



ESCC
ENGINEERED SEALS & COMPONENTS, LLC.

POLY-TREL™ (TPC-ET) FAMILY OF COMPOUNDS



TYPICAL COMPOUND USAGE AND TEMPERATURE GUIDE

Compound Number			Description	Temperature Range		Typical Usages
				°C	°F	
ESC-Ion™	Compound	PA940	Glass Filled Nylon 6	-54°/+135°	-65°/+275°	Wear Rings, Back-ups, Piston Seals, Guide Rings, Bearings
ESC-Ion™	Compound	PA940-B	Glass Filled Nylon 6 / Lub	-54°/+135°	-65°/+275°	Wear Rings, Back-ups, Piston Seals, Guide Rings, Bearings
ESC-Ion™	Compound	PA940-CB	Glass Filled Nylon 6 / Lub (Blue "CB")	-54°/+135°	-65°/+275°	Wear Rings, Back-ups, Piston Seals, Guide Rings, Bearings
ESC-Ion™	Compound	PA940-15	Glass Filled Nylon 6 / PTFE	-54°/+135°	-65°/+275°	Wear Rings, Back-ups, Piston Seals, Guide Rings, Bearings
ESC-Ion™	Compound	PA101-N	Nylon Unfilled 6/6	-54°/+135°	-65°/+275°	Wear Rings, Back-ups, Piston Seals, Guide Rings, Bearings
ESC-Ion™	Compound	PA101-BK	Nylon Unfilled 6/6 Black	-54°/+135°	-65°/+275°	Wear Rings, Back-ups, Piston Seals, Guide Rings, Bearings
ESC-Ion™	Compound	PA101-BLU	Nylon Unfilled 6/6 Blue	-54°/+135°	-65°/+275°	Wear Rings, Back-ups, Piston Seals, Guide Rings, Bearings
ESC-Ion™	Compound	PA933-BK	Glass Filled Nylon 6/6	-54°/+135°	-65°/+275°	Wear Rings, Back-ups, Piston Seals, Guide Rings, Bearings
ESC-Ion™	Compound	HTN20-C	Hi Temp. "No Swell" Carbon Filled	-54°/+148°	-65°/+300°	Wear Rings, Back-ups, Piston Seals, Guide Rings, Bearings
ESC-Ion™	Compound	HTN30-C	Hi Temp. "No Swell" Carbon Filled	-54°/+148°	-65°/+300°	Wear Rings, Back-ups, Piston Seals, Guide Rings, Bearings
ESC-Ion™	Compound	HTN-30	Hi Temp. "No Swell" Glass Filled	-54°/+148°	-65°/+300°	Wear Rings, Back-ups, Piston Seals, Guide Rings, Bearings
ESC-Ion™	Compound	HTN-40	Hi Temp. "No Swell" Glass Filled	-54°/+148°	-65°/+300°	Wear Rings, Back-ups, Piston Seals, Guide Rings, Bearings
ESC-tal™	Compound	POM95-BK	Acetal Unfilled	-43°/+100°	-45°/+200°	Wear Rings, Back-ups, Piston Seals, Guide Rings, Bearings
ESC-tal™	Compound	POM-30G	Acetal Glass Filled	-43°/+100°	-45°/+200°	Wear Rings, Back-ups, Piston Seals, Guide Rings, Bearings
ESC-tal™	Compound	POM-10C-RED	Acetal Carbon Filled	-43°/+100°	-45°/+200°	Wear Rings, Back-ups, Piston Seals, Guide Rings, Bearings
ESC-tal™	Compound	POM-30C	Acetal Carbon Filled	-43°/+100°	-45°/+200°	Wear Rings, Back-ups, Piston Seals, Guide Rings, Bearings
ESC-comp™	Compound	V-100	Laminate Composite	-40°/+100°	-40°/+200°	Wear Rings, Back-ups, Piston Seals, Guide Rings, Bearings
ESC-comp™	Compound	V-111	Laminate Composite	-40°/+100°	-40°/+200°	Wear Rings, Back-ups, Piston Seals, Guide Rings, Bearings
ESC-comp™	Compound	V-131A	Laminate Composite	-40°/+100°	-40°/+200°	Wear Rings, Back-ups, Piston Seals, Guide Rings, Bearings
ESC-comp™	Compound	V-333A	Laminate Composite	-40°/+148°	-40°/+300°	Wear Rings, Back-ups, Piston Seals, Guide Rings, Bearings
POLY-trel™	Compound	HT40-BK	TPC-ET 40 Shore D, Black	-54°/+121°	-65°/+250°	Back-up Rings, Rod Wipers, Seals, Gaskets, Cushions
