Technical Data Sheet
Version 3. 04/2023

Plastic Steel® 5-Minute® Putty (SF)

Description: A steel-filled, fast-setting epoxy putty for filling, rebuilding, and bonding metal surfaces.

Intended Use: Industrial Use: Restores worn or fatigued metals; patches castings; makes jigs and fixtures; rebuilds pump and valve bodies; restores bearing journals and races

Features:
Bonds to aluminum, concrete, and many other metals
Resistant to chemicals and most acids, bases, solvents, and alkalis
Applies easily to vertical surfaces
Machinable to metallic finish

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	Standard Tests
Adhesive Tensile Shear	2,026 psi (14.0 MPa)	Cure Shrinkage ASTM D 2566
Coefficient of Thermal Expansion (x10-6)	34 in/in.°F (61.2 cm/cm.°C)	Adhesive Tensile Shear ASTM D 1002
Compression Strength	10,400 psi (71.7 MPa)	Dielectric Strength, volts/mil ASTM D 149
Cured Shrinkage	0.0006 in/in (cm/cm)	Coef. of Thermal Expansion ASTM D 696
Dielectric Constant	35	Flexural Strength ASTM D 790
Dielectric Strength	30 volts/mil (1.2 kV/mm)	Thermal Conductivity ASTM C 177
Flexural Strength	7,680 psi (52.9 MPa)	Compressive Strength ASTM D 695
Hardness	85 Shore D	Cured Hardness Shore D ASTM D 2240
Modulus of Elasticity	7.5 psi x10^5 (5.2 GPa)	Dielectric Constant ASTM D 150
Solids by Volume	100%	Modulus of Elasticity ASTM D 638
Temperature Resistance	Dry: 200°F (93°C)	
Thermal Conductivity (x10-3)	2.65 cal/s.cm.°C	

Uncured Properties @ 72°F (23°C)	
Color	Dark Grey
Coverage (1/4" / 6.35mm)	49 in2/lb (697 cm2/Kg)
Functional Cure	1 hr
Mix Ratio by Volume	1:01
Mix Ratio by Weight	1.7:1
Mixed Viscosity	Putty
Pot Life @ 75F	5 min.
Recoat Time	15-30 min.
Specific Gravity	2.2
Specific Volume	12.2 in3/lb (0.44 cm3/g)

Surface

1. Thoroughly clean the surface with Devcon® Cleaner Blend 300 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 Devcon® Cleaner Blend 300 to remove all traces of oil, grease, dust or other foreign 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 (13°C to 32°C). In cold working conditions, directly heat repair area to 100 - 110°F (38°C - 43°C) prior to applying epoxy and maintain at this temperature during any moisture, product cure to dry off 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:

1. Spread mixed material on repair area and work firmly into substrate to ensure maximum surface contact.
2. Assemble with mating part within recommended working time.
3. Apply firm pressure between mating parts to minimize any gap and ensure good contact (a small fillet of epoxy should flow out the edges to display adequate gap fill.) Plastic Steel® 5-Minute® Putty (SF) 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 repair area and Plastic Steel® 5 Minute® Putty (SF) prior to application.

FOR VERTICAL SURFACE APPLICATIONS
Plastic Steel® 5 Minute® Putty (SF) can be troweled up to ¼" (6.4 mm) 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 ± 70°F APPLICATIONS
Applying epoxy at temperatures below 70°F (21°C) lengthens functional cure and pot lifetimes. Conversely, applying above 70°F (21°C) shortens functional cure and pot life.

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

- Lathe speed: 150 ft/min
- Cut: Dry
- Tools: Carbide Top Rake 6° (+/-2°) – Side/Front 8°F (+/-2°)
- 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 inch.

Storage: Shelf life 3 yrs from manufacture. See package label. Store at room temperature, 70 °F (21°C).

Compliances: Accepted for use in U.S. meat and poultry plants

Chemical Resistance: Chemical resistance is calculated with a 7 day, room temp. cure (30 days immersion) @ 75°F (24°C)

1,1,1-Trichloroethane	Fair	Phosphoric 10%	Fair
Ammonium Hydroxide 20%	Fair	Potassium Hydroxide 40%	Fair
Cutting Oil	Very good	Sodium Chloride Brine	Fair
Gasoline (Unleaded)	Very good	Sodium Hypochlorite	Fair
Hydrochloric 10%	Fair	Sulfuric 10%	Fair
Methyl Ethyl Ketone	Poor	Sulfuric 50%	Poor
Methylene Chloride	Poor	Trisodium Phosphate	Fair
Mineral Spirits	Very good	Xylene	Fair

Precautions: **FOR INDUSTRIAL USE ONLY:** Please refer to the appropriate **S**afety **D**ata **S**heet prior to using this product.

Warranty: ITW Performance Polymers 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:

Item No.	**Package Size**
10240	1 lb. kit (0.45 Kg)

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Disclaimer:

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