



Even in Harsh Ethylene Oxide Environments, Chemraz® 541 Provides Excellent Chemical Resistance

Ethylene oxide is one of the most aggressive fluids to seal against. In ethylene oxide service, elastomeric seals can experience chemical attack and/or degradation in performance. Greene Tweed partnered with a third-party laboratory to assess Chemraz® 541's compatibility with ethylene oxide. The o-rings were soaked in ethylene oxide over 30 days at 27°C (81°F). The data reported at the end of the test period shows Chemraz® 541 has provided good resistance to ethylene oxide under the given test conditions.

Test Conditions

Testing was conducted at a third-party accredited laboratory under the following conditions:

- 5 samples of Chemraz® 541 o-rings
- Gas phase: Nitrogen gas and EO vapor
- Liquid Phase: Liquid EO
- Pressure: 480 kPa
- Temperature: 27°C (81°F)
- Test Duration: 30 days

Results

- Upon completion of the autoclave immersion test, the material showed no blistering, cracking, or discoloration.
- Volume change for Chemraz® 541 measured at 7.06%. Volume change of less than 10% indicates good chemical compatibility to a fluid.
- Chemraz® 541 retained its tensile strength, dropping significantly less than competitors

Conclusion

Chemraz® 541 o-ring demonstrated resistance to ethylene oxide during the third-party evaluation, indicating its suitability for use with ethylene oxide.

Physical and mechanical properties of Chemraz® 541 compound

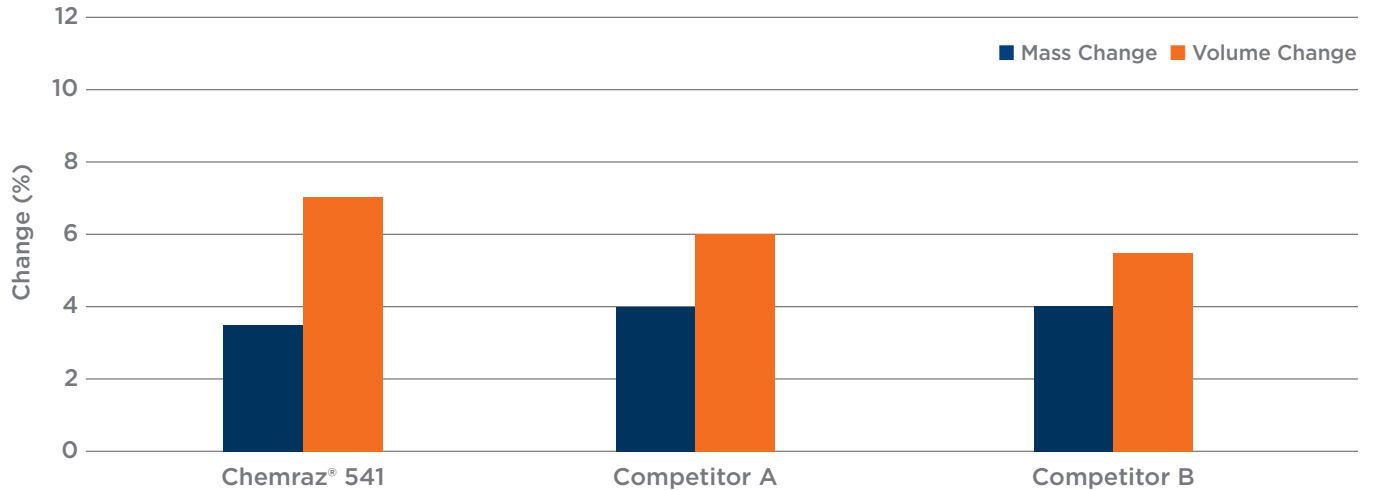
Test		Before Immersion Test	After Immersion Test	Degree of Change
Density (g/cm ³)	Average of 5 o-ring samples	1.99	1.93	-3.43%
	Average of 3 button samples	2.00	1.95	-2.45%
Volume (cm ³)	Average of 5 o-ring samples	0.87	0.93	7.06%
	Average of 3 button samples	8.02	8.38	4.51%
Mass in Air (g)	Average of 5 o-ring samples	1.75	1.81	3.38%
	Average of 3 button samples	16.09	16.40	1.95%
Shore A Hardness	Average of 3 button samples	73	66	-10.02%
Tensile Strength (MPa)	Median of 5 o-ring samples	14.85	12.54	-15.54%
Ultimate Elongation (%)	Median of 5 o-ring samples	144.70	168.73	16.61%



