# mClad™ Ceramic Metal
## Product Technical Data

MCOR™ 3330

MCOR™ 3330 (mClad™ Ceramic Metal) is two component ceramic reinforced silicon-modified epoxy compound. Thixotropic with high molecular weighing reactive polymers and oligomers; the molecular ceramic is utilized as a trowel grade paste-like polymer to restore, repair and reclaim metal components of engineering grade machinery, equipment, and other mechanical components. The mClad™ Ceramic Metal provides advanced wear resistance cladding and sealed corrosion protection with neutral conductivity and fillers. It may be drilled, tooled, tapped, filed or machined for repair of equipment and parts that may require precision finishing and dressing. Once cured, the material replaces worn or lost metal and restores metallic profile with poly-mechanical bonding and reinforcing as a cold-weld alternative.

### Applications Include

The mClad™ Ceramic Metal is versatile, often utilized as cladding epoxy, metal reclaimer, and/or mechanical filler.

- Oversized bearing / bush housings
- Cavitated impellers / propellers
- Fractured and holed casings / blocks
- Corrosion cells and tank leaks
- Scored hydraulic rams
- Sloppy keyways
- Scored machine beds
- Flange faces
- Fractured pipes
- Undersized / scored shafts
- Pitted and warped valves

### Features

- Machinable
- 100% solid
- Ease of application
- Neutral fillers, great electrical insulation
- Minimize cathodic disbondment
- For all metals
- Extended working time
- Convenient 1:1 ratio by volume

### Film Thickness & Theoretical Coverage

Approximate coverage per 1 kilogram covers 1335 $cm^2$ at 1 cm. thickness (1 pound covers 41.5 $in^2$ at 0.5 in. thickness).

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MCOR™ 3330 (mClad™ Ceramic Metal) is a thixotropic material intended to be applied in various controlled applications for specific needs, and can be further controlled by sanding/machining for precision dressing. Intended as a cladding epoxy or filler at various thicknesses, the mClad™ Ceramic Metal can be applied at any thickness up to 1.25 cm (1/2 inch) per pass without sagging, without mechanical support; and thicker if applied in multiple passes or with mechanical support (ie- MCOR™ FG and/or MT Mesh, weld rods, metal and fabric scrim)

### Surface Preparation

The success of any coating application is directly proportional to the completeness of the substrate preparation and the care the application crew puts into the application. Surface must be clean and sound. Verify that the temperature of the surface is at least 3 degrees C (5 degrees F) higher than the dew point temperature to preclude condensation.

Metal: Before preparing steel, please inspect and remove oil, grease, or other contaminants - "Solvent Cleaning" (SSPC-SP1) may be required. Grind any weld spatter or steel weld inconsistencies. Abrasive blasting (or other approved mechanical methods) to SSPC SP-10/NACE No.2 "Near White Blast Cleaning" must be used in order to achieve a clean surface with a minimum profile of 76 microns (3 mils) remove dust and debris by high compressive air or solvent cleaning (SSPC-SP1) may be require again. MCOR™ MTe (or MTw) Primecoat™ is advised as a primer should the substrate be susceptible to flash-rusting.

### Application Method

Material is supplied in two (2) containers (base+cure) as a unit. If possible, always mix a complete unit in the proportions supplied. Use a calibrated scale to weigh out each component or use measuring cups to measure by volume. Adding more or less hardener will adversely affect the cured physical properties.

Measure the material temperature prior to mixing. If the material is cooler than 16 °C (60 °F), raise its temperature slowly to above 22 °C (72 °F). For published working time to remain manageable, do not exceed 32 °C (90 °F).

After the components have been measured on a clean, flat mixing board, mix thoroughly with a trowel/spatula/putty-knife until the mixture becomes a uniform in color and viscosity with no visible streaks or lumps (2 - 3 minutes). Incomplete mixing will result in loss of physical properties and unmixed/malcured patches.

Apply the mixture immediately with a trowel/spatula/putty-knife. Cover large holes or cracks with mechanical support (ie- MCOR™ FG and/or MT Mesh, weld rods, metal and fabric scrim) and apply mClad™ mFill™ over the patch and onto an adjacent solid area. Pipes can be repaired by coating a cloth "bandage" with mClad™ mFill™ and wrapping the bandage around the pipe. An additional layer of mClad™ Ceramic Metal should be applied over the bandage.

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## Packaging & Color

A unit is a two-component (base+cure)

The volume capacity of 1 kg. of mixed MCOR™ 3330 is 750 cm3 (45.7 in3).

mClad™ Ceramic Metal is available in:

- Grey

## Storage & Handling

Shelf life: 36 months, sealed.

Store in a dry area away from direct sunlight.

The material should be conditioned to between 24 °C (75 °F) and 35 °C (95 °F) before use.

Clean tools with MCOR™ #5 Cut & Clean.

## Thinning

Thinning is not advised.

## Safety

Consult Material Safety Data Sheet (MSDS) for all material safety information.

## Technical Properties

| | | |
|---|---|---|
| Type: | | Thixotropic Ceramic Epoxy |
| Base component (consistency): | | Paste |
| Base component (color): | | Dark grey |
| Solidified component (consistency): | | Paste |
| Solidified component (color): | | Light grey |
| Finish: | | Matte |
| Mixing ratio | | 1 : 1 (by volume)<br>1.18 : 1 (by weight) |
| Solids by volume: | ASTM D2697 | 100% |
| Solvents (VOC) by volume: | | 0% |
| Bond strength (steel): | ASTM D4541 | 82 Bar (1200 psi) |
| Durometer | | 88 Shore D |
| Impact Strength: | | 2.4 m- 0.45 kilo (7.9 ft-lb) |
| Tensile strength: | ASTM D 638 | 27.6MPa (4,000 psi) |
| Flexural strength: | ASTM D 790 | 51.7 MPa (7,500 psi) |
| Compressive strength: | | 83 MPa (12,000 psi) |
| Temperature exposure (dry): | | -26 °C – 104 °C (-15 °F – 220 °F) |
| Temperature exposure (wet-max): | | 93 °C (200 °F) |
| Wear resistance (% weight loss): | | 0.4% (high velocity media) |
| Pot life: | | 40 min.<br>@ 20 °C @ 200g mass |

## Cure Table

| TEMPERATURE | 41 °F (5 °C) | 50 °F (10 °C) | 59°F (15°C) | 68 °F (20 °C) | 77°F (25°C) | 86 °F (30 °C) |
|---|---|---|---|---|---|---|
| Movement or use involving no loading or immersion (min.) | 12 hrs | 10 hrs | 8.5 hrs | 8 hrs | 6.5 hrs | 6 hrs |
| Machining and/or light loading (min.) | 10 hrs | 9 hrs | 8.5 hrs | 8 hrs | 6 hrs | 5.5 hrs |
| Full electrical, mechanical or thermal loading (min.) | 24 hrs | 24 hrs | 20 hrs | 18 hrs | 16 hrs | 14 hrs |
| Immersion in chemicals (min.) | 36 hrs | 32 hrs | 30 hrs | 28 hrs | 24 hrs | 18 hrs |

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