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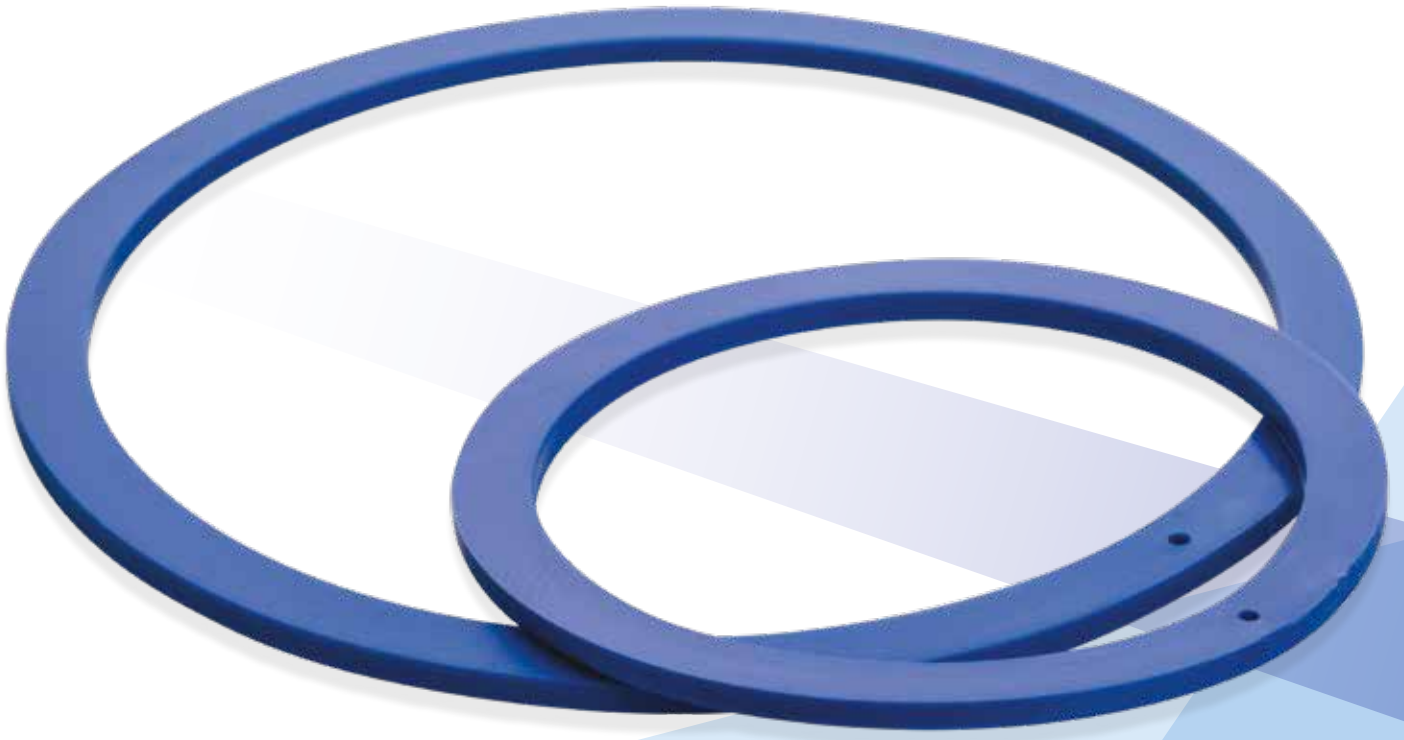
ENGINEERED SEALS & COMPONENTS, LLC.

POLY-TREL SERIES 756
VENTED BACK-UPS

KEY FEATURES OF SERIES 756 BACK-UPS:

- Dynamic Back-Up Applications
- Reduces Pressure Trapping
- Tempurature Range -65°F to +275°F
- Extended Range Fluid Compatibility



SERIES 756
VENTED BACK-UP RINGS

The Vented back-up ring Series 756 was designed to help eliminate pressure trapping between 2 back-up rings and the O-ring. See Figure 1.

In a fast moving, continuous cycling hydraulic cylinders, pressure trapping may occur.

As the piston continues to cycle, the thermal expansion from the friction of the back-up rings rubbing on the cylinder surface causes them to expand. When the back-up rings have become a seal, from thermo expansion and pressure, the fluid trapped in-between the 2 back-ups rings becomes very hot.

As the system continues to cycle, the fluid between the 2 back-up rings become pressurized from the heat. This pressure will become much greater than the system pressure and will cause the back-up rings to extrude in opposite direction from each other. See Figure 1.

