ESC
ENGINEERED SEALS & COMPONENTS, LLC.

HI-PREFORMANCE PISTON SEALS

SERIES ECT
SERIES 704
SERIES 708
SERIES 302
SERIES 300

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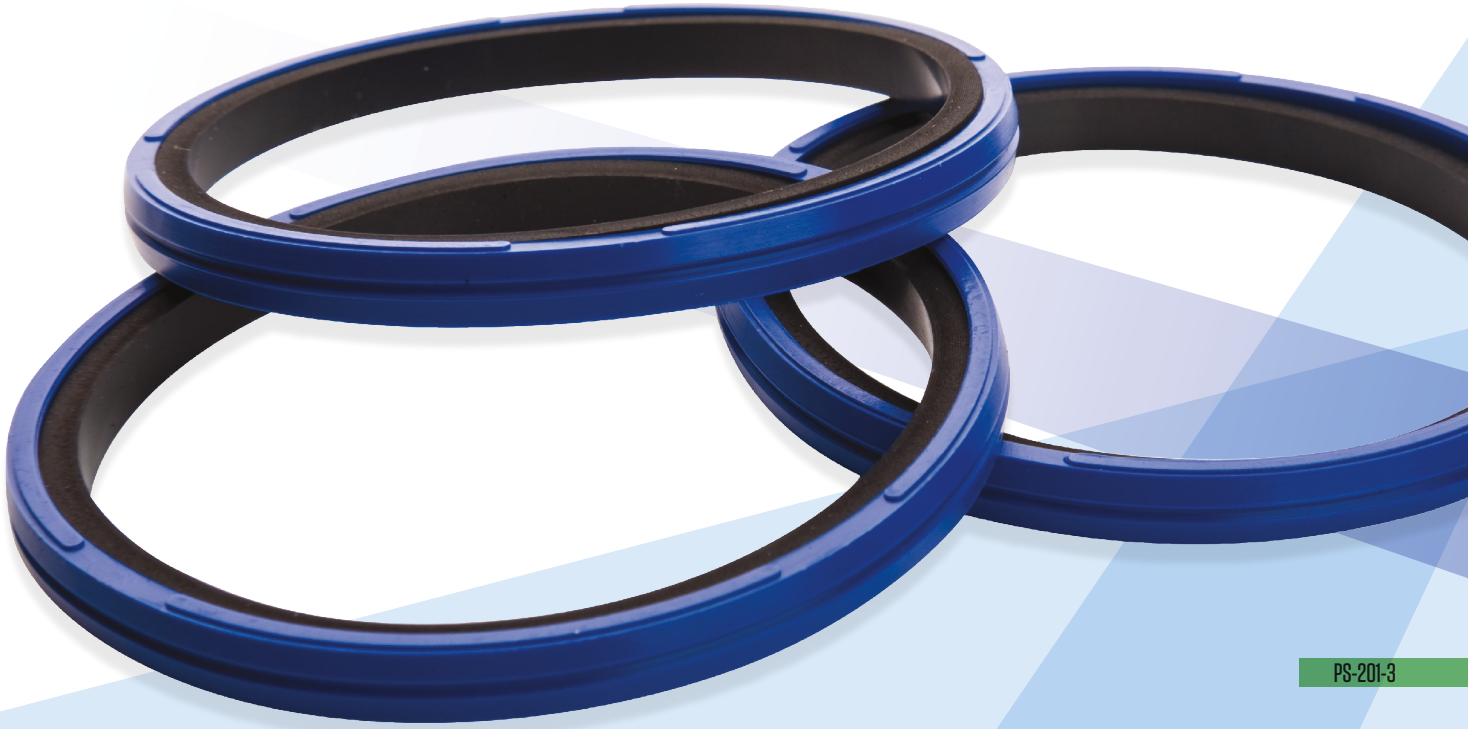
PISTON SEALS
M-PAC
302 SERIES

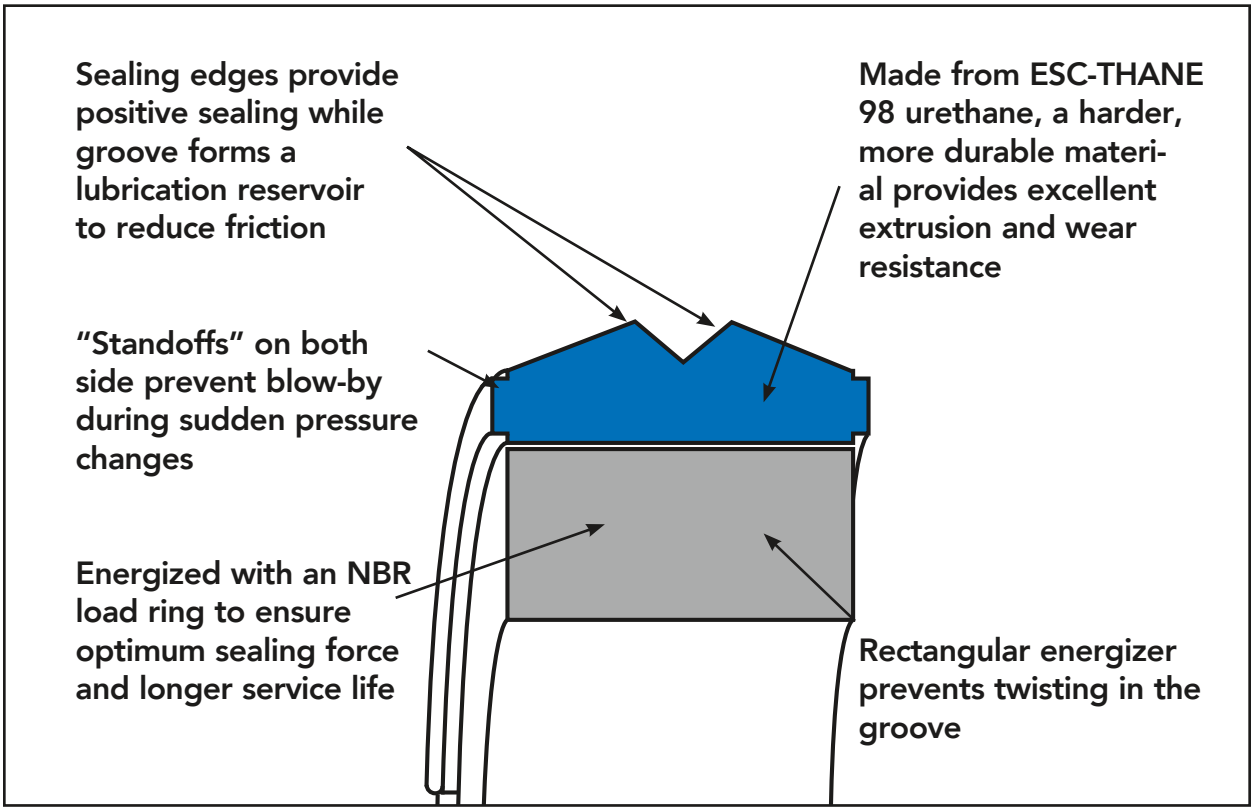
KEY FEATURES OF SERIES 302 M-PAC:

