



## Plastic Steel Putty (A)

**Description:** A steel-filled epoxy putty that cures at room temperature and is designed for filling, rebuilding, and bonding metal surfaces.

**Intended Use:** Industrial Use: Patching and repairing areas where welding or brazing would be undesirable or impossible flowable epoxy is needed; duplicating or tracing masters; short run dies and molds

**Features:** Applies easily to vertical surfaces

Machinable to metallic finish

Bonds to aluminum, concrete, and many other metals

Resistant to chemicals and most acids, bases, solvents, and alkalis

**Limitations:** Suitability of product is determined by the end user for their application and process.  
Not recommended for long term exposure to concentrated acids or to organic solvents

**Typical Physical Properties:** Technical data should be considered representative or typical only and should not be used for specification purposes.

### Cured 7 Days @ 75°F (24°C)

	Typical Values
Adhesive Tensile Shear	2,800 psi (19.3 MPa)
Coefficient of Thermal Expansion (x10-6)	48 in/in.°F (86.4 cm/cm.°C)
Compression Strength	8260 psi (57 MPa)
Cured Shrinkage	0.0006 in/in (cm/cm)
Dielectric Constant	67.5
Dielectric Strength	30 volts/mil (1.2 kV/mm)
Flexural Strength	5600 psi (38.6 MPa)
Hardness	85 Shore D
Modulus of Elasticity	8.5 x10 <sup>5</sup> psi (5.9 GPa)
Solids by Volume	100
Temperature Resistance	Wet: 120°F (49°C); Dry: 250°F (121°C)
Thermal Conductivity (x10-3)	1.37 cal/sec.cm.°C

### Standard Tests

Dielectric Constant ASTM D 150
Compressive Strength ASTM D 695
Cured Hardness Shore D ASTM D 2240
Cure Shrinkage ASTM D 2566
Modulus of Elasticity ASTM D 638
Coef. of Thermal Expansion ASTM D 696
Adhesive Tensile Shear ASTM D 1002
Dielectric Strength, volts/mil ASTM D 149
Flexural Strength ASTM D 790
Thermal Conductivity ASTM C 177

### Uncured Properties @ 72°F (23°C)

Color	Grey
Coverage (1/4" / 6.35 mm)	48 in <sup>2</sup> /lb (310 cm <sup>2</sup> /Kg)
Functional Cure	16 hrs
Mix Ratio by Volume	2.5:1
Mix Ratio by Weight	9:01
Mixed Viscosity	Putty
Pot Life @ 75°F	45 min.
Recoat Time	2-4 hrs.
Specific Gravity	19.45 lb/Gal (2.33 g/cm <sup>3</sup> )
Specific Volume	11.9 in <sup>3</sup> /lb (0.43 cm <sup>3</sup> /g)

**Surface Preparation:**

1. Thoroughly clean the surface with a solvent such as Isopropanol Alcohol or Acetone to remove all oil, grease and dirt.
2. Grit blast surface area with 8-40 mesh grit, or grind with a coarse wheel or abrasive disc pad, to create increased surface area for better adhesion (Caution: An abrasive disc pad can only be used provided white metal is revealed). Desired profile is 3-5mil, including defined edges (do not "feather-edge" epoxy).

Note: For metals exposed to sea water or other salt solution, grit-blast and high-pressure-water-blast the area, then leave overnight to allow any salts in the metal to "sweat" to the surface. Repeat blasting to "sweat out" all soluble salts. Perform chloride contamination test to determine soluble salt content (should be no more than 40ppm).

3. Clean surface again with a solvent such as Isopropanol Alcohol or Acetone to remove all traces of oil, grease, dust or other substances from the grit blasting.

4. Repair surface as soon as possible to eliminate any changes or surface contaminants.

**WORKING CONDITIONS:** Ideal application temperature is 55°F to 90°F (12.8°C to 32.2°C). In cold working conditions, directly heat repair area to 100 -110°F (38-43°C) prior to applying epoxy and maintain at this temperature during product cure to dry off any moisture, contamination or solvents, as well as to achieve maximum performance properties.