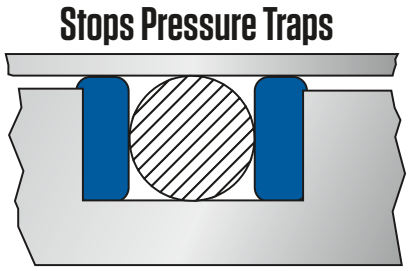


Figure 1

Cylinder applications such as steering cylinders or any cylinder that oscillates or vibrates at a high rate of speed and use an O-ring and two back-ups to seal the piston, are likely to see this phenomenon.

The series 756 Back-up ring was designed to prevent the pressure trapping. The back-up rings are seated on opposite sides of the sealing ring within the annular groove of a hydraulic piston.

The sealing ring is in frictional engagement with the interior of the hydraulic cylinder. The back-up rings are positioned within the cylinder groove and on opposite sides of the sealing ring. See Figure 2.

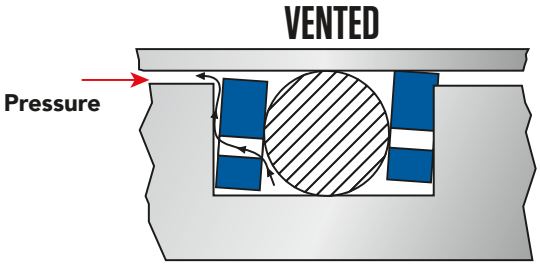


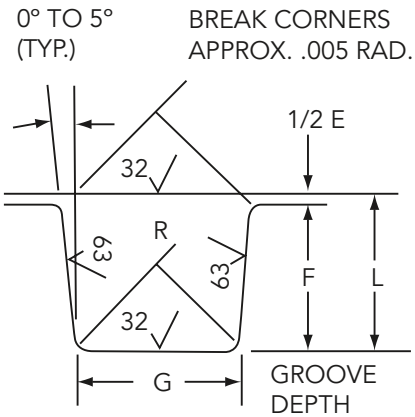
Figure 2

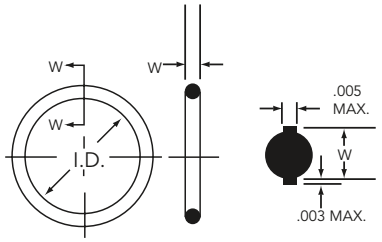
Series 756 back-up rings include a vent hole extending axially there through to permit the alleviation of any fluid pressure accumulating between the two spaced apart Back-up rings.

In Figure 2. the system pressure will push the back- up ring away from the side of the groove, thus releasing any fluid or pressure build-up thru the vent hole. The axial hole then acts as a relief, or vent, and it is unlikely a pressure buildup will occur. It takes very little movement or pressure to make the Series 756 do its job, "VENT".

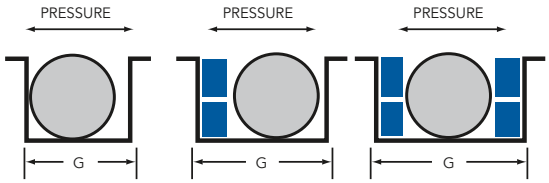
Series 756 an excellent choice in static ID applications such as the static seal between the piston and rod.

SERIES 756
POLY-TREL BACK-UP & O-RING GROOVE DESIGN GUIDE





SECTION W-W



INDUSTRIAL O-RING *DYNAMIC SEAL* GLAND GUIDELINE

O-Ring Size	W Cross Section		L Gland Depth	Squeeze		E (a) (c) Diameteral Clearance	G Groove Width			R Groove Radius	Eccentricity Max. (b)
	Nominal	Actual		Actual	%		No Back-up Ring	One Back-up Ring	Two Back-up Rings		
-044 through -050	1/16	.070 ±.003	.055 to .057	.010 to .018	15 to 25	.002 to .005	.093 to .098	.138 to .143	.205 to .210	.005 to .015	.002
-102 through -178	3/32	.103 ±.003	.088 to .090	.010 to .018	10 to 17	.002 to .005	.140 to .145	.140 to .145	.238 to .243	.005 to .015	.002
-201 through -284	1/8	.139 ±.003	.121 to .123	.012 to .022	9 to 16	.003 to .006	.187 to .192	.187 to .192	.275 to .280	.010 to .025	.003
-309 through -395	3/16	.210 ±.003	.181 to 188	.017 to .030	8 to 14	.003 to .006	.281 to .286	.281 to .286	.410 to .415	.020 to .035	.004
-425 through -475	1/4	.275 ±.003	.237 to .240	.029 to .044	11 to 16	.004 to .007	.375 to .380	.375 to .380	.538 to .543	.020 to .035	.005

(a) Clearance gap must be held to a minimum consistent with design requirements for temperature range variation.
(b) Total Indicator reading between groove and adjacent bearing surface.
(c) Reduce maximum diameteral clearance 50% when using silicone O-rings.