- 2 Piece Design for Maximum Performance
- Resists Twisting & Spiral Failure
- Easy to Install
- High Pressure Range
- Vented for Optimum Sealing
- Unique Seal Geometry
- Temperature Range: -40°F to +220°F
- NEW PPDI Compound -60F to +275F



PISTON SEALS M-PAC

SERIES 302



* **UNIQUE SEAL GEOMETRY:** The geometry of the M-PAC Seal allows a fluid reservoir between the two points of the M (in between the two separate sealing surfaces). This provides extra lubrication for reduced breakaway and running friction. The rectangular load ring provide positive, no drift sealing in many cylinder applications.

* **RESISTS SPIRAL FAILURE:** M-PAC Seals are generally rectangular in cross section providing improved stability to resist cocking, twisting, sticking, and rolling.

* **EASY TO INSTALL:** Because of the unique 2 piece design, M-PAC Seals are a SNAP to install. No more resizing as is the case with many other types of seals.

* **FLUID PRESSURE RANGE: ESC M-PAC Seals** are rated to withstand pressure up to 5800 psi at recommended groove dimensions and tolerances.

* **FLUID & TEMPERATURE RANGE:** Temperature limits of -65° to +300° F can be attained with POLY-TREL. ESC-THANE compound has a range of -40° F to +220° F and is the standard compound.

* **VENTED:** This causes the seal to be more responsive to high speed pressure shifts.

This series has been designed to give you, the designer, maximum flexibility. The standard seal has been designed to replace an O-ring (without back-ups). This is a 2 piece unit. Because of the rectangular cross section design, this seal is very resistant to rolling or twisting. If you are replacing an O-ring and two back-ups, we recommend that you use the appropriate M-PAC Piston Seals and two 756-Series vented back-ups. The 302 Series is our most popular with medium duty cylinder applications.

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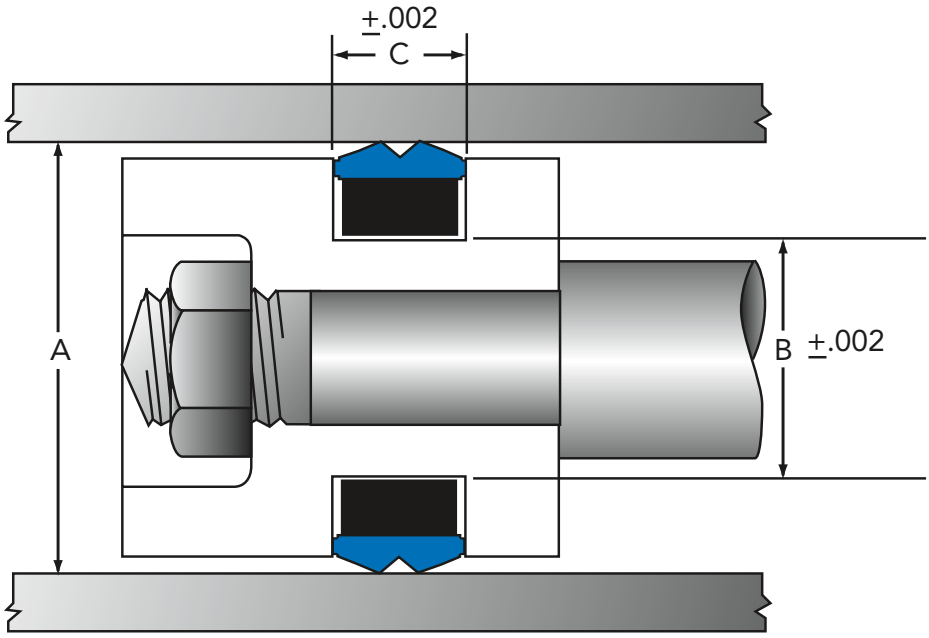

SERIES 302

Part No.	Nominal Dims. (inch) OD	ID	C/S	A (inch)	B (inch)	C (inch)
302-210-187	1	3/4	1/8	1.000	0.758	0.187
302-214-187	1-1/4	1	1/8	1.250	1.008	0.187
302-218-187	1-1/2	1-1/4	1/8	1.500	1.258	0.187
302-222-187	1-3/4	1-1/2	1/8	1.750	1.508	0.187
302-326-281	2	1-5/8	3/16	2.000	1.630	0.281
302-328-281	2-1/4	1-7/8	3/16	2.250	1.880	0.281
302-330-281	2-1/2	2-1/8	3/16	2.500	2.130	0.281
302-332-281	2-3/4	2-3/8	3/16	2.750	2.380	0.281
302-334-281	3	2-5/8	3/16	3.000	2.630	0.281
302-336-281	3-1/4	2-7/8	3/16	3.250	2.880	0.281
302-338-281	3-1/2	3-1/8	3/16	3.500	3.130	0.281
302-340-281	3-3/4	3-3/8	3/16	3.750	3.380	0.281
302-342-281	4	3-5/8	3/16	4.000	3.630	0.281
302-344-281	4-1/4	3-7/8	3/16	4.250	3.880	0.281
302-346-281	4-1/2	4-1/8	3/16	4.500	4.130	0.281
302-348-281	4-3/4	4-3/8	3/16	4.750	4.380	0.281
302-350-281	5	4-5/8	3/16	5.002	4.630	0.281
302-427-375	5-1/4	4-3/4	1/4	5.252	4.778	0.375
302-429-375	5-1/2	5	1/4	5.502	5.028	0.375
302-431-375	5-3/4	5-1/4	1/4	5.752	5.278	0.375
302-433-375	6	5-1/2	1/4	6.002	5.528	0.375
302-435-375	6-1/4	5-3/4	1/4	6.252	5.778	0.375
302-437-375	6-1/2	6	1/4	6.502	6.028	0.375
302-438-375	6-3/4	6-1/4	1/4	6.752	6.278	0.375
302-439-375	7	6-1/2	1/4	7.002	6.528	0.375

* More sizes available. Consult factory if you do not see the size you need.

