

Product Bulletin



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EC-433
 HIGH TEMPERATURE
 EPOXY CASTING SYSTEMS
 ALUMINUM FILLED

3 HARDENERS AVAILABLE 0302

DESCRIPTION

EC-433 aluminum filled epoxy casting systems are developed for use in heat resistant tooling applications such as prototype injection molding, vacuum forming, and other high temperature cast tooling applications. EC-433 offers 3 separate hardeners with various working times, suitable for any tool size. EC-433 is a room temperature hardening (B Stage) system, but a post cure is necessary for use over 66°C/150°F. Tools made with EC-433 can be used at continuous temperatures of 160°C/320°F and intermittent temperatures up to 177°C/350°F. EC-433 features easy mixing, accepts higher loading of bulk aluminum, and exhibits greater dimensional stability. EC-433 takes advantage of the latest polymer technology to reduce exotherm, protecting valuable masters.

USES

Vacuum Form Molds	Compression Molds
Prototype Injection Moldings	RIM Molds
Foam Molds	Other High Temp Cast Applications

HANDLING CHARACTERISTICS @ 25°C/77°F

	EC433-2 (FAST)	EC-433-3 (MEDIUM)	EC-433-4 (SLOW)
Mix Ratio (parts by weight)	100R/12H	100R/13H	100R/13H
Density (Mixed – lbs./gal.)	13.5	13.3	13.3
(Mixed – lbs./cu. in.)	0.0584	0.0575	0.0575
Specific Gravity	1.62	1.59	1.59
Mixed Viscosity (cps)	9,000	15,000	15,000
Work Life	120 min.	200 min.	270 min.
Demold Time	24 hours	*** See Schedule ***	
Complete Cure	Post cure	Post Cure	Post Cure
Recommended Casting Size	< 2 cu. ft.	2 – 5 cu. ft.	> 5 cu. ft.
Color	Resin – Gray	Hardener – Amber	Mixed – Gray
Shelf Life (Stored in closed container at ambient temperature)	1 Year	1 Year	1 Year

PHYSICAL PROPERTIES

CAST BAR:

	EC433-2 (FAST)	EC-433-3 (MEDIUM)	EC-433-4 (SLOW)
Ultimate Tensile Strength (ASTM D-638.91)	5,750 psi	6,185 psi	7,990 psi
Tensile Modulus (ASTM D-638.91)	941,200 psi	803,200 psi	665,000 psi

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PHYSICAL PROPERTIES (Cont.)

	<u>EC433-2 (FAST)</u>	<u>EC-433-3 (MEDIUM)</u>	<u>EC-433-4 (SLOW)</u>
Ultimate Flexural Strength (ASTM D-790.92)	10,620 psi	10,280 psi	11,670 psi
Flexural Modulus (ASTM D-790.92)	700,900 psi	762,300 psi	756,000 psi
Ultimate Compressive Strength (ASTM D-695.91)	16,300 psi	16,100 psi	18,650 psi
Impact Strength – Notched Izod (ASTM D-256.93A)	11.8 in-lb/in	7.22 in-lb/in	8.8 in-lb/in
Coefficient of Thermal Expansion (in/in-°F)	28.17x10 ⁻⁶	28.28x10 ⁻⁶	29.28x10 ⁻⁶
T _g by DMA	288°F/142°C	305°F/152°C	285°F/141°C
Hardness	89-90 Shore D	90 Shore D	91 Shore D
Linear Shrinkage (200 cm ³ mold (-2); 4,650 cm ³ mold (-3 & -4))	0.005in/in	0.004 in/in	0.004in/in
Linear Shrinkage filled with N-20 aluminum grain (4,650 cm ³ mold)	0.0016 in/in	0.003 in/in	0.003in/in

CURE SCHEDULE

PRELIMINARY CURE

24 hours @ 25°C/77°F
 3 hours @ 66°C/150°F

You may attach support structure and demold tool after the preliminary schedule is complete.

POST CURE

Curing to a temperature 25°F above the required service temperature is acceptable; 150°F is the minimum cure temperature. The following schedule is recommended.

	<u>Optional</u>
2 hours @ 200°F	2 hours @ 200°F
2 hours @ 250°F	2 hours @ 350°F
2 hours @ 300°F	

The 350°F option may be necessary to condition tool at least 25°F above required service temperature.

Insure proper heat curing temperatures are met by installing a thermocouple directly in the center of the tool.

Always allow tools made with ADTECH high temp systems to gel at room temperature before subjecting them to post cure (24 hours is sufficient). This will prevent excessive exotherm and shrinkage from occurring.

When taking tools through a preliminary or post cure phase always place tool in a room temperature oven and increase temperature at a rate of no more than 5°F/minute.

When cooling tools always allow tool to remain in heat environment and decrease temperature at a rate of no more than 10°F/minute. Do not remove tool from heat environment until tool has reached 100°F or less. Removing tool at temperatures above 100°F can result in thermal shock and warpage.