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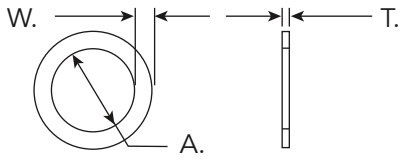
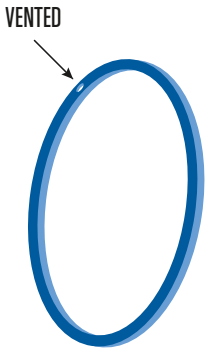
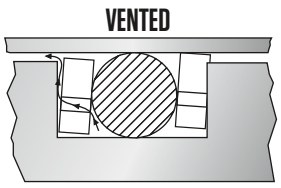
SERIES 756
VENTED POLY-TREL BACK-UP SIZES

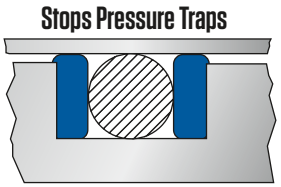


Part Number SERIES	ID		C/S		Width		STANDARD COMPOUND
	A	TOL	W	TOL	T	TOL	
756-133S	1.812	± .010	.088	± .005	.050	± .005	HT47N
755-212S	.875	± .010	.115	± .005	.050	± .005	HT47N
756-218S	1.250	± .010	.115	± .005	.050	± .005	HT47N
756-218	1.250	± .010	.115	± .005	.050	± .005	HT55BLU
756-222S	1.520	± .010	.108	± .003	.050	± .005	HT47N
756-226S	1.250	± .010	.115	± .005	.050	± .005	HT47N
756-232	2.625	± .010	.115	± .005	.050	± .005	HT55BLU
756-233BK	2.895	± .010	.108	± .003	.050	± .005	HT55BK
756-234	3.000	± .015	.115	± .005	.050	± .005	HT55BLU
756-250	5.020	± .015	.108	± .003	.050	± .005	HT55BLU
756-326	1.625	± .010	.175	± .005	.070	± .006	HT55BLU
756-326S	1.625	± .010	.175	± .005	.070	± .006	HT47N
756-328S	1.875	± .010	.175	± .005	.070	± .006	HT47N
756-329S	2.000	± .010	.175	± .005	.070	± .006	HT47N
756-330	2.125	± .015	.175	± .005	.070	± .006	HT55BLU
756-330S	2.125	± .015	.175	± .005	.070	± .006	HT47N
756-334	2.625	± .015	.175	± .005	.070	± .006	HT55BLU
756-336	2.625	± .015	.175	± .005	.070	± .006	HT55BLU
756-338	3.125	± .015	.175	± .005	.070	± .006	HT55BLU
756-342	3.625	± .015	.175	± .005	.070	± .006	HT55BLU
756-345	4.000	± .015	.175	± .005	.070	± .006	HT55BLU
756-346	4.150	± .015	.167	± .003	.070	± .006	HT55BLU
756-348	4.375	± .015	.175	± .005	.070	± .006	HT55BLU
756-350	4.625	± .015	.175	± .005	.070	± .006	HT55BLU
756-357	5.525	± .015	.167	± .003	.070	± .006	HT55BLU
756-361	6.000	± .023	.175	± .005	.070	± .006	HT55BLU
756-425	4.539	± .015	.222	± .003	.105	± .006	HT55BLU
756-433	5.539	± .015	.222	± .003	.105	± .006	HT55BLU
756-437	6.039	± .015	.222	± .003	.105	± .006	HT55BLU
756-439	6.539	± .015	.222	± .003	.105	± .006	HT55BLU
756-441	7.039	± .015	.222	± .003	.105	± .006	HT55BLU
756-445	8.039	± .015	.222	± .003	.105	± .006	HT55BLU
756-446	8.539	± .015	.222	± .003	.105	± .006	HT55BLU
756-447	9.039	± .015	.222	± .003	.105	± .006	HT55BLU
756-448	9.539	± .015	.222	± .003	.105	± .006	HT55BLU
756-449	10.039	± .015	.222	± .003	.105	± .006	HT55BLU
756-455	13.039	± .015	.222	± .003	.105	± .006	HT55BLU

For sizes not shown, consult the factory.







