

TASK[®] 21

High Performance Urethane Casting Resin



www.smooth-on.com

PRODUCT OVERVIEW

TASK[®] 21 is a performance urethane casting resin that has been described by many as having similar performance and mechanical characteristics to ABS plastic, with high compressive and flexural strength. **TASK[®] 21** has no odor and is easy to process. Mix ratio is 2A:1B by weight or volume. Pot life is 6 minutes and handling strength is reached in 60 minutes at room temperature (depending on mass and configuration).

TASK[®] 21 features a low mixed viscosity of 500 cps and readily de-airs itself when cast into molds. **SO-Strong[®]** or **IGNITE[®]** colorants can be added for color and a variety of powder fillers can be added to alter performance or appearance characteristics. Applications for **TASK[®] 21** include rapid prototyping, casting strong and highly detailed models, making holding / assembly fixtures, figurines and decorative castings.

IMPORTANT - TASK[®] 21 can not be cast into platinum-cure silicone molds.

We recommend casting TASK[®] 21 into tin-cure silicone or urethane rubber molds (using a release agent).

TECHNICAL OVERVIEW

Mix Ratio; 2A:1B by volume or weight	
Mixed Viscosity, cps; 500	(ASTM D-2393)
Specific Gravity, g/cc; 1.07	(ASTM D-1475)
Specific Volume, cu. in./lb.; 25.9	(ASTM D-1475)
Pot Life; 6 minutes @ 73°F/23°C	(ASTM D-2471)
Cure time; 1 hour @ 73°F/23°C * *	
Color; White	
Shore D Hardness; 75	(ASTM D-2240)
Ultimate Tensile, psi; 5,500	(ASTM D-638*)
Tensile Modulus; 270,000 psi	(ASTM D-638*)
Elongation @ Break; 7.5%	(ASTM D-638*)
Flexural Strength; 7,100 psi	(ASTM D-790*)
Flexural Modulus; 250,000 psi	(ASTM D-790*)
Compressive Strength; 7,100 psi	(ASTM D-695*)
Heat Deflection Temp; 144°F/62°C	(ASTM D-648*)
Compressive Modulus; 78,500 psi	(ASTM D-695*)
Shrinkage; 0.0058 in/in	(ASTM D-2566*)

* Value measured after 7 days at 73°F/23°

** Depending on Mass

PREPARATION... Materials should be stored and used in a warm environment (73°F/23°C). These products have a limited shelf life and should be used as soon as possible. All liquid urethanes are **moisture sensitive and will absorb atmospheric moisture**. Mixing tools and containers should be clean and made of metal, glass or plastic. Mixing should be done in a well-ventilated area. Wear safety glasses, long sleeves and rubber gloves to minimize contamination risk.

IMPORTANT - TASK[®] 21 can not be cast into platinum silicone molds.

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.

Applying A Release Agent - If you are unsure about surface compatibility, a trial casting on a surface finish similar to the final mold or model should be made to avoid damage to the working surface. Polyurethane, latex or metal molds should be dry and require a coat of suitable release agent. **Universal Mold Release** (available from Smooth-On) is ideal for this purpose. A liberal coat of release agent should be applied onto all surfaces that will contact the plastic. To ensure thorough coverage, lightly brush the release agent with a soft brush over all surfaces. Follow with a light mist coating and let the release agent dry for 30 minutes.

MEASURING & MIXING...

Measuring - The proper mixing ratio is 2A:1B by volume or weight. Dispense the required amount of Part A into a mixing container. Dispense the appropriate amount of Part B and combine with Part A.

Mixing - Materials should be stored and used in a warm environment (73° F / 23° C). **Shake or stir Part A & Part B before using.** Add Part A to Part B and mix thoroughly. Stir slowly and deliberately making sure that you scrape the sides and bottom of the mixing container several times. Be careful not to splash low viscosity material out of container. Remember, product sets up quickly. The higher the mass concentration, the faster the material gels and cures. Do not delay between mixing and pouring.

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 product.

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) is a modified aliphatic diisocyanate. Vapors, which can be significant if 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 (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.

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.

POURING, CURING & PERFORMANCE...

Pouring - If casting TASK® 21 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.

Vacuum Degassing - mixed resin is low in viscosity and does not require vacuum degassing. If you choose to vacuum the material, subject mixture to 29 h.i.g. mercury in a vacuum chamber until mixture rises, breaks and falls. Allow for 3 to 4 times volume expansion in mixing container. Be aware of pot life so that material does not set up in mixing container.

Pressure Casting - Although not necessary for most applications, best results for eliminating air/bubbles are obtained using a pressure casting technique. After pouring the resin into a rubber mold (that has also been made using pressure), place mold into a safety-rated pressure chamber and subject the mixture to 60 PSI (4.2 kg/cm²) until the material cures. After material cures, wait 30 minutes before releasing pressure and removing mold / casting from the pressure chamber.

Curing - For most applications, room temperature curing at 73°F (23°C) for 16 hours is adequate. Low mass or thin-walled castings will take longer to cure than castings with higher mass concentration. Castings will reach ultimate physical properties at room temperature in 7 days.

Post Curing Option - Castings will reach "full cure" faster and achieve maximum physical properties / heat resistance if TASK® 21 is heat post cured in a dedicated shop oven. Post curing is recommended if castings are thin or of low mass concentration. Castings should be post cured in a mold or support structure. Allow the material to cure fully at room temperature followed by 4 hours at 150°F (65°C). Casting should be allowed to cool to room temperature before handling.

Demold - Demold time of the finished casting depends on mass and mold configuration. Make sure casting has reached handling strength before demolding. If casting has a flat back, it can be removed from mold and allowed to cure outside the mold on a flat, level surface to attain full working properties. Allow material to cure for 24 hours at room temperature before putting into service.

Performance - Cured castings of TASK® 21 are rigid and durable. They resist moisture, moderate heat, solvents, dilute acids and can be machined, primed/painted or bonded to other surfaces (any release agent must be removed). Castings can be displayed outdoors after priming and painting.

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

The new www.smooth-on.com is loaded with information about mold making, casting and more.