SERIES 302 M-PAC STANDARD COMPOUND

ESC-thane Compound U98-BLU

TPU thermoplastic polyester urethane

Property	Test Method	Units	Value
Mechanical			
Tensile Modulus	DIN 53.479	MPa (psi)	
@50% Elongation			–
@100% Elongation			11
@300% Elongation			19
Tensile Strength	DIN 53.504	MPa (psi)	35
Ultimate Elongation		%	400
Elongation at Break	DIN 53.504	%	600
Tear Strength, Die "C"	DIN 53.515	KN/m (PSI)	150
Compression Set	ASTM D395B		
22 hours at 25 C (77 F)		%	35
22 hours at 70 C (158 F)		%	44
Hardness , Shore A	DIN 53.505		98A / 52D
Taber Abrasion Resistance	DIN 53.516	mm 3	25
Tg		F	-37
Vicat Softening point	ASTM D1525	F	257
Useful Temperature Range			-40F to 250F
Reinforcement	NO		
Color			BLUE

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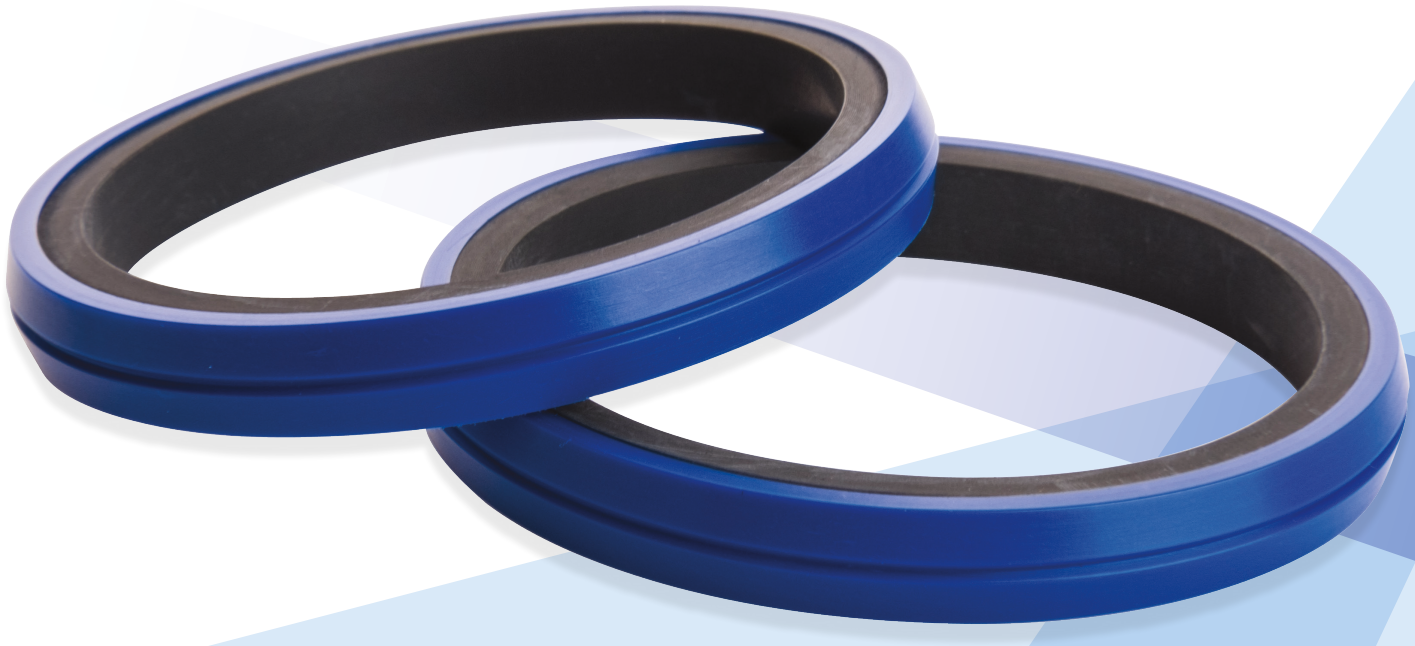
PISTON SEALS
M-SEAL
300 SERIES

