EPOXICAL

Distributed by:
Rudolph Bros. & Co.
PO Box 425, Canal Winchester, OH 43110
Phone: 614-833-0707
Fax: 800-600-9508
e-mail: rbcsupport@rudbro.com
www.rudbro.com

TECHNICAL DATA BULLETIN

ALUMINUM FILLED EPOXY CASTING SYSTEM

301A RESIN / 301B, 731B, 308B HARDENER

Epoxical 301A Resin with Epoxical 301B, 731B or 308B Hardeners provide accurate thick or thin section plastic castings for dimensionally stable tooling. The systems cure at room temperature, but a mild post cure will increase the operating service temperature of the part. The material can be poured into molds made of plaster, wood, metal or plastic. The low shrinkage aids precision fabrication of match plates, core boxes, dryer patterns, and cope and drag equipment for the foundry. The three systems offer a choice of hardeners for casting tools or patterns in a range of thicknesses from 1/16" to 5 ". The high loading of aluminum filler provides for excellent machinability.

HANDLING PROPERTIES

	VALUE			TEST METHOD
301A	301B	731B	308B	
Resin Density, lbs/gal	16.6	16.6	16.6	ASTM E-201
Hardener Density, lbs/gal	8.5	8.2	8.0	ASTM E-201
Resin Viscosity @ 25ºC, cps	17,000	17,000	17,000	ASTM D-2393
Hardener Viscosity @ 25ºC, cps	120	2,400	3,200	ASTM D-2393
Mixed Viscosity @ 25ºC, cps	7,000	6,800	6,600	ASTM D-2393
Pot Life @ 25ºC,150g mass,minutes	45-50	60-70	90-100	ASTM D-2471
Mix Ratio By Weight	12A : 1B	9A : 1B	7A : 1B	Calculated
Mix Ratio by Volume	6.2A : 1B	4.3A : 1B	3.4A : 1B	Calculated
Casting Thickness				
Wood or Plaster Molds, inches	≤½	≤1-½	≤4	
Metal Molds, inches	≤¾	≤1-¾	≤5	
Minimum Thickness, inches	1/16	½	2-½	

Shelf Life – One year from date of shipment.

PHYSICAL PROPERTIES

301A	301B	731B	308B	TEST METHOD
Color	Gray	Gray	Gray	Visual
Shore D Hardness	92	88	83	ASTM D-2240
Tensile Strength, psi	4,500	4,600	3,900	ASTM D-638
Tensile Modulus, psi	270,000	290,000	245,000	ASTM D-638
Compressive Strength, psi	13,500	13,000	10,000	ASTM D-695
Flexural Strength, psi	8,400	8,500	8,200	ASTM D-790
Flexural Modulus, psi	290,000	310,000	260,000	ASTM D-790
Shrinkage, in./in.	<0.002	<0.003	<0.005	ASTM D-2566
HDT, RT, ºF	135	130	128	ASTM D-648
HDT, Post Cure, ºF	170	160	155	ASTM D-648
CTE, in/in/ºF	2.5×10^{-5}	2.6×10^{-5}	2.7×10^{-5}	ASTM D-696
Density, Cured, g/cm^3 (lbs./in.^{3})	1.85 (0.067)	1.80 (0.065)	1.77 (0.064)	ASTM D-792
Density, Cured, in.^{3}/lb.	14.9	15.4	15.6	Calculated
Thermal Conductivity, BTU/hr/ft/ft²/ºF	0.62	0.60	0.58	ASTM E-1225

MIXING AND HANDLING:
Premixing of the resin is required to insure complete suspension of the aluminum filler. Mix the resin for at least 5 minutes with a power mixer and an appropriate size blade for the container dimensions. Once mixed, add the appropriate amount of hardener and mix for 5 minutes or until mixture is thoroughly blended. Pour the mixed material slowly and consistently into the mold cavity to reduce trapped air and do not exceed the specified depth for the system being used. It may be necessary to pour in multiple stages for improved control over exotherm. Each stage must cool to room temperature before the next stage is poured to eliminate undesired exotherm. Always use clean dry tools for mixing and applying. Material temperatures should not be below 65ºF when mixing.

CURE INCREMENTS:
Epoxy systems require an elevated temperature postcure to enable the mixed resin and hardener to develop their full physical and temperature properties. Use the following postcure cycle if enhanced HDT properties are required: 150ºF for 5 hours.

TOOL, MOLD AND/OR PATTERN PREPARATION:
Wood structures should be sealed. The moisture in wood not sealed will react with the epoxy system to cause a higher exotherm and a froth-like condition near the wood. Gypsum molds should be dried to remove free moisture and sealed with the PFP process or appropriate sealer. Non-porous tools, molds or patterns should be treated with release or parting agents which can withstand the temperature that the part will be cured at while remaining in a supported position.

ALUMINUM PARTICLE ADDITIVES:
The addition of aluminum grain, shot, granules, puffs or chopped wire will lower the exothermic temperature of large pours while curing. The cured part will have greater dimensional stability when exposed to temperature variations and higher impact resistances. Care must be taken on the selection of particle size if additional machining operations are required.

STORAGE:
Store at 60-90ºF in a dry place. After use, tightly reseal. Store products on pallets during cold weather and avoid storing near outside walls or doors. Epoxy resins that are contaminated with dust or moisture or are subjected to low temperatures may crystallize. Do not use material that has any sign of crystallization until it has been reliquified. A crystallized resin or hardener can be returned to its original state by heating the material to 140ºF to 150ºF and stirring until its liquid consistency is regained.

SAFETY HANDLING:
Work in well ventilated areas using gloves, eye protection and clothing protection. Avoid contact to the skin and eyes. Avoid clothing contamination. Wash thoroughly after handling. These products may cause skin and respiratory allergic reactions. Consult Material Safety Data Sheets for complete precautions with this product.

Revised April 2003