacuum Max: 25,000 psi		Min: Atmosphere Max: 12,000 psi		Min: Vacuum Max: 20,000 psi		Min: Atmosphere Max: 57,000 psi	
<b>Leakage Range</b>	Min: 10 <sup>^</sup> (-12) cc/sec Max = 10 <sup>^</sup> (-1) cc/sec		Min: 10 <sup>^</sup> (-13) cc/sec Max = 10 <sup>^</sup> (-2) cc/sec		Min: 10 <sup>^</sup> (-4) cc/sec Max = 10 <sup>^</sup> (+3) cc/sec		Min: 10 <sup>^</sup> (-11) cc/sec Max = 10 <sup>^</sup> (+1) cc/sec		Min: 10 <sup>^</sup> (-3) cc/sec Max = 10 <sup>^</sup> (+3) cc/sec		Min: 10 <sup>^</sup> (-11) cc/sec Max = 10 <sup>^</sup> (-6) cc/sec		Min: 10 <sup>^</sup> (-11) cc/sec Max = 10 <sup>^</sup> (-6) cc/sec	
<b>Leak Expectation</b>	Depending on the cross-section, can be bubble tight seal		Yes, this is a bubble tight seal		No, this is not a bubble tight seal		Depending on the cross-section, can be bubble tight seal		No, this is not a bubble tight seal		Yes, this is a bubble tight seal		Depending on the cross-section, can be bubble tight seal	
<b>Applications</b>	Valve assemblies, pressure vessels, jet engines, fuel injectors, separable fittings		Pressure vessel enclosures, manways, steam generators, gasoline/diesel engines, exhaust joints		Pneumatic joints, turbine engines, bleed air ducting joints, turbine engine cases, low-load flanges, and joints		Heavy joints with minimal movement, static low-leakage face sealing		Valve assemblies, pressure vessels, jet engines, fuel injectors, separable fittings, etc., that require more springback		Small process valves, pressure vessels, high loads applied, cost-effective assemblies, static applications		Static and low cycle dynamic axial sealing, quarter turn valve systems, mechanical seal to shaft interface	
<b>Features</b>	Relatively flexible for use with non-flat flanges, optimized one-piece construction for low cost		Similar design as the C-Ring, but allows for higher load applications and rougher mating surfaces		Multiple cross-sections, low load seal, generally used unplated, fully elastic for consistent performance over many cycles		Standard metal O-rings available for all "MS" sizes and configurations, robust, high integrity seal for ease of handling		Compliant low load seal, generally used unplated, strongly pressure energized		Can be made with many different material options, requires a large clamping load		Close tolerance seal for light installation loads. Plating partially transfers to stem for low wear	
<b>Relative Cost</b>	\$\$		\$\$\$		\$\$\$		\$\$		\$\$\$		\$		\$\$\$\$	



# Design Guide Walkthrough

Using our Metal Seal Design Guide, Catalog CSS 5129, you can customize all of our standard catalog parts to fit your application using our universal part number system. We also offer a variety of part configurators on our website.

Visit [www.parker.com/css](http://www.parker.com/css) to customize your sealing solution.

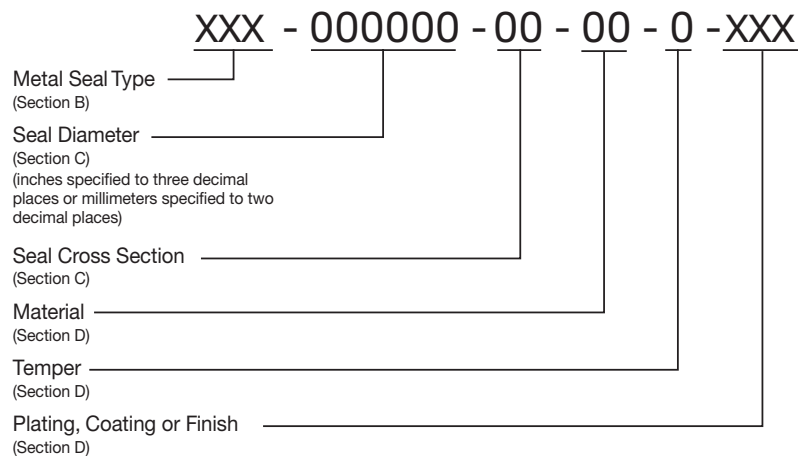


**DOWNLOAD THE GUIDE  
CSS 5129**

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[www.parker.com/css](http://www.parker.com/css)

**WHERE TO BUY**



This design guide provides a rapid, unambiguous, self-selection process with all the features, applications and limitations of each product clearly stated. The guide is organized into sections which easily allows you to determine the part number of the metal seal that is right for your application.

- Section B helps you to determine which metal seal type is most appropriate for your application.
- Section C is organized by metal seal type. Having selected the best metal seal type from Section B, simply turn to the page in Section C for the seal selected and you will find all the groove and metal seal dimensions you need.
- Section D lists the many available metal seal materials and assists you in determining which combination of materials is most appropriate for your sealing environment.
- Section E provides supporting technical information and recommendations.
- Section F shows a number of other metal seal designs which are available for unique applications when only a special seal will do. In these cases, please contact one of our applications engineers at any of our worldwide offices and we will be happy to assist you. Please send us your application data sheet (Page F-103 & F-104) for a fast, complete response.

