

Resilon™ WR (P4301A90) Water Resistant Polyurethane for the Oilfield

No. 5219B-1 USA

Resilon™ WR (P4301A90) premium-grade resilient polyurethane provides superior water resistance and compression set resistance in water-based drilling and control fluids

Why use polyurethane?

Polyurethane is the toughest, yet still resilient, elastomer used in sealing today. High tensile strength and modulus make polyurethane an excellent choice in oilfield applications. Parker Hannifin's proprietary Resilon™ materials deliver the best over-all sealing performance of all commercial polyurethane formulations currently on the market. Resilon's superior resilience/rebound characteristics distinguish it from other polyurethane formulations -- evidenced by successful, reliable sealing in applications likely to experience severe shock loads and momentary pressure spikes.

Best over-all sealing performance now in water-resistant formulation

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. Resilon WR can be used at temperatures where normal polyurethanes break down. Its unique formulation makes it resistant to hydrolytic deterioration. Resilon WR maintains excellent physical properties at operating temperatures as high as 212°F in water.

Features of Resilon WR

- Water resistant formulation
- Excellent compression set resistance
- Very high rebound resilience
- Best wear and extrusion resistance of elastomers



Advantages of Resilon™ WR (P4301A90)

- Performs at temperatures where other polyurethanes break down in water
- Maintains sealing lip contact while reacting to rapid changes in pressurization
- Will not crack when exposed to water based fluids
- Outperforms other elastomers without back-up rings

Enhances system performance

Resilon WR is recommended where equipment is exposed to the corrosive effects of seawater. Seals made from Resilon WR add to the service life of subsea connection applications by preventing the exchange of free saltwater which exchange brings corrosion-promoting oxygen into connections of all types. Resilon WR prevents that exchange. Applications such as riser strings, both in production and drilling processes, can benefit with enhanced system performance with the installation of Resilon WR seals.

Numerous applications

This exceptional water- and oil-resistant compound may be used in numerous applications where water and water-based fluids may be encountered, such as:

- Blow-out preventers
- Subsea connections
- Risers and other equipment

Contact us

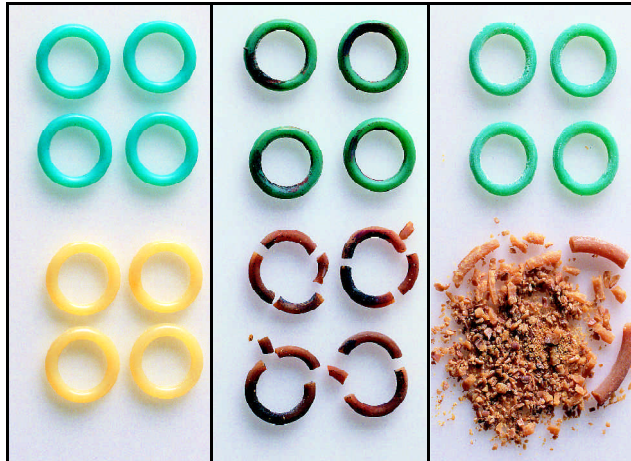
Call EPS Application Engineers for more information on Resilon WR and the Resilon family of polyurethanes at (801) 972-3000.

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 **Parker** Seals
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Resilon™ WR vs. conventional polyurethanes



Parker **Resilon™ WR**
P4301A90 Polyurethane

Typical Physical Properties

| | |
|--|--------------|
| Hardness, Shore A points | 92 |
| Modulus @ 100%, psi | 2044 |
| Modulus @ 300%, psi | 3868 |
| Ultimate tensile strength, psi | 7052 |
| Elongation, % | 513 |
| Compression set, 70 hrs. @ 158°F, % | 24.1 |
| Useful temperature range, °F | -50° to 270° |
| Maximum operating pressure, psi | 5000 |

From left, aqua proprietary Parker P4301A90 seals and competitor's yellow conventional polyurethane seals as manufactured; after 1493 hours of exposure to 212°F water; and after 1493 hours of exposure to steam.

**Comparative Compatibility of
Resilon™ WR**

| Media | Conditions | Hardness Change, pts. | 100% Modulus Change, % | 300% Modulus Change, % | Ultimate Tensile Change, % | Elongation Change, % | Weight Change, % | Volume Change, % |
|---|------------------|-----------------------|------------------------|------------------------|----------------------------|----------------------|------------------|------------------|
| ACCOLADE BASE ESTER | 168 hrs @ 212 F | +4 | -10 | -11 | -5 | -2 | +5 | +8 |
| AQUALINK HT 180 SC | 168 hrs @ 180 F | -3 | -19 | -25 | -15 | +17 | +2 | +1 |
| AQUALINK HT 300 | 168 hrs @ 180 F | -3 | -26 | -36 | -50 | +20 | +3 | +3 |
| AQUALINK HT 804 | 168 hrs @ 180 F | -1 | -18 | -23 | -14 | +13 | +1 | +1 |
| CASTROL TRANSAQUA HT | 168 hrs @ 212 F | -1 | -11 | -19 | -35 | +12 | +3 | +3 |
| ETHYLENE GLYCOL 97% | 12 weeks @ 100 C | -2 | -23 | | -68 | -55 | 0 | +1 |
| HOUGHTO-SAFE 273 CF | 168 hrs @ 180 F | -3 | -28 | -44 | -69 | +12 | +3 | +3 |
| MARSTEN BENTLEY HW 443 | 168 hrs @ 158F | -1 | -15 | -22 | -9 | +12 | +1 | +2 |
| MARSTEN BENTLEY HW 540 | 168 hrs @ 158F | -2 | -17 | -22 | -12 | +7 | +5 | +6 |
| PETROFREE SF OLEFIN | 168 hrs @ 212 F | +3 | -10 | -7 | +10 | -4 | +3 | +4 |
| STACK GUARD 804 | 168 hrs @ 180 F | -4 | -21 | -33 | -46 | +28 | +2 | +1 |
| STACK MAGIC 200N | 168 hrs @ 180 F | -5 | -34 | -52 | -79 | -39 | +5 | +6 |
| ZINC BROMIDE/CALCIUM BROMIDE/H ₂ O | 168 hrs @ 70 C | not recommended | | | | | | |