

# HIGH TEMPERATURE CERAMIC-METALLIC PASTES

Pyro-Putty® High Temperature Ceramic-Metallic Putties are used to seal joints and repair defects in cast aluminum, cast iron, steel and stainless steel. Formulated using the most advanced organic and inorganic-ceramic resin technologies, these advanced materials resist temperatures to 2000 °F. Applications for Pyro-Putty® are widespread and found typically in the aerospace, automotive, foundry, heat treating, incineration and power generation industries.

## TYPICAL APPLICATIONS

- Afterburners
- Boilers
- Castings
- Exhaust Stacks
- Flanges
- Furnaces
- Headers
- Incinerators
- Manifolds
- Molds and Dies
- Ovens
- Heat Exchangers
- Pumps
- Blowers
- Piping
- Ducting
- Turbines

## PRODUCT HIGHLIGHTS

- Resists Temperatures to 2000 °F
- Resurfaces and Repairs Defects
- Reduces Scrap
- Machinable
- Gets Stronger with Heat
- Readily Painted or Powder Coated
- Easy and Safe to Use

### Pyro-Putty® 653

- Ceramic and Stainless-Filled, One-Part, Water-Based Paste.
- For Vertical Surfaces and Applications to 1/2" Thick.
- Repairs Cast Iron, Steel and Stainless Parts to 2000 °F.

### Pyro-Putty® 950

- Ceramic Fiber-Filled, Organic Caulk.
- For Sealing High Temperature Flanges, Joints to 950 °F, 750 psi.
- Cures Into a Tough, Pliable, Inert Material.

### Pyro-Putty® 1000

- Ceramic and Aluminum-Filled, Two-Part, Water-Based Paste.
- For Applications to 1/2" Thick.
- Repairs Cast Aluminum Parts to 1400 °F.

### Pyro-Putty® 1500

- Ceramic-Filled, One-Part, Thixotropic Paste.
- Used Primarily to Seal Boiler Doors and Molten Metal Systems.
- Easy to Apply and Removable; For uses to 2300 °F.

### Pyro-Putty® 2400

- Ceramic and Stainless-Filled, One-Part, Water-Based Paste.
- For Applications to 3/8" Thick.
- Repairs Cast Iron, Steel and Stainless Parts to 2000 °F.

### Pyro-Putty® 2500

- Ceramic and Black Iron Oxide-filled One-Part, Water-Based Paste.
- For Applications to 1/4" Thick.
- Repairs Cast Iron, and Steel Parts to 1600 °F.



Pyro-Putty® 653 seals corroded burner manifold.



Pyro-Putty® 1000 bonds heater.



Pyro-Putty® 2400 seals high temp ducting.



Pyro-Putty® 950 seals turbo.



Pyro-Putty® 2400 seals high temp threads.

## PYRO-PUTTY® PROPERTIES

Product	653	950	1000	1500	2400	2500
Type	Inorganic	Organic	Inorganic	Inorganic	Inorganic	Inorganic
Filler	Stainless	Ceramic Fiber	Aluminum	Ceramic	Stainless	Iron Oxide
Maximum Temp., °F (°C)	2000 (1093)	950 (510)	1400 (760)	2300 (1260)	2000 (1093)	1600 (871)
Specific Gravity, gms/cc	1.9	1.09	1.8	1.27	1.50	2.90
Viscosity, cps	Paste	Paste	Paste	Paste	Paste	Paste
No. Components	1	1	2	1	1	1
Mix Ratio, powder:liquid	N/A	N/A	2:1	N/A	N/A	N/A
Curing	Air Set, hours	2-4	N/A	2-4	1-2	2-4
	Heat Cure, °F, hrs	200, 3	400, 1 or 225, 6	160, 1-2	200, 1	200, 2-4
Color	Gray	Silver Gray	Light Gray	Gray-Brown	Dark Gray	Black
Shelf Life, mos.	6	6	6	6	6	6
Storage, °F	40-90	40-90	40-90	40-90	40-90	40-90
Packaging	Pt, Qt, Gal, 5 Gal	11 oz Cartridge	Pt, Qt, Gal, 5 Gal	Pt, Qt, Gal, 5 Gal, 11 oz Cartridge	Pt, Qt, Gal, 5 Gal	Pt, Qt, Gal, 5 Gal

