E-FLEX™

Metal E -Rings

SEALING CONCEPT

E-FLEX™ Metal E-rings are designed to have low load, high spring back performance for high pressure/temperature applications. In service, the E-FLEX™ is pressure energized by the system which increases the contact stress and further minimizes leakage. The E-FLEX™ geometry can be designed to meet the requirements for each unique application and can be manufactured in a wide range of sizes. Typical markets for E-FLEX™ seals include Aerospace, Industrial Turbines, and Automotive.

E-FLEX™ TYPES

E-FLEX™

The standard E-FLEX™ design exhibits improved spring back and reduced load compared to C-Rings.

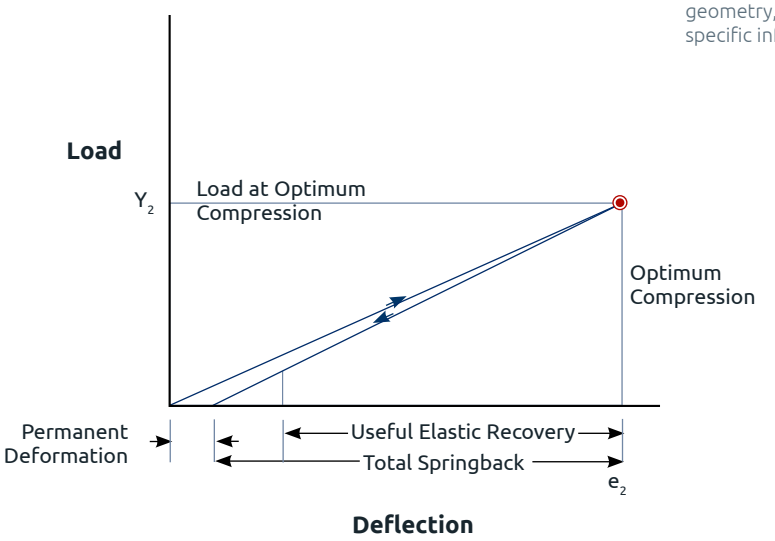
SUPER E-FLEX™

The Super E-FLEX™ is designed to have less stress during installation. These seals typically have less load than the traditional E-FLEX™ seals and have nearly 100% spring back at room temperature.

MULTI-CONVOLUTION

These seals are designed with extra convolutions and special geometry for applications that require maximum spring back in service.

E-FLEX™ CHARACTERISTIC CURVE



NOTE: Actual spring back and load will vary based on material, geometry, and wall thickness. Please check characteristic chart for specific information.

COATINGS AND PLATINGS

Type	Description
Tribological Coating	An HVOC tribaloy coating ideal for applications exhibiting high wear patterns.
Silver Plating	Not recommended for most applications. The E-FLEX™ seal does not generate enough load to plastically deform the silver plating.
Custom	Please contact us at sales@technetics.com for special or custom coating requests.

MATERIAL SELECTION

Material	Status	Temperature	Heat Treatment
Alloy X750	Optional	T < 1,100°F	Solution heat treat and precipitation harden per AMS5598
Alloy 718	Standard	T < 1,200°F	Solution heat treat and precipitation harden per AMS5596
Waspaloy	Optional	T < 1,350°F	Solution heat treat, stabilize and pre-cipitation harden per AMS5544

E-FLEX™ CHARACTERISTICS FOR ALLOY 718 MATERIAL AT 70°F

E-FLEX™ Type	Free Height	Material Thickness	Seal Diameter	Seating Load (PCI) Y_2	Installation Springback	Installation Compression e_2
E-FLEX™	0.075	0.006	0.625 6.000	42 28	0.009 0.011	0.013
	0.098	0.008	0.625 8.000	104 64	0.013 0.014	0.021
	0.102	0.010	0.625 8.000	92 56	0.011 0.013	0.015
	0.132	0.008	1.250 24.000	32 16	0.013 0.014	0.014
	0.132	0.015	1.250 24.000	50 28	0.013 0.014	0.014
	0.218	0.015	3.375 40.000	93 78	0.026 0.031	0.037
	0.243	0.010	6.000 40.000	12 11	0.072 0.073	0.073
	0.295	0.020	10.000 60.000	83 69	0.046 0.047	0.048
	0.375	0.020	8.000 60.000	55 44	0.062 0.062	0.062
Super E-FLEX™	0.108	0.0095	0.950 40.000	38 28	0.015 0.021	0.021
	0.140	0.010	1.750 40.000	24 14	0.022 0.022	0.022
	0.140	0.012	1.750 40.000	41 24	0.021 0.022	0.022
Multiple Convolution E-FLEX™	0.209	0.007	25.000	30	0.040	0.048
	0.230	0.008	25.000	30	0.065	0.065
	0.243	0.008	25.000	46	0.046	0.057
	0.263	0.006	25.000	29	0.062	0.068
	0.286	0.010	25.000	25	0.061	0.061
	0.300	0.010	25.000	55	0.041	0.055