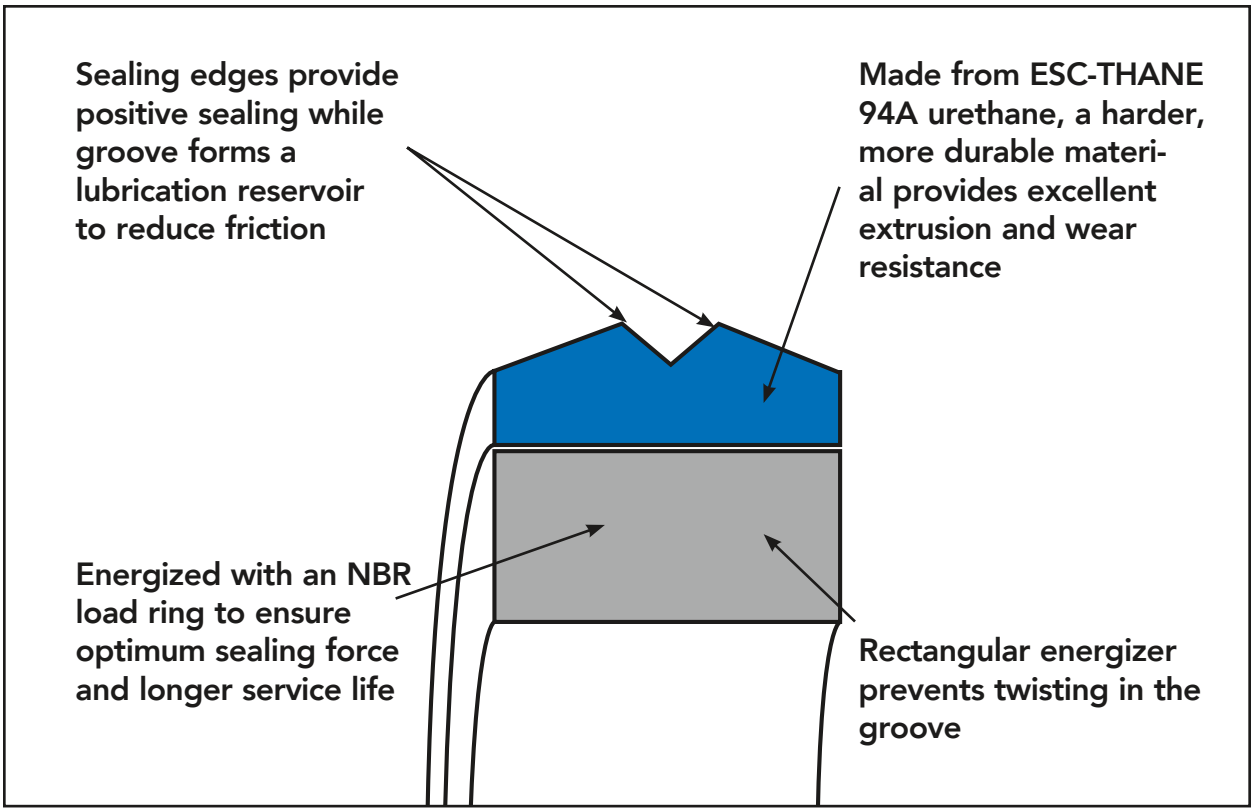
KEY FEATURES OF SERIES 300 M-SEAL:

- 2 Piece Design for Maximum Performance
- Resists Twisting & Spiral Failure
- Easy to Install
- High Pressure Range
- Unique Seal Geometry
- Temperature Range: -40°F to +220°F



PISTON SEALS M-SEAL

SERIES 300



* **UNIQUE SEAL GEOMETRY:** The geometry of the M-Seal allows a fluid reservoir between the two points of the M (in between the two separate sealing surfaces). This provides extra lubrication for reduced breakaway and running friction. The rectangular load ring provide positive, no drift sealing in many cylinder applications.

* **RESISTS SPIRAL FAILURE:** M-SEAL Seals are generally rectangular in cross section providing improved stability to resist cocking, twisting, sticking, and rolling.

* **EASY TO INSTALL:** Because of the unique 2 piece design M-Seals are a SNAP to install. No more resizing as is the case with many other types of seals.

* **FLUID PRESSURE RANGE: ESC M-Seals** are rated to withstand pressure up to 5000 psi at recommended groove dimensions and tolerances.

* **FLUID & TEMPERATURE RANGE:** Temperature limits of -65° to +300° F can be attained with POLY-TREL. ESC-THANE compound has a range of -40° F to +220° F and is the standard compound.

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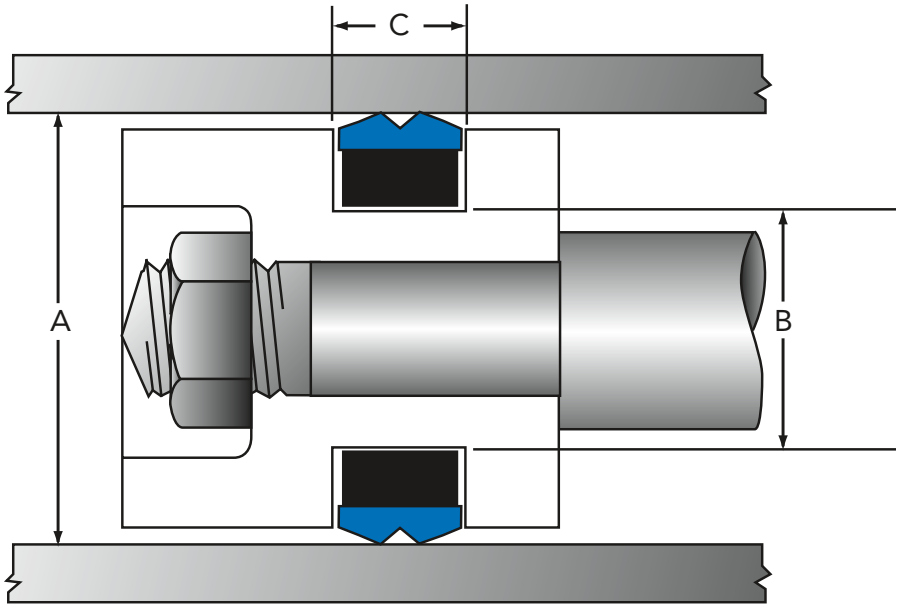

SERIES 300

Part No.	Nominal Bore A.	Nominal Part Dims. (inch)				Groove Dims. (inch)			
300-024-250	1.500	1.500	1.125	0.188	0.250	1.125		0.263	
300-032-312	2.000	2.000	1.625	0.188	0.312	1.625	+.004	0.328	
300-040-312	2.500	2.500	2.125	0.188	0.312	2.125	-.000	0.328	
300-048-312	3.000	3.000	2.625	0.188	0.312	2.625		0.328	
300-056-312	3.500	3.500	3.125	0.188	0.312	3.125		0.328	
300-064-375	4.000	4.000	3.500	0.250	0.375	3.500		0.394	
300-072-375	4.500	4.500	4.000	0.250	0.375	4.000	+.005	0.394	+.015
300-080-375	5.000	5.000	4.500	0.250	0.375	4.500	-.000	0.394	-.000
300-096-375	6.000	6.000	5.500	0.250	0.375	5.500		0.394	
300-112-375	7.000	7.000	6.500	0.250	0.375	6.500		0.374	
300-128-625	8.000	8.000	7.250	0.375	0.625	7.250		0.657	
300-144-625	9.000	9.000	8.250	0.375	0.625	8.250		0.657	
300-160-625	10.000	10.000	9.250	0.375	0.625	9.250	+.007	0.657	
300-176-625	11.000	11.000	10.250	0.375	0.625	10.250	-.000	0.657	
300-192-625	12.000	12.000	11.250	0.375	0.625	11.250		0.657	
300-224-625	14.000	14.000	13.250	0.375	0.625	13.250		0.657	

* More sizes available. Consult factory if you do not see the size you need.

