Scarf-Guard®

Composite Mechanical Protection for Directionally Drilled Pipelines

The patented Scar-Guard® line of products is designed to protect field joint and mainline coatings from the mechanical stresses and scarring associated with horizontal directional drilling (HDD), boring and micro-tunneling of pipelines. Scar-Guard® is a composite abrasion resistant overcoat comprised of fiberglass cloth and pre-impregnated flexible resin that is activated by water and cured within minutes. This sacrificial outer laminate system protects pre-approved anticorrosion field joint coatings and mainline coatings such as FBE, liquid epoxies, shrink sleeves, and tapes. The Scar-Guard® line of products minimizes the need for costly repairs after pull back, and provides robust protection of the underlying pipeline coating. U.S. Patent #8522827

Bury, Bore or Drill with Confidence

- Provides unparalleled protection against impact, abrasion, gouge, punctures and tears that may result from directional drilling, rough handling, native backfills or severe in-service conditions

Cure Options for any Environment

- Fast cure, slow cure, UV-Curable, UV-Resistant – all available options to suit a wide range of project cycle time requirements and construction conditions

Non-Shielding

- Suggested voltages for high-spark voltage testing as per NACE SP0188 pass through Scar-Guard® to ensure the anticorrosion coating can be tested for integrity after pull-through and protected for the lifetime of the asset.

Fast, Easy Installation

- Scar-Guard® products are simply wrapped onto the existing coatings surface and activated by water. Pre-impregnated moisture cured polyurethane resin means - no field mixing or saturation required!

Applications

- Onshore Pipelines
- Offshore Pipelines
- Abrasion Resistant Overcoat (ARO)
- HDD, Drilling and Boring
- Girth-Weld Joints
- Mainline Coating Protection
Scar-Guard®
Composite Mechanical Protection for Directionally Drilled Pipelines

<table>
<thead>
<tr>
<th>Properties</th>
<th>Test Method</th>
<th>Scar-Guard*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Thickness</td>
<td>SSPC-PA-2</td>
<td>68 mils</td>
</tr>
<tr>
<td>Thickness per Layer</td>
<td>SSPC-PA-2</td>
<td>34 mils</td>
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<tr>
<td>Density</td>
<td>ASTM D792</td>
<td>n/a</td>
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<tr>
<td>Colour</td>
<td>Visual</td>
<td>Grey</td>
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<tr>
<td>Resin Type</td>
<td>Per Manufacturer</td>
<td>Polyurethane</td>
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<tr>
<td>Impact Resistance</td>
<td>ASTM G14-04</td>
<td>48 Joules</td>
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<tr>
<td>Gouge Resistance</td>
<td>CSA Z245.20.10</td>
<td>16 mils at 50 kg</td>
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<tr>
<td>Abrasion Resistance</td>
<td>ASTM D4060</td>
<td>1667 cycles/mil</td>
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<tr>
<td>Compressive Strength</td>
<td>ASTM D695</td>
<td>27,182 psi</td>
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<tr>
<td>Tensile Strength</td>
<td>ASTM D638</td>
<td>n/a</td>
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<tr>
<td>Dielectric Strength</td>
<td>ASTM D149</td>
<td>263 V/mil</td>
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<tr>
<td>Adhesion to existing coating (FBE)</td>
<td>ISO 21809-3 Annex C</td>
<td>Rating 1</td>
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<tr>
<td>Hardness (Shore D)</td>
<td>ASTM D2240</td>
<td>78 @ &lt; 75°F</td>
</tr>
</tbody>
</table>

**Cure Schedule**

- Pot Life (Gel Time): 100-gram resin mass, 12 min
- Hard Dry Time (Shore D > 70): ASTM D2240, 30 min

*Cure times were tested at an ambient temperature of 24°C (75°F).

Since 1967, Canusa-CPS has been a leading developer and manufacturer of specialty pipeline coatings for the sealing and corrosion protection of pipeline joints and other substrates. Canusa-CPS high performance products are manufactured to the highest quality standards and are available in a number of configurations to accommodate many specific project applications.

Canusa-CPS
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**Quality Management system registered to ISO 9001**

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