ES-221
HIGH TEMP EPOXY SURFACE COAT
FOR PLASTIC FACED PLASTER APPLICATIONS

PRODUCT BULLETIN

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DESCRIPTION

ES-221 is a hydrophobic epoxy system (cures in the presence of water) engineered primarily for use as a high temperature surface coat for plastic faced plasters. Its white color allows easy viewing of scribe lines on PFP masters. The versatility of this room temperature cure, 300ºF high temperature capable system (see post cure schedule), provides the engineer with a wide range of applications. Popular handling properties producing accurate, detailed, chip resistant surface coat duplications in epoxy laminate or cast tool fabrication. **Typical applications include: Plastic Faced Plasters, Vacuum Molds, Checking Fixtures, Duplication Molds, Spotting Racks, and Bonding Fixtures.**

HANDLING CHARACTERISTICS @ 25°C/77°F

Mix Ratio (parts by weight)	100R/13H
Work Life (226 gram mass)	22 minutes
Mixed Viscosity	16,800 cps
Mixed Volumetric Density	12.4 lbs/gallon
	0.054 lbs/cu in
Specific Gravity	1.49 grams/cc
Cure-To-Demold	8-16 hours
Complete Cure	refer to recommended oven cure schedule on page 2
Resin Color	White or Black
Hardener Color	Amber
Mixed Color	White or Black
Shelf Life ES-221 Resin (in original unopened containers)	2 years
Shelf Life ES-221 Hardener (in original unopened containers)	1 year

TYPICAL PHYSICAL PROPERTIES (Cast Bar)

Tensile Strength	7,591 psi
Tensile Elongation	1%
Flexural Strength	13,998 psi
Flexural Modulus	740,800 psi
Compressive Strength	17,120 psi
Izod Impact Strength	5.8 (ft-lb)/ft
Hardness	90 Shore D
Heat Deflection Temperature @ 264 psi	107°C/225°F
Heat Deflection Temperature @ 66 psi	110°C/230°F

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APPLICATION GUIDE

Proper Preparation Of Model Or Pattern Surface

Note: A porous surface needs to be completely sealed before a mold release is applied. Whichever sealer you choose to use you should refer to sealer instructions regarding number of coat applications and dry-to-cure-times before applying mold release.

Note: A non-porous surface should be thoroughly cleaned before applying mold release. Refer to application instructions of mold release.

Once your model or pattern are properly released, catalyze ES-221 surface coat and brush on a 0.030" to 0.040" coating, taking care not to entrap air or puddle resin in corners or at the bottom of steep details.

When surface coat reaches "tack-stage" (resin will not stick to your finger when touched but soft and sticky enough to leave fingerprint) immediately brush on a second layer of catalyzed ES-221 surface coat to a thickness of .030" to .040", followed by the pouring of plaster onto wet surface coat, filling cavity.

NOTE: Prior to pouring of plaster, some fabricators prefer to sprinkle or broadcast sisal fibers on to 2nd wet surface coat to secure a mechanical bonding feature.

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 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 93°C/200°F.

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 13°C/25°F per hour. When cooling, allow molds to remain in heated oven, decreasing the temperature at a rate of 27°C/50°F per hour. Do not remove mold from oven until temperature has been lowered to 38°C/100°F.

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