SERIES 300 STANDARD COMPOUND

ESC-thane Compound U94

TPU thermoplastic polyester urethane

Property	Test Method	Units	Value
Mechanical			
Tensile Modulus	ASTM D 412	MPa (psi)	
@50% Elongation			8.4 (2250)
@100% Elongation			11.0 (1600)
@300% Elongation			27.6 (4000)
Ultimate Tensile Strength	ASTM D 412	MPa (psi)	44.8 (6500)
Ultimate Elongation	ASTM D 412	%	400
Elongation Set After Break	ASTM D 412	%	30
Tear Strength, Die "C"	ASTM D 624	KN/m (PLI)	145 (830)
Compression Set	ASTM D 395		
22 hours at 25 C (77 F)	Method B	%	25
22 hours at 70 C (158 F)		%	29
Hardness , Shore A	ASTM D 2240		90-98A
Taber Abrasion Resistance	ASTM D 1044		
1000 g, 1,000 cycles;			
H-22 wheel (coarser)		10	mg
Flexural Modulas	ASTM D 790	Mpa (psi)	82.7 (12,000)
Reinforcement	NO		

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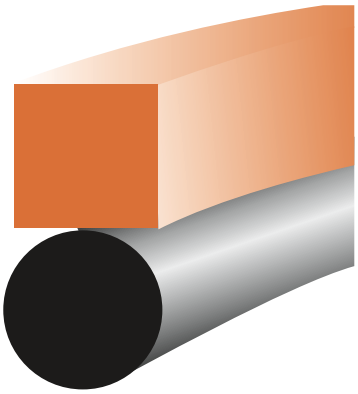
POLY-TREL PISTON SEALS

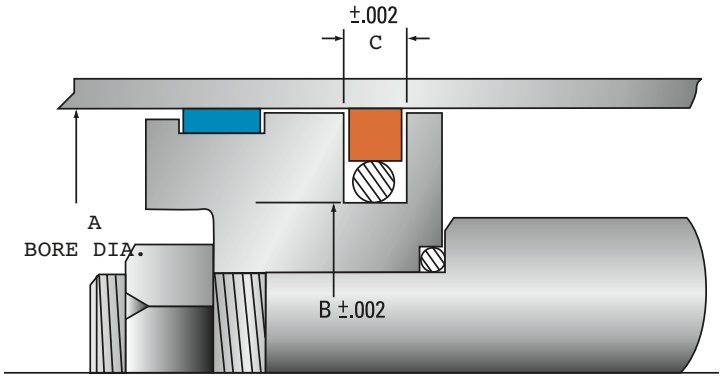
KEY FEATURES OF SERIES 704 & 708 PISTON SEALS:

- Positive Sealing to 5000 PSI
- Large "E" Gaps +.020 Total
- Double Acting
- Superior Physical Properties
- Easy to Install - No Resizing
- -40°F to +230°F
- Zero Leakage at Low & High PSI
- Series 704 - Square Cross Section
- Series 708 - Rectangular Cross Section
- Vented Series Upon Request

SERIES 704 "SQUARE"
POLY-TREL PISTON SEALS



SERIES 704
Square Section



Series 704 Poly-Trel Piston Seals is a square, compact, low friction seal for light to medium duty hydraulic cylinders.

Poly-Trel Piston Seals are manufactured from a very tough polyester elastomeric material with friction reducing agents. They are directly interchangeable with TFE, urethane, and rubber seals.

Rapid recovery of seal after assembly. No re-sizing is required unlike common PTFE seals.

Energized with an O-ring this seals exhibits excellent position holding characteristics under load.

Wide range of fluid compatibility, temperature ranges -40F to +230F, and speeds up to 3.0 ft/sec. with a maximum pressure of 5,000 PSI.

It is recommended that an adequate ESC-LON Wear Ring be used in conjunction with this seal.

704 Dash Number	A BORE Diameter	GROOVE DIMENSIONS B ± .002 Diameter	GROOVE DIMENSIONS C ± .002 WIDTH	O-Ring Dash Number
-008	.500	.241	.083	-009
-010	.625	.366	.083	-011
-012	.750	.491	.083	-013
-014	.875	.616	.083	-015
-016	1.000	.741	.083	-017
-018	1.125	.866	.083	-019
-020	1.250	.991	.083	-021
-022	1.375	1.116	.083	-023
-024	1.500	1.241	.083	-025
-025	1.562	1.172	.122	-122
-026	1.625	1.235	.122	-123
-028	1.750	1.360	.122	-125
-030	1.875	1.485	.122	-127
-032	2.000	1.606	.130	-129
-034	2.125	1.731	.130	-131
-036	2.250	1.856	.130	-133
-038	2.375	1.981	.130	-135
-040	2.500	2.106	.130	-137
-044	2.750	2.356	.130	-141
-048	3.000	2.606	.130	-145
-052	3.250	2.856	.130	-149
-056	3.500	3.106	.130	-151

704 Dash Number	A BORE Diameter	GROOVE DIMENSIONS B ± .002 Diameter	GROOVE DIMENSIONS C ± .002 WIDTH	O-Ring Dash Number
-060	3.750	3.356	.130	-152
-064	4.000	3.606	.130	-153
-068	4.250	3.856	.130	-154
-072	4.500	4.106	.130	-155
-076	4.750	4.356	.130	-156
-080	5.000	4.606	.130	-157
-084	5.250	4.856	.130	-158
-088	5.500	5.106	.130	-159
-092	5.750	5.232	.159	-251
-096	6.000	5.482	.159	-253
-100	6.250	5.732	.159	-255
-104	6.500	5.982	.159	-257
-108	6.750	6.232	.159	-258
-112	7.000	6.482	.159	-259
-116	7.250	6.732	.159	-260
-120	7.500	6.982	.159	-261
-124	7.750	7.232	.159	-262
-128	8.000	7.482	.159	-263
-136	8.500	7.982	.159	-265
-144	9.000	8.482	.159	-267
-152	9.500	8.982	.159	-269
-160	10.000	9.482	.159	-271

* Consult factory if you do not see the size you need.

