



# Clear Flex® 50 & 95

Water Clear Urethane Rubber

## PRODUCT OVERVIEW

**Clear Flex® 50** and **Clear Flex® 95** are water white clear urethane liquid rubber compounds designed for applications that require absolute clarity and resistance to sunlight. Low viscosity ensures easy mixing and pouring. Clear Flex® 50 and 95 cure at room temperature with negligible shrinkage. Cured castings are clear, flexible and UV Resistant. Vibrant colors and color effects are achieved by adding pigments.

Applications include making clear-cut molds, model reproductions, decorative cast pieces, special effects, prototype parts.

**CAUTION: NOT FOR HOME USE. THIS PRODUCT IS FOR INDUSTRIAL USE ONLY. Proper ventilation, A NIOSH Approved Respirator and Protective Clothing are required to minimize the risk of inhalation and dermal sensitization. If breathing is affected or a dermal rash develops, immediately cease using this product and seek medical attention. Read MSDS before using.**

## TECHNICAL OVERVIEW

Product	Mixing Ratio	Shore Hardness	Pot Life	Gel Time
Clear Flex® 50	50 Parts A to 100 Parts B by weight (1A : 2B)	50A*	25 minutes	40 minutes*
Clear Flex® 95	100 Parts A to 150 Parts B by weight (1A : 1.5B)	95A*	25 minutes	40 minutes*

\*Cure time depends on casting thickness and configuration. See "Curing" section on reverse side of this bulletin.

Properties	Viscosity (A+B Mixed)	G/CC	Cu. In./Lb.	Tensile Strength	Elongation At Break	Tear Strength	Shrinkage**
Clear Flex® 50	250 cps	1.04	26.8	250 psi	500%	25 pli	.0015 in./in.
Clear Flex® 95	250 cps	1.04	26.8	2,500 psi	175%	200 pli	.0028 in./in.

Refractive Index: 1.495

\*\*Shrinkage: above values measured for 400 grams of material cured at room temperature cast at 10" x 2" x 1" (25.4 cm x 5 cm x 2.5 cm). Material is mass sensitive and will exotherm. Large amounts of material cast at one time will generate heat and will shrink in proportion to mass. The more material cast in a large concentration, the higher the shrinkage. Amount and nature of shrinkage will depend on casting thickness and mold configuration.

## Surface Preparation

## Applying A Release Agent

## Measuring

**Some Materials Must Be Sealed** – Materials should be stored and used in a warm environment (72° F / 22° C). They also have a limited shelf life and should be used as soon as possible. Wear safety glasses, long sleeves and rubber gloves to minimize contamination risk. To prevent adhesion between the rubber and model surface, models made of porous materials (gypsum plasters, concrete, wood, stone, etc.) must be sealed prior to applying a release agent. The best sealer for sealing porous materials is **SuperSeal®** or **One Step®** (Available from Smooth-On). **Spray shellac** is suitable for rough contours. A high quality Shellac is suitable for sealing modeling clays that contain sulfur or moisture (water based). Allow sealer to dry thoroughly.

**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. A liberal coat of release agent should be applied onto all surfaces that will contact the rubber. **~IMPORTANT:** To ensure thorough coverage, lightly brush the release agent with a soft brush over all surfaces of the model. Follow with a light mist coating and let dry for 30 minutes. **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.**

**If Casting Into Mold Rubber** – If you want to cast Clear Flex® into silicone rubber, use Smooth-On's Mold Max® silicone. Do not use a platinum-based silicone, as inhibition may occur. If Mold Max® silicone mold is newly made, post cure rubber at 150°F / 65°C for 6 hours & let cool prior to casting Clear Flex®. Casting into platinum cure silicones is not recommended because of inhibition potential. If casting into Smooth-On urethane rubber, apply Ease Release® 200 or Universal® Mold Release to the mold surface prior to casting Clear Flex®.

**Measuring – IMPORTANT: Stir Part B thoroughly before dispensing.** The correct mix ratios for Clear Flex® 50 and Clear Flex® 95 are listed above. Dispense the required amount of Part A into a mixing container. Weigh out the appropriate amount of Part B and combine with Part A.

## Mixing

## Pouring

## Casting Thickness

## Curing

## Post Curing

**IMPORTANT:** Shelf life of product is drastically reduced after opening. Immediately replace container lids after dispensing. Use remaining product as soon as possible. Purging opened containers with XTEND-IT® dry gas blanket (available from Smooth-On or your distributor) before re-sealing will significantly extend shelf life of unused product.

**Important: Pre Mix the Part B before using.** After dispensing proper amounts of Parts A and B into mixing container, mix thoroughly for at least 3 minutes making sure that you scrape the sides and bottom of the mixing container several times.

**If Mixing Large Quantities** (16 lbs./7 kg. or more) at one time, use a mechanical mixer (i.e. Squirrel Mixer or equal) for 3 minutes followed by careful hand mixing for one minute as directed above. Then, pour entire quantity into a new, clean mixing container and do it all over again. If coloring or filling Clear Flex® 50 or Clear Flex® 95, add filler or pigment dispersion to Part B and mix thoroughly before adding Part A. (**Important;** Material is mass sensitive and will exotherm. Large amounts of material cast at one time will generate heat and will shrink in proportion to mass. The more material cast in a large concentration, the higher the shrinkage. Amount and nature of shrinkage will depend on casting thickness and mold configuration.)

If **vacuum degassing** prior to pouring, subject mixture to 29 inches of mercury in a suitable vacuum chamber for 2 -3 minutes or until mixture rises, breaks and falls. Allow for 3 to 4 times volume expansion in mixing container.

**Pouring** – If casting Clear Flex® 50 or Clear Flex® 95 into a rubber mold, pour mixture in a single spot at the lowest point of the mold. If encapsulating an object, do not pour the mixture directly over the object. Let the mixture seek its level. A uniform flow will help minimize entrapped air.

**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 at least two hours.

**Curing - For most applications**, room temperature curing (70 F/ 22 C) for 24 - 48 hours is adequate. Castings will reach ultimate physical properties at room temperature in 5 - 7 days. Castings removed from mold before 12 hours may exhibit a tacky surface that can be eliminated by exposing casting to 150 F / 65 C for 4 - 6 hours. If you are pouring less than 1/4 in./ .64 cm of material, the casting should be heat post cured.

**Post Curing** – Castings will cure faster and achieve maximum physical properties and heat resistance if Clear Flex® 50 or Clear Flex® 95 is post cured. Post curing is recommended if castings are thin or low mass concentration. Castings should be post cured in a mold or support structure.

**Post Cure Schedule:** Allow the material to cure for 6 - 8 hours at room temperature followed by 16 hours at 150 - 160 F (65 - 72 C). Allow casting or part to cool to room temperature before demolding.

## Safety First!

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*The Material Safety Data Sheet (MSDS) 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.*

**Be careful.** Clear Flex® 50 and Clear Flex® 95 Parts A are modified aliphatic diisocyanates. Vapors, which can be significant if the material is heated or sprayed, 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 seek immediate medical attention. Remove from skin with waterless hand cleaner followed by soap and water. Refer to MSDS. Part B is irritating to the eyes and skin. Avoid prolonged or repeated skin contact.. Remove from skin with soap and water. If contaminated, flush eyes with water for 15 minutes and seek immediate medical attention. Use only with adequate ventilation.

**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.

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

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