

# Free Form™ AIR HT

## High Temperature Epoxy Dough



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### PRODUCT OVERVIEW

**Free Form™ AIR HT is a low density, lightweight epoxy putty that offers high temperature resistance to 300°F/149°C when cured at room temperature and 400°F/204°C when heat post cured.** This is a **low-odor, low shrinkage formula** that is easy to use. **Free Form™ AIR HT** is mixed by hand with a 2A:1B by volume or weight mix ratio. It offers a long working time and cures overnight at room temperature to a hard, rigid epoxy that is very strong with modeling board-like properties. It can be sanded, shaped, drilled, tapped and CNC machined/routed.

**Epoxy Laminating;** Laminate **Free Form™ AIR HT** putty in between layers of EpoxAmite™ HT Laminating Epoxy and fiberglass cloth, carbon or other fiber for making lightweight composite parts. Eliminates the need to make multiple layers of laminating with liquid epoxy; saves time and labor.

**Epoxy Tooling Applications** – use as a filleting material. Also good for jig and fixture construction.

**Used as a lightweight adhesive, Free Form™ AIR HT** will bond to itself and a variety of surfaces including wood, stone and EpoxAcoat™ HT surface coat epoxy.

**Pot Life/Working Time;** this material is mass sensitive. The more material you mix at one time, the less time you have to work with it. Working tip; If mixing a large quantity, flatten putty with a rolling pin to reduce mass concentration and extend pot life.

- **Thickness; 1.5 inch (3.81 cm)** – pot life is 90 minutes, handling time is 3 hours, full cure in 16 hours.
- **Thickness; 3/8" (0.95 cm)** – pot life is 2.5 hours, handling time is 5.5 hours, full cure in 16 hours.
- **Thickness; 1/8" (0.32 cm)** - pot life is 3 hours; handling time is 6.5 hours, full cure in 16 hours.

### TECHNICAL OVERVIEW

Mix Ratio: 2A:1B by weight or volume

Mixed Viscosity: Dough (ASTM D-2393)

Specific Gravity, g/cc: 0.51 (ASTM D-1475)

Specific Volume, cu. in. /lb.: 54.31 (ASTM D-1475)

Pot Life: 150 minutes (ASTM D-2471)

Demold: 16 hours

Color: Grey

Shore D Hardness: 55 (ASTM D-2240)

Heat Deflection: 400°F/204°C (After Heat Post Cure)

\* All values measured after 7 days at 73°F/23°C

\*\* Depending on mass

### PROCESSING RECOMMENDATIONS

**Safety** – Use in a well-ventilated area ("room size" ventilation). Generally, if you use any epoxy system on a regular basis, wearing a NIOSH approved respirator is advised. Wear safety glasses, long sleeves and rubber gloves to minimize skin contact. Wear nitrile or vinyl gloves only.

**Preparation** – Materials should be stored and used at room temperature (73°F/23°C). This product has a limited shelf life and should be used as soon as possible. Mixing should be done in a well-ventilated area. Wear safety glasses, long sleeves and rubber gloves to minimize contamination risk. If making a 2 or more piece mother mold, apply appropriate shim apparatus to rubber mold exterior. **Because no two applications are quite the same, a small test application to determine suitability for your project is recommended if performance of this material is in question.**

**Applying A Release Agent** – For releasing epoxy from non-porous surfaces such as resin, metal, glass etc., use Sonite™ Wax (available from Smooth-On) to prevent adhesion.

This product is mixed by hand. **You must wear gloves when mixing this material**, wearing vinyl gloves reduces inhibition risk.

### MEASURING

**Free Form™ AIR HT** putty comes as two parts. Dispense 2A:1B by weight or volume. These products have a limited shelf life and should be used as soon as possible.

## Safety First!

The Material Safety Data Sheet (SDS) for this or any Smooth-On product should be read prior to use and is available upon request from Smooth-On. All Smooth-On products are safe to use if directions are read and followed carefully.

### KEEP OUT OF REACH OF CHILDREN

**Be careful.** Use only with adequate ventilation. Contact with skin and eyes may cause irritation. Flush eyes with water for 15 minutes and seek immediate medical attention. Remove from skin with waterless hand cleaner followed by soap and water.

**Important:** The information contained in this bulletin is considered accurate. However, no warranty is expressed or implied regarding the accuracy of the data, the results to be obtained from the use thereof, or that any such use will not infringe upon a patent. User shall determine the suitability of the product for the intended application and assume all risk and liability whatsoever in connection therewith.

## MIXING

Knead parts together aggressively to a uniform color and apply quickly to surface of tool or mold.

## APPLYING & LAMINATING

**Using Water as a Bonding Primer** – Before applying Free Form™ AIR HT, spray a light mist of water over all surfaces. Do not allow water to pool.

**Applying** – Mixed Free Form™ AIR HT is a dough that can be applied up to 1.5" (3.81 cm) thickness. Mix only enough material to be used at one time. Free Form™ AIR HT will bond to itself.

**Laminating** - Free Form™ AIR HT can be used in conjunction with EpoxAcoat™ HT surface coat and EpoxAmite™ HT laminating resin to create a strong and lightweight composite tool or mold. Free Form™ AIR HT can also be used to stabilize tools during the heat post curing process to help reduce deformation.

## CURING & HEAT RESISTANCE

**Cure Time** - Refer to specified Cure Times in the Product Overview section at room temperature depending on mass. Cured material will be hard and unable to penetrate with a finger nail. Cured epoxy can now be dry sanded. *If machining or sanding, wear NIOSH approved mask to prevent inhalation of particles. Pot Life and Cure Time values are dependent on mass and mold configuration, as epoxies are mass-sensitive.*

**Heat Resistance** – Putty cured at room with a minimum thickness of ½" (1.27 cm) will resist temperatures up to 300°F/149°C

**Post Curing For Maximum Heat Resistance** - The tool should be allowed to cure at room temperature (73°F/23°C) for 16 hrs. At that point, preheat oven to 200°F and apply the following oven cure. Cycle should be 50 degrees per hour (tool temperature, not air temperature).

1 Hour at 200°F/93°C, 1 Hour at 250°F/121°C, 1 Hour at 300°F/149°C, 1 Hour at 350°F/ 177°C, 1 Hour at 400°F/204°C, then turn off oven and allow tool to cool to room temperature.

This post cure schedule will result in a heat resistance of 400°F/204°C.

**Removing Uncured Free Form™ AIR HT Epoxy Putty** - Remove as much uncured material from the surface as possible. Clean any residue with soap and water. **Optional** - Use E-POX-EE KLEENER™ available from Smooth-On.



**Call Us Anytime With Questions About Your Application.**

**Toll-free: (800) 381-1733 Fax: (610) 252-6200**

The new [www.smooth-on.com](http://www.smooth-on.com) is loaded with information about mold making, casting and more.