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SERIES 756
VENTED POLY-TREL BACK-UPS STANDARD COMPOUNDS

POLY-TREL™ Compound HT55-BLU, & HT47-N
TPC-ET Thermoplastic Polyester Elastomer

Property Compound Number	Test Method	Units	Value HT47-N	Value HT55-BLU
Tensile Modulus	ISO 527-1/-2	psi	16,000	27,557
Stress @5% Strain	ISO 527-1/-2	psi	N	1,000
Stress @10% Strain	ISO 527-1/-2	psi	1,020	1,600
Stress @ 50% Strain	ISO 527-1/-2	psi	1,740	2,030
Stress at Break	ISO 527-1/-2	psi	2,470	5,800
Nominal Strain at Break	ISO 527-1/-2	%	400	780
Strain at Break	ISO 527-1/-2	%	200	>300
Flexural Modulus	ISO 178	psi	16,100	29,000
Shear Modulus	ISO 6721	psi	5,660	9,430
Tensile creep modulus, 1000h	ISO 899-1	psi	N	18,900
Charpy Impact Strength, 23°C	ISO 179/1eU	ftlb/in²	N	N
Charpy Impact Strength, -30°C	ISO 179/1eU	ftlb/in²	N	N
Charpy Notched Impact Strength, 23°C	ISO 179/1eU	ftlb/in²	N	71.4
Charpy Notched Impact Strength, -40°C	ISO 179/1eU	ftlb/in²	57.1	14.3
Puncture Force, -30°C	ISO 6603-2	N	N	.48
Puncture Energy, -30°C	ISO 6603-2	J	N	60
Brittleness Temperature	ISO 974	°F	-86.8	-144
Shore D Hardness, 15s	ISO 868	D	43	51
Shore D Hardness, Max	ISO 868	D	48	55
Tear Strength, parallel	ISO 34-1	kN/m	100	133
Tear Strength, Normal	ISO 34-1	kN/m	90	133
Abrasion Resistance	ISO 4649	mm³	33	120
Melting Temperature, 10°C/min	ISO 11357-1/-3	°F	406	397
Glass Transition Temperature (10°C/min)	ISO 11357-1/2	°F	-49	-4
Vicat Softening Temperature, 50°C/h, 10N	ISO 306	°F	239	356
Coeff. Of Linear Therm. Expansion, Parallel	ISO 11359-1/2	E-4/°F	1.22	1.11
Coeff. Of Linear Therm. Expansion, Normal	ISO 11359-1/2	E-4/°F	1.06	1.11
Shelf Life	ISO R1183		10 years	10 years
Service Temperature Range*			-65°F to +250°F	-65°F to +275°F
Color			OFF WHITE	BLUE

Test specimen for ISO 527 is 1BA (2mm) at 50mm/min; all other ISO & ASTM mechanical properties measured at 4mm; electrical properties measured at 2mm.
All mechanical & electrical properties measured on injection molded specimens.
Test temperatures are 23C unless otherwise stated.

The information provided in this data sheet corresponds to our knowledge on the subject at the date of this publication. This information may be subject to revision as new knowledge and experience becomes available. The data provided fall within the normal range of product properties and relate only to the specific material designated; these data may not be valid for such materials used in combination with any other material, additives or pigments or in any process, unless expressly indicated otherwise. The data provided should not be used to establish specifications limits or used alone as the basis of design; they are not intended to substitute for any testing you may need to do to determine the suitability of a specific compound for your particular purpose. Since Engineered Seals, LLC cannot anticipate all variation in actual end-use conditions ESC makes no warranties and assumes no liability in connection with any use of this information. Caution: Do not use this product in medical application involving permanent implantation in the human body.