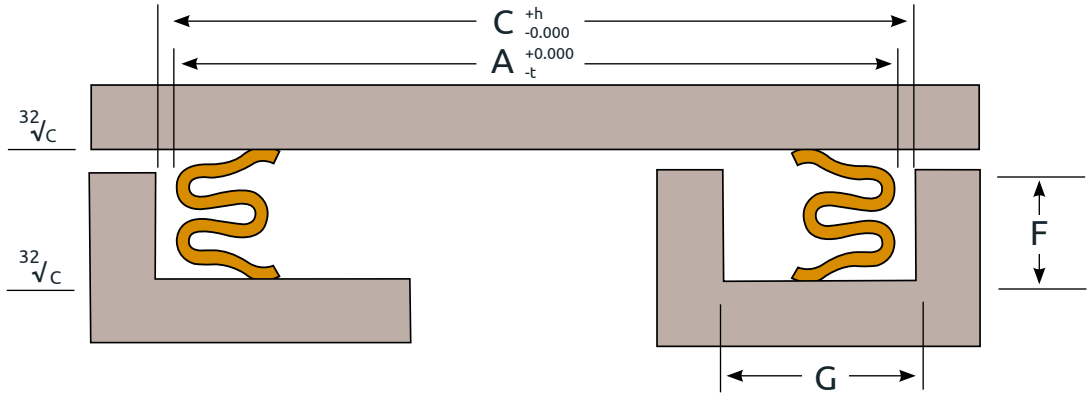
Dimensions in inches

NOTES:

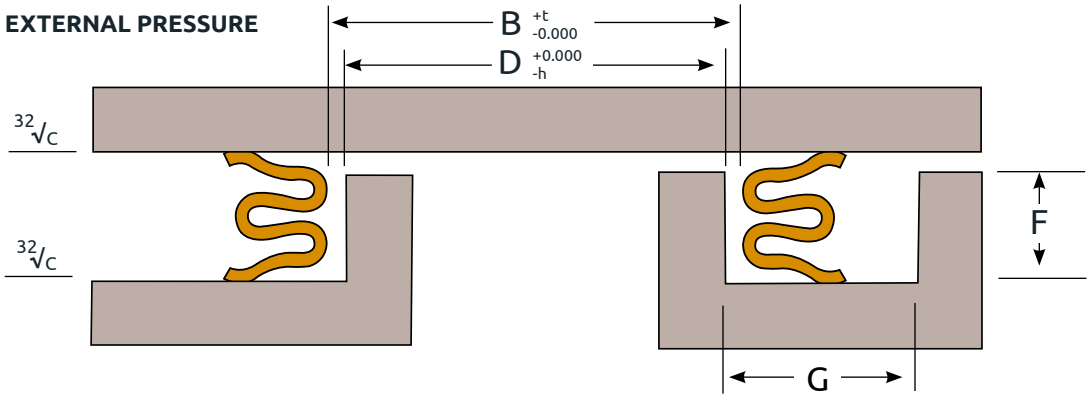
1. PCI = Pounds force per circumferential inch
2. Seating load (Y_2) is an approximation and may vary based on groove clearance, seal diameter, tolerance and coating thickness. It does not allow for system pressure requirements and should be verified for each application and seal size.
3. The customer must verify that system bolts and flanges can generate the required seating load without warping or distorting.
4. The customer must test and verify that the seal design meets customer designated performance requirements.

Other materials: Please contact us at sales@technetics.com
Anti-Wear Coatings: Please contact us at sales@technetics.com

INTERNAL PRESSURE



EXTERNAL PRESSURE



SEAL AND GROOVE SIZING CALCUATIONS

The equations below can be used for basic groove calculations. Applications that have significant thermal expansion may require additional clearance. Please contact us at sales@technetics.com for design assistance.

