Kast-Series Urethane Resins Technical Bulletin

DESCRIPTION: Kast Series products are high-performance, fast-cast urethane tooling and casting systems that are designed for use in a variety of applications including foundry, special effects, prototyping, vacuum and thermo-forming, and many other industrial and commercial applications.

Kast products were developed to provide greater moisture resistance, improved filler suspension, easier premixing of the components, and minimal shrinkage.

Slo-Kast provides a longer pot life and demold time for larger pours, while **Metal-Kast** simulates many of the desirable characteristics of aluminum metal.

MOLD PREPARATION: These products reproduce minute detail from a mold or pattern but may stick or foam when poured on improperly prepared surfaces. A trial casting on a surface finish similar to the final mold should be made to avoid damaging a valuable mold. Polyethylene and silicone rubber molds (e.g., TinSil® and PlatSil® silicone rubber) do not require a release agent. When casting these plastics in silicone molds, the use of an appropriate primer sprayed in the mold and allowed to dry before casting, will result in a pre-primed cast part and will help additional paint adhere to the part. Latex, urethane rubber (e.g., 74- and 75-Series rubbers) or metal molds must be dry and require a coat of a suitable release agent (i.e., Pol-Ease® 2300 Release Agent).

MIXING: Before use, be sure that Parts A and B are at room temperature and that all tools are ready. Surface and air temperatures should be above 60°F during application and for the entire curing period.

Read product labels to determine the correct mix ratio. Because Kast Series products contain components of high density, there will be some separation at the bottom of each container. Before combining Parts A and B, use a paint shaker, jiffy mixer, or mixing spatula to re-suspend the ingredients in each component. Use metal or plastic mixing vessels and spatulas to avoid introducing moisture (paper or wood tools can introduce moisture).

High-Performance Urethane Tooling Resins

Why Choose the Kast Series?

- Low exotherm and minimal shrinkage

- Low viscosity

- High heat deflection temperature

Weigh Parts A and B into a mixing container, such as a polyethylene pail. Mix thoroughly, scraping the sides and bottom of the mixing container. Pour mix into cavity as soon after mixing as possible.

Once the containers of Parts A and B are opened, they should be used or resealed tightly since atmospheric moisture contamination may cause foaming of the plastic. PolyPurge, a dry gas product, can be sprayed into opened containers of Kast resins to displace moist air before resealing containers to extend shelf life.

CURING: Castings should be allowed to remain in the mold until thoroughly cured. Parts demolded too soon may be subject to deformation. Use of pre-warmed molds will hasten curing. Low temperatures will slow the curing and extend demold time. Refer to the Physical Properties table for individual product pour and demold times. Thin castings or thin sections of castings will take longer to cure than thick castings or thick sections of castings.

ADDITIVES: Poly 15 Part X Accelerator can be added to accelerate cure times. Stir Part X into Part B before adding Part A. When using Part X, exotherm (heat of reaction) and thus shrinkage is increased. Experiment to determine the best amount of Part X to use, but never use more than 1% of the total weight of the mix or the final physical properties may be affected. **Fillers** can be added to alter the properties of the cured plastic. It is imperative that any filler be thoroughly dried before mixing with resin.

PHYSICAL PROPERTIES

Kast Series Product	BC-8002 Kwik-Kast	BC-8655 Kwik-Kast	BC-8009 Slo-Kast	BC-8010 Metal-Kast
Mix Ratio By Weight or Volume	1A:1B	1A:1B	1A:1B	1A:1B
Shore Hardness*	D85	D83	D85	D83
Pot Life (min) (1 lb mix)	5-6	8-10	14-18	6-7
Demold Time (hr)†	1-2	1-2	3-4	1.5-2
Specific Gravity	1.8-1.9	1.9	1.8-1.9	1.8
Cured Color	Gray	Blue	Gray	Gray
Initial Mixed Viscosity (cP)	2,350	2,120	2,250	2,250
Specific Volume (in^3/lb)	15	14.6	15	15.4
Linear Shrinkage (in/in)^*	0.0008	0.0008	0.0002	0.0007
Heat Deflection Temp.*	179	177	173	179
Tensile Strength (psi)*	4,900	4,120	5,850	4,046
Flexural Strength, 5% Strain (psi)*	6,700	6,250	6,900	6,650
Compressive Strength (psi)*	8,300	9,200	8,800	9,750

*All values measured after 7 days at 73°F/23°C. †Demold time varies with thickness of casting and the amount of accelerator used. ^Shrinkage is primarily caused by gelling while hot then cooling.