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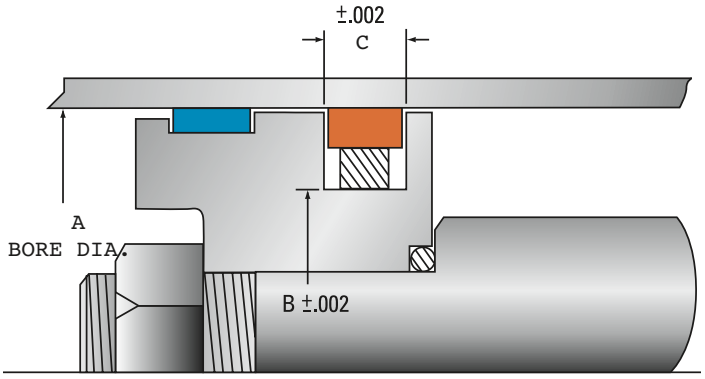
SERIES 708 "RECTANGLE"
POLY-TREL PISTON SEALS

SERIES 708
Rectangular Section



Series 708 Poly-Trel Piston Seals is a rectangular, compact, low friction seal for light to heavy duty hydraulic cylinders.

Poly-Trel Piston Seals are manufactured from a very tough polyester elastomeric material with friction reducing agents and reinforcements for exceptional extrusion resistance.

Rapid recovery of seal after assembly. No re-sizing is required unlike common PTFE seals.

Energized with a Square Nitrile Ring this seal exhibits excellent stability and position holding characteristics under load.

Wide range of fluid compatibility, temperature ranges -40F to +230F, and speeds up to 3.0 ft/sec. with a maximum pressure of 5,000 PSI.

It is recommended that an adequate ESC-LON Wear Ring be used in conjunction with this seal.

Consult us for all of your *ESC-LON* Wear Ring needs.

708 Dash Number	A BORE Diameter	GROOVE DIMENSIONS B ± .002 Diameter	GROOVE DIMENSIONS C ± .002 WIDTH	Square Ring Dash Number
-016	1.000	.688	.126	-115
-020	1.250	.938	.126	-119
-024	1.500	1.188	.126	-123
-028	1.750	1.438	.126	-127
-032	2.000	1.688	.126	-131
-036	2.250	1.938	.126	-135
-040	2.500	2.188	.126	-139
-044	2.750	2.438	.126	-143
-048	3.000	2.442	.279	-333
-052	3.250	2.692	.279	-335
-056	3.500	2.942	.279	-337
-060	3.750	3.192	.279	-339
-064	4.000	3.442	.279	-341
-068	4.250	3.692	.279	-343
-072	4.500	3.942	.279	-345
-076	4.750	4.192	.279	-347
-080	5.000	4.442	.279	-349

708 Dash Number	A BORE Diameter	GROOVE DIMENSIONS B ± .002 Diameter	GROOVE DIMENSIONS C ± .002 WIDTH	Square Ring Dash Number
-084	5.250	4.476	.378	-425
-088	5.500	4.726	.378	-427
-092	5.750	4.976	.378	-429
-096	6.000	5.226	.378	-431
-104	6.500	5.726	.378	-435
-112	7.000	6.226	.378	-438
-120	7.500	6.726	.378	-440
-128	8.000	7.226	.378	-442
-136	8.500	7.726	.378	-444
-144	9.000	8.110	.378	-445
-152	9.500	8.610	.378	-446
-160	10.000	9.110	.378	-447
-176	11.000	10.110	.378	-449
-192	12.000	11.110	.378	-451
-208	13.000	12.110	.378	-453
-224	14.000	13.110	.378	-455

* Consult factory if you do not see the size you need.

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SERIES 704 & 708 STANDARD COMPOUNDS

POLY-TREL Compound HT55-5

TPE thermoplastic polyester elastomer

Property	Test Method	Units	Value
Mechanical			**HT55-5**
Tensile Elongation	D638	Mpa (kpsi)	500%
Yield Stress	ISO 527	Mpa (kpsi)	
Stress at Break	ISO 527	Mpa (kpsi)	
Strain at Break	ISO 527	%	
Normal Strain at Break	ISO 527	%	
Flexural Strength	D638	psi	18 (60)
Tensile Strength	D638	Mpa (kpsi) 29 (4.15)	
Flexural Modulus -40C (-40F) 23C (73F) 100C (212F)	D638	Mpa (kpsi)	552 (80)
Hardness , Shore D 15s	ISO 868		 52
Maximum			60
Tensile Impact Strength	ISO 8256 kJ/m2	kJ/m2	
Impact Strength IZOD notched 1/8 in (3.2 mm) section unotched 1/8 in (3.2 mm) section		 D256	 7.8 ft-lbs/in 10.6 ft-lb/in
Reinforcement	YES	%	< 5
Color			Orange

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.

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SERIES 704 & 708 STANDARD COMPOUND

POLY-TREL Compound HT55-BLACK

TPE thermoplastic polyester elastomer

Property	Test Method	Units	Value
Mechanical			
Tensile Stress	ISO 527	Mpa (kpsi)	
@5% Strain			6.9 (1)
@10% Strain			11 (1.6)
@50% Strain			
Yield Stress	ISO 527	Mpa (kpsi)	14 (2.0)
Stress at Break	ISO 527	Mpa (kpsi)	44 (6.4)
Strain at Break	ISO 527	%	500
Normal Strain at Break	ISO 527	%	800
Yield Strain	ISO 527	%	37
Tensile Modulus	ISO 527	Mpa (kpsi)	188 (27.3)
Flexural Modulus	ISO 178	Mpa (kpsi)	
-40C (-40F)			760 (110)
23C (73F)			200 (29)
100C (212F)			100 (14)
Hardness , Shore D	ISO 868		
15s			51
Maximum			55
Tensile Impact Strength	ISO 8256	kJ/m2	200
Notched Charpy Impact Strength	Iso 179/1eA	kJ/m2	
-40C (-40F)			148
-30C (-22F)			90
Shelf Life			10 years
Tempurature Range			-65F to to +275F
Color			Black

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.