POLY-trel™	Compound	HT47-BK	TPC-ET 47 Shore D, Black	-54°/+121°	-65°/+250°	Back-up Rings, Rod Wipers, Seals, Gaskets, Cushions
POLY-trel™	Compound	HT47-N	TPC-ET 47 Shore D, Off White	-54°/+121°	-65°/+250°	Back-up Rings, Rod Wipers, Seals, Gaskets, Cushions
POLY-trel™	Compound	HT47-BLU	TPC-ET 47 Shore D, Blue	-54°/+121°	-65°/+250°	Back-up Rings, Rod Wipers, Seals, Gaskets, Cushions
POLY-trel™	Compound	HT50-OR	TPC-ET 50 Shore D, Orange	-54°/+135°	-65°/+275°	Back-up Rings, Rod Wipers, Seals, Gaskets, Cushions
POLY-trel™	Compound	HT55-OR	TPC-ET 55 Shore D, Orange	-54°/+135°	-65°/+275°	Back-up Rings, Rod Wipers, Rod Seals, Piston Seals, Gaskets
POLY-trel™	Compound	HT55-SOR	TPC-ET 55 Shore D, Orange / Fiber Glass	-54°/+135°	-65°/+275°	Back-up Rings, Rod Wipers, Rod Seals, Piston Seals, Gaskets
POLY-trel™	Compound	HT55-OR	TPC-ET 55 Shore D, Orange	-54°/+135°	-65°/+275°	Back-up Rings, Rod Wipers, Rod Seals, Piston Seals, Gaskets
POLY-trel™	Compound	HT55-BK	TPC-ET 55 Shore D, Black	-54°/+135°	-65°/+275°	Back-up Rings, Rod Wipers, Rod Seals, Piston Seals, Gaskets
POLY-trel™	Compound	HT55-BLU	TPC-ET 55 Shore D, Blue	-54°/+135°	-65°/+275°	Back-up Rings, Rod Wipers, Rod Seals, Piston Seals, Gaskets
POLY-trel™	Compound	HT55SH-OR	TPC-ET 55 Shore D, Orange- Heat Stabilized	-54°/+135°	-65°/+275°	Back-up Rings, Rod Wipers, Rod Seals, Piston Seals, Gaskets
POLY-trel™	Compound	HT55-SHS-OR	TPC-ET 55 Shore D, Orange -Hydrolytically Stabilized	-54°/+135°	-65°/+275°	Back-up Rings, Rod Wipers, Rod Seals, Piston Seals, Gaskets
POLY-trel™	Compound	HT63-N	TPC-ET 63 Shore D, Off White	-54°/+135°	-65°/+275°	Back-up Rings, Rod Wipers, Rod Seals, Piston Seals, Gaskets
POLY-trel™	Compound	HT63-OR	TPC-ET 63 Shore D, Orange	-54°/+135°	-65°/+275°	Back-up Rings, Rod Wipers, Rod Seals, Piston Seals, Gaskets
POLY-trel™	Compound	HT-63-5-OR	TPC-ET 63 Shore D, Orange / Fiber Glass	-54°/+135°	-65°/+275°	Back-up Rings, Piston Seals, Filler Rings
POLY-trel™	Compound	HT-72-N	TPC-ET 72 Shore D, Off White	-54°/+135°	-65°/+275°	Back-up Rings, Piston Seals, Filler Rings
ESC-thane™	Compound	U95K-BLU	TPU Urethane 95 Shore A, Blue	-40°/+121°	-40°/+250°	Back-up Rings, Rod Wipers, Rod Seals, Piston Seals, Gaskets
ESC-thane™	Compound	U95K-BLK	TPU Urethane 95 Shore A, Black	-40°/+121°	-40°/+250°	Back-up Rings, Rod Wipers, Rod Seals, Piston Seals, Gaskets
ESC-thane™	Compound	U94-BK	TPU Urethane 94 Shore A, Black	-40°/+110°	-40°/+230°	Back-up Rings, Rod Wipers, Rod Seals, Piston Seals, Gaskets
ESC-thane™	Compound	U94-BLU	TPU Urethane 94 Shore A, Blue	-40°/+110°	-40°/+230°	Back-up Rings, Rod Wipers, Rod Seals, Piston Seals, Gaskets
ESC-thane™	Compound	U65D-N	Urethane 65 Shore D, Milky	-40°/+110°	-40°/+230°	Back-up Rings, Rod Wipers, Rod Seals, Piston Seals, Gaskets
ESC-thane™	Compound	U95-HT	Urethane PPDI 95 Shore A	-40°/+135°	-40°/+275°	Back-up Rings, Rod Wipers, Rod Seals, Piston Seals, Gaskets
ESC-thane™	Compound	U95-LT	Urethane PPDI 95 Shore A	-54°/+121°	-65°/+250°	Back-up Rings, Rod Wipers, Rod Seals, Piston Seals, Gaskets