***We highly recommend testing in your specific application, this is a guide only.**

ENGINEERED SEALS & COMPONENTS
POLY-TREL FLEXABILITY AT TEMPERATURE

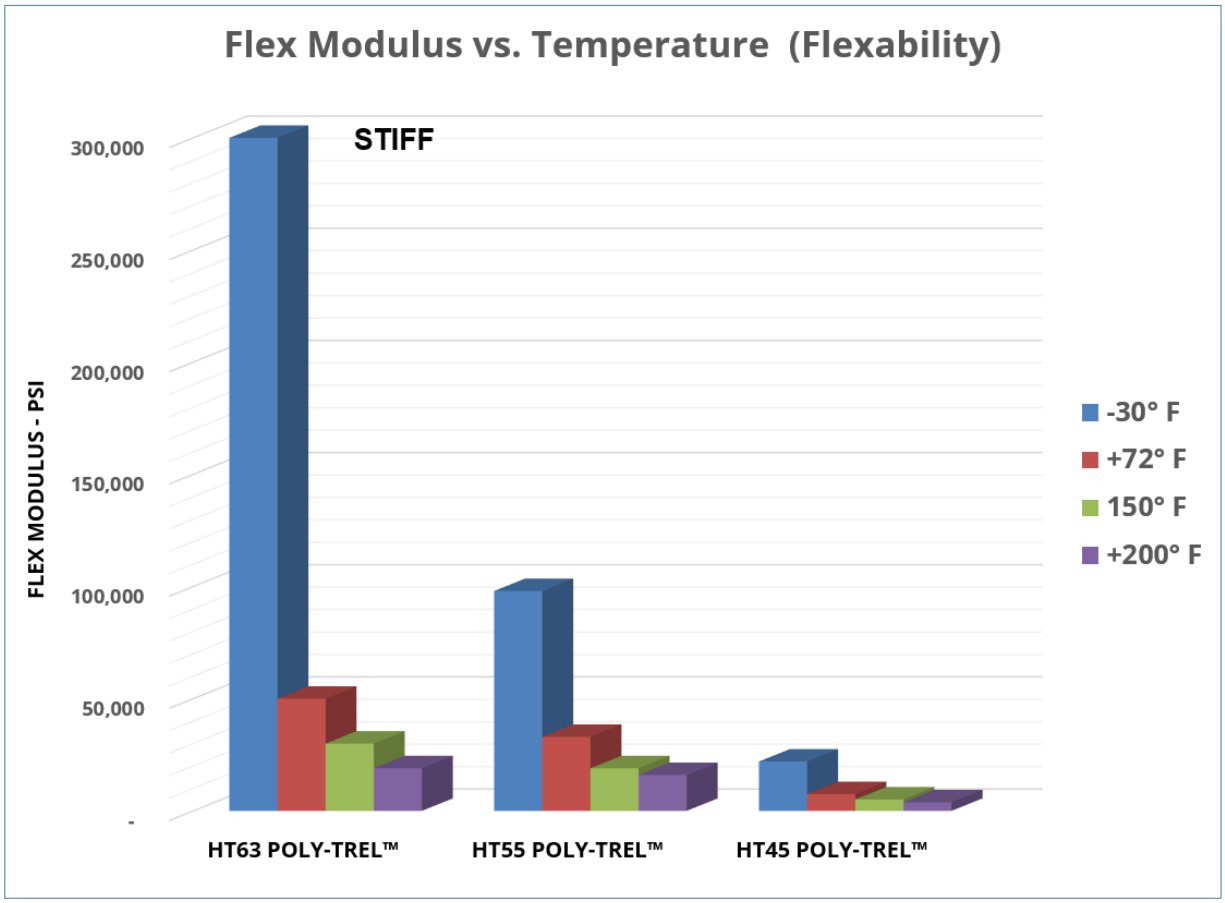

Chart Flex-1

Chart Flex-1 shows how Temperature effects the hardness and flexibility of 3 grades of POLY-TREL.

HT63 63 Shore D
HT55 55 Shore D
HT45 45 Shore D

The colder the parts are the less flexible they become. Conversely, the hotter the parts get, the more flexible they become.

These compounds were engineered to be better at certain temperatures and pressures with certain extrusion gaps.

Compound HT55 is the best all around Material. Is not too hard as to interfere with assembly, yet not too soft to give up on the higher temperature ranges. These compounds have a useful temperature range of -65 F to +275 F.

WARRANTY AND REMEDY

Important Notice:

We reserve the right to make changes without notice in our products and in the information content of this brochure / catalog. The statements and information in the brochure / catalog are intended to serve as a guide only. They are not warranties or binding descriptions of the products.

Requests for more information are welcome. In particular, we will be glad to provide samples for your to inspect and test in your assemblies and plant before you make a final decision for you application.

Notice of Exclusive Warranty and Remedy

Briefly, our exclusive warranty is against defects in materials and workmanship at the time of shipment. It is in lieu of all other warranties. There is no implied warranty of merchantability or fitness for a particular purpose. The exclusive remedy is replacement of defective products, or at our option, refund of their purchase price. All damages exceeding the purchase price are excluded, weather consequential or otherwise and regardless of cause. The terms and conditions on our printed quotation contain a much more complete statement of our Exclusive Warranty and Remedy

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