



HIGH-PERFORMANCE GASKET SEALS FOR ALKALINE ELECTROLYZERS

Precision Seals & Design Expertise For Enhanced Performance

Technical and durability requirements for large-diameter polymer gaskets in current and next generation alkaline electrolyzers have become more stringent and challenging. To support this hydrogen sector, Omniseal Solutions developed new material formulations that not only meet but also exceed sealing performance and stability.

This new sealing solution, Omniseal® Gaskets, is the engineered result of our many years of design expertise as well as in-house R&D capabilities.

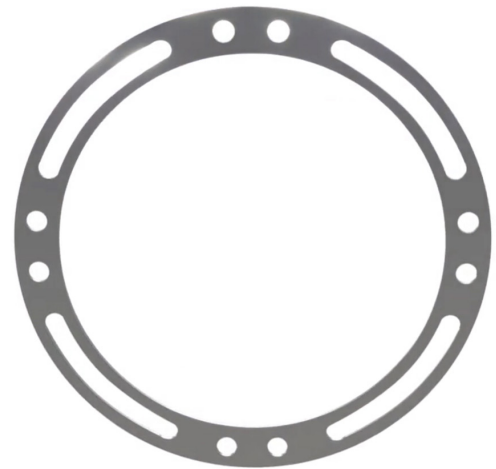
Tailored For Your Critical Applications

Sealing technology is an essential criteria of overall electrolysis cell efficiency. The gasket is subject to temperature gradients and harsh environments and therefore relied upon to maintain its dimensional stability and sealing performance.

Our newly formulated gasket sealing solutions are created with a series of different matrixes and fillers that deliver chemical compatibility with KOH solutions. They provide superior tightness while exhibiting low installation stresses and mechanical stability to creep relaxation. These precision seals are available in finished parts and customized prototypes.

Other technology advantages include:

- Chemical compatibility (30% KOH solution)
- Mechanical stability (high creep resistance)
- Tight tolerance and quality control
- Electrical insulation
- Proven sealing performance with high temperature gradient
- Excellent dimensional stability