Complete physical specifications can be found at www.engseals.com



Compound Information

ESCC's POLY-TREL™ Family of Compounds

TPE-ET Thermoplastic Polyester Elastomer

Property	Test Method	Units	COMPOUND NUMBER					
			HT40 Value	HT47 Value	HT50 Value	HT55 Value	HT63 Value	HT72 Value
Hardness , Shore D	ISO 868	D	40	47	50	55	63	72
Tensile Strength, Ultimate	ISO 527	Mpa (psi)	21 (3,050)	30.5 (4,425)	36.0 (5,220)	40 (5,800)	41 (5950)	45.8 (6640)
Tensile Stress	ISO 527							
@5% Strain		Mpa (psi)	2.5 (0.4)	n/a		6.9 (1)	12 (1.7)	14 (2)
@10% Strain		Mpa (psi)	4.4 (0.6)	6.8 (1.0)	6.8 (1.0)	11 (1.6)	15 (2.2)	23 (3.3)
@50% Strain		Mpa (psi)	8.0 (1.2)	11 (1.6)	11 (1.6)			
Yield Stress	ISO 527	Mpa (psi)	x	x	30	14 (2,000)	19 (2,800)	x
Stress at Break	ISO 527	Mpa (psi)	17 (2,500)	17 (2,500)		44 (6,400)	46 (6,700)	53 (7,700)
Strain at Break	ISO 527	%	250	200		500	490	450
Normal Strain at Break	ISO 527	%	350	>50		800	540	x
Yield Strain	ISO 527	%	x	x	30	37	35	x
Tensile Modulus	ISO 527	Mpa (psi)	55 (8,000)	105 (15,200)	740 (10,700)	188 (27,300)	280 (41,000)	525 (76,000)
Flexural Modulus -40°C (-40°F)	ISO 178	Mpa (psi)	200 (29,000)	260 (37,000)	470 (68,700)	760 (110,000)	248 (36,000)	2350 (340,000)
Flexural Modulus 23°C (73°F)	ISO 178	Mpa (psi)	65 (9,400)	117 (17,000)	124 ((18,000)	200 (29,000)	330 (48,000)	570 (83,000)
Flexural Modulus 100°C (212°F)	ISO 178	Mpa (psi)	30 (4,000)	60 (9,000)	46 (6,700)	100 (14,000)	296 (43,000)	200 (28,000)
Elongation at Break	ISO 527	%	424	462	530	500	490	450
Tensile Strength at Yield	ISO 527	Mpa (psi)	7.5 (1,090)	7.2 (1,045)	36 (5,220)	6.9 (1,000)	19 (2760)	26 (3770)
Glass Transition Temperature (10°C/min)	ISO 11357-1/2	°C (°F)	-25 (-31F)	-45 (-49F)	62 (144F)	-20 (-4F)	0 (32F)	25 (77F)
Deflection Temp @ 66 psi	ISO 75f	°C (°F)	50 (122F)	60 (140F)	62 (144)	70 (160F)	85 (185F)	95 (203F)
Deflection Temp @ 264 psi	ISO 75f	°C (°F)	x	x	40 (104F)	40 (113F)	45 (113F)	45 (126F)
Temperature Range			-65F to +250F	-65F to +250F	-65F to +275F	-65F to +275F	-65F to +275F	-65F to +275F
Shelf Life	ISO R1183	Years	10 years	10 years	10 years	10 years	10 years	10 years

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 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.





