



**EC-415
EPOXY CASTING
SYSTEM**
HIGH TEMPERATURE
ALUMINUM FILLED GREY



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DESCRIPTION

EC-415 is an advanced two-component aluminum-filled ultra high-temperature epoxy casting system for use up to 220°C/425°F for the extreme temperature requirements of today's material processing. Molds and tools fabricated with EC-415 exhibit extreme wear resistance capabilities and extended production capabilities. EC-415 is a room temperature (B-stage) hardening system, however, a preliminary post cure (see schedule) of the cast is recommended prior to demolding to pre-cure the cast. EC-415 offers a low coefficient of thermal expansion and high heat deflection and excellent tool life. **Typical applications include: Autoclave (prepreg) Tooling, Plastic Injection Molds, SMC Compression Molds, High-Pressure/High-Temp RTM Molds, LP-SMC Compression Molds, High-Temp Rubber Molding.**

To achieve maximum casting volume or thickness it is recommended that EC-415 be used in conjunction with N-20 granular aluminum, N-50 aluminum grain or N-6 ceramic bulk filler.

HANDLING CHARACTERISTICS @ 25°C/77°F:

Mix Ratio (parts by weight)	100R/10H
Density: Resin	13.42 lbs/gal
Hardener	8.35 lbs/gal
Mixed	10.88 lbs/gal
.....	0.047 lbs/cu.in
Specific Gravity	1.30 gms/cc
Mixed Viscosity	32,000-40,000 cps
Work Life (200 gram mass)	2-3 hours
De-mold Time	24 hours
Complete Cure	Post Cure
Shelf Life EC-415 Resin (in original unopened containers)	1 year
Shelf Life EC-415 Hardener (in original unopened containers)	2 years

PHYSICAL PROPERTIES

CAST BAR

Ultimate Tensile Strength	3,311 psi
Ultimate Flexural Strength	7,743 psi
Ultimate Compressive Strength	15,980 psi
Coefficient of Thermal Expansion	10.3 x 10 ⁻⁶ in/in°F
Heat Deflection Temperature	
@ 66 psi	>220°C/428°F
@ 264 psi	>220°C/428°F
Tensile Elongation	0.512%
Cast Linear Shrinkage (Neat Resin)	0075 in/in
(Filled 50% by volume with N-20 Aluminum Shot)	0.0037 in/in
Hardness	88-90 Shore D

RECOMMENDED CURE SCHEDULE

Always allow tools made with ADTECH high temperature systems to harden (B-stage) at room temperature before subjecting them to post cure, 24 hours is recommended. This will prevent excessive exotherm and shrinkage from occurring. The recommended preliminary post cure schedule for EC-415 is as follows:

- ◆ Cure for 24 hours at room temperature (25°C/77°F)
- ◆ Followed by a heat cure on the model for a minimum of 3 hours at 66°C/150°F
- ◆ You may de-mold the tool after the preliminary cure schedule is complete and proceed with the heat conditioning cure schedule described below:

A conditioning post cure at a temperature equivalent to your production molds constant operational temperature is advised. If an additional post cure is necessary beyond the preliminary cure schedule; the recommended cure schedule is as follows:

- ◆ Ramp up and cure for 2 hours at 93°C/200°F
- ◆ Ramp up and cure for 2 hours at 121°C/250°F
- ◆ Ramp up and cure for 2 hours at 149°C/300°F
- ◆ Ramp up and cure for 2 hours at 176°C/350°F

Always insure that proper heat curing temperatures are met by installing a thermocouple directly in the center of the tool casting and monitoring the temperature readings.

HEAT CONDITIONING OF CAST EPOXY MOLDS

It is always advisable to heat cure cast epoxy molds internally, using the temperature control system built into your working mold (i.e. copper tubing or insulated electrical grid). If oven curing is your only option, it is advisable to complete the initial cure on the model at 52°C/125°F for 6-8 hours or overnight before increasing the oven temperatures. Extremely large cast molds should always be heat cured internally and should not be moved or transported to another location prior to an internal heat cure process of 66°C/150°F.

RATES OF HEATING AND/OR COOLING OF CAST EPOXY MOLDS

When taking molds through the post cure phase, always place mold in a room temperature oven and increase the temperature at a rate of no more than 13°C/25°F per hour. When cooling, allow the mold to remain in the heated environment and decrease the temperature at a rate of no more than 27°C/50°F per hour. Never remove the mold from the oven until it has reached 38°C/100°F. Removing a mold heated above 38°C/100°F can result in thermal shock and warp. Ensure proper curing temperatures are met by installing a thermocouple directly in the center of the mold casting. Please contact our Technical Service department with any questions regarding post curing.

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