**Mixing Instructions:**

---- It is strongly recommended that full units be mixed, as ratios are pre-measured. ----

1. Add hardener to resin.
2. Mix thoroughly with screwdriver or similar tool (continuously scrape material away from sides and bottom of container until a uniform, streak-free consistency is obtained).

**INTERMEDIATE SIZES (1,2,3 lb. units):** Place resin and hardener on a flat, disposable surface such as cardboard, plywood or plastic sheet. Use a trowel or wide-blade tool to mix the material as in Step 2 above.

**LARGE SIZES: (25 lb., 30 lb., 50 lb. buckets):** Use a T-shaped mixing paddle or a propeller-type Jiffy Mixer Model ES on an electric drill. Thoroughly fold putty by vigorously moving paddle/propeller up and down until a homogenous mix of resin and hardener is attained.

**Application Instructions:**

Spread mixed material on repair area and work firmly into substrate to ensure maximum surface contact. Plastic Steel® Putty (A) fully cures in 16 hours, at which time it can be machined, drilled, or painted.

**FOR BRIDGING LARGE GAPS OR HOLES:** Place fiberglass sheet, expanded metal, or mechanical fasteners between the repair area and Plastic Steel® Putty (A) prior to application

**FOR VERTICAL SURFACE APPLICATIONS:** Plastic Steel® Putty (A) can be troweled up to  $\frac{1}{4}$ " thick without sagging.

**FOR MAXIMUM PHYSICAL PROPERTIES:** Cure at room temperature for 2.5 hours, then heat cure for 4 hours @ 200°F (93°C).

**FOR  $\pm 70^{\circ}\text{F}$  ( $21^{\circ}\text{C}$ ) APPLICATIONS**

Applying epoxy at temperatures below  $70^{\circ}\text{F}$  ( $21^{\circ}\text{C}$ ) lengthens functional cure and pot lifetimes. Conversely, applying above  $70^{\circ}\text{F}$  ( $21^{\circ}\text{C}$ ) shortens functional cure and pot life.

**MACHINING:**

Allow material to cure for at least one hour before machining.

- Lathe speed: 150 ft/min (46 m/min)
- Cut: Dry
- Tools: Carbide Top Rake  $6^{\circ}\text{F} (+/-2^{\circ})$  – Side/Front  $8^{\circ}\text{F} (+/-2^{\circ})$
- Feed Rate (rough): Travel speed .020 Rough cut .020 - .060
- Feed Rate (finishing): Travel speed .010 Finish cut .010
- Polishing: Use 400 - 650 grit emery paper wet. Material should polish to a 25 - 50 micro in

**Storage:**

Shelf life 3 yrs from manufacture. See package label. Store at room temperature,  $70^{\circ}\text{F}$ .

**Compliances:**

None

**Chemical Resistance:**

Chemical resistance is calculated with a 7 day, room temp. cure (30 days immersion) @  $75^{\circ}\text{F}$  ( $25^{\circ}\text{C}$ )

1,1,1-Trichloroethane	Very good	Phosphoric 10%	Very good
Ammonia	Very good	Potassium Hydroxide 20%	Very good
Cutting Oil	Very good	Sodium Chloride Brine	Very good
Gasoline (Unleaded)	Very good	Sodium Hydroxide 10%	Very good
Hydrochloric 10%	Very good	Sulfuric 10%	Very good
Kerosene	Very good	Sulfuric 50%	Poor
Methylene Chloride	Poor	Trisodium Phosphate	Very good
Methyl Ethyl Ketone	Poor	Xylene	Fair

**Precautions:**

**FOR INDUSTRIAL USE ONLY:** Please refer to the appropriate Safety Data Sheet prior to using this product.

**Warranty:**

ITW Polymers & Fluids will replace any material found to be defective. Because the storage, handling and application of this material is beyond our control, we can accept no liability for the results obtained.

**Order Information:**

<b>Item No.</b>	<b>Package Size</b>
D10110	1 lb.kit (0.5kg)
D10210	1.5kg kit

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