Polytek Development Corp.

PolyPoxy® Laminating Epoxy Series Technical Bulletin

DESCRIPTION: PolyPoxy® Laminating Epoxies are low viscosity, room temperature curing (RTV) systems formulated for general purpose and high-temperature fabrication applications. These room temperature curing systems should be used with reinforcement materials such as fiberglass, carbon fiber, and other materials for lay-up mold making and master production applications. **Product options include:**

PolyPoxy® 5008-2 is a clear, unfilled general purpose laminating epoxy.

PolyPoxy® 5010 is a white, filled general purpose laminating epoxy with higher viscosity than 5008-2.

PolyPoxy® 5105 (unfilled) and **PolyPoxy® 5114** (filled system) are heat-resistant options for high-heat applications up to 300°F (for use above 150°F, post cure is required). This product is well-suited for constructing vacuum form tools, lay-up and compression molds, RTM and RIM molds, and matched dies. **PolyPoxy® 5114** provides a higher viscosity mix for vertical applications.

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

WARNING: THE EPOXY CURE REACTION IS VERY EXOTHERMIC - IMPROPER USE OF LAMINATING EPOXY CAN CAUSE WARPING AND EVEN A FIRE. Laminating epoxy is not suitable for casting applications and is designed to be applied in very thin layers and with reinforcement material. Exothermic reactions can be greater when working in temperatures higher than the recommended mixing/application temperature range and when the epoxy is in a mass in the mixing container. It is recommended to only mix as much epoxy as will be needed for one layer. Because epoxy is especially exothermic in masses, it is important to work quickly to get the epoxy out of the mixing container and onto the desired surface.

PRODUCT LINE FEATURES

- Room-temperature curing (RTV)

- Low-Viscosity Formulas

- General Purpose & High-Temperature Application Product Options

- Product Options with Varying Pot Lives

- Excellent Wet Out of Reinforcement Materials

PREPARATION: Prior to the application of laminating epoxy, a surface coat epoxy should be applied to a properly-prepared original master. Looking for a compatible surface coat epoxy? Consider PolyPoxy® 6005, PolyPoxy® 6060 or PolyPoxy® 6126.

Once the final layer of the surface coat epoxy has been applied, allow it to cure to a point where it's tacky, but not wet. At that point, the first layer of laminating epoxy can be applied.

Before use, be sure that Resin and Hardener are at room temperature (73°F) and that all tools are ready. Surface and air temperatures should be between 60°F and 80°F during mixing, application, and for the entire curing period.

Elevated temperatures will reduce pot life, while lower temperature will slow the cure. Very low temperatures could possibly prevent the cure entirely.

MIXING: Read product labels to determine the correct mix ratio and if pre-mixing of the Resin or Hardener component is required.

It is recommended to only mix as much epoxy as will be needed for the

PHYSICAL PROPERTIES

PolyPoxy® Laminating Product	PolyPoxy® 5008-2	PolyPoxy® 5105	PolyPoxy® 5010	PolyPoxy® 5114
Mix Ratio By Weight	100 Parts Resin : 25 Parts Hardener	100 Parts Resin : 17 Parts Hardener	6 Parts Resin : 1 Part Hardener	100 Parts Resin : 13 Parts Hardener
Mix Ratio By Volume	100 Parts Resin : 26 Parts Hardener	100 Parts Resin : 20 Parts Hardener	4.5 Parts Resin : 1 Part Hardener	100 Parts Resin : 18 Parts Hardener
Shore Hardness*	D86	D90	D90	D90
Cured Color	Clear	Clear	White	Gray
Mixed Viscosity (cP) (after 2 min)	550	2,000	3,200	3,600
Pot Life (1/2 lb mass)	25 - 30 min.	55 min.	25 -30 min.	60 min.
Demold Time	8 - 12 hr.	24 hr.	8 - 12 hr.	24 hr.
Total Cure Time	7 days	7 days	7 days	7 days
Specific Gravity	1.10	1.15	1.36	1.31
Specific Volume (in^3/lb)	25.2	24.1	20.4	21.2
Tensile Strength* (psi)	9,500^	29,000^†	25,100^	26,000^†
Flexural Strength* (psi)	18,000^	34,000^†	30,500^	33,000^†
Compressive Strength* (psi)	17,400^	58,600^†	38,600^	52,800^†
Heat Distortion Temperature* (°F)	159	293	190	295

*All values measured after 7 days at 73°F/23°C. ^Properties obtained from a 10 oz. glass cloth laminate. †Post-cure properties.

