METALCLAD® DuraWrap®
Carbon Fiber Pipe Wrap System
Repair, reclaim, reinforce & extend the life of all types of metal & concrete pipes & tanks.

METALCLAD® DuraWrap® polymer / carbon fiber reinforced composite makes repairing and rebuilding aging, often severely deteriorated piping, tanks and other fluid flow equipment possible.

The ENECON® METALCLAD® DuraWrap® composite, a unique marriage of ENECON™'s high performance polymers and cutting-edge carbon fiber technology, was specifically created to repair, rebuild, reinforce and even restore the integrity of fluid flow systems - thereby greatly extending their service life and eliminating the need for expensive replacement.

- 100% Solids
- Requires No Heat
- High Tensile Strength
- Safe & Simple To Use
- No Special Tools Required

METALCLAD® DuraWrap® can be applied to the interior and / or exterior of piping and equipment to both seal and strengthen these components. When applied to the interior walls of underground or otherwise inaccessible piping, METALCLAD® DuraWrap® can effectively repair and restore piping integrity without expensive excavation and replacement.

The outstanding performance of the ENECON® METALCLAD® DuraWrap® system allows today's maintenance professional to extend the service life of yesterday's equipment and structures.

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6 Platinum Court · Medford, NY 11763-2251
**Mixing Ratios**

<table>
<thead>
<tr>
<th></th>
<th>Base</th>
<th>Activator</th>
</tr>
</thead>
<tbody>
<tr>
<td>DuraWrap® Primer</td>
<td>By volume</td>
<td>2.8</td>
</tr>
<tr>
<td></td>
<td>By weight</td>
<td>9</td>
</tr>
<tr>
<td>DuraWrap® Polymer</td>
<td>By volume</td>
<td>2.2</td>
</tr>
<tr>
<td></td>
<td>By weight</td>
<td>5</td>
</tr>
</tbody>
</table>

**DuraWrap® System Properties**

*Based on a two-ply composite using 12K x 3K Carbon Fiber*

- **Indefinite Shelf Life**
- **Tensile Strength** ASTM D-3039 123,600 psi 8,650 kg/cm²
- **Tensile Modulus** ASTM D-3039 8,450,000 psi 591,500 kg/cm²
- **Elongation** ASTM D-3039 1.38%
- **Flexural Strength** ASTM D-790 97,400 psi 6,820 kg/cm²
- **Flexural Modulus** ASTM D-790 7,950,000 psi 556,550 kg/cm²
- **Adhesion to steel** ASTM D-1002 > 3,500 psi >245 kg/cm²
- **Adhesion to concrete** ASTM D-4541 Greater than the cohesive strength of the concrete.

**Cure Times - DuraWrap® Primer**

<table>
<thead>
<tr>
<th>Ambient Temperature</th>
<th>Working Life</th>
<th>Touch Dry</th>
<th>Full Cure</th>
</tr>
</thead>
<tbody>
<tr>
<td>59°F 15°C</td>
<td>2 hrs</td>
<td>12 hrs</td>
<td>5 days</td>
</tr>
<tr>
<td>77°F 25°C</td>
<td>60 min</td>
<td>6 hrs</td>
<td>3 days</td>
</tr>
<tr>
<td>86°F 30°C</td>
<td>40 min</td>
<td>4 hrs</td>
<td>2 days</td>
</tr>
</tbody>
</table>

**Cure Times - DuraWrap® Polymer**

<table>
<thead>
<tr>
<th>Ambient Temperature</th>
<th>Working Life</th>
<th>Touch Dry</th>
<th>Full Cure</th>
</tr>
</thead>
<tbody>
<tr>
<td>59°F 15°C</td>
<td>90 min</td>
<td>18 hrs</td>
<td>7 days</td>
</tr>
<tr>
<td>77°F 25°C</td>
<td>45 min</td>
<td>9 hrs</td>
<td>4 days</td>
</tr>
<tr>
<td>86°F 30°C</td>
<td>30 min</td>
<td>6 hrs</td>
<td>3 days</td>
</tr>
</tbody>
</table>

**Using DuraWrap®**

- **Surface Preparation** - The METALCLAD® DuraWrap® System should only be applied to clean, dry and well roughened surfaces.
  1. Remove all loose material and surface contamination and clean with a suitable solvent which leaves no residue on the surface after evaporation such as acetone, MEK, isopropyl alcohol, etc.
  2. Thoroughly roughen surfaces by abrasive blasting to achieve an SSPC - SP 10 near white metal degree of cleanliness and an anchor pattern of 3 mils / 75 microns.
  3. If necessary, apply moderate heat and / or allow the component(s) to ‘teach’ to remove ingrained contaminants.

- **Mixing & Installation** – The DuraWrap® Polymer Base and Activator have been provided in precisely measured quantities. Simply pour the contents of each container into the Base container and mix thoroughly until a uniform, streak-free color is achieved. Continue the process until the entire area is covered with two layers of the Activator container into the Base container and, using a spatula (provided), putty knife or other appropriate tool, mix thoroughly until a uniform, streak-free color is achieved.

- **Technical Support** - The ENECON® engineering team is always available to provide technical support and assistance. For guidance on difficult application procedures or for answers to simple questions, call your local ENECON® Fluid Flow Systems Specialist or the ENECON® Engineering Center.

**Priming** – All surfaces to which the DuraWrap® System is to be applied must first be treated with the DuraWrap® Primer. For your convenience, the DuraWrap® Primer Base and Activator are supplied in precisely measured quantities. Simply pour the contents of the Activator container into the Base container and, using a spatula (provided), putty knife or other appropriate tool, mix thoroughly until a uniform, streak-free color is achieved.

Once mixed, the DuraWrap® Primer should be applied immediately to the provided stiff-bristle brush or a roller. The DuraWrap® Primer has been specifically formulated to fill-in pits and / or damage as deep as approximately ¼ inch (6 mm). Deeper areas may require an additional “pass” to adequately fill the voids.

The installation of the DuraWrap® Polymer / Carbon Fiber composite may begin immediately after priming and must be completed within 6 – 8 hours at a temperature of 77°F / 25°C.

**Prepping the Carbon Fiber** – Two layers of Carbon Fiber must be installed in all areas. On small diameter pipes, it may be possible to spiral wrap the Carbon Fiber onto the pipe; however, on larger pipes / components, the easiest way to install the Carbon Fiber is to cut the material into pieces approximately 2 - 4 inches (5 - 10 cm) longer than the perimeter of the component being “wrapped” and install these pieces in a continuous process while overlapping the preceding piece by 50% of its width.

Note: Carbon Fiber is electrically conductive. When the DuraWrap® system is used in immersion service on the inside of piping, normal industry standards specify that a layer of non-conductive fiberglass fabric be installed (using the DuraWrap® Polymers and application guidelines) as an insulator prior to the installation of the two-layer DuraWrap® Carbon Fiber System.

**Cleaning Equipment** - Wipe excess material from tools immediately. Use acetone, MEK, isopropyl alcohol or similar solvent as needed.

**Health & Safety** - Every effort is made to insure that ENECON® products are as simple and safe to use as possible. Normal industry standards and practices for housekeeping, cleanliness and personal protection should be observed.

Please refer to the detailed SAFETY DATA SHEETS (SDS) supplied with the material (also available on request) for more information.

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