

# Resilon® Polyurethane

Proprietary high-performance material for hydraulic sealing



## High-performance polyurethane for long sealing life

Parker's proprietary Resilon polyurethane delivers unequalled resilience, strength, and thermal stability -- translating into superior sealing performance in critical engineering applications. The chemical nature of Resilon polyurethane's backbone polymer (PPDI) produces unique dynamic properties which make it a stand-out choice for long life in hydraulic applications involving high cyclic loading.

Contact Parker to learn about how the extended capabilities of Resilon can deliver longer seal life.



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## Product Features:

- Performs where other polyurethanes fail
- Expanded temperature range
- 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
- Water resistant (4301) and extrusion resistant (4304) formulations available



ENGINEERING YOUR SUCCESS.

# PPDI-based Resilon® formulation

Delivers best overall sealing performance for heavy duty hydraulics

## Three Basic Types of Sealing Grade Materials

There are three base formulations or chemical backbones used in compounding modern thermoplastic polyurethane (TPU) seal materials. They are:

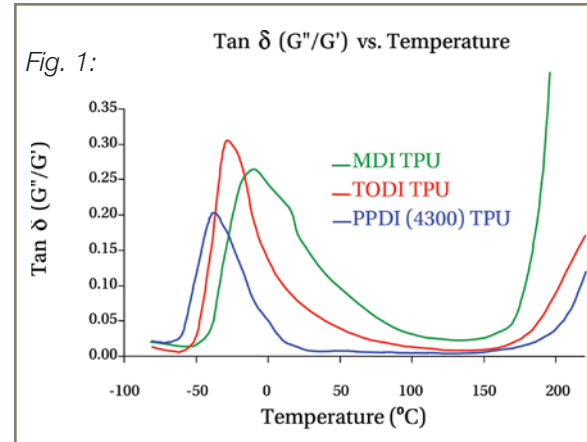
- MDI (diphenylmethane diisocyanate)
- TODI (diphenyldiisocyanate)
- PPDI (p-phenylenediisocyanate)

All three produce the abrasion resistance and long wear benefits that are typical of any good polyurethane seal material. There are other physical properties though, such as heat resistance, compression set resistance, and rebound/resilience, which are major concerns in critical hydraulic applications which require effective, long-term sealing. It is in these latter performance areas that the characteristics inherent in MDI,

TODI or PPDI formulations become most apparent. This unique Parker-developed PPDI-based formulation – Resilon – yields the best over-all sealing performance of all commercially available TPU formulations currently on the market.

## Superior Heat Resistance

Rheometric examination of the dynamic behavior of MDI, TODI, and PPDI (4300) were measured under tensile mode and produced the data shown in the chart at right. The low tangent delta,  $\tan \delta$ , values of Resilon PPDI across the practical application range indicate a lower ratio of energy absorbed as heat to energy returned as resilience. In addition, the higher temperature upturn of the  $\tan \delta$  value verifies the higher softening temperature for the Resilon PPDI formulation.



Resilon's internal heat build-up (hysteresis) is much lower across the entire temperature range of operation (-40° to +275°F)

## Superior Resilience/Rebound

Resilon (4300) also has superior resilience/rebound characteristics compared to other available TPU materials. Quick rebound is a major advantage in applications likely to experience severe shock loads and momentary pressure spikes. In addition, Resilon's enhanced resilience/rebound characteristics allow the sealing lips of rod or piston seal profiles to conform to the moving seal interface with greater rapidity, maintaining critical sealing lip contact.

## Applications

Recommended for piston seals, rod seals, wipers and O-rings for all types of light, medium and heavy-duty hydraulic cylinders, shock absorbers, off-road, industrial and construction equipment.

## Resilon® Polyurethane Materials

Typical Physical Properties	4300A90	4301A90	4304D60
Hardness, Shore, pts	92A	90A	55D
Tensile Strength at Break, psi	8625	7129)	6521
Ultimate Elongation, %	560	514	556
100% Modulus, psi	1793	2029	2940
Compression set at 158°F, %	28.9	24.8	32.2
Rebound, %	63	45	46
Service Temperature Range, °F	-65 to +275	-35 to +225	-65 to +275