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## APPLICATION PROCEDURES

### Surface Preparation

All surfaces must be free of oil, grease, dirt, corrosives or other contaminants before application. Porous metal castings should be baked at high temperature to burn off embedded oils. Smooth metal surfaces should be abrasive blasted with a coarse media to a minimum SP-10 near white blast (0.001" minimum profile) for best results.

### Mixing

All products should be mixed thoroughly to a uniform consistency prior to use. Product viscosities may be reduced by adding a maximum of 5-10% by weight of the appropriate thinner. Thinner may be ordered by adding a "-T" to the product number (eg. 653-T).

The mix ratio for Pyro-Putty® 1000 is 2.0 parts powder to 1.0-1.5 parts liquid by weight. This ratio will produce the consistency of a thick paste. Pyro-Putty® 1000 will outgas slightly after mixing and it is recommended that the mixture be limited to the amount required for a specific application. Store mixed material at room temperature in a plastic container that is approximately twice the mixture volume. Allow to outgas for 24 hours. Remix contents thoroughly prior to use. Note that mixture will not begin to harden in a closed container for over 24 hours. Hardening will initiate when mixture is removed from container and exposed to air.

### Application

Pyro-Putty® products may be applied using a spatula, putty knife or caulk gun. For cross-sections greater than 1/8" - 1/4" multiple applications should be made to avoid blistering. Cross-sections for all products should not exceed 1/2" - 3/4" (3/8" maximum for Pyro-Putty® 2400).

### Curing

The following instructions are guidelines for curing. Alternative cure times may be appropriate depending on the size of the application.

#### Pyro-Putty® 653:

- 1) Air dry for 2 hours at room temperature and up to 4 hours for thick cross-sections.
- 2) Heat cure at 200 °F for 3 hours.
- 3) For multiple applications, air set for 1-2 hours between coats, then heat cure at 200 °F for 3-4 hours after the last coat.

#### Pyro-Putty® 950:

- 1) This product can be cured in service at the operating temperature of the equipment.
- 2) For curing before service, heat cure the joint without pressure at 400 °F for 30-60 minutes or 225 °F for 4-6 hours.

#### Pyro-Putty® 1000:

- 1) A heat cure is not required for cross-sections less than 1/8" thick. Air dry at room temperature for a minimum of 2-4 hours prior to use.
- 2) A heat cure is recommended for cross-sections greater than 1/8" thick. Air dry at room temperature for a minimum of 2-4 hours, then heat cure at 160 °F for 1-2 hours.
- 3) After curing, this product can be sanded to achieve a bright aluminum appearance.

#### Pyro-Putty® 1500:

- 1) This product dries at room temperature and cures in service at the operating temperature of the equipment.

#### Pyro-Putty® 2400:

- 1) Air dry at room temperature for a minimum of 5-7 hours, longer for thick cross-sections.
- 2) A heat cure is not required if the use temperature exceeds 400 °F. Otherwise, heat cure at 200 °F for 3 hours.

#### Pyro-Putty® 2500:

- 1) Air dry at room temperature for a minimum of 1 hour, longer for thick cross-sections.
- 2) Heat cure at 200 °F for 2 hours or air dry at room temperature for 16 hours prior to use.

### Storage

Unopened containers have a six month shelf life when stored at room temperature. Make sure opened containers are capped securely to prevent evaporation. Place a plastic film in between the cap and container to prevent air leakage. The container may be inverted periodically to minimize settling. Store container between 40 °F and 90 °F.

### Safety

Read Material Safety Data Sheet carefully before using any of the above products. Prolonged skin contact should be avoided due to possible irritation. In the uncured state, materials can be washed from the skin with a mild soap and water. If any material contacts eyes, flush continuously with water or neutralizing solutions, then consult a physician immediately.