

## TECHNICAL DATA SHEET

# EC-415

## HIGH TEMPERATURE/EPOXY CASTING SYSTEM ALUMINUM FILLED GRAY

### DESCRIPTION

*DESCRIPTION* EC-415 is an advanced two-component aluminum-filled ultra-high temperature epoxy casting system for use up to 425°F (220°C) 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 casting. EC-415 offers a low coefficient of thermal expansion, high thermal conductivity, high heat deflection, and excellent tool life. **Typical applications include: Autoclave (prepreg) Tooling, Plastic Injection Molds, SMC Compression Molds, High-Pressure/High-Temperature RTM Molds, LP-SMC Compression Molds, High-Temperature Rubber Molding.**

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

### APPLICATIONS

- Autoclave (prepreg) Tooling
- Plastic Injection Molds
- SMC Compression Molds
- High-Pressure/High-Temperature RTM Molds
- LP-SMC Compression Molds
- High-Temperature Rubber Molding

## PHYSICAL PROPERTIES

<b>Typical Handling Properties @ R.T. (77 °F)</b>	
Mix Ratio (parts by weight):	100R/10H
Color	Aluminum Gray
Specific Gravity (g/cc)	1.30
Mixed Viscosity - (cps & mPa.s)	32,000 – 40,000
Pot Life (200 gram mass) - Hours	2-3
De-mold Time - Hours	24
Complete Cure*	See Post Cure
Cure Time	8 - 12 hours

<b>TYPICAL PHYSICAL PROPERTIES – TESTED @ R.T. (77 °F) - Full Cure*</b>	
Tensile Strength - psi (Mpa)	3,311 (23)
Tensile Elongation - (%)	1.0
Flexural Strength - psi (Mpa)	7,743 (53)
Compressive Strength - psi (Mpa)	15,980 (110)
Hardness - (Shore D)	88 - 90
Linear Shrinkage – (in/in)	0.0075
Linear Shrinkage – (in/in) (Filled 50% by volume with N-20 Aluminum Shot)	0.0037
Heat Deflection Temperature @ 66 psi.	428°F (220°C)
Coefficient of Thermal Expansion (TMA) (ppm/°F (°C))	10 (19)
Thermal Conductivity - W/mK	0.617

### RECOMMENDED CURE SCHEDULE\*

Always allow tools made with 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 (77°F (25°C))
- ◆ Followed by a heat cure on the model for a minimum of 3 hours at 150°F (66°C)
- ◆ 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 (4 hours minimum). If an additional post cure is necessary beyond the preliminary cure schedule; the recommended cure schedule is as follows:

(Full Cure Schedule)\*

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

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 125°F (52°C) 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 150°F (66°C).**

## 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 50°F (30°C) per hour. When cooling, allow the mold to remain in the heated environment and decrease the temperature at a rate of no more than 50°F (30°C) per hour. Never remove the mold from the oven until it has reached 100°F. Removing a mold heated above 100°F (38°C) 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.

## HANDLING PRECAUTIONS

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Normal health and safety precautions should be observed when handling these products:

- Ensure good ventilation.
- Wear gloves, glasses and protective clothes.

For further information, please consult the Safety Data Sheets.

## STORAGE CONDITIONS

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- This product has a shelf life of 12 months for the resin and 24 months for the hardener as indicated by the expiration date on the container when stored in original unopened containers.

## PACKAGING

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Packaging information on request, please contact your local sales representative or find your local contact on [www.sikaadvancedresins.us](http://www.sikaadvancedresins.us)

## LEGAL NOTICE

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