ESC
ENGINEERED SEALS & COMPONENTS, LLC.

ECT
CAPPED T-SEALS

KEY FEATURES OF ECT CAPPED T-SEALS:

- Back-ups for Positive Actuation
- Contamination Resistant
- Excellent Extrusion Resistance
- Low Friction
- Drift Resistant
- Long Wear - Long Life
- Positive Sealing to 5000 PSI
- Easy Orientation of Components

ECT CAPPED T-SEALS

ESC's Capped T-Seal is a double-acting, high-pressure, high-performance piston seal accommodating larger extrusion gaps when used with ESC close tolerance wear-rings.

The **Capped T-Seal** assembly consists of a filled PTFE cap and an elastomeric energizer. The two components are protected from extrusion and foreign material by two plastic anti-extrusion rings. While grit may become trapped between seal and dynamic surface in conventional systems, the Capped T-Seal's anti-extrusion rings serve as bore wipers, pre-cleaning the seal path and significantly reducing contamination caused wear or scoring.

Each of the elements of **ESC's Capped T-Seal** is designed to perform a specific task. The T-shaped elastomeric energizer must transform axial pressure to radial loading and is compounded for low compression set and high modulus. The low friction sealing element (cap) is designed for sealability and optimal wear resistance, resulting in long operational life. Finally the anti-extrusion rings have been designed based on the use of wear-resistant Acetal or Nylon material to provide stability and superior extrusion protection.

This seal offers a high degree of sealability in both high and low pressure environments. The seal is designed to handle temperature extremes, a wide variety of fluid media and larger than normal clearances--yet it requires a short axial length gland, and assembles and installs easily in the shop or in the field. The **Capped T-Seal** is especially suited for long stroke applications due to its low sliding friction and unique geometry which prevents rolling or spiraling.

Unlike conventional cap-type seals, **ESC's Capped T-Seal** virtually eliminates piston drift. Piston drift is caused by low pressure leakage past the cap. Because conventional caps are not adequately energized at low pressures, leakage can occur, ultimately resulting in piston drift. ESC's cap is loaded both in the static mode through high energizer squeeze, and in the dynamic mode through the proportional axial-to-radial conversion of system pressure levels. Thus, a fully positive seal is maintained throughout the pressure range. The substantial, uniform cap permits a high degree of evenly distributed radial load, virtually eliminating the possibility of excessive wear and premature failure found in conventional cap type seals.

Wider clearances can be used when designing with the **Capped T-Seal**. This allows for the use of wear rings which eliminate the possibility of piston and bore damage due to metal-to-metal contact.

When designing with the **Capped T-Seal**, refer to drawing and gland dimensions listed in Table 2.

Vented Back-up rings available upon request.

TABLE 1

MATERIALS INFORMATION:

CAP RINGS:

CAP NUMBER	COMPOUND	TEMP. RANG	TYPICAL SERVICE
155	PTFE 15% glass/5% moly	-100° to +450°F	General purpose hydraulic, hydrocarbon & water.
232	PTFE 25% carbon/graphite	-100° to +450°F	High pressure hydraulic, hydrocarbon & water. Low friction.
405	PTFE 40% bronze/5% moly	-100° to +450°F	High speed with improved sealability.
555	PTFE 55% bronze/5% moly	-100° to +450°F	High speed, pressure & abrasion resistance.

ENERGIZER:

NUMBER	COMPOUND	TEMP. RANGE	TYPICAL SERVICE
70B	70 duro NBR	-35° to +265°F	General purpose hydraulic & hydrocarbon service.
80L	80 duro NBR Low Temp.	-40° to +240°F	Low temperature hydraulic fluid service.
75V	Fluoroelastomer	-20° to +400°F	High temp.,harsh media applications, hydrocarbon & diester.

BACK-UP RINGS:

NUMBER	COMPOUND	TEMP. RANGE	TYPICAL SERVICE
95	Acetal	-40° to +225°F	General purpose hydraulic, hydrocarbon service.
94	Glass Filled Nylon	-40° to +300°F	General purpose hydraulic service.

Temperature ranges shown are limited by the functional range of the ECT assembly. Materials shown may have different operating ranges when used in other seal designs. The information contained herein is based on laboratory tests believed to be reliable. It is offered for comparison and guidance to persons who will conduct their own test in order to determine suitability for any purpose.

NOTE: ESC is has been a leader in designing seals for most hydraulic applications. Our engineering department should be contacted for design criteria if your application exceeds the limits of the above materials

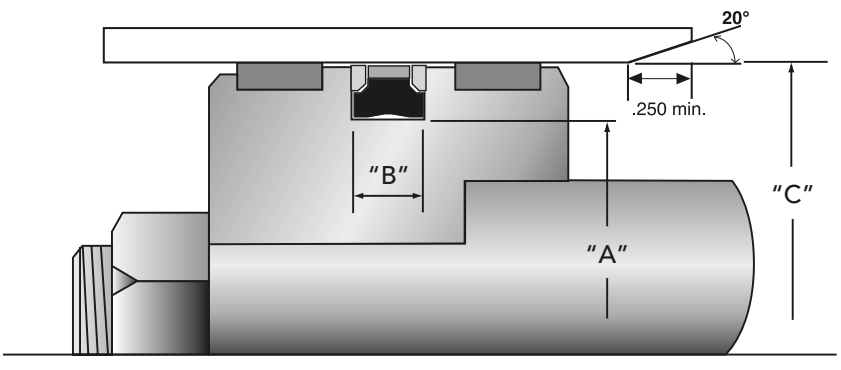
ECT CAPPED T-SEALS

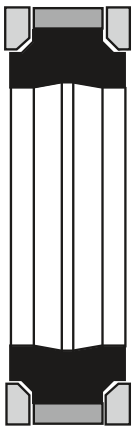
ECT 4250 - 80L - 155 - 95

- 4250: Dash No. (See Table 2)
- 80L: Energizer Compound (See Table 1)
- 155: Cap Compound (See Table 1)
- 95: Back-up Compound (See Table 1)

