Oilfield Technologies

Key performance intermediates for corrosion inhibition packages.

As your downstream and production chemical additives partner with a fully integrated supply chain and world-class technical support, we are ready to craft your perfect chemical solutions.
Long lasting corrosion protection.

Ingevity provides specialty chemicals that purify, protect and enhance the world around us. We can solve your toughest corrosion challenges with a variety of anti-corrosion technology to meet your needs. We provide a wide variety of functional and intermediate chemicals derived from tall oil fatty acid (TOFA). Our chemical solutions help save you time and money, and protect you from the unexpected.

<table>
<thead>
<tr>
<th>Performance Intermediate</th>
<th>Acid Number (mg KOH/g)</th>
<th>Water</th>
<th>Isopropanol</th>
<th>Xylene</th>
<th>Aromatic 150</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tenax® 2010</td>
<td>300</td>
<td>I</td>
<td>S</td>
<td>P</td>
<td>D</td>
</tr>
<tr>
<td>Diacid 1550™</td>
<td>270</td>
<td>D</td>
<td>S</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>EnvaDym® 595</td>
<td>180</td>
<td>I</td>
<td>P</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>Tenax WS 5560</td>
<td>165</td>
<td>S</td>
<td>P</td>
<td>I</td>
<td>D</td>
</tr>
</tbody>
</table>

S=Soluble, D=Dispersed, P=Paste, I=Insoluble

Comparative Viscosity of Performance Intermediates
Ingevity Corrosion Performance Intermediates

**Tenax**
The Tenax product line improves the performance of corrosion inhibition packages (CIPs) in both sweet and sour systems. The unique molecular structures of Tenax-based corrosion inhibitor formulations are stable and will perform in high-temperature and high-pressure environments.

Performance advantages:
- Improved corrosion inhibition efficiencies compared to dimer
- Forms highly persistent films under various conditions
- Cost effective
- Suitable for both oil-soluble (Tenax) and water-dispersible (Tenax WS) CIPs

**Diacid 1550**
Like Tenax, Diacid 1550 offers a higher acid number than conventional dimer acid film formers, yet provides improved product viscosity and solubility for ease of formulation. Diacid 1550 has dual acid functionality that gives the molecules a higher affinity for metal surfaces creating a chemical protective barrier, inhibiting corrosion.

Performance advantages:
- Di-functional modified fatty acid with high acid number versus dimer
- Improved product viscosity for ease of formulation
- Increased solubility in water, alcoholic and/or butyl ether solvents

**EnvaDym**
Manufactured to ensure consistent performance and reliable supply, these dimer and trimer acids are produced by the oligomerization of our high-quality, refined TOFA. The primary products of the reaction are C36 diacid (dimers), in which the C18 units are linked together by carbon-carbon bonds.

Performance advantages:
- Consistent performance
- Reliable supply
- Various dimer-to-trimer ratios available

EnvaDym, Tenax and Diacid 1550 products may be neutralized with nitrogenous bases, such as our EnvaCor imidazolines, as part of a formulated CIP. The formed salts strongly adsorb onto the charged surface of metals allowing the long hydrocarbon chains to form a passivating film on the surface of the metal.

**EnvaCor®**
EnvaCor imidazolines are thermally stable, nitrogenous bases for corrosion inhibitor formulations. The lipophilic nature of these imidazolines allows them to solubilize in nonpolar solvents. Through proper choice of imidazoline and formulation, EnvaCor imidazolines also afford dispersibility in aqueous systems. Ingevity provides a number of TOFA-based imidazolines, derived from TOFA and various amines.