METALCLAD® CeramAlloy® CL+ is a 100% solids, two component, liquid high-performance polymer composite used for repairing, resurfacing and coating components to provide outstanding fluid flow erosion and corrosion resistance. When mixed, METALCLAD® CeramAlloy® CL+ is a viscous liquid. CL+ then cures to a hard, ceramic-like material with an extremely smooth surface finish.

Heat Exchanger Tube Sheets & Water Boxes, Pumps, Valves & Pipework, Housings & Tanks, Cooling Towers, etc.
**Technical Data**

- **Volume capacity per kg.** 25 in³ / 410 cc
- **Mixed density** 0.088 lbs per in³ / 2.44 gm per cc
- **Coverage rate per kg.** @ 12 - 15 mils. 10-11 ft² / 1 m²
- **Shelf life** Indefinite
- **Volume solids** 100%
- **Mixing ratio Base Activator**
  - By volume 2.6  1
  - By weight 7.5  1

**Working Life & Cure Times**

<table>
<thead>
<tr>
<th>Ambient Temperature</th>
<th>Working Life</th>
<th>Machining/ Light Load</th>
<th>Full Mechanical</th>
<th>Chemical Immersion</th>
</tr>
</thead>
<tbody>
<tr>
<td>41°F  5°C</td>
<td>4 hrs</td>
<td>1 day</td>
<td>4 days</td>
<td>8 days</td>
</tr>
<tr>
<td>59°F  15°C</td>
<td>2 hrs</td>
<td>12 hrs</td>
<td>2 days</td>
<td>4 days</td>
</tr>
<tr>
<td>77°F  25°C</td>
<td>1 hr</td>
<td>6 hrs</td>
<td>1 day</td>
<td>3 days</td>
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<tr>
<td>86°F  30°C</td>
<td>40 min</td>
<td>4 hrs</td>
<td>20 hrs</td>
<td>2 days</td>
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</table>

**Physical Properties**

<table>
<thead>
<tr>
<th></th>
<th>Typical Values</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressive strength</td>
<td>16,000 psi</td>
<td>ASTM D-695</td>
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<tr>
<td>Flexural strength</td>
<td>15,500 psi</td>
<td>ASTM D-690</td>
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<tr>
<td>Izod impact strength</td>
<td>1.3 ft lbs/in</td>
<td>ASTM D-256</td>
</tr>
<tr>
<td>Hardness Shore D</td>
<td>82</td>
<td>ASTM D-2240</td>
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<tr>
<td>Tensile Shear Adhesion</td>
<td></td>
<td></td>
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<tr>
<td>Steel</td>
<td>2400 psi</td>
<td>ASTM D-1002</td>
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<tr>
<td>Aluminum</td>
<td>2500 psi</td>
<td>ASTM D-1002</td>
</tr>
<tr>
<td>Copper</td>
<td>1950 psi</td>
<td>ASTM D-1002</td>
</tr>
<tr>
<td>Stainless steel</td>
<td>2700 psi</td>
<td>ASTM D-1002</td>
</tr>
<tr>
<td>Surface resistivity</td>
<td>1 x 10¹⁵ ohms</td>
<td>ASTM D-257</td>
</tr>
<tr>
<td>Volume resistivity</td>
<td>1 x 10¹⁵ ohm/cm</td>
<td>ASTM D-257</td>
</tr>
<tr>
<td>Dielectric constant</td>
<td>7.5</td>
<td>ASTM D-150</td>
</tr>
<tr>
<td>Dielectric strength</td>
<td>652 volts / mil</td>
<td>ASTM D-115</td>
</tr>
<tr>
<td>Breakdown voltage</td>
<td>6.1 Kv</td>
<td>ASTM D-115</td>
</tr>
</tbody>
</table>

**Chemical Resistance**

- Acetic acid (0-10%) . . . . . . EX
- Acetic acid (10-20%) . . . . . . G
- Acetone . . . . . . . . . . . . . . G
- Nitric acid (0-10%) . . . . . . G
- Aviation fuel . . . . . . . . . . . . EX
- Nitric acid (10-20%) . . . . . . G
- Butyl alcohol . . . . . . . . . . . . G
- Propyl alcohol . . . . . . . . . . . . EX
- Ethyl alcohol . . . . . . . . . . . . G
- Methyl alcohol . . . . . . . . . . . . G
- Sodium hydroxide . . . . . . . . . . . . EX
- Sodium chloride . . . . . . . . . . . . EX
- Sulfuric acid (0-10%) . . . . . . EX
- Sulfuric acid (10-20%) . . . . . . G
- Toluene . . . . . . . . . . . . . . G
- Xylene . . . . . . . . . . . . . . EX

- Methyl ethyl ketone . . . . . . G
- Phosphoric acid (0-5%) . . . . . . G
- Phosphoric acid (5-10%) . . . . . . G
- Potassium chloride . . . . . . . . . . . . EX
- Propyl alcohol . . . . . . . . . . . . EX
- Sodium hydroxide . . . . . . . . . . . . EX
- Sodium chloride . . . . . . . . . . . . EX
- Sulfuric acid (0-10%) . . . . . . EX
- Sulfuric acid (10-20%) . . . . . . G
- Toluene . . . . . . . . . . . . . . G
- Xylene . . . . . . . . . . . . . . EX

- Water . . . . . . . . . . . . . . EX
- Methanol . . . . . . . . . . . . . . EX
- Acetone . . . . . . . . . . . . . . EX
- MeK . . . . . . . . . . . . . . EX
- Isopropyl alcohol . . . . . . . . EX

**Using CeramAlloy® CL+**

**Surface Preparation** - METALCLAD® CeramAlloy® CL+ 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. Clean / roughen surface by abrasive blasting.
3. If necessary, apply moderate heat and/or allow the component(s) to "leach" to remove ingrained contaminants.
4. Thoroughly roughen surfaces by abrasive blasting to achieve a "metal" degree of cleanliness and an anchor pattern of 3 mils.

**Mixing & Application** - For your convenience, the METALCLAD® CeramAlloy® CL+ Base and Activator have been supplied in precisely measured quantities. Simply pour the entire contents of the Activator container into the Base container and, using a spatula, putty knife or other appropriate tool, mix thoroughly until the METALCLAD® CeramAlloy® CL+ reaches a uniform, streak-free color.

Apply the mixed material to the prepared surface using a stiff-bristled brush, flexible applicator or roller. As a guide, an even thickness of approximately 12-15 mils per coat should be obtained. A minimum two coat application is required.

Overcoating should ideally be performed when the previously applied coat is just surface tacky; and certainly within 8 hours of the previous coat.

**Health & Safety** - Every effort is made to ensure 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.

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

**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.

All information contained herein is based on long term testing in our laboratories as well as practical field experience and is believed to be reliable and accurate. No condition or warranty is given covering the results from use of our products in any particular case, whether the purpose is disclosed or not, and we cannot accept liability if the desired results are not obtained.

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