**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, giving significant reductions in downtime and maintenance.

Chemraz compounds are compatible with all well fluids and gases and injection and treatment chemicals, including reservoir fluids with high H₂S 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, Vee ring, G-T® ring, electrical connector boots, slabs, metal bonded seals, Arlon® thermoplastic bonded seals, miniature seals, diaphragms and custom configurations.

**TYPICAL APPLICATIONS**

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

**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 rapid gas decompression 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 rapid gas decompression and aggressive environments.
- Chemraz 605—High-temperature capabilities (-4°F to 500°F, -20°C to 260°C) in aggressive oilfield environments.

[www.gtweed.com](http://www.gtweed.com)
RAPID GAS DECOMPRESSION RESISTANCE

Rapid Gas Decompression Test Data 526 in CO₂

- 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

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)

TEST RESULTS ON CHEMRAZ® 526

<table>
<thead>
<tr>
<th>Cross Section</th>
<th>Hardness M</th>
<th>Initial</th>
<th>1 Minute</th>
<th>30 Minutes</th>
<th>Damage</th>
</tr>
</thead>
<tbody>
<tr>
<td>325</td>
<td></td>
<td>0.211 in. (5.36 mm)</td>
<td>0.232 in. (5.89 mm)</td>
<td>0.220 in. (5.58 mm)</td>
<td>1</td>
</tr>
<tr>
<td>214</td>
<td></td>
<td>0.140 in. (3.56 mm)</td>
<td>0.149 in. (3.78 mm)</td>
<td>0.143 in. (3.63 mm)</td>
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LONG-TERM COMPRESSION SET EVALUATION FOR CHEMRAZ 562

<table>
<thead>
<tr>
<th>Temperature (°F)</th>
<th>400</th>
<th>550</th>
<th>600</th>
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</thead>
<tbody>
<tr>
<td>70 hours</td>
<td>20</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>168 hours</td>
<td>30</td>
<td>25</td>
<td>20</td>
</tr>
<tr>
<td>336 hours</td>
<td>40</td>
<td>35</td>
<td>30</td>
</tr>
<tr>
<td>500 hours</td>
<td>50</td>
<td>45</td>
<td>40</td>
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</table>

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