POLY-TREL BACK-UP RING FLUID RESISTANCE DESIGN GUIDE

Chemical	Rating*	Chemical	Rating*	Chemical	Rating*
Acetic acid, 20%	A	Diocetyl phthalate	A	Nitrobenzene	C
Acetic acid, 30%	A	Epichlorohydrin	X	Oleic acid	A
Acetic acid, glacial	A	Ethyl acetate	A,B	Oleum 20-25%	C
Acetic acid, glacial (+100° F - +38° C)	B	Ethyl alcohol	A	Palmitic acid	A
Acetic Anhydride	T	Ethyl chloride	C	Perchloroethylene	B,C
Acetone	B	Ethylene dichloride	B,C	Phenol	C
Acetylene	A	Ethylene glycol	A	Pickling Solution (20% nitric acid, 4% HF)	X
Aluminum chloride solutions	T	Ethylene oxide	A	Pickling Solution (17% nitric acid, 4% HF)	X
Aluminum sulfate solutions	T	Ferric chloride solutions	T	Potassium dichromate solutions	T
Ammonium chloride solutions	A	Fluosilicic acid	T	Potassium hydroxide solutions	A
Ammonium hydroxide solutions	T	Formaldehyde 40%	B	Pydraul 312C	A
Ammonium sulfate solutions	B	Formic Acid	B	Pyridine	X
Amyl Acetate	B	FREON®-11	A	SAE 10 oil	A
Amyl alcohol	A	FREON®-12	A	Sea water	A
Aniline	C	FREON-113® (130° F - 55° C)	A	Silicone grease	A
ASTM oil = 1 (300° F - 149° C)	A	FREON®-114	A	SKYDROL 500	A
ASTM oil = 3 (300° F - 149° C)	A	Gasoline	A	Soap solutions	A
ASTM reference fuel A (158°F - 70° C)	A	Glue	A	Sodium chloride solutions	A
ASTM reference fuel B (158°F - 70° C)	A	Glycerin	A	Sodium dichromate 20%	T
ASTM reference fuel C	A	n-Hexane	A	Sodium hydroxide 20%	A
ASTM reference fuel C (158°F - 70° C)	B	Hydrazine	C	Sodium hypochlorite 5%	B
Asphalt	T	Hydrochloric acid 20%	B	Sodium hydroxide 46.5%	A
Barium hydroxide solutions	T	Hydrocyanic acid	T	Soybean oil	T
Beer	A	Hydrofluoric acid 48%	X	Stannous chloride 15%	T
Benzene	B	Hydrofluoric acid 75%	X	Steam (212° F - 100° C) stabilized	B
Borax solutions	A	Hydrofluoric acid, anhydrous	X	Steam (230° F - 110° C) stabilized	C
Boric acid solutions	A	Hydrogen	A	Stearic acid	T
Bromine anhydrous liquid	X	Hydrogen sulfide	A	Styrene	X
Butane	A	Isooctane	A	Sulfur, molten	T
Butyr acetate	B	Isopropyl alcohol	A	Sulfur dioxide, liquid	T
Butyric acid	T	JP-4	A	Sulfur dioxide, gas	T
Calcium chloride solutions	A	Kerosene	T	Sulfuric acid up to 50%	A
Calcium hydroxide solutions	T	Lacquer solvents	A,B	Sulfuric acid 50-80%	C
Calcium hypochlorite 5%	A	Lactic acid	T	Sulfuric acid 60%	C
Carbon bisulfide	B	Linseed oil	T	Sulfuric acid 90%	C
Carbon dioxide	A	Lubricating oils	A	Sulfuric acid 95%	C
Carbon monoxide	A	Magnesium chloride solutions	T	Sulfuric acid fuming (20% oleum)	C
Carbon tetrachloride	A,B,C	Magnesium hydroxide solutions	T	Sulfurous acid	B
Castor oil	A,B	Mercuric chloride solutions	T	Tannic acid 10%	A
Chlorine gas, dry	X	Mercury	A	Tartanic acid	T
Chlorine gas, wet	X	Methyl alcohol	A	Tetrahydrofuran	A,B
Chloroacetic acid	X	Methyl ethyl ketone	A,B	Toluene	B
Chlorobenzene	X	Methylene chloride	C	Trichloroethylene	C
Chloroform	C	Mineral oil	A	Triethanolamine	C
Chlorosulfonic acid	C	Naphtha	A	Trisodium phosphat solution	C
Citric acid solutions	A	Naphthalene	A,B	Tung oil	T
Copper chloride solutions	A	Nitric acid 10%	B	Water (158° F - 70° C)	A
Copper sulfate solutions	A	Nitric acid 30%	C	Water (212° F - 100° C) with stabilizer	B
Cottonseed oil	A	Nitric acid 60%	C	Xylene	A,B
Cyclohexane	A	Nitric acid 70%	C	Zinc chloride solutions	A
Dibufyl phthalate	A	Nitric acid, red fuming	C		
Diethyl sebacate	A				

* Rating Key
 A- Fluid has little or no effect
 B- Fluid has minor to moderate effect

C- Fluid has severe effect
 T-No data- likely to be compatible
 X- No Data-not likely to be compatible

Unless otherwise noted concentrations of aqueous solutions are saturated. All ratings are at room temp. unless specified.

We emphasize that this tabulation should be used as a guide only. It is based primarily on laboratory and service tests but does not take into account all variables that can be encountered in actual use. Therefore, it is always advisable to test the material under actual service conditions before specification. If this is not practical, tests should be devised that simulate service conditions as closely as possible.





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