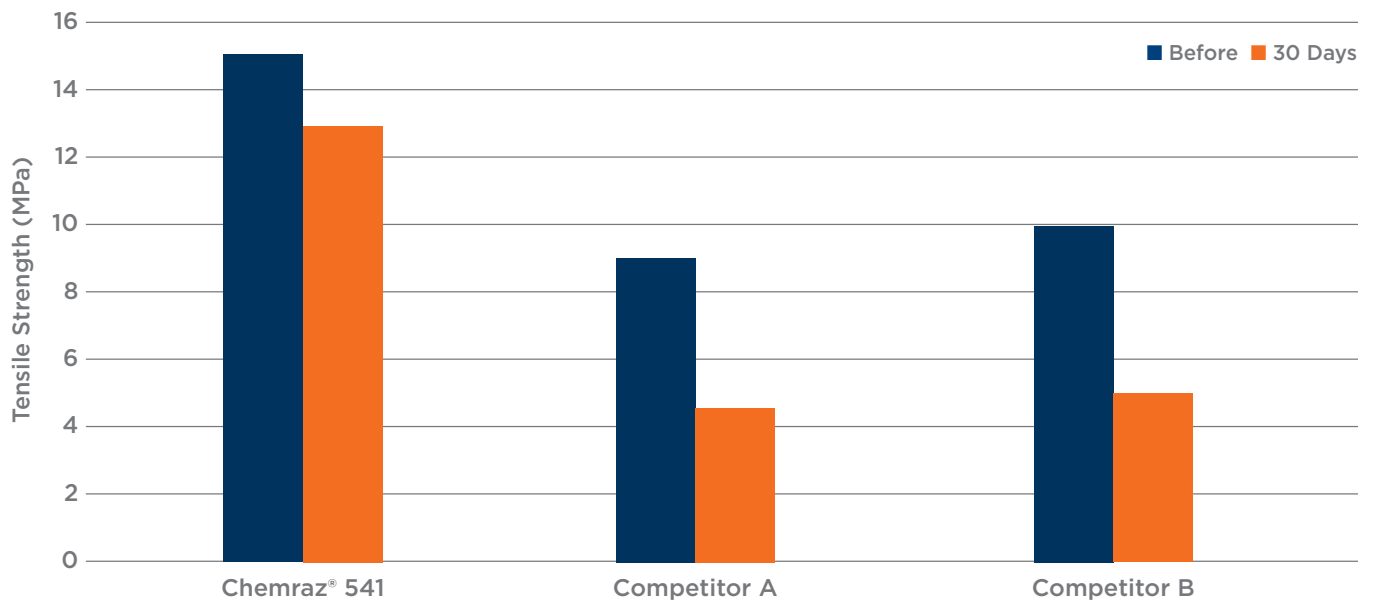
GREENE TWEED
Chemraz®
541

a universal purpose compound suitable for a wide range of industries

Volume & Mass Change at 27°C (81°F) in Liquid Ethylene Oxide



Tensile Strength (MPa) Change at 30 days and 27°C (81°F) in Liquid Ethylene Oxide



The competitor data presented is sourced from the Ethylene Oxide Product Stewardship Guidance Manual ©2023, with specific data taken from the 2006 testing included in the report. These values are estimates and have not been evaluated.

See: <https://www.americanchemistry.com/industry-groups/ethylene-oxide/resources/ethylene-oxide-product-stewardship-manual-2023>