

# PolyFoam Series

# Technical Bulletin

**DESCRIPTION:** PolyFoam Series casting foams consist of two parts (A and B) that, after mixing, form rigid or flexible foam products with densities in the range of 3 to 20 lb/ft<sup>3</sup>. PolyFoam R-2, R-5 and R-8 are rigid foams. PolyFoam F-3 and F-5 are flexible for casting soft parts. Consider PolyFoams for production of decorative objects, lightweight mold shells, production parts, models, patterns, fixtures, duplicate masters and general tooling use. PolyFoam systems are practically odorless and do not contain toluene diisocyanate, MOCA, heavy metals or HCFCs.

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

**MOLD PREPARATION:** PolyFoam reproduces minute detail from molds or patterns, but may stick when poured on improperly prepared surfaces. Polyethylene and silicone rubber molds (e.g., PlatSil® 71-Series or 73-Series) do not require a release agent. When casting rigid foams, the use of an appropriate primer paint (or other water-based primer) sprayed in the silicone mold and allowed to dry before casting can help to extend mold life. It will also result in a pre-primed cast part and will help additional paint adhere to the part. Polyurethane rubber (e.g., Poly 74- Series or 75-Series) or metal molds must be dry and coated with a suitable release agent (i.e., paste wax, PolyCoat or PVA Solution). Rubber molds and the overall mold construction must be strong enough so as not to distort when subjected to packing pressures.

**MIXING:** Before mixing foam, be sure that both Parts A and B are at room temperature and that all tools are ready. PolyFoams set fast -- meaning that you must work quickly. Measure or weigh Parts A and B into separate containers (e.g., polyethylene pails). Combine Parts A and B and mix immediately with a Turbo Mixer or other high speed mixer for 15 seconds. Small mixes can be stirred rapidly by hand. Pour mix into cavity as quickly as possible since foaming starts immediately. If too much time elapses, the foam will rise in the mixing container and the mix may be lost.

Once the containers of Parts A and B are opened, they should be used or resealed tightly since atmospheric moisture contamination may cause

## PRODUCT LINE FEATURES

- Rigid and flexible foam options
- Densities range from 3 to 20 lb/ft<sup>3</sup>
- Specially formulated fire-retardant versions are available upon request

foaming of the plastic. PolyPurge, a dry gas product, can be sprayed into opened containers of PolyFoam to displace moist air before resealing containers to extend shelf life.

**CURING:** Packing PolyFoams to a minimum of 2 to 3 lb/ft<sup>3</sup> above their free-rise density is recommended to achieve good surface detail and mold fill. A lid with small vents to allow air to escape as foam rises should be firmly clamped in place prior to rise. Once foam begins to rise, avoid stirring or other movement that will cause cells to collapse. Castings should be allowed to remain in the mold until thoroughly cured. Parts demolded too soon may be subject to deformation. For best casting results, the mold should be warmed to 75 to 85°F prior to casting the first part. Once a mold is heated and cycled, it will maintain heat for continued production.

Flexible foam parts should be hand crushed after demold to minimize shrink and distortion.

**FINISHING:** Cured PolyFoam systems will yellow and chalk when exposed to sunlight and should be painted or sealed for exterior use (painting is not recommended on flexible foam). PolyFoam R-2, R-5 and R-8 can be easily drilled, sanded and machined. If a casting is 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.

**COLORS:** Add PolyColor Dyes to PolyFoam Part B before mixing with

## PHYSICAL PROPERTIES

Product	PolyFoam R-2	PolyFoam R-5	PolyFoam R-8	PolyFoam F-3	PolyFoam F-5
Mix Ratio By Weight or Volume (unless otherwise noted)	1A:1B	1A:1B	1A:1B	1A:2B (by weight)	1A:1B
Mix Viscosity (cP)	500	1,100	1,100	2,000	1,400
Cream Time	30 sec.	45 sec.	45 sec.	25 sec.	45 sec.
Rise Time	3 min.	2 min.	2 min.	1.5 min.	3-5 min.
Tack-Free Time	10 min.	3 min.	3 min.	3 min.	25 min.
Demold Time	30 min.	10-15 min.	10-15 min.	10 min.	30-60 min.
Free-Rise Density (lb/ft <sup>3</sup> )	2.5	5	8	3	5
Molded Density (lb/ft <sup>3</sup> )	4-8	8-20	8-20	5-8	8-15

Part A to create foams 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.

**CLEAN UP:** Tools should be scraped clean before the foam cures. 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, 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 only outdoors or 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. If experiencing respiratory irritation, get medical attention. Wear impervious gloves, such as butyl rubber or nitrile rubber. Wash contaminated clothing before reuse. Wash skin thoroughly with soap and water after handling. If skin irritation occurs, get medical attention. Wear eye protection, such as chemical safety glasses/goggles. If in eyes, rinse cautiously with water for several minutes, removing contact lenses if present and easy to do. If eye irritation occurs, get medical attention. Store in a well-ventilated place and keep container tightly closed. If spilled, avoid release to the environment.

**Part B:** Keep out of reach of children. 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 skin thoroughly with soap and water after handling. Wear eye protection, such as chemical safety glasses/goggles. If in eyes, rinse cautiously with water for several minutes, removing contact lenses if present and easy to do.

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

PolyFoam F-5 Part A may crystallize, develop sediment and become cloudy if stored at temperatures below 60°F. To restore product, loosen lid (to avoid pressure buildup) and warm product to 120-160°F until the liquid is clear. Before use, let product cool to room temperature. Using a crystallized or cloudy Part A may result in a foam with inferior physical properties.

**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.

### Note on Foam Compaction Calculation:

Determine the volume of the space you want to fill with foam in cubic inches (in<sup>3</sup>). Convert the volume to ft<sup>3</sup> by dividing by 1728 in<sup>3</sup>/ft<sup>3</sup>. Determine the desired density of the foam part in pounds per cubic foot (lb/ft<sup>3</sup>). Note: Foam products are typically compacted to at least 2 pounds more than their free-rise density to produce good quality parts. Therefore, to determine the quantity of foam needed, add at least 2 pounds to the free-rise density (e.g., for R-2, use at least 4 lb/ft<sup>3</sup>; for R-5 use 7 lb/ft<sup>3</sup>; and so on). Multiply the volume of the part (ft<sup>3</sup>) by the desired density (lb/ft<sup>3</sup>) to determine how many pounds of PolyFoam liquid to mix.

**Example:**

You intend to make a part that is 4320 in<sup>3</sup>.

Convert to ft<sup>3</sup>: 4320 in<sup>3</sup> ÷ 1728 in<sup>3</sup>/ft<sup>3</sup> = 2.5 ft<sup>3</sup>.

Desired density is 5 lb/ft<sup>3</sup>, so choose R-2 and determine volume to pour based on packing to 5 lb/ft<sup>3</sup>.

5 lb/ft<sup>3</sup> x 2.5 ft<sup>3</sup> = 12.5 lb PolyFoam total

## ACCESSORIES

**Sealers & Release Agents:**

PolyCoat Sealer & Release Agent  
Poly PVA Solution

**Product Life Extender:**

Poly Purge Aerosol Dry Gas

**Colors:**

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