

Poly 15 Series Liquid Plastics

Pourable Polyurethane Casting Resins

DESCRIPTION: Poly 15 Series Liquid Plastics are excellent for casting decorative objects, production parts, tools, models, patterns, fixtures, duplicate masters, mold shells and more. Poly 15-6, 1511, 1512 and 1512X Plastics have the feel and density of wood or thermoplastics. Poly 15-3 and 15-3X Plastics resemble stone. Poly 15-8 is an aluminum-filled system that is ideal for applications where heat resistance and thermal conductivity are required (i.e., vacuum forming). Both Poly 1511 and 1512X mixed with Poly Fiber II create tough, lightweight moldshells. With proper equipment and acceleration (with 74/75 Part X), Poly 1512 can be sprayed for hardcoating or to make sprayed-up castings. For applications requiring water-clear, non-yellowing plastics, consider Poly-Optic® 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, such as TinSil® 70 and PlatSil® 71 and 73 Series, do not require a release agent, but a barrier coat may be helpful. Latex, polyurethane rubber or metal molds must be dry and require a coat of a suitable release agent (i.e., Pol-Ease® 2300). Poly 74 Series polyurethane mold rubbers are a good choice.

MIXING: Prior to mixing Parts A and B, have all molds and equipment ready. Parts A and B should be above 60°F and stirred thoroughly, if needed, prior to use. Over time, sediment may accumulate on the container bottoms of some 15 Series products.

FEATURES

- Easy 1:1 mix formulations
- Reproduces fine detail
- Can be machined, drilled and sanded
- Tough and hard, but not brittle
- Lightweight for mold shells
- Low shrinkage upon cure
- Air bubbles rise and break
- Long working time or instant set with 15X
- Low odor formula
- Castable in large masses
- Sprayable for hardcoating

Normally, gentle mixing is all that is required to disperse the sediment. Use metal or plastic mixing vessels and spatulas to avoid introducing moisture (i.e., with paper or wood tools). Measure or weigh Parts A and B into a mixing container, such as a polyethylene pail. Mix immediately, thoroughly scraping sides and bottom for one minute. Pour mix into cavity as quickly 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. Poly Purge™, a dry gas product, can be sprayed into opened containers of Poly Plastics to displace moist air before resealing containers to extend shelf life.

PHYSICAL PROPERTIES

	15-3/15-3X	15-6	15-8	1511	1512/1512X
Mix Ratio (By Weight)	1A:1B	1A:1B	26A:100B	1A:1B	1A:1B
Hardness, Shore D	80	72	80	71	71
Pour Time, 1-lb mix (min)	15 (15-3) 5 (15-3X)	5	30	10	22 (1512) 5 (1512X)
Maximum Exotherm, 1-lb mass	122°F (50°C)	203°F (95°C)	131°F (55°C)	251°F (122°C)	251°F (122°C)
Demold Time (hr) (varies with 15X)	12 (15-3) 1 (15-3X)	1-3	1-16	0.5-1	1-16 (1512) 0.5 (1512X)
Specific Gravity	1.53	1.08	1.57	1.10	1.10
Color, Cured	Tan	Tan	Gray	White	White
Viscosity, 2-min after mix (cP)	2,000	800	6,000	400	400
Specific Volume (in ³ /lb)	18	26	17.6	25.1	25.1
Shrinkage Upon Cure (in/in)	0.0002* (15-3) 0.008* (15-3X)	0.003*	0.0002	Very low*	Very low*

*Shrinkage is primarily caused by gelling while hot then cooling. Parts that cure with minimal temperature rise exhibit minimal shrinkage.

15 Series Product	Packaging		
	Unit Sizes (lb)	Part A (lb)	Part B (lb)
Poly 15-3, 15-3X Mix Ratio 1A:1B	5.0	1 qt (2.5)	1 qt (2.5)
	20.0	1 gal (10)	1 gal (10)
	100	5 gal (50)	5 gal (50)
Poly 15-6, 1511, 1512, 1512X Mix Ratio 1A:1B	4.0	1 qt (2.0)	1 qt (2.0)
	16.0	1 gal (8.0)	1 gal (8.0)
	80.0	5 gal (40.0)	5 gal (40.0)
	900	55 gal (450)	11 x 5 gal (450)
Poly 15-8 Mix Ratio 26A:100B	3.2	1 pt (0.7)	1 qt (2.5)
	12.0	1 qt (2.5)	1 gal (9.6)
	48.5	1 gal (10.0)	5 gal (38.0)

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.

ADDITIVES: Part 15X Catalyst can be added to accelerate cure times. A few drops added to a one-pound mix speeds the cure significantly. Stir Part 15X into the Part B before adding Part A. When using 15X, exotherm (heat of reaction) and thus shrinkage is increased. Experiment to determine the best amount of Part 15X to use, but never use more than 1% of the total weight of the mix or the final physical properties may be affected.

Part 15F Foamer can be added to Poly 15-6 to create rigid, open-cell foams with densities as low as 6 lb/ft³. Stir Part 15F into the Part B before adding Part A. Experiment to determine the best amount of Part 15F for the application at hand, but never use more than 3% Part 15F of the total weight of the mix or the final physical properties may be affected. For self-skinning foams, consider Polytek's PolyFoam™ products.

Fillers can be added to alter the properties of the cured or uncured resin. It is imperative that any filler be thoroughly dried before mixing with resin. Fillers should be added to mixed A and B. Add **Poly Fiber II** to thicken the uncured mix to make a paste-like consistency. Microballoons can be added to create a wood-like,

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 15-6, 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 PolyColors to 15 Series Part B before mixing with Part A to create plastics of any color.

SPRAYING: Poly 1512X can be accelerated to create a fast (~10 sec) gelling plastic, which can be sprayed using equipment such as the Plas-Pak 1500 Sprayer. Call Polytek for more information.

FINISHING: Poly 15 Series Plastics yellow and chalk when exposed to sunlight and should be painted or sealed for exterior use. They can be easily drilled, sanded and machined. If they are to be painted or coated, adhesion of the 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.

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 waxed or coated with Pol-Ease 2300 Release Agent so hardened resin can be removed.

SAFETY: Before use, read product labels and Material 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: At least six months in unopened containers stored at room temperature (60-90°F).

DISCLAIMER: The information in this bulletin and otherwise provided by Polytek® 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
Part 15X Catalyst
1 oz, 1 pt (1.0 lb), 1 gal (8.0 lb), 5 gal (40 lb)
Part 15F Foamer
1 oz, 1 pt (1.0 lb), 1 gal (8.0 lb), 5 gal (40 lb)
Bronze Powder
2-lb can, 10-lb can, 110-lb can
Poly Fiber II
5-gal pail, 10-lb bag
PolyFil ND
22-lb pail
Pol-Ease® 2300 Release Agent
12-oz aerosol can, case of 12 cans
Pol-Ease® 2500 Release Agent
12-oz aerosol can, case of 12 cans
Poly Purge™
10-oz can, case of 12 cans
PolyColors (Red, Green, Yellow, Blue, Brown, Black & White)
4-oz bottle (0.25 lb), 1.0 pint (1.0 lb)