Polytek Development Corp.

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Poly 15-Series Liquid Plastics Technical Bulletin

DESCRIPTION: Poly 15-Series Liquid Plastics are excellent for casting decorative objects, production parts, tools, models, patterns, fixtures, duplicate masters, mold shells and more.

BEFORE USE: Thoroughly read Safety Data Sheets, product labels and the "SAFETY" section in this Technical Bulletin.

Choose the Poly 15-Series product that's best for your application:

Poly 1511, 1512 and 1512X plastics have the feel and density of wood or thermoplastics. Both Poly 1511 and 1512X mixed with PolyFiber II create tough, lightweight mold shells.

Poly 15-3 and 15-3X are dense, mineral-filled plastics with low shrinkage.

For applications requiring water-clear, non-yellowing plastics, consider **Poly-Optic® 14-Series** products. For applications requiring spray application, consider **EasyFlo Series** products.

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 rubbers) do not require a release agent. When casting 15-Series 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, polyurethane rubber (e.g., 74- and 75-Series rubbers) or metal molds must be dry and require a coat of a suitable release agent (e.g., Pol-Ease® 2300 Release Agent).

PRODUCT LINE FEATURES

- Easy 1A:1B mix ratios by weight

- Reproduces fine detail

- Can be machined, drilled and sanded

- Tough and hard, but not brittle

- Lightweight for mold shells

- Low shrinkage upon cure

- Fast-setting and slower-setting options

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 and if pre-mixing of Part A or Part B component is required. Use metal or plastic mixing vessels and spatulas to avoid introducing moisture (paper or wood tools can introduce moisture).

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 or apply mix 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

PHYSICAL PROPERTIES					
Product	**15-3**	**15-3X**	**1511**	**1512**	**1512X**
Mix Ratio By Weight	1A:1B	1A:1B	1A:1B	1A:1B	1A:1B
Shore Hardness*	D80	D80	D71	D71	D71
Pot Life (1-lb mix)	15 min.	5 min.	10 min.	22 min.	5 min.
Demold Time† @ 73°F	12-16 hr.	1-12 hr.	1-16 hr.	1-16 hr.	0.5-4 hr.
Cured Color	Tan	Tan	White	White	White
Mixed Viscosity (cP)	2,000	2,000	400	400	400
Specific Volume (in^3/lb)	18	18	25.1	25.1	25.1
Specific Gravity	1.53	1.53	1.10	1.10	1.10
Linear Shrinkage*^ (in/in)	0.0006	0.0015	0.0044	0.0034	0.0048
Elongation* (%)	2.6	2.6	5.4	5.4	5.4
Max Exotherm (°F)	125	160	251	251	251
Heat Deflection Temp.* (°F)	ND	149	142	142	142
Tensile Strength* (psi)	3,509	3,890	6,712	6,712	6,712
Elastic Modulus* (psi)	202,276	ND	118,352	118,352	118,352
Flexural Modulus* (psi)	479,648	ND	241,223	241,223	241,223
Flexural Strength, 5% Strain* (psi)	5,232	ND	10,046	10,046	10,046

*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. ND = Not Determined

into opened containers of 15-Series plastics 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. 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 filler with the same density as Poly 1511, 1512 and 1512X, 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 15-Series 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: Poly 15-Series plastics 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. Poly 15-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: Safety: Before use, thoroughly read Safety Data Sheets and product labels. Follow safety precautions and directions.

Part A: Keep out of reach of children. Do not breathe fumes, vapors or mists. Use with adequate general or local exhaust ventilation to minimize exposure levels. If needed, a NIOSH-approved respirator with organic vapor cartridge may be used. If inhaled, remove victim to fresh air and keep at rest in a position comfortable for breathing. Wear impervious gloves, such as butyl rubber or nitrile rubber. Wash thoroughly with soap and water after handling. If skin irritation or rash occurs, get medical help. Wear eye protection, such as chemical safety glasses/googles. If in eyes, rinse cautiously with water for several minutes, removing contact lenses if present and easy to do. If eye irritation persists, get medical help.

Part B: Keep out of reach of children. Keep away from heat, hot surfaces, sparks, open flames, or other sources of ignition. Do not eat, drink, or smoke when using this product. Do not breathe fumes, vapors or mists. Use with adequate general or local exhaust ventilation to minimize exposure levels. If needed, a NIOSH-approved respirator with organic vapor cartridge may be used. Wear impervious gloves, such as butyl rubber or nitrile rubber. Wash thoroughly with soap and water after handling. If skin irritation occurs, get medical help. Wear eye protection, such as safety glasses/goggles. If in eyes, rinse with water for several minutes, removing contact lenses if present and easy to do. If eye irritation occurs, get medical help. If swallowed, rinse mouth and call a Poison Control center if you feel unwell. If spilled, collect spillage and avoid release to the environment.

STORAGE LIFE: For best results, store products in unopened containers at room temperature (60-90°F/15-32°C). 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

Fillers:
Bronze Powder
PolyFil ND

Thickeners:
PolyFiber II

Sealers & Release Agents:
Pol-Ease® 2300 Release Agent
Pol-Ease® 2500 Release Agent
PolyCoat Sealer & Release Agent
Poly PVA Solution (Green or Clear)

Product Life Extender:
Poly Purge Aerosol Dry Gas

Colors:
PolyColor Dyes
Black - Brown - Blue - Green - Red - Yellow - White - Fleshtone

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