DETERMINING SEAL DIAMETER:

Internal	External
A = C-X-2Pmax	B = D + X + 2Pmax

DETERMINING GROOVE DIAMETER:

Internal	External
C = A + X + 2Pmax	D = B – X – 2Pmax

Tolerancing: See chart

Where:
- A = Seal Outer Diameter
- B = Seal Inner Diameter
- C = Groove Outer Diameter
- D = Groove Inner Diameter
- Pmax = Maximum Plating or Coating Thickness
- x = Diametrical clearance

TOLERANCES

	E-FLEX™		Super E-FLEX™		Multiple Convolution E-FLEX™	
Seal Diameter Range	Groove Tolerance "h"	Seal Tolerance "t"	Groove Tolerance "h"	Seal Tolerance "t"	Groove Tolerance "h"	Seal Tolerance "t"
1.000 to 1.999	0.002	0.003	0.002	0.004	-	-
2.000 to 2.999	0.002	0.004	0.003	0.006	-	-
3.000 to 3.999	0.003	0.005	0.004	0.008	-	-
4.000 to 4.999	0.003	0.006	0.004	0.008	-	-
5.000 to 5.999	0.003	0.006	0.005	0.010	-	-
6.000 to 6.999	0.004	0.007	0.006	0.012	-	-
7.000 to 7.999	0.004	0.008	0.007	0.014	-	-
8.000 to 8.999	0.005	0.009	0.008	0.016	-	-
9.000 to 9.999	0.005	0.010	0.009	0.018	-	-
10.000 to 10.99	0.005	0.010	0.010	0.020	0.005	0.010
11.000 to 11.999	0.006	0.011	0.010	0.020	0.006	0.011
12.000 to 12.999	0.006	0.012	0.010	0.020	0.006	0.012
13.000 to 13.999	0.007	0.013	0.010	0.020	0.007	0.013
14.000 +	Contact Us at sales@technetics.com					

Dimensions in inches

SEAL					GROOVE DIMENSIONS				
E-FLEX™ Type	Free Height	Material Thickness (Prior to Forming)	Radial Width (Max. Ref.)	Internal A Diameter Range	External B Diameter Range	Diametrical Clearance x	Groove Depth F	Groove Width (Min) G	
								Int. Press.	Ext. Press.
E-FLEX™	0.075	0.006	0.066	1.360 to 6.000	1.200 to 6.000	0.003	0.062 ± 0.001	0.090	0.090
	0.098	0.008	0.083	2.000 to 10.000	1.200 to 10.000	0.003	0.077 ± 0.002	0.110	0.110
	0.102	0.010	0.091	2.000 to 10.000	1.200 to 10.000	0.003	0.087 ± 0.001	0.115	0.115
	0.132	0.008	0.120	1.360 to 13.000	2.500 to 13.000	0.003	0.118 ± 0.002	0.145	0.145
	0.132	0.015	0.120	1.360 to 13.000	2.500 to 13.000	0.003	0.118 ± 0.002	0.145	0.145
	0.218	0.015	0.190	2.600 to 13.000	2.600 to 13.000	0.005	0.181 ± 0.002	0.210	0.220
	0.243	0.010	0.260	6.000 to 40.000	6.000 to 40.000	0.005	0.170 ± 0.003	0.300	0.320
	0.295	0.020	0.266	6.000 to 60.000	6.000 to 60.000	0.005	0.247 ± 0.003	0.315	0.335
	0.375	0.020	0.340	8.000 to 60.000	8.000 to 60.000	0.005	0.313 ± 0.003	0.405	0.425
Super E-FLEX™	0.108	0.0095	0.145	2.000 to 13.000	2.500 to 13.000	0.003	0.087 ± 0.002	0.170	0.180
	0.140	0.010	0.194	2.500 to 13.000	2.500 to 13.000	0.005	0.118 ± 0.002	0.220	0.250
	0.140	0.012	0.194	2.500 to 13.000	2.500 to 13.000	0.005	0.118 ± 0.002	0.220	0.250
Multiple Convolution E-FLEX™	0.209	0.007	0.116	10.000 to 40.000	10.000 to 40.000	0.003	0.199 / 0.166	0.180	0.180
	0.230	0.008	0.184	10.000 to 40.000	10.000 to 40.000	0.003	0.210 / 0.170	0.255	0.255
	0.243	0.010	0.150	10.000 to 60.000	10.000 to 60.000	0.003	0.231 / 0.191	0.220	0.220
	0.263	0.006	0.150	10.000 to 40.000	10.000 to 40.000	0.003	0.248 / 0.200	0.220	0.220
	0.286	0.010	0.200	10.000 to 40.000	10.000 to 40.000	0.003	0.270 / 0.230	0.270	0.270
	0.300	0.010	0.150	10.000 to 60.000	10.000 to 60.000	0.003	0.285 / 0.245	0.220	0.220

Dimensions in inches

NOTE: Contact Us at sales@technetics.com for additional sizes.

