

# EpoxAcast™ 650 and EpoxAcast™ 650 BLACK

Mineral Filled Castable Epoxy



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## PRODUCT OVERVIEW

EpoxAcast™ 650 and EpoxAcast™ 650 BLACK are mineral filled general purpose casting epoxies that are low cost and versatile. They feature a low mixed viscosity for minimal bubble entrapment. Choose Fast, Medium or Slow catalyst to fit your project. You can also use HT Hardener to give your castings higher heat resistance. EpoxAcast™ 650 and EpoxAcast™ 650 BLACK are used for making hard dies for metal stamping as well as patterns and fixtures. They are also used for electrical encapsulation to extend the life cycles and enhance the performance of potted electronic devices. The high compressive strength of EpoxAcast™ 650 and EpoxAcast™ 650 BLACK makes it ideal for making stamping dies for production pressing of metal ornaments.

Part A Base Mixed With	Mix Ratio Base:Hardener	Pot Life	Cure Time (@ 73°F/23°C)	Cure Time (@ 150°F/60°C)
101 FAST Hardener	100A:12B by weight	20 Minutes	1 Hour	30 Minutes
102 MEDIUM Hardener	100A:13B by weight	90 Minutes	4 Hours	2 Hours
103 SLOW Hardener	100A:14B by weight	3.5 Hours	24 Hours	6 Hours
HT HIGH TEMP Hardener	100A:10B by weight	3.0 Hours	24 Hours followed by: Heat cure for 2 hrs at 175°F/80°C followed by 3 hrs at 300°F/150°C	n/a

## PRODUCT SPECIFICATIONS

EpoxAcast™ 650 and EpoxAcast™ 650 BLACK		
Handling Properties	Using 101, 102 or 103 Hardener	Using HT Hardener
Mixed Viscosity - CPS. (ASTM D2393)	7,000	5,000
Specific Gravity - Mixed; g./c.c. (ASTM D1475)	1.52	1.52
Spec. Volume - Mixed; cu. in./lb. (ASTM D792)	18.22	18.22
Physical Properties		
Barcol 935 Hardness (ASTM D2240)	93	93
Ultimate Tensile - P.S.I. (ASTM D638)	6,000	6,900
Tensile Modulus - P.S.I. (ASTM D638)	1,503,000	1,079,000
Tensile Elongation (ASTM D638)	0.42	0.82
Flexural Strength - P.S.I. (ASTM D790)	5,890	10,850
Flexural Modulus - P.S.I. (ASTM D790)	710,000	775,000
Compressive Strength - P.S.I. (ASTM D695)	16,350	15,980
Compressive Modulus - P.S.I. (ASTM D695)	142,600	134,400
Shrinkage - in./in. (ASTM D-2566)	0.001	0.007
Heat Deflection Temp. (ASTM D648) If cured at room temperature	129°F/54°C	n/a
if post cured according to heat post curing schedule	n/a	187°F/86°C
<b>Volume Resistance</b> (ohm) (ASTM D257-99): >5.42E+11 <b>Volume Resistivity</b> (ohm cm) (ASTM D257-99): >3.59E+15 <b>Dielectric Constant k' @ 60 Hz</b> (ASTM D150-98): 5.3 <b>Dielectric Constant k' @ 1 kHz</b> (ASTM D150-98): 5.08 <b>Dielectric Strength</b> (V/mil) (ASTM D-147-97a): 404 <b>Color</b> EpoxAcast™ 650 - Off-White EpoxAcast™ 650 BLACK - Black <i>All values measured after 7 days at 73°F / 23°C</i> <b>*Pot Life and Cure Time values are dependent on mass and mold configuration, as epoxies are mass-sensitive.</b>		

## PROCESSING RECOMMENDATIONS

### PREPARATION...

Avoid breathing fumes - use in a well ventilated area at minimum. NIOSH approved respirator is recommended. Wear safety glasses, long sleeves and rubber gloves to minimize skin contact.

Materials should be stored and used in a room temperature environment (73°F/23°C). Elevated temperatures will reduce Pot Life. EpoxAcast™ 650 Resin and Hardeners must be properly measured and thoroughly mixed to achieve full, high-strength, solid-cure properties. Mixing containers should have straight sides and a flat bottom. Mixing sticks should be flat and stiff with defined edges for scraping the sides and bottom of your mixing container. **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 Ease Release™ 200 or 205 (available from Smooth-On) to prevent adhesion.

**IMPORTANT:** To ensure thorough coverage, lightly brush the release agent with a soft brush over all surfaces of the mold or model. Follow with a light mist coating and let the release agent dry for 30 minutes.

**Pre-mixing Part A** - The fillers in this epoxy system will settle in the container over time. Before using, fillers need to be reconstituted by pre-mixing Part A thoroughly. The best method is to use a "turbine" mixer (available from Smooth-On) or similar drill mixer attached to a power drill and drill mix on medium speed for 2 minutes. Follow with hand mixing using a flat edge paddle for 1 minute until fillers are uniformly dispersed. Stir Part B thoroughly before dispensing.