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Fillers should be added after Part A and Part B are mixed. Add **PolyFiber II** to thicken the uncured mix to make a paste-like consistency. Microballoons can be added to create a lower density material. Bronze powder, calcium carbonate or other dry fillers can be added for varying effects. **PolyFil ND,** a neutral-density filler, can be added to reduce the cost of castings and lower the exotherm, thereby reducing shrinkage. Experiment by adding fillers at varying levels up to ~50% by weight of the mixed resin.

COLORS: Add PolyColor Dyes to Part B before mixing with Part A to create plastics of any color. Add up to 0.5% PolyColor Dye of the total mixed weight when using PolyColor Black, Brown, Blue, Green, Red and Yellow. Add up to 2% PolyColor Dye of the total mixed weight when using PolyColor White and Fleshtone.

FINISHING: Cured Kast-Series parts will yellow and chalk when exposed to sunlight and should be painted or sealed for exterior use. The adhesion of this coating should be checked carefully over a period of time to determine that it is satisfactory for the intended use. If all mold release is removed by detergent washing, most oil paints work well. An auto body primer sprayed onto the clean casting and allowed to cure for at least 24 hours can help paint adhere better. Kast-Series plastics can be easily drilled, sanded and machined.

CLEAN UP: Tools should be scraped clean before the plastic is hard. Denatured alcohol is a good cleaning solvent, but must be handled with extreme caution owing to its flammability and health hazards. Work surfaces can be coated with wax or release agent so that cured plastic can be easily removed.

SAFETY: Before use, read product labels and Safety Data Sheets. Follow safety precautions and directions. Contact with uncured products may cause eye, skin and respiratory irritation and dermal and/or respiratory sensitization. Avoid contact with skin and eyes. If skin contact occurs, remove with waterless hand cleaner or alcohol then soap and water. In case of eye contact, flush with water for 15 minutes and call physician. Use only with adequate ventilation. Polytek plastics are not to be used where food or body contact may occur. Plastics burn readily when ignited. Care should be taken with sanding dust and other easily ignitable forms of these products.

STORAGE LIFE: For best results, store products in unopened containers at room temperature (60-90°F/15-32°C) and use products within six months from date of shipment.

DISCLAIMER: The information in this bulletin and otherwise provided by Polytek® Development Corp. is considered accurate. However, no warranty is expressed or implied regarding the accuracy of the data, the results to be obtained by the use thereof, or that any such use will not infringe any patent. Before using, the user shall determine the suitability of the product for the intended use and user assumes all risk and liability whatsoever in connection therewith.

Accessories:

Accelerator
Poly 15 Part X Accelerator - 1 oz, 1 lb, 8 lb, 40 lb

Fillers
PolyFil ND - 22 lb

Thickeners
PolyFiber II - 0.5 lb, 3 lb, 15 lb

Sealers & Release Agents
Pol-Ease® 2300 Release Agent - 12-oz can, case of 12
Pol-Ease® 2500 Release Agent - 12-oz can, case of 12
PolyCoat Semi-Permanent Sealer/Release - 1qt, 1 gal
Poly PVA Solution (Green or Clear) - 2 lb, 40 lb

Product Life Extender
Poly Purge Aerosol Dry Gas - 10-oz can, case of 12

Colors
PolyColor Dyes - 0.25 lb, 1 lb, 8 lb
Black - Brown - Blue - Green - Red - Yellow - White - Fleshtone