



# Tips for Being Successful Using Silicone Rubber To Make Molds of UV Resin 3D Prints

As costs have come down in recent years, the popularity of SLA printers (using UV cure resin media to print 3D models) has grown immensely. Often, people want to make rubber molds of their UV resin 3D prints and subsequently multiple urethane or epoxy resin castings.

Both tin-catalyzed (condensation cure) and platinum-catalyzed (addition cure) silicone rubbers are used to make molds of 3D printed models made with UV cured resin. There are advantages and disadvantages to both.

The following offers tips on increasing your chances for success using Smooth-On silicone rubber products.

## Using Platinum Silicone Rubber to Make Molds of UV resin 3D prints

Platinum silicones offer the advantage of dimensional stability and long-term library life. However, platinum silicones are more subject to cure inhibition against a UV cure resin model that is not fully cured.

Smooth-On platinum cure silicones will work against most SLA 3D print models with one caveat; the printed model must be fully UV cured. When models are done printing, they are not fully cured.

### Cleaning and Curing Procedure:

- 1. Clean the Print** – While wearing disposable gloves, dip the 3D print in isopropyl alcohol (91%). This eliminates excess uncured resin on the model surface. Next, wash the print with dish soap and water. This should remove all alcohol. Let model fully dry.
- 2. Full UV Cure – place model in a UV cure chamber or direct sunlight for a minimum of 6 hours.** You cannot overexpose the model and the longer the exposure, the better. Cure time may vary depending on how well all areas of the print are exposed to the UV light. You must make sure all areas of the print are fully UV post cured. **The print should be turned and rotated to make sure the light hits all surfaces** of the print. It needs to hit all areas for the 6 hours otherwise under post cured areas will have inhibition.
- 3. For efficient UV curing, clear or translucent resin is better than using an opaque resin.** A clear resin will allow the UV light to penetrate through the print and cure the entire print, inside and out. The print will yellow under the post cure which is a good visual indicator UV light has reached all areas on the print. If your intention is to make a silicone mold of your 3D print, do not use an opaque resin.
- 4. Model Configuration Dependent** - deep areas, odd angles on the model or pass throughs within a print that are not exposed to UV light may cause the resin not to cure and subsequent inhibition in the mold. For example, if your model is a skull with deep set eyes and the UV light does not reach all the way down into the eyes, the model will not cure fully and will cause inhibition in the rubber mold.  
*Remedy; rotate and turn the 3D model frequently to maximize UV exposure to all surfaces.*

## Preparing to Make the Mold

**Applying a Sealing Agent** – Referencing the columns below, recommended sealing agents are XTC-3D epoxy coating or Krylon Crystal Clear Acrylic Spray (Gloss). Using very little material, XTC-3D coating will leave a smooth, glass-like finish on the surface of the 3D model. Krylon Acrylic Spray is widely available. However, it will leave a slight texture on the surface. Apply sealer and let fully dry.

**Applying a Release Agent** – Referencing the columns below, some mold rubbers require application of a release agent only (Ease Release 200) to all surfaces of the fully UV cured model. Apply a light mist coating of Ease Release 200 to all model surfaces. This will help minimize scuffs and scratches and improve the surface finish significantly. It will also make demolding the model from the rubber mold easier. After applying the release agent allow it to dry fully then proceed to mold your model.

<b>MOLD RUBBER</b>	<b>Ease Release 200</b>	<b>XTC +200</b>	<b>KRYLON +200</b>
Mold Star 15 Slow	Not Recommended	Good	Good
Mold Star 16 Fast	Not Recommended	Good	Good
Mold Star 30	Good	Good	Good
Mold Star 19T	Not Recommended	Good	Good
Mold Star 20T	Good	Good	Not Recommended
Mold Star 31T	Not Recommended	Good	Good
Dragon Skin 10 VF	Not Recommended	Good	Good
Dragon Skin 10 Fast	Not Recommended	Good	Good
Dragon Skin 10 Med	Not Recommended	Good	Good
Dragon Skin 10 Slow	Not Recommended	Good	Good
Dragon Skin 10 NV	Not Recommended	Good	Good
Dragon Skin 20	Not Recommended	Good	Good
Dragon Skin 30	Not Recommended	Good	Good
Dragon Skin FX PRO	Good	Good	Good
EcoFlex 00-10	Good	Good	Good
EcoFlex 00-20	Not Recommended	Good	Good
EcoFlex 00-30	Not Recommended	Good	Good
EcoFlex 00-35	Good	Good	Good
EcoFlex 00-50	Good	Good	Good
Smooth-Sil 936	Good	Good	Not Recommended
Smooth-Sil 940	Good	Good	Not Recommended
Smooth-Sil 945	Good	Good	Not Recommended
Smooth-Sil 950	Good	Good	Good
Smooth-Sil 960	Not Recommended	Good	Good
Rebound 25	Good	Good	Good
Rebound 40	Good	Good	Good
Sorta-Clear 12	Not Recommended	Good	Good
Sorta-Clear 18	Not Recommended	Good	Good
Sorta-Clear 40	Good	Good	Not Recommended
Body Double Standard	Good	Good	Good
Body Double Fast	Good	Good	Good
Body Double Silk	Good	Good	Good
Skin Tite	Good	Good	Good
EZ-Brush Vac	Good	Good	Good
Solaris	Good	Good	Good

**Note:** For extraordinarily complicated models, using Smooth-On's 'Inhibit-X' is an option and can help if you experience cure inhibition in your mold. Inhibit-X is only for use with platinum cure silicone.

## Using Tin-Cure Silicone Rubber to Make Molds of UV resin 3D Prints

**Advantages** - Tin cure silicones are far less likely to be inhibited by UV cure resin which makes it a good choice when molding an SLA print. A tin catalyzed silicone will also yield approximately the same amount of castings from a similar platinum cure mold at a lower cost. But it does have some disadvantages when compared to platinum cure silicone.

**Disadvantages** - Tin cure silicone has a shorter library life than platinum cure silicone. Tin cure silicone needs to be mixed by weight and require the use of a gram scale making it less convenient and slightly more difficult to use. Tin cure silicones are also very thick and require vacuum degassing before pouring over any model. By comparison, many platinum cure silicones are lower in viscosity and are easier to measure/mix with 1 to 1 mix ratios by volume.

**Making a Mold of Your 3D Print Using Tin-Catalyzed Silicone** - Models should be fully UV cured before applying silicone mold rubber. Sealing is optional. Apply a light mist coating of Ease Release 200 to all model surfaces. This will help minimize scuffs and scratches and improve the surface finish significantly. It will also make demolding the model from the rubber mold easier. After applying the release agent allow it to dry fully then proceed to mix and pour mold rubber.

**Note** - If you are making UV resin prints with the goal of med sim or prosthetic applications, tin catalyzed silicone can not be used if the final parts/pieces are to be cast in a platinum cure silicone such as Dragon Skin or EcoFlex. Tin cure and platinum cure silicones are not compatible and cannot be used together.