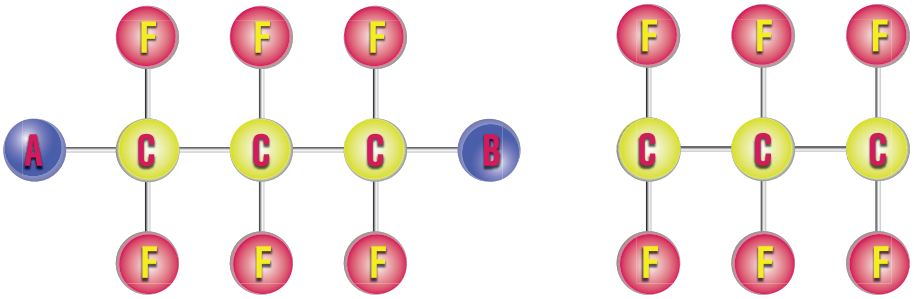
Chemraz®
Perfluoroelastomer

The Ultimate Elastomer

Chemraz® is a member of the perfluoroelastomer polymer family—polymers of three or more monomers in which all hydrogen positions have been replaced with fluorine. This complete state of fluorination results in outstanding resistance to heat and most chemicals and solvents. The principle monomer of Chemraz® is tetrafluoroethylene (TFE); the proprietary second and third perfluorinated monomers are unique to it and confer the balance of the properties it demonstrates. Chemraz's® resistance to steam and significantly improved low-temperature properties are its hallmark.

Chemraz®, the ultimate elastomer for demanding oilfield applications, gives excellent sealing performance when exposed to mixes of aggressive chemicals found downhole and is often specified by operators. Special compounds have been formulated for improved resistance to rapid gas decompression and abrasion, providing significant reductions in downtime and maintenance.



Chemraz® *PTFE*

Chemraz® compounds are compatible with all well fluids and gases and injection and treatment chemicals, including reservoir fluids with high H_2S content, stimulation treatment fluids, completion fluids, and asphaltene removers such as Xylene and Toluene together with amine-based inhibitors. Chemraz® is available in o-ring, V-ring, G-T® ring, electrical connector boots, slabs, metal bonded seals, Arlon® thermoplastic bonded seals, miniature seals, diaphragms, and custom configurations.

Applications

- Subsurface safety valves
- Packers
- Geothermal applications
- Logging tools
- Wireline tools
- Drillstem test tools

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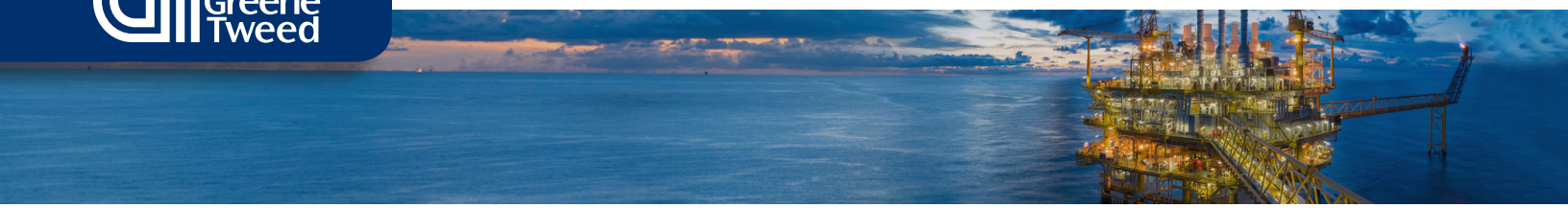


Chemraz® Compounds

- Chemraz® 505—Universal compound. High-/ low-temperature capabilities (-22°F to 466°F, -30°C to 230°C).
- Chemraz® 510—Developed specifically for o-ring applications in downhole environments. High-/ low-temperature capabilities (-22°F to 466°F, -30°C to 230°C).
- Chemraz® 526—The ultimate RGD-resistant perfluoroelastomer. High-/low-temperature capabilities (4°F to 482°F, -20°C to 250°C).
- Chemraz® 562—The ultimate high-temperature elastomer (10°F to 600°F, -12°C to 316°C).
- Chemraz® 564/566 LT—Low-temperature material delivers exceptional performance in extreme environments (-40°F to 445°F, -40°C to 229°C).
- Chemraz® 600—High-/ low-temperature capabilities (-4°F to 500°F, -20°C to 260°C). Higher durometer gives greater resistance to RGD and aggressive environments.
- Chemraz® 605—High-temperature capabilities (-4°F to 500°F, -20°C to 260°C) in aggressive oilfield environments.

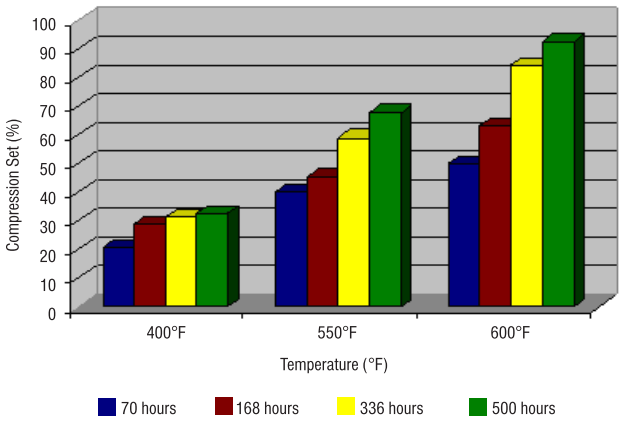
Glass Transition

Lower numbers mean that elastomers will seal better at lower temperatures.

Chemraz® 605 = 27°F (-3°C)

Competitive FFKM = 42°F (6°C)

Long-Term Compression Set Evaluation for Chemraz® 562



Rapid Gas Decompression (RGD) Resistance

RGD Test Data 526 in CO_2

Parameters

1. Pressure—800 psi
2. Soak Time—24 hours
3. Temperature—ambient
4. Media—carbon dioxide
5. Release Rate—5 seconds to atmosphere
6. Test Sample—AS-568 size 325 and 214 o-rings

Damage Rating Scale Modified NACE Test Method #TM0192-92

External Visual Damage

1. No visible damage
2. Less than or equal to two pimples
3. Three to ten pimples or one to two blisters
4. Less than 5% of surface subjected to blistering
5. Considerable damage; more than 50% of surface covered with blisters or splits

Internal Visual Damage

1. No visible damage
2. Slight damage; one split/blister per cut surface
3. Moderate damage; less than 50% of surface cut
4. Severe damage; more than 50% of surface cut

Test Results on Chemraz® 526	
Cross-Section 325	Hardness, M
Initial 0.211 in. (5.36 mm)	1 Minute, 91
1 Minute, 0.232 in. (5.89 mm)	30 Minutes, 95
30 Minutes, 0.220 in. (5.58 mm)	
Damage	
External, 1	Internal, 1
Cross-Section 214	Hardness M
Initial, 0.140 in. (3.56 mm)	1 Minute, 92
1 Minute, 0.149 in. (3.78 mm)	30 Minutes, 95
30 Minutes, 0.143 in. (3.63 mm)	
Damage	
External, 1	Internal, 1

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