

Resilon® 4301 Polyurethane

Premium grade polyurethane provides superior water-resistance and compression set resistance in water-based fluids



Superior PPDI-based formulation

Parker's proprietary PPDI-based Resilon family of polyurethane materials delivers the best overall sealing performance of all commercially available TPUs. Its superior resilience/rebound characteristics and thermal stability distinguish it from other MDI and TODI formulations – evidenced by successful, reliable sealing in applications where there are likely to be severe shock loads and momentary pressure spikes. Resilon 4301 polyurethane can be used at temperatures where normal polyurethanes break down because its unique formulation makes it resistant to hydrolytic deterioration.



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Product Features:

- Water resistant formulation
- Will not crack when exposed to water-based fluids
- PPDI polymer backbone
- Improved strength and wear-resistance extends seal life
- Resists extrusion over a broad pressure range
- Compression set resistance helps seal maintain lip contact under rapid changes to pressure and load



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Comparison of Typical MDI-based TPU vs. Resilon® 4301 Polyurethane

	MDI Typical TPU	Resilon 4301
Media: Distilled Water	720 hrs. @ 160F	720 hrs. @ 160F
Hardness Change, pts.	+2	+5
100% Modulus Change, %	-5	-3
300% Modulus Change, %	-24	-7
Ultimate Tensile Change, %	-16	+9
Elongation Change, %	+8	+2
Weight Change, %	+1	+1
Volume Change, %	+2	+2
Media: Distilled Water	720 HRS @180F	720 HRS @180F
Hardness Change, pts.	+3	+5
100% Modulus Change, %	-7	-4
300% Modulus Change, %	-29	-8
Ultimate Tensile Change, %	-15	-32
Elongation Change, %	+4	-9
Weight Change, %	+1	+1
Volume Change, %	+2	+3
Media: Distilled Water	1000 HRS @ 212F	1000 HRS @ 212F
Hardness Change, pts.		-2
100% Modulus Change, %		-16
300% Modulus Change, %	Too	-22
Ultimate Tensile Change, %	Brittle	-24
Elongation Change, %	to Test	+3
Weight Change, %		+1
Volume Change, %		+2

Resilon 4301 polyurethane vs. conventional urethanes

High-performance polyurethanes may meet long life and/or high pressure operating criteria in oil-based fluids; however, more applications are using water based fluids for environmental or safety concerns. At room temperature, water-based fluids cause little problem, but as the temperature rises even the toughest long wearing materials start to suffer from hydrolysis or breakdown of the molecules. PPDI-based Resilon 4301 polyurethane can be used at temperatures where normal polyurethanes break down because its unique formulation makes it resistant to hydrolytic deterioration. Resilon 4301 maintains excellent physical properties at operating temperatures as high as 212°F.



Frame 1 Frame 2 Frame 3

From left, aqua-colored Resilon 4301 polyurethane seals and competitor's yellow conventional MDI-based urethane seals as manufactured (Frame 1); after 1493 hours of exposure to 212°F water (Frame 2); and after 1493 hours of exposure to steam (Frame 3).

Resilon® 4301 Polyurethane

Typical Physical Properties	4301A90
Hardness, Shore A, pts	90
Modulus @ 100%, psi	2029
Tensile Strength at Break, psi	7129
Ultimate Elongation, %	514
Specific Gravity	1.19
Rebound, %	45
Compression Set, 70 hrs @ 158°F, %	24.8
Useful temperature range, °F	-35 to +225
Max operating pressure, psi	5000