TABLE 2

ESC Dash Number	NOM SEAL C/S	BORE Diameter (øA)	BORE Tolerance	GLAND Diameter (øF)	GLAND Tolerance	GLAND LENGTH (G) +.010 -.000	CLEARANCE (D) Without wear Ring max.	CLEARANCE (D) With wear Ring min./max
-1000		1.000		.627				
-1062		1.063		.690				
-1125		1.125		.752				
-1187		1.187		.815				
-1250		1.250		.877				
-1312		1.313		.940				
-1375		1.375		1.002		.424		
-1437		1.437		1.065				
-1500		1.500		1.127			.006	
-1562		1.562		1.150				.024/.030
-1625	3/16"	1.625		1.252				
-1687		1.687		1.315				
-1750		1.750		1.377				
-1875		1.875		1.502				
-2000		2.000		1.627				
-2125		2.125		1.752				
-2250		2.250		1.877				
-2375		2.375		2.002	+.000 -.002			
-2500		2.500	+.002 -.000	2.127				
-2625		2.625		2.252				
-2750		2.750		2.377				
-2875		2.875		2.502				
-3000		3.000		2.522				
-3125		3.125		2.647				
-3250		3.250		2.772			.007	
-3375		3.375		2.897				
-3500		3.500		3.022				
-3625		3.625		3.147				
-3750	1/4"	3.750		3.272				.024/.038
-3875		3.875		3.397				
-4000		4.000		3.522				
-4125		4.125		3.647		.579		
-4250		4.250		3.772				
-4375		4.375		3.897				
-4500		4.500		4.022				
-4635		4.625		4.147				
-4750		4.750		4.272			.008	
-4875		4.875		4.397				
-5000		5.000		4.274				
-5125		5.125		4.399				
-5250		5.250		4.524				
-5375		5.375		4.649				
-5500		5.500		4.774				
-5625		5.625		4.899		.750		
-5750		5.750		5.024				
-5875		5.875		5.149				
-6000		6.000		5.274	+.000 -.003		.009	
-6125		6.125		5.399				
-6250		6.250	+.003 -.000	5.524				
-6325		6.325		5.649				
-6500		6.500		5.774				
-6750		6.750		6.024				
-7000		7.000		6.274				
-7250		7.250		6.524				
-7500		7.500		6.774				.024/.045
-7750	3/8"	7.750		7.024				
-8000		8.000		7.274				
-8250		8.250		7.524				
-8500		8.500		7.774				
-8750		8.750		8.024				
-9000		9.000		8.274				
-9500		9.500		8.775				
-10000		10.000		9.275				
-10500		10.500		9.775				
-11000		11.000		10.275				
-11500		11.500		10.775			.010	
-12000		12.000		11.275	+.000 -.004			
-12500		12.500	+.004 -.000	11.775				
-13000		13.000		12.275				
-13500		13.500		12.775				
-14000		14.000		13.275				
-14500		14.500		13.775				
-15000		15.000		14.275				
-15500		15.500		14.775				
-16000		16.000		15.275				





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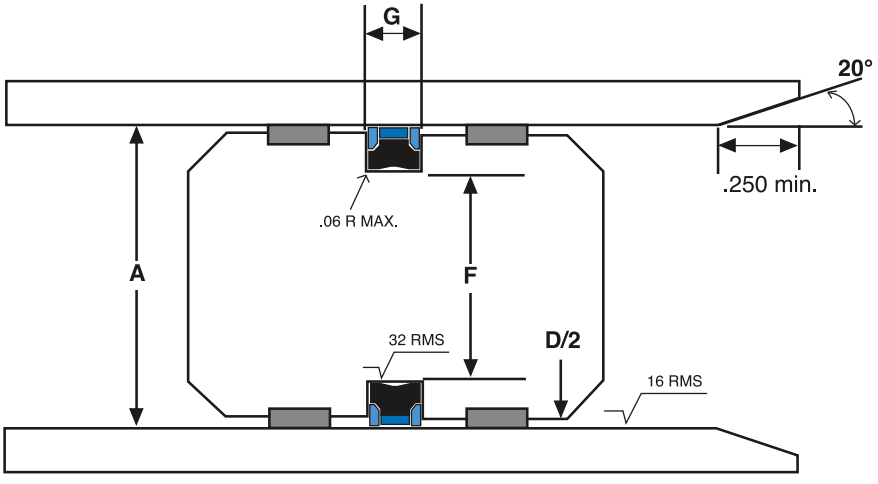
ECT CAPPED T-SEALS

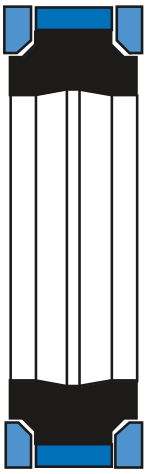
ECT 024 - 80L - 150 - 98

024	80L	150	98
Dash No. (See Table 3)	Energizer Compound (See Table 1)	Cap Compound (See Table 1)	Back-up Compound (See Table 1)

TABLE 3

ESC Dash Number	NOM SEAL C/S	BORE Diameter (øA)	BORE Tolerance	GLAND Diameter (øF)	GLAND Tolerance	GLAND LENGTH (G) +.010 -.000	CLEARANCE (D) Without wear Ring max.	CLEARANCE (D) With wear Ring min./max
-016	9/64	1.000	+.002 -.000	.722		.295	.015	.020/.030
-020	1/4	1.250		.752		.295		
-024	1/4	1.500		1.004		.295		
-026	1/4	1.625		1.129		.295		
-028	1/4	1.750		1.254		.295		
-030	1/4	1.875		1.377		.295		
-032	9/32	2.000		1.442		.295		
-036	9/32	2.250		1.692	+.000 -.004	.295		
-040	9/32	2.500		1.942		.295		
-044	9/32	2.750		2.192		.295		
-048	9/32	3.000		2.442		.420		.020/.038
-052	9/32	3.250		2.692		.420		
-056	9/32	3.500		2.942		.420		
-060	9/32	3.750		3.192		.420		
-064	9/32	4.000	+.003 -.000	3.442		.420		
-068	9/32	4.250		3.692		.420		
-072	9/32	4.500		3.942		.420		
-076	9/32	4.750		4.192		.420		
-080	9/32	5.000		4.442		.420		





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