## Safety First!

The material safety data sheet (MSDS) for this or any Smooth-On product should be read before using and is available on request. All Smooth-On products are safe to use if directions are read and followed carefully.

### **EpoxAcast™ 650 Resin PART A:**

#### **WARNING: IRRITANT TO EYES, SKIN & MUCOUS MEMBRANES.**

EpoxAcast™ 650 Resin is irritating to the eyes and skin. Avoid prolonged or repeated skin contact to prevent possible sensitization. Avoid breathing vapors and use only with adequate ventilation. Wear personal protective equipment.

First Aid: In case of eye contact, flush thoroughly with water for 15 minutes and get immediate medical attention. In case of skin contact, wipe clean with white vinegar and wash thoroughly with soap and water. If irritation persists, get medical attention. If swallowed, do not induce vomiting. Drink 1 - 2 glasses of water and get immediate medical attention. If vapors are inhaled or if breathing becomes difficult, remove person to fresh air. If symptoms persist, get medical attention.

#### **Keep Out Of Reach Of Children.**

### **EpoxAcast™ 650 Hardener PART B:**

#### **WARNING: IRRITANT TO EYES, SKIN & MUCOUS MEMBRANES.**

EpoxAcast™ 650 Hardener is corrosive, causing severe skin and eye burns. Avoid prolonged or repeated skin contact to prevent possible sensitization. Use only with adequate ventilation. If contaminated flush eyes with water for 15 minutes and seek medical attention. Remove from skin with waterless hand cleaner then soap and water. Refer to MSDS. First Aid: In case of eye contact, flush thoroughly with water for 15 minutes and get immediate medical attention.

#### **Keep Out Of Reach Of Children.**

**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.

**Removing Epoxy** - Uncured/ Non-curing epoxy: Scrape as much material as possible from the surface using a scraper. Clean the residue with E-POX-EE KLEENER™ available from Smooth-On, lacquer thinner, acetone or alcohol. Follow safety warnings pertaining to solvents and provide adequate ventilation.



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

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

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

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## MEASURING / DISPENSING...

The proper mixing ratio is 100 Parts of EpoxAcast™ 650 resin to Parts hardener by weight. **You must use an accurate digital gram scale to weigh Parts A and B properly. Do not use an analog scale or attempt to measure components by volume.**

Mixing tools and containers should be clean and dry. Mixing should be done in a well ventilated area. Wear safety glasses, long sleeves and rubber gloves to minimize contamination risk. Combine EpoxAcast™ 650 resin with the appropriate amount of hardener. Mix thoroughly for 3 minutes making sure that you scrape the bottom and sides of the container several times.

**Adding Color** - EpoxAcast™ 650 can be colored with UVO™ or IGNITE™ colorants. Pre-mix colorant with Part A thoroughly and then add Part B.

**Mixing** - Be sure mixing utensils are clean and free of any potential contaminants such as dirt, dust or grease. Mix Parts A and B thoroughly for at least 3 minutes with a square edged mixing stick. Be aggressive and scrape sides and bottom of mixing container several times. Use the square edge of mixing stick to bring material off of the sides of container and blend. **If using a drill mixer**, follow with hand mixing as directed above to ensure thorough mixing.

**Adding Fillers** - A variety of dry fillers can be added. Pre-mix dry filler with Part A before adding Part B.

**Lowering Viscosity** - Epic™ Epoxy Thinner is a clear, water-like liquid that will lower the viscosity of some Smooth-On casting and laminating epoxies. Epic™ is not a solvent and can be added in different proportions to improve flow-ability to make it easier to mix and pour or laminate. Epic™ will also aid in reducing bubble entrapment.

**Increasing Flexibility** - Flexer™ Epoxy Flexibilizer is a clear, low viscosity liquid additive that will lower the durometer (Shore hardness) of some Smooth-On casting and laminating epoxies. When added to the epoxy system in the proper proportion, the cured epoxy will be softer and, in some cases, can be made semi-rigid. See the Flexer™ Technical Bulletin for more information.

## POURING / CURING...

If casting EpoxAcast™ 650 into a rubber mold, pour mixture in a single spot at the lowest point of the mold. Let the mixture seek its level. A uniform flow will help minimize entrapped air.

If making vacuum forming molds, it is best to use piano wire (15/1000 inch gauge) to make vacuum holes.

**Cure Time** - Refer to specified Cure Times in Material Properties section of this TB. Castings that are 1/4 in. / 0.64 cm. thickness or less will cure more slowly and may require more time to fully cure at room temperature. Cured material will be hard and unable to be penetrated with a finger nail. After curing, epoxy can 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 Curing** - For best results, EpoxAcast™ 650 should be heat cured in an oven. Cure at 175°F/80°C for two hours, followed by three hours at 300°F/150°C. Allow material to cool to room temperature.

**Painting** - Cured EpoxAcast™ 650 can be painted and / or primed and then painted with acrylic enamel paints. Let paint fully dry before putting part into service.