



# ES-229 HIGH TEMP EPOXY SURFACE COAT

PRODUCT BULLETIN



ALUMINUM FILLED

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## DESCRIPTION

ES-229 is a thixotropic, aluminum filled, high temperature epoxy surface coat which gives excellent surface duplication while maintaining non-sag qualities. ES-229 mixes easily and applies smoothly with a brush. ES-229 can be used for high-temp tooling applications up to 149°C/300°F. Use ES-229 surface coat with EC-433 / EC-439 / EC-440 casting systems or EL-336 / EL-337 laminating systems. **Typical applications include: Vacuum Form Molds, RIM Molds, High Temp Bonding Fixtures, Autoclave Molds, Plastic Injection Molding Prototypes, High Temp Holding Fixtures, RTM Molds, Cold Press Molds and Drape Form Molds.**

## HANDLING CHARACTERISTICS @ 25°C/77°F

|  |   |
|--|---|
| Mix Ratio (parts by weight).....                                       | 100R/15H  |
| Mixed Viscosity .....  | 12,400 cps  |
| Mixed Density.....   | 11.6 lbs/gallon                                   |
| .....  | 0.050 lbs cu/in                                   |
| Yield Per Pound @ 0.030" .....   | 4.6 sq/ft   |
| Work Life (230 gram mass).....   | 23 minutes  |
| Specific Gravity .....   | 1.39 grams/cc                                     |
| Cure-To-Demold (also reference laminating or casting system used)..... | 8-16 hours  |
| Complete Cure .....  | refer to recommended oven cure schedule on page 2 |
| Resin Color.....   | Grey  |
| Hardener Color.....  | Amber   |
| Mixed Color .....  | Aluminum Grey                                     |
| Shelf Life ES-229 Resin (in original unopened containers) .....        | 2 years   |
| Shelf Life ES-229 Hardener (in original unopened containers) .....     | 2 years   |

## TYPICAL PHYSICAL PROPERTIES (CAST BAR)

|  |                |
|--|----------------|
| Tensile Strength .....                     | 11,640 psi     |
| Tensile Elongation.....                    | 4.5%           |
| Flexural Strength.....                     | 19,560 psi     |
| Flexural Modulus.....                      | 509,000 psi    |
| Compressive Strength.....                  | 15,290 psi     |
| Izod Impact Strength .....                 | 5.8 (ft-lb)/ft |
| Hardness .....                             | 90 Shore D     |
| Heat Deflection Temperature @ 264 psi..... | 104°C/220°F    |
| Heat Deflection Temperature @ 66 psi.....  | 110°C/229°F    |

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**POST CURE SCHEDULE**

16 – 24 hours @ 25°C/77°F  
+2 hours @ 66°C/150°F  
+2 hours @ 93°C/200°F  
+2 hours @ 121°C/250°F  
+2 hours @ 149°C/300°F

NOTE: The post cure schedule of the high-temp tooling epoxy laminate or casting system used with your surface coat would have precedence over that of the surface coat. However, to attain suitable high temperature resistance and chemical resistance, the surface coat is recommended to be post cured to a minimum of 93°C/200°F.

**HEATING AND COOLING RATES DURING POST CURE**

When oven curing laminated molds always place the mold in a room temperature oven, increasing the temperature at a rate of no more than 13°C/25°F per hour. When cooling, allow molds to remain in the heated oven, decreasing the temperature at a rate of no more than 27°C/50°F per hour. Never remove the mold from the oven until temperature has been lowered to less than 38°C/100°F.

Once a mold has been heat cured and conditioned, and during the production curing cycles of composite parts or thermoplastic parts, you can revert to the heating/cooling rates prescribed for the production pre-preg, two component resin or thermoplastic being processed.