

# Product Bulletin

# CASS POLYMERS

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**ES-225**  
EPOXY SURFACE COAT  
HIGH TEMPERATURE - POLISHABLE  
ALUMINUM

0302

## DESCRIPTION

ES-225 is an aluminum filled, epoxy system designed for tool makers. This new high temperature product produces an abrasion-resistant surface that can be polished to a high gloss. ES-225 features a fast cure time, modest tack time, excellent brushing characteristics, and inter-layer open time exceeding one hour. Developed for use with Adtech casting resins, such as the EC-433 system.

## APPLICATIONS

- Vacuum-form Molds
- Autoclave / High-temperature Tooling
- Blow Molds
- Bond Fixtures

## TYPICAL MIXED PROPERTIES @ ROOM TEMPERATURE 77° F (25° C)

Property	Test Method	Test Values
		<u>ES-225</u>
Mix Ratio by Weight		100R / 9H
Viscosity (cps)	ASTM D-2392	54,000
Density (lbs./gal)	ASTM D-792	14
Specific Gravity (grams/cc)	ASTM D-792	1.69
Work Life (minutes)		25
Tack Time (minutes)		75
Demold Time (hours)		24

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**PHYSICAL PROPERTIES**

<b>Property</b>	<b>Test Method</b>	<b>Test Values</b>
<u>Cast Bar</u>		<u>ES-225</u>
Tensile Strength (psi)	ASTM D-638	8,100
Tensile Modulus (psi)	ASTM D-638	876,000
Tensile Elongation (%)	ASTM D-638	1.6
Flexural Strength (psi)	ASTM D-790.92	15,570
Flexural Modulus (psi)	ASTM D-790.92	570,000
Comp. Strength (psi)	ASTM D-695.91	21,300
Comp. Modulus (psi)	ASTM D-695	256,000
Tg by DMA (° F/° C)		238
IZOD Impact (in-lbs./inch.)	ASTM D-256	8.4
HDT @ 66 psi (° F/° C)	ASTM D-648.82	221 / 105
HDT @ 264 psi (° F/° C)	ASTM D-648.82	208 / 98
Shore D Hardness	ASTM D-2240	88
Shrinkage, in/in	ASTM D-2566 Mold #1	0.0028

**RECOMMENDED CURE SCHEDULE**

The recommended cure time for surface coat systems is seven days at 77° F (25° C). For superior properties, however, an elevated temperature cure is required.

Post-cure schedule:

- Cure for 24 hours at room temperature 77° F (25° C)
- Heat cure for 2 hours at 150° F (66° C)

NOTE: We recommend the tool be left on the master for this initial post cure. The tool can then be supported with back-up structure and demolded for the remaining post cures.

- Continue heat cure for 2 hours at 200° F (93° C) plus 2 hours at 250° F (° C)

Post-cure Instructions: Always heat or cool tools at a rate of 3 to 5° F per minute only. Begin by placing tool in a room-temperature oven. Initiate post-cure by ramping the tool to 150° F (66° C) and hold for 2 hours. Continue 3 to 5° F per minute ramp-up rate and hold for 1 hour at each 50° F increment until intended use temperature is reached.

When cooling, allow the tools to remain in the heated environment and decrease the temperature at a rate of no more than 5° F per minute. Remove the tool after cooling the oven below 100° F to avoid thermal shock and warpage. Install thermocouples in the tool to ensure proper curing temperatures.

**PACKAGING**

ES-225 system is available in the following kits:

Quart Kits  
Gallon Kits  
Pail Kits