



**ESG-215 SERIES
EPOXY PATCHING
PASTE
GRAPHITE FILLED
HIGH TEMP**



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DESCRIPTION

ESG-215 GRAPHITE FILLED HIGH TEMP EPOXY PATCHING PASTE was developed to meet the requirement of the aircraft and aerospace industry for use in repairing surface defects on composite molds and for making minor engineering changes. ESG-215 resin is available with 2 hardener options: ESG-215 hardener is a lower viscosity hardener for filling minor surface defects; ESG-215-T is a thicker hardener for filling large repairs requiring greater sag resistance.

HANDLING CHARACTERISTICS @ 25°C/77°F

	<u>ESG-215 Hardener</u>	<u>ESG-215-T Hardener</u>
Mix Ratio (parts by weight)	100R/14H.....	100R/14.7H
Density (mixed)	11 lbs/gallon.....	10.4 lbs/gallon
.....	0.047 lbs/cu/in.....	0.045 lbs/cu/in
Mixed Specific Gravity	1.32 gms/cc	1.25 gms/cc
Resin Viscosity.....	9,000,000 cps	9,000,000 cps
Hardener Viscosity.....	20 cps	100,000 cps
Mixed Viscosity	thixotropic paste	thixotropic paste
Work Life	35-50 minutes	35-50 minutes
Cure-To-Sanding-Time	2-4 hours.....	2-4 hours
NOTE: See optional accelerated cure information on page 2.		
Resin Color.....	Black	Black
Hardener Color.....	Amber	Amber
Mixed Color	Black	Black
Shelf Life ESG-215 Resin (in original unopened containers).....		1 year
Shelf Life ESG-215 and ESG-215-T Hardener (in original unopened containers).....		2 years

PHYSICAL PROPERTIES (Following oven cure at 177°C/350°F)

Ultimate Tensile Strength (ASTM D-638.91)	6,276 psi	7,101 psi
Tensile Modulus (ASTM D-638.91).....	989,600 psi	803,400 psi
Tensile Elongation (ASTM D-638.91)	0.88%.....	0.91%
Ultimate Compressive Strength (ASTM D-695.91)	14,420 psi	21,700 psi
Compressive Modulus (ASTM D-695.91).....	250,800 psi	241,600 psi
Ultimate Flexural Strength (ASTM D-790.92).....	11,500 psi	8,416 psi
Flexural Modulus (ASTM D-790.92).....	667,400 psi	428,400 psi
Coefficient of Thermal Expansion	28.5x10 ⁻⁶ in/in/°F	25x10 ⁻⁶ in/in/°F
Heat Deflection Temperature @ 66 psi (ASTM D-648.82)	131°C/268°F	188°C/371°F
Heat Deflection Temperature @ 264 psi (ASTM D-648.82).....	121°C/249°F	196°C/385°F
Notched Izod Impact Strength (ASTM D-256.93A)	4.01 in-lb/ft	n/a
Moisture Absorption (ASTM D-570.88).....	0.142%.....	n/a
Hardness	90 Shore D.....	90 Shore D
Shrinkage	0.005 in/in	0.003 in/in

POST CURE SCHEDULE

8 hours @ 25°C/77°F
+3 hours @ 177°C/350°F

OPTIONAL ACCELERATED CURE

ESG-215 can be cured to a sandable condition by directing a localized heat source, such as a heat gun or heat lamp, at the repaired area until material has hardened. A complete cure of ESG-215-T can then be achieved during the high temperature use of the mold.

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.

SPECIFICATIONS

Boeing MMS-101 and M41-03-01 Code HPAP

ESG-215 Series/Revised 2/17/10
Supercedes 8/24/09