55 Hilton Street, Easton, PA 18042 | 800.858.5990 | 610.559.8620 | Fax 610.559.8626 | www.polytek.com | sales@polytek.com

application of one layer. Because epoxy is very exothermic, especially in masses, it is important to work quickly to get the epoxy out of the mixing container and onto the desired surface.

Accurately weigh and dispense the Resin and Hardener components into clean plastic, metal or wax-free paper containers. Mix thoroughly, scraping the sides and bottom of the mixing container repeatedly.

APPLYING: NOTE: Laminating epoxies are not recommended for casting applications due to their very strong exothermic reactions – never cast these materials in thicknesses greater than 3/16" without reinforcement.

Once mixed thoroughly, use a chip brush (cut the bristles for better control) to brush a very thin initial layer onto the epoxy surface coat. Once thoroughly coated, apply reinforcement material into this layer. Use the chip brush in a stippling motion to work the epoxy into the reinforcement material to ensure thorough saturation. Use additional epoxy to fully saturate the reinforcement material if needed. Do not over-apply the epoxy to the point where it starts to pool.

Allow this initial layer to cure until almost "tack-free" – when in this state, the application of the second layer should not disturb or pull away the initial layer. Continue to apply thin layers in the same manner as the initial layer until a desired thickness has been achieved. Do not allow a preceding layer to cure for the specified demold time before applying the next layer.

CURING: Allow epoxy to cure at room temperature for the specified demold time listed in the Physical Properties table in this Technical Bulletin. Parts demolded too soon may be subject to deformation. Low temperatures will slow the curing and extend demold time, while higher temperatures will shorten the demold time.

Although a part may be demolded after the specified demold time, ultimate physical properties will not be achieved until after 7 days at room temperature. For PolyPoxy® 5105, ultimate physical properties are achieved upon post curing.

POST-CURING: For PolyPoxy® 5105 & 5114 - For best results, post cure on the original master to help eliminate deformation. Post cure for applications requiring temperatures above 150ºF can be accomplished in an oven with gradual heat rise; 2 hours @ 150ºF plus 2 hours @ 250ºF plus 2 hours at 300ºF. This post cure schedule will result in a laminate with a heat distortion temperature of approximately 300°F / 149°C.

CLEAN UP: Tools should be wiped clean before the epoxy 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.

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.

SAFETY: Before use, thoroughly read Safety Data Sheets and product labels. Follow safety precautions and directions.

Resin: Keep out of reach of children. Avoid breathing 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. Contaminated work clothing should not be allowed outside of the workplace. Take off contaminated clothing and wash it before reuse. If skin rash or irritation occurs, get medical help. Wear eye protection, such as chemical safety glasses/googles. If in eyes, rinse immediately with water for several minutes, removing contact lenses if present and easy to do. If eye irritation persists, get medical help.

Hardener: Keep out of reach of children. 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. 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. Contaminated work clothing should not be allowed out of the workplace. Take off contaminated clothing and wash it before reuse. If skin rash occurs, get immediate medical help. Wear eye protection, such as safety glasses/goggles. If in eyes, immediately rinse with water for several minutes, removing contact lenses if present and easy to do. Get immediate medical help. If swallowed, rinse mouth and do not induce vomiting. Get medical attention immediately. If spilled, collect spillage and avoid release to the environment.

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ACCESSORIES

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

Product Life Extender:
Poly Purge Aerosol Dry Gas

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