**Technical Data Sheet**
Version 3. 09/2023

# Titanium Putty

**Description:** High-tech, titanium-reinforced epoxy putty engineered for making critical repairs to machinery and precision parts.

**Intended Use:** Industrial Use: Restore bearing housings and scored shafts; rebuild wear rings, hydraulic rams, and valves; repair equipment and parts that require a machined finish

**Features:**
**High compressive strength**
**Temperature resistance to 350°F (177°C)**
**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.

**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 | 2,000 psi (14 MPa) | Adhesive Tensile Shear ASTM D 1002 |
| Coefficient of Thermal Expansion (x10-6) | 22 in/in.°F (39.6 cm/cm.°C) | Cure Shrinkage ASTM D 2566 |
| Compressive Strength | 15,200 psi (105 Mpa) | Dielectric Strength, volts/mil ASTM D 149 |
| Cured Shrinkage | 0.0010 in/in (cm/cm) | Coef. of Thermal Expansion ASTM D 696 |
| Dielectric Constant | 44.8 | Flexural Strength ASTM D 790 |
| Dielectric Strength | 56 volts/mil (2.2 kV/mm) | Thermal Conductivity ASTM C 177 |
| Flexural Strength | 7,700 psi (53 MPa) | Compressive Strength ASTM D 695 |
| Hardness | 87 Shore D | Cured Hardness Shore D ASTM D 2240 |
| Modulus of Elasticity | 9.5 psi x$10^5$ (6.6 GPa) | Dielectric Constant ASTM D 150 |
| Solids by Volume | 100 | Modulus of Elasticity ASTM D 638 |
| Temperature Resistance | Wet: 150°F / 65°C; Dry: 350°F / 177°C | |
| Thermal Conductivity (x10-3) | 1.95 cal/sec.cm.°C | |

| Uncured Properties @ 72°F (23°C) | |
|---|---|
| Color | Grey |
| Coverage (1/4" / 6.35mm) | 47 in2/lb (848 cm2/Kg) |
| Functional Cure | 16 hrs. |
| Mix Ratio by Volume | 3.1:1 |
| Mix Ratio by Weight | 4.3:1 |
| Mixed Viscosity | Putty |
| Pot Life @ 75F | 21 min. |
| Recoat Time | 7 hrs. |
| Specific Gravity | 19.7 lb/Gal (2.36 g/cm3) |
| Volume | 11.7 in3/lb (0.423 cm3/g) |

**Surface Preparation:**

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 (38-43°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. Titanium Putty 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 Titanium Putty prior to application.

FOR VERTICAL SURFACE APPLICATIONS
Titanium Putty can be troweled up to ½" thick without sagging. Chemical immersion is possible after 24 hours.

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 (21°C) APPLICATIONS
Applying epoxy at temperatures below 70°F lengthens functional cure and pot life times. Conversely, applying above 70°F shortens functional cure and pot life.

MACHINING:
Allow material to cure for at least four hours before machining, but wait no longer than 24 hours as the material will wear the tools. Machine using these guidelines:

- 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:**

Qualifies under MIL-PRF-24176C, supersedes DOD-C-21476B SH, Type 1

**Chemical Resistance:**

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

| | |
|---|---|
| Acetic (Dilute) 10% | Excellent |
| Benzene | Excellent |
| Gasoline (Unleaded) | Excellent |
| Hydrochloric 10% | Very good |
| Kerosene | Excellent |
| Mineral Spirits | Excellent |
| Nitric 20% | Fair |
| Phosphoric (dilute) | Fair |

| | |
|---|---|
| Potassium Hydroxide 40% | Very good |
| Sodium Hydroxide 10% | Excellent |
| Sodium Hydroxide 50% | Very good |
| Sodium Hypochlorite | Excellent |
| Sulfuric 10% | Very good |
| Sulfuric 50% | Fair |
| Toluene | Excellent |
| Trisodium Phosphate | Excellent |

**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** |
|---|---|
| 10760 | 1 lb. (454 g) kit |
| 10770 | 2 lb. (908 g) kit |

**Contacts:**

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