Part Number	AS1895/7 Reference	Duct Size	SEAL DIMENSIONS			
			OD	ID (Ref)	Out of Roundness of Outer Diameter	Free Height
E-800128 -100	AS1895/7 -100	1.00	1.249 1.245	0.958	0.040 0.020	0.113 0.103
E-800128 -125	AS1895/7 -125	1.25	1.499 1.495	1.208	0.040 0.020	0.113 0.103
E-800128 -150	AS1895/7 -150	1.50	1.749 1.745	1.458	0.040 0.020	0.113 0.103
E-800128 -175	AS1895/7 -175	1.75	1.999 1.995	1.708	0.040 0.020	0.113 0.103
E-800128 -200	AS1895/7 -200	2.00	2.249 2.245	1.958	0.040 0.020	0.113 0.103
E-800128 -225	AS1895/7 -225	2.25	2.499 2.493	2.208	0.040 0.020	0.113 0.103
E-800128 -250	AS1895/7 -250	2.50	2.749 2.743	2.458	0.040 0.020	0.113 0.103
E-800128 -275	AS1895/7 -275	2.75	2.999 2.993	2.708	0.040 0.020	0.113 0.103
E-800128 -300	AS1895/7 -300	3.00	3.249 3.243	2.958	0.040 0.020	0.113 0.103
E-800128 -325	AS1895/7 -325	3.25	3.499 3.491	3.208	0.040 0.020	0.113 0.103
E-800128 -350	AS1895/7 -350	3.50	3.749 3.741	3.458	0.050 0.030	0.113 0.103
E-800128 -400	AS1895/7 -400	4.00	4.249 4.241	3.958	0.050 0.030	0.113 0.103
E-800128 -450	AS1895/7 -450	4.50	4.749 4.739	4.458	0.050 0.030	0.113 0.103
E-800128 -500	AS1895/7 -500	5.00	5.249 5.239	4.958	0.060 0.040	0.113 0.103
E-800128 -550	AS1895/7 -550	5.50	5.749 5.737	5.458	0.060 0.040	0.113 0.103
E-800128 -600	AS1895/7 -600	6.00	6.249 6.237	5.958	0.060 0.040	0.113 0.103
E-800128 -650	AS1895/7 -650	6.50	6.749 6.735	6.458	0.065 0.045	0.113 0.103
E-800128 -700	AS1895/7 -700	7.00	7.249 7.235	6.958	0.065 0.045	0.113 0.103
E-800128 -750	AS1895/7 -750	7.50	7.749 7.733	7.458	0.065 0.045	0.113 0.103

NOTE: Material: Alloy 718 per AMS 5596
Heat Treatment: Solution heat treated and precipitation hardened per AMS 5596 in inert atmosphere.

APPLICATIONS DATA SHEET

Tel: 800-233-1722 Fax: 803-783-4279
E-Mail: sales@technetics.com

Technetics GROUP
EnPro Industries companies

COMPANY:	PHONE:
CONTACT:	FAX:
ADDRESS:	E-MAIL:
	DATE:

APPLICATION: (please attach customer drawing / sketch)

Brief Description: _____

Annual quantities: _____ RFQ Quantities: _____

Is This a New Design? o Yes o No Are Modifications Possible? o Yes o No

Drawing or Sketch Attached? o Yes o No What is the Seal Type? o Shaped o Circular

SERVICE CONDITIONS:

Media: Life Expectancy:

Working Temperature: _____ Max/Proof Pressure: _____ @ Temp. = _____

Working Pressure: Max Temperature: @ Pressure =

Pressure Direction: (Internal/External/Axial) _____ **Target Sealing Level:** Helium: _____ Std.cc/sec

Pressure Cycles: _____ Flow Rate: _____ cc/minute

Temperature Cycles: Other:

FLANGE DETAILS: (Please Provide Drawing)

Amount of Flange Movement in Service: (Inches) Radial: Axial: #Cycles:

Material: _____ Thickness: _____

o Groove / Counter Bore: Please list dimensions in Groove Details section

o ANSI Raised Face Size: _____ # Rating: _____ Face Surface Finish: _____ (RMS)

o Flange(s) with Clamping System: (ISO,KF, etc) Standard: _____ Size: _____

o Other: Description: (Please Provide Drawing)

GROOVE DETAILS: (Please Provide Drawing)

Type (Rectangular, Dovetail, etc.): _____

Outer Diameter: _____ Tolerance: _____ Depth: _____ Tolerance: _____

Inner Diameter: _____ Tolerance: _____ Finish (RMS) _____ Type: _____

Finish Type: lathe (circular), endmill (multi-directional), other

BOLTING DETAILS: (Please Provide Drawing)

Size: _____ Type / Grade: _____

Number: _____ Bolt Circle _____ Tapped / Through: _____

OTHER:

Special coating / plating specification:

Special quality / inspection specifications:

Other: