

# Smooth-Cast™ Semi-Rigids

Semi-Rigid Urethane Casting Resins



www.smooth-on.com

## PRODUCT OVERVIEW

The Smooth-Cast™ Semi-Rigid line of low-cost semi-rigid urethane casting resins cure quickly to semi-rigid plastics that offer exceptional strength and impact resistance. Smooth-Cast 45D, 60D and 61D are formulated with a translucent white appearance and improved physical properties. All Smooth-Cast semi-rigids are mercury free and phthalate free. These plastics are easy-to-use (mix ratio is 1A:1B by volume) and have low viscosities for minimal bubble entrapment. Vibrant colors are possible by adding SO-Strong™, UVO™ or Ignite™ colorants.

Shore Hardness Available:	45D	57D, 60D & 61D	65D & 66D	70D (for comparison)
	Softer, Semi-Rigid	Some Flexibility	More Rigid	Rigid, Not Flexible

These semi-rigid plastics are good for making impact resistant prototypes, models, toys, props, climbing holds, etc.

**NOTE:** Smooth-Cast™ 57D and Smooth-Cast™ 65D are also suitable for rotational casting applications. Do not use other Smooth-Cast™ semi-rigid plastics for roto casting.

## TECHNICAL OVERVIEW

	A:B Mix Ratio by Volume	A:B Mix Ratio by Weight	Pot Life @ 73°F / 23°C (ASTM D-2471)	Cure Time ** @ 73°F / 23°C	Shore Hardness	Mixed Viscosity	Specific Gravity	Specific Volume	Tensile Strength (ASTM D-638)	Elongation at Break (ASTM D-638)	Shrinkage in./in. (ASTM D-2566)	Color
Smooth-Cast™ 45D	1A:1B	100A:93B	5 min	30 min	45D	250 cps	1.10	25.2	1,560 psi	100%	0.007	Translucent White
Smooth-Cast™ 57D	1A:1B	100A:93B	3 min	30 min	57D	300 cps	1.05	26.4	2,420 psi	100%	0.012	Translucent White
Smooth-Cast™ 60D	1A:1B	100A:93B	5 min	30 min	60D	430 cps	1.05	26.4	2,420 psi	100%	0.012	Translucent White
Smooth-Cast™ 61D	1A:1B	100A:93B	7 min	60 min	61D	430 cps	1.05	26.4	2,420 psi	100%	0.012	Translucent White
Smooth-Cast™ 65D	1A:1B	100A:93B	2.5 min	10-15 min	65D	120 cps	1.05	26.4	2,400 psi	20%	0.01	White
Smooth-Cast™ 66D	1A:1B	100A:93B	7 min	60 min	66D	120 cps	1.05	26.4	2,400 psi	20%	0.01	Grey

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

\*\* Depending on Mass

## PROCESSING RECOMMENDATIONS

### PREPARATION...

**Safety** - These products have a limited shelf life and should be used as soon as possible. Materials should be stored and used in a warm environment (73°F/23°C). All liquid urethanes will react with moisture in the air, causing bubbles. Use in a low humidity environment (below 50% RH). 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. Mixing should be done in a well-ventilated area. Wear safety glasses, long sleeves and rubber gloves to minimize contamination risk. **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** - A release agent is necessary to facilitate demolding when casting into or over most surfaces. Use a release agent made specifically for mold making (Universal™ Mold Release or Mann's Ease Release™ 200 available from Smooth-On or your Smooth-On distributor). A liberal coat of release agent should be applied onto all surfaces that will contact the plastic.

**IMPORTANT:** To ensure thorough coverage, apply release and brush with a soft brush over all surfaces. Follow with a light mist coating and let the release agent dry for 30 minutes. Smooth-On silicone rubber molds usually do not require a release agent unless casting silicone into the mold. Applying a release agent will prolong the life of the mold.

**IMPORTANT:** Shelf life of product is reduced after opening. Remaining product should be used as soon as possible. Immediately replacing the lids on both containers after dispensing product will help prolong the shelf life of the unused product. XTEND-IT™ Dry Gas Blanket (available from Smooth-On) will significantly prolong the shelf life of unused liquid urethane products.

## 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.

### Keep Out of Reach Of Children.

**Be Careful - Part A** (Yellow Label) contains methylene diphenylisocyanate. Vapors, which can be significant if heated or sprayed, may cause lung damage and sensitization. Use only with adequate ventilation. Contact with skin and eyes may cause severe irritation. Flush eyes with water for 15 minutes and get immediate medical attention. Remove from skin with soap and water.

**Part B** (Blue Label) is irritating to the eyes and skin. Avoid prolonged or repeated skin contact. If contaminated, flush eyes with water for 15 minutes and get immediate medical attention. Remove from skin with soap and water.

When mixing with Part A, follow precautions for handling isocyanates. If machining cured castings, wear dust mask or other apparatus to prevent inhalation of residual particles.

**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 a copyright or patent. User shall determine suitability of the product for the intended application and assume all associated risks and liability.

## MEASURING & MIXING...

Liquid urethanes are **moisture sensitive** and will absorb atmospheric moisture. Mixing tools and containers should be clean and made of metal, glass or plastic. Materials should be stored and used in a warm environment (73°F/23°C).

**Stir or shake both Part A & Part B thoroughly before dispensing.** After dispensing equal amounts of Parts A & B by volume in a mixing container, mix thoroughly. Make sure that you scrape the bottom and sides of your container several times. Smooth Cast™ 45D, 57D, 60D & 65D are very fast setting materials. Do not delay between mixing and pouring. Also, the higher the mass concentration, the faster the material gels and cures.

## POURING, CURING & PERFORMANCE...

**Pouring** - For best results, pour your mixture in a single spot at the lowest point of the containment field and let the mixture seek its level. This will help minimize air entrapment.

**For Best Results:** Best results are obtained using a pressure casting technique. After pouring the mixed compound, the entire casting assembly (mold, dam structure, etc.) is placed in a pressure chamber and subjected to 60 PSI (4.2 kg/cm<sup>2</sup>) air pressure for the full cure time of the material.

**Curing - Important:** Use this product with at least room size ventilation or in proximity to a forced outlet air vent and do not inhale/breathe fumes. Fumes, which may be visible with a significant mass concentration, will quickly dissipate with adequate ventilation. Castings with significant mass may be hot to the touch and irritate skin immediately following cure. Let casting cool to room temperature before handling.

Demold time of the finished casting depends on mass and mold configuration. Low mass or thin-walled castings will take longer to cure than castings with higher mass concentration.

If making rotational or hollow castings, backfilling with a rigid foam (Foam-iT! 5 or other) will provide lightweight reinforcement. Foam backfilling is recommended if castings will be subjected to temperatures above 85°F/30°C.

**Performance** - Cured castings are semi-rigid and impact resistant. They resist moisture, mild heat, solvents (intermittent contact) and can be primed/painted or bonded to other surfaces (any release agent must be removed) using Urebond or similar flexible adhesive. If machining material, wear breathing protection. Unpainted castings may discolor in proportion to duration and intensity of exposure to UV light.

Because no two applications are quite the same, a small test application to determine suitability is recommended if performance of this material is in question.



**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.