

# 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 materials delivers the best over-all 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



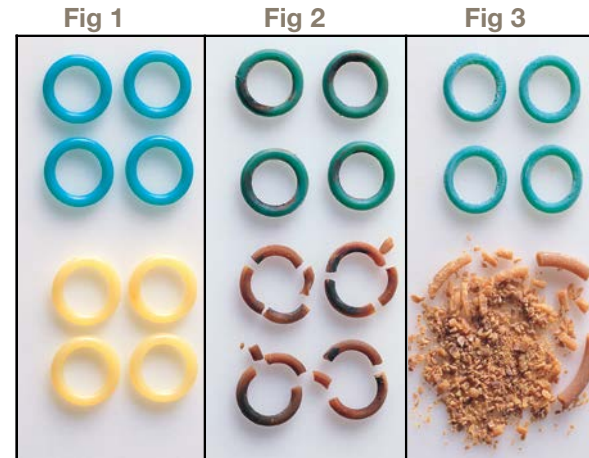
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# Comparison of MDI-based TPU vs. Resilon® 4301 Polyurethane

|                               | MDI Typical TPU        | Resilon 4301           |
|-------------------------------|------------------------|------------------------|
| <b>Media: Distilled Water</b> | <b>720 hrs. @ 160F</b> | <b>720 hrs. @ 160F</b> |
| 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                     |
| <b>Media: Distilled Water</b> | <b>720 HRS @180F</b>   | <b>720 HRS @180F</b>   |
| 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                     |
| <b>Media: Distilled Water</b> | <b>1000 HRS @ 212F</b> | <b>1000 HRS @ 212F</b> |
| 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.



Proprietary Resilon 4301 polyurethane seals (aqua color) and competitor's conventional urethane seals (yellow color).

Fig 1. As manufactured

Fig 2. After 1493 hours of exposure to 212°F water

Fig 3. After 1493 hours of exposure to steam

## Resilon®4301 Polyurethane

| Typical Physical Properties    | 4301A90     |
|--------------------------------|-------------|
| Hardness, Shore A, pts         | 92          |
| Tensile Strength at Break, psi | 7188        |
| Ultimate Elongation, %         | 548         |
| 100% Modulus, psi              | 1958        |
| Compression set at 158°F, %    | 22.3        |
| Rebound, %                     | 41          |
| Temperature Range, °F          |             |
| in oil                         | -35 to +275 |
| in hot water                   | -35 to +225 |
| Max operating pressure, psi    | 5000        |

