Arlon® 3000 XT

Expanded High-Temperature Performance

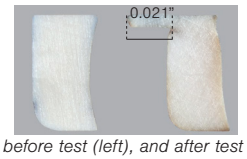
Arlon® 3000 XT fire seals

Applications

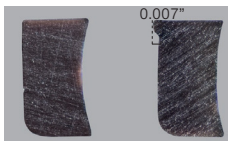
- Engines (Zones 1-3)
- Braking systems
- Fire seal backup rings
- Backup rings for HP and/or HT environments
- General seal assemblies

Testing

Extrusion Test: backup ring cross sections tested at 450°F (232°C), 40 ksi for 48 hours



PEEK before test (left), and after test (right)



Arlon® 3000 XT before test (left), and after test (right)

Advanced Material for Aerospace Environments

With the onset of new aircraft programs over the next decade, demand has increased for actuator designs that meet and exceed a more rigorous performance envelope. Some of the requirements, such as the fire and flammability resistance defined in RTCA, Inc.'s DO-160, go beyond the use of standard hydraulic seal designs. As a result, Greene Tweed has expanded the use of their newest engineering thermoplastic, Arlon® 3000 XT, into products such as fire seals for the Aerospace market.

Arlon® 3000 XT is an engineering thermoplastic developed to withstand these extreme conditions. With improved creep and extrusion resistance at temperatures above 350°F (177°C), it enhances performance over existing PAEK polymers. In DMA (Dynamic Mechanical Analysis), Arlon® 3000 XT had a Tg 35°F (19.5°C) higher than PEEK, and provided superior mechanical property retention from 350°F (177°C) – 600°F (315°C). In extrusion testing at 35 ksi and 550°F (288°C), it outperformed both virgin and filled grades of PEEK and PEKEKK. In addition, Arlon® 3000 XT exhibits chemical resistance comparable to PEEK.

Arlon® 3000 XT delivers enhanced mechanical performance in high-pressure (HP) and/or high-temperature (HT) conditions. Through increased reliability and extended service life, it expands design headroom overall. The result is safer, more efficient operations in extreme environments.

Aerospace fluid compatibility testing results can be found in the Aerospace, Engineering Thermoplastics, section of the Greene Tweed website under Design Tools.

Features and Benefits

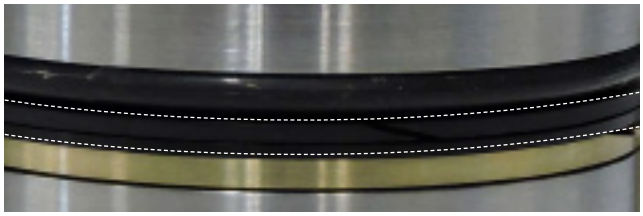
- Enhanced mechanical property retention at high temperatures improves performance over current PEEK- and PEKEKK-based solutions
- Increased reliability of critical components over 350°F (177°C)
- Compatible with common Aerospace fluid chemistries; chemical resistance comparable to PEEK
- Retrofit to existing legacy applications

Testing (Continued)

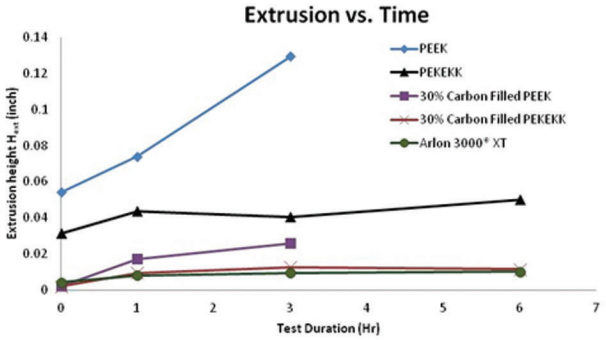
Fire Test (15 minutes at 2000°F [1093°C], seal pressurized to 3000 psi with nitrogen gas)

Before: Arlon® 3000 XT rings are the two black components closest to the bronze alloy ring (see image below).

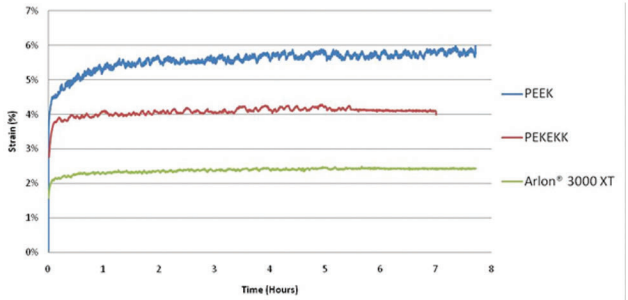
Arlon® 3000 XT



Extrusion Test: 550°F (288°C), 35 ksi, extrusion gap 0.020 in. Lower scores indicate higher performance.

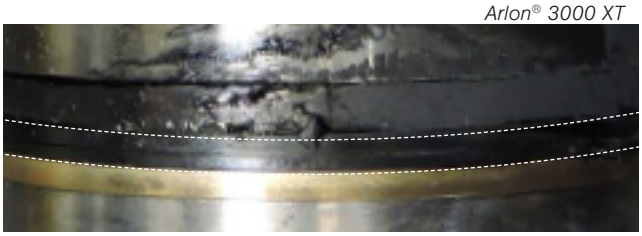


Creep Test: 500°F (260°C), stress level 14.5 ksi, performed in accordance with ASTM 2990. Lower scores indicate high performance.

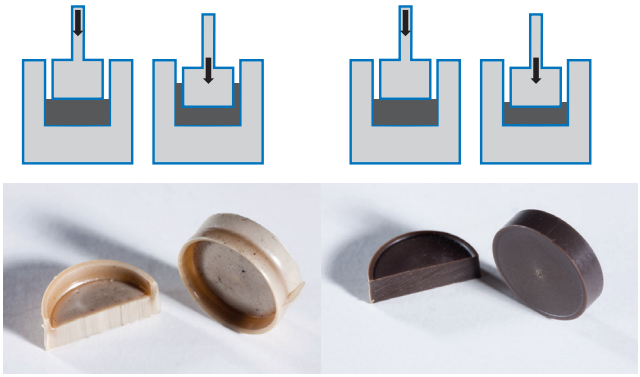


After: Arlon® 3000 XT rings experienced minimal degradation, with temperatures exceeding 1000°F (538°C) internally during the test (see image below).

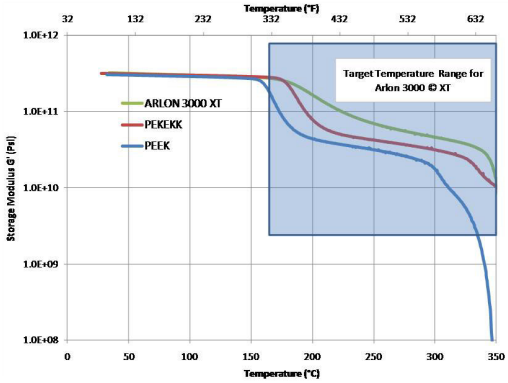
Arlon® 3000 XT



Extrusion Test (Continued): Test Fixture & Results Arlon® 3000 XT showed 10 times greater extrusion resistance.



Dynamic Mechanical Analysis: Arlon® 3000 XT provided improved mechanical properties in the range of 350°F (177°C) to 600°F (316°C).



Arlon® 3000 XT is patent pending
Arlon® 3000 XT by Greene Tweed based on VESTAKEEP®, an Evonik product