



TWO-PART RTV MIXING AND PROCESSING GUIDELINES

Two-part RTV silicone rubber products are easy to use. Proper mixing and handling provides excellent product reliability and performance. The following guidelines provide a step-by-step approach to working with Elkem Silicones' Moldmaking RTVs.

MEASURING THE COMPONENTS

1. Stir the Base component (Part A) and shake the catalyst (Part B) well before use.
2. Weigh the calculated quantity of Base (Part A) into a clean container that is about three to four times the volume of the Base component volume. This extra capacity is required to allow sufficient expansion room during the air evacuation (deairing) process. Tip the container and roll the Base (Part A) around the sidewalls of the container up to about two (2) inches from the top. This procedure will prevent the Catalyst (Part B) from soaking into the container, in particular if a fiber-based (paper) container is used.
3. Carefully add the calculated amount of Catalyst (Part B) into the container ~ follow mix ratio instructions provided in Product Technical Data Sheet. All platinum (addition) cure, and most tin (condensation) cure products are supplied with pre-measured Catalyst to match the weight ratio of the Base, when supplied as a kit. If the entire kit is to be mixed, the catalyst may be poured directly into the base component. When using less than a full container of the Base component, both components **MUST** be weighed to ensure the proper mix ratio.

MIXING

After adding the Catalyst (Part B) into the Base (Part A), stir the components well using a clean, flat ended metal spatula, or with a hand drill/power mixer blade assembly. Scrape any material clinging to the sides and bottom of the container back into the body of the mixture at least twice during the mixing process. Most of the catalysts (Part B) are pigmented resulting in a color change of the mixed rubber. Make sure the catalyst (Part B) is blended into the Base (Part A) until a homogeneous color is obtained, without swirls or striations.

NOTE: When using a power mixer, AVOID HIGH SHEAR MIXING SPEEDS - DO NOT EXCEED 350rpm. High speed mixing will create excessive heat build-up which will drastically shorten the work life and pot life of the RTV product being mixed.



AIR EVACUATION (DEAIRING)

Air entrapped during the mixing process must be removed to eliminate air pockets in the cured rubber. Entrapped air is removed from the mixture in a vacuum chamber using a vacuum pump which is capable of achieving 29 inches of vacuum and displacement of 1-5 cfm. The mixed RTV will rapidly rise (froth) to about four (4) times its original level, crest, and then recede. Keep the mixed RTV under full vacuum for an additional three (3) to five (5) minutes after the mix has crested and collapsed. Bleed air into the chamber SLOWLY. When chamber is at atmospheric equilibrium, remove container. If the container is not large enough to allow the mixture to crest without overflowing, it will be necessary to quickly bleed (break) the vacuum, then close the bleeder, allow the material to rise again. This process may have to be repeated several times until the mixture crests and falls by itself. Again, hold full vacuum for 3-5 minutes after cresting.

POURING PROCEDURE

After deairing, the mixed RTV is usually poured over a pattern, model or electronic module (potting). Pouring should be done carefully to avoid entrapping air. To minimize air entrapment, if possible, incline the mold slightly, slowly pour, in a continuous stream, the mixed silicone into the low end of the mold, allowing the silicone to flow around the master to the upper part of the mold, forcing any air out of the mold. In some cases, it may be necessary to apply (pour or brush) a thin film (brush coat) of silicone over the master/model to ensure complete coverage for maximum detail reproductions, especially with parts that have deep undercuts or detail. Putting the filled mold in a pressure chamber and exerting about 60psi pressure for 1-2 hours, or placing a partially filled mold under vacuum are also methods employed to ensure void-free molds.

CURING

CONDENSATION (TIN) CURE SYSTEMS:

Demold time and cure time will depend upon catalyst (Part B) selected and proportion (% of catalyst) used. Demold time is usually 16-24 hours at ambient conditions. Molds to be used for casting polyester, epoxy, and polyurethane resins should be allowed to rest AT LEAST an additional twenty four (24) hours "breathing time" after demolding. A three (3) day total cure before putting the mold into production is recommended for optimum mold life. Temperature during cure cycle should be no lower than 68°F (20°C), if the temperature is lower, the polycondensation system will cure slower and softer. See product Technical Data Sheet for cure condition recommendations. Heat acceleration is not recommended for polycondensation systems.



ADDITION (PLATINUM) CURE SYSTEMS:

Follow the cure time and temperature recommendations on specific Product Technical Data Sheets. Many addition cure RTV's are designed to cure at room temperature without the aid of heat. NOTE: During the cure cycle the temperature should be no lower than 68°F (20°C), if the temperature is lower, the polyaddition system will cure slower and softer. Some addition cure products require an oven heat cure to reach optimum physical properties. All addition cure RTV systems may be heat accelerated, but shrinkage will be higher than when cured at room temperature. Lower temperatures (100-130°F/37-55°C) are recommended to keep shrinkage to a minimum for tooling molds.

PRIMERS

Adhesion of two part RTV's to any substrate will require the use of a primer, unless otherwise stated on the product Technical Data Sheet. The primer is applied to the substrate surface to provide an adhesion promoting interface between the substrate and the RTV. When the RTV cures, it is actually bonding to the primer interface, not directly to the surface of the substrate.

Substrate surfaces must be thoroughly cleaned with a suitable hydrocarbon solvent such as Naptha, toluene, or Methyl Ethyl Ketone (MEK). Many substrate surfaces can be cleaned using "Scotch Brite^(R)" and solvent (in that order) to enhance the bonding surface for better wetting properties. Some solvents dry very rapidly, be sure that no residue remains on the substrate surface. Appropriate solvent handling precautions should be observed.

The majority of primers are one component, liquid systems, which require no mixing. Primers may be applied by brushing, wiping, dipping or spraying. Apply only a thin film (1-2 mil). Thicker films, or recoating should be avoided, since thicker films are detrimental to achieving optimal adhesion. A light, chalky layer should be visible when the primer dries. The best conditions for primer curing are 75°F (24°C) and 50% Relative Humidity.

Allow the primer to dry for 1-2 hours prior to application of the RTV silicone rubber mixture. The primer should be completely dry, with a light chalky layer visible to the eye. Do not touch the primed area(s) after application of the primer.

BLUESIL™ V-04 and BLUESIL™ V-06 primers may be used with both Addition and Condensation cure RTV systems. Refer the Technical Data Sheet for the specific product for details on application and usage of the primer.



SUBSTRATE COMPATIBILITY

CONDENSATION (TIN) CURED SILICONE RTV'S

Condensation (Tin) cure products will completely cure in contact with most substrates. Substrates that will inhibit the cure of Condensation cure RTV's are: Modeling clays containing high sulfur content and sulfur cured elastomers such as Neoprene, Polysulfide, and Latex.

ADDITION (PLATINUM) CURED SILICONE RTV'S

Platinum cure systems are more sensitive to ingredients present in many substrates. Cure inhibition will occur in contact with vinyl plastics particularly flexible sheeting, sulfur containing synthetic and natural elastomers, epoxies containing strong amine hardeners, modeling clays containing sulfur, some woods particularly pine and plywood, leathers, tapes with latex adhesive, chlorinated substances, and organo-metallic salt containing materials such as silicone condensation (tin) cured RTV's. Questionable substrates should be tested in a small, inconspicuous area to determine compatibility to preclude potential problems.

Consult with you Elkem Silicones' Sales or Technical Representative for additional assistance.

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