



**ES-219
HIGH TEMP EPOXY
SURFACE COAT
ALUMINUM FILLED**



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DESCRIPTION

ES-219 is a thixotropic, aluminum filled, high temperature epoxy surface coat which gives excellent surface duplication while maintaining no sag qualities. ES-219 mixes easily and applies smoothly with a brush. ES-219 can be used constantly at temperatures up to 310°F (154°C). Use ES-219 with ADTECH EL-336 or EL-337. **Typical applications include: vacuum form molds, blow molds, high temperature bonding fixtures, high temperature holding fixtures and any high temperature tooling.**

TYPICAL HANDLING CHARACTERISTICS @ 77°F (25°C)

Mix Ratio (parts by weight)	100R/10H
Mix Ratio (parts by volume)	9.1R/1H
Density (mixed)	10 lbs/gallon
.....	0.043 lbs/cu in
Specific Gravity	1.20 g/cc
Resin Viscosity	200,000cps
Hardener Viscosity	750cps
Mixed Viscosity	100,000cps
Work Life	30-40 minutes
Tack Free Time	2-3 hours
Demold Time	16-24 hours
Resin Color	Gray
Hardener Color	Amber
Mixed Color	Gray
Shelf Life ES-219 Resin (in original unopened containers)	1 year
Shelf Life ES-219 Hardener (in original unopened containers).....	2 years

TYPICAL PHYSICAL PROPERTIES

Ultimate Tensile Strength(ASTM D-638.91).....	5,000psi (35MPa)
Tensile Modulus(ASTM D-638.91)	641,400psi (4,422MPa)
Tensile Elongation(ASTM D-638.91).....	0.60%
Ultimate Compressive Strength(ASTM D-695.91)	27,500psi (190MPa)
Compressive Modulus(ASTM D-695.91)	154,500psi (1,0652MPa)
Ultimate Flexural Strength(ASTM D-790.92)	8,000psi (55MPa)
Flexural Modulus(ASTM D-790.92)	319,800psi (2,205MPa)
Coefficient of Thermal Expansion: PPM/°F (°C)	20.3 (36.5)
Heat Deflection Temperature @66psi(ASTM D-648.82)	236°F (113°C)
Heat Deflection Temperature @ 264psi(ASTM D-648.82)	221°F (105°C)
Notched Izod Impact Strength(ASTM D-256.93A)	6.87 in-lb/ft
Moisture Absorption (ASTM D-570.88)	0%
Hardness.....	90 - 92 Shore D
Shrink	0.0002 in/in

POST CURE SCHEDULE

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

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

HEATING AND COOLING RATES DURING POST CURE

Always allow tools made with high-temp resin systems to gel at room temperature before subjecting them to post cure (16 to 24 hours is usually sufficient). When oven curing, place mold in a room temperature oven, increasing temperature at a rate of 50F per hour. When cooling, allow molds to remain in heated oven, decreasing the temperature at a rate of 50°F (30°C) per hour. Do not remove mold from oven until temperature has been lowered to 100°F (38°C).

ES-219 Tech/Revised 1/13/15
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