Going Beyond In Mechanical Stability & Chemical Resistance



Design & Material Formulation Advantages

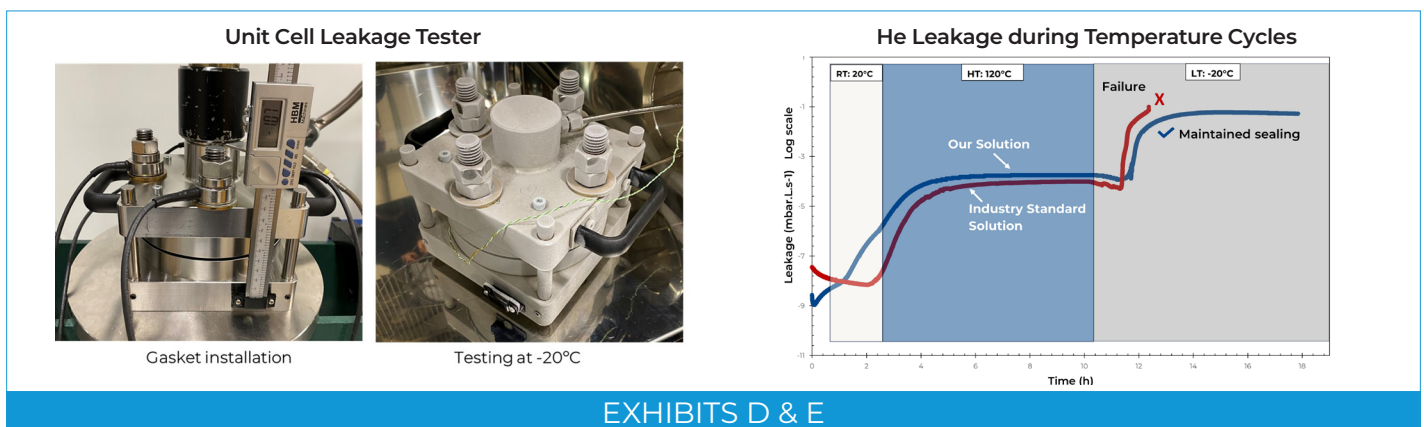
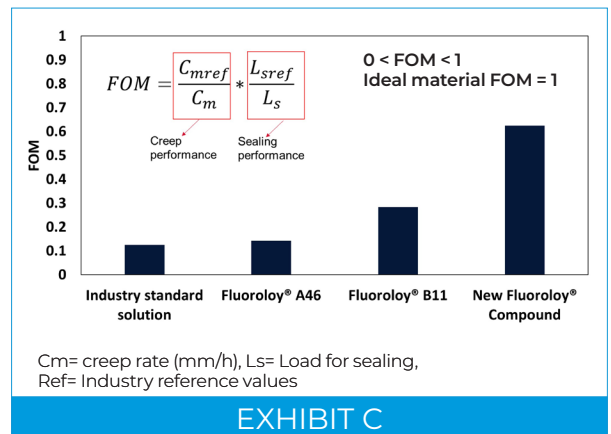
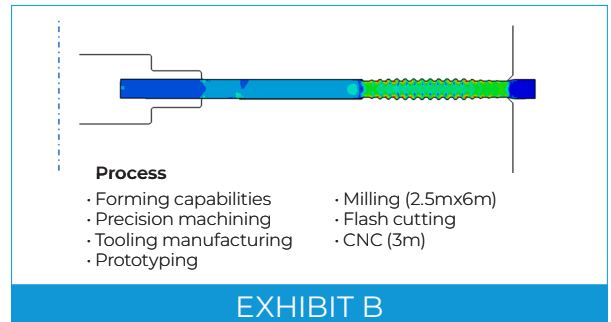
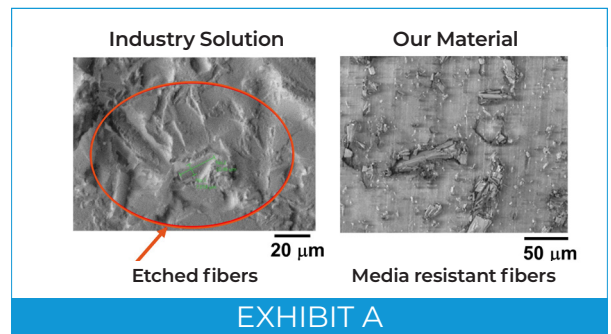
In developing these new polymer gaskets, our technical team conducted in-house comparative testing of these materials:

- An industry standard solution
- Omniseal Solutions' Fluoroloy® B11
- Omniseal Solutions' Fluoroloy® A46
- Omniseal Solutions' New Fluoroloy® compound (developed to meet the electrolyzer application requirements)
- **Advanced Characterization (SEM, Tomography, DSC & FTIR):** Exhibit A shows our materials are resistant to harsh media due to a combination of creep-resistant polymer base with filler reinforcements.
- **Simulation Process:** Exhibit B presents the axisymmetric model with stress distribution on our gasket solution after installation and applying cell fluid, using an optimized plate groove design for sealing performance.

Certification Procedure & Technology Advantages

The following are the electrolyzer testing application conditions and objectives: 1) Simulate assembling and operating conditions; 2) Customize sealing lines (grooves); and 3) Use He media for leakage test (vacuum method).

- **Material Performance Evaluation:** Exhibit C shows the Figure of Merit (FOM) characterizing the ability of the material solution to seal while maintaining dimensional stability over time (creep) of a given load and temperature.
- **Leakage Testing For Temperature Cycles (120°C to -20°C):** Exhibits D & E demonstrate our material's ability to withstand temperature gradients while keeping a high level of sealing performance.
 - Industry Standards EN 13555 & DIN 52913
 - Internal Testing and Qualification Procedures
 - Static: Creep and Leakage
 - Cyclic: Temperature Cycles
 - Media: Pressurized 30% KOH solution at 85°C



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