



# METAL COLD CASTING

With Urethane Resin

There are different techniques used to achieve a metallic finish with a resin. “*Cold-Casting*” is a term used to describe the process of mixing metal powder with a resin and applying the mixture into a mold. The finished casting gives the appearance and weight of solid metal. The metal cold-cast process is faster and much less expensive when compared with foundry casting of molten metal (lost wax process). Different metal powders such as bronze, brass, nickel-silver and copper can be used depending on the desired effect.

**Overview** - To make a metal cold-casting, metal powder is mixed into the resin until the mixture is thick and creamy. The mixture is then “slush-cast” (poured into a mold and rolled around) or brushed onto the mold surface (gel coat) until the resin cures. The gel coat is then back-filled with straight resin, resin mixed with metal powder, resin mixed with lead shot (for weight) or Foam-iT! 3 rigid foam.

**Specifics - Cold Cast Bronze** - Our example will detail making a cold-casting using bronze powder (also referred to as “bonded bronze”) by first applying a “gel coat” layer and then adding more resin on top of the gel coat (back filling).

## **Materials Needed:    A. Bronze Powder\*    B. Casting Resin    C. Liquid Pigment (Black)**

- A. Bronze Powder** - Recommended metal powder mesh size for mixing with resin is –325. Metallic powders are available from Smooth-On and its distributors.
- B. Casting Resin - Smooth-Cast 325 Colormatch** works best because it is a neutral clear amber and readily accepts metal powders and/or pigments. Also, SC 325 has no odor.
- C. Liquid Pigment** - Adding a dark pigment (black or dark brown) to the resin/bronze powder mixture will give the final casting added definition and dimension.

*Also required:* Rubber Mold; Mold Release Agent; measuring and mixing containers; mixing paddles; 1” paint brushes.

Amount of resin, bronze powder and pigment required will vary depending on the desired effect. The mixing ratio can be as low as 1A : 1B : 1 Metal Powder. Using more metal powder gives the finished casting greater weight thereby simulating the weight of real metal castings (i.e. 1A : 1B: 3 Metal Powder). However, the addition of steel or lead beads to the “back-fill” resin can also be used to add weight at a much lower cost than the metal powder. For this example, we will use the following:

Part B of Resin: 1 Part	Bronze Powder: 1 Part
Part A of Resin: 1 Part	Liquid Pigment: 0.1 Part (small amount)

- 1. Apply Release Agent to Rubber Mold\*\*** - To prevent resin mixture from sticking to rubber mold, thoroughly spray mold release agent over entire mold surface. Brush into all surface detail and follow with second light mist coating of release agent and let dry for 15 minutes.
- 2. Mix Metal Powder and Pigment with Part B of Resin** - To allow ample mixing time, mix metal powder and pigment thoroughly with Part B of SC 325 (Blue Label) prior to adding Part A (Yellow

Label). Dispense 1 part of Part B into clean mixing container. Add 1 part of bronze powder and 0.1 (small amount) part of black pigment to Part B and mix thoroughly.

3. **Add 1 part of Part A** - to the Part B/bronze powder/pigment mixture and **mix thoroughly**.
4. **Gel Coat** – Brush mixture into the mold cavity. The objective is to coat mold surface thoroughly until mixture begins to set up or “gels”. Continuously brushing mixture up onto all vertical surfaces until mixture begins to thicken will ensure a uniform coating. Allow gel coat to cure 15 minutes.
5. **Back-fill** - with resin, resin mixed with metal powder, or Foam-iT! 5.

**Tip:** Adding steel or lead beads to this mix gives the finished piece the weight necessary to simulate the feel of a real solid bronze casting. Fill almost to top, leaving 3/8” (0.95 cm) headspace. Let this mixture gel and cap remaining headspace with SC 325 resin pigmented with dark brown pigment or SC 325 resin and bronze powder to closely match the color of gel coat.

6. **Entire casting should be thoroughly cured before demolding** - Remember: the resin/bronze mixture or filled resin will take longer to harden than unfilled resin. Cure time depends on size of casting, mold configuration, amount of fillers used, etc. Generally 30 to 40 minutes is a sufficient amount of time. Applying mild heat will accelerate cure time. Let cool to room temperature.
7. **Demold the casting from mold** - Lightly abrade casting with medium/fine steel wool until the desired metal shine and luster is attained.
8. Highlighting surface with dark brown shoe polish will give casting added depth and dimension.
9. Patina effect can be achieved with patina paints available through Sur Fin Chemicals: Tel. (323) 262-8108 (Super Antique 40, Berde, Rusty Brass, and Easy Brown)
10. To prevent oxidation of the metal, spray finished casting with two coats of clear gloss spray (acrylic works well) available at most hardware/DIY stores.

\* Recommended metal powder mesh size for mixing with resin is: -325 to -225. Metallic powders are available from Smooth-On and its distributors. Call our Technical Help Hot Line to find your nearest distributor.

\*\* Use only a release agent specifically made for mold making and casting such as Universal Mold Release™ or Mann Ease Release 200™ (both available from Smooth-On and its distributors).

**For Technical Help Call Us At:**  
**Telephone: (262) 524-0440 or (800) 255-9847**  
**Fax: (262) 524-0150**  
**Visit Us at Our Website:**  
**[www.Techno-Industrial.com](http://www.Techno-Industrial.com)**