Product Bulletin

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ES-215-IHG, ES-215-1 & ES-215-2
HIGH-TEMP EPOXY SURFACE COAT
FOR USE IN TOOLING & PREPREG
APPLICATION AND IN AUTOCLAVE
COMPOSITE TOOLS. COLOR: BLACK

REV: 0302

DESCRIPTION

These HIGH-TEMP SURFACE COATS were developed to meet the requirements of the aircraft and aerospace industry for use which demands higher temperature applications greater than 170°C/350°F. These surface coats have proven in tests that their compatibility with prepreg systems produce excellent surface conditions cured under heat and vacuum bagging. The thermo-cycling of the systems exhibit a great degree of high physical stability when used in tooling and composite fabrication. These systems are versatile in that they can be used in RHL and IHL heat environment applications. These qualities allow the fabricator a single system which will sustain both specifications in deference to using two different systems.

These systems are hygienically safe for shop usage as they ***DO NOT CONTAIN MDA OR VCHD***. Use in conjunction with any ADTECH high-temp laminating resin.

HANDLING CHARACTERISTICS @ 25ºC/77ºF:	**ES-215-IHG**	**ES-215-1**	**ES-215-2**
Mix Ratio (parts by weight)	100:17	100:18	100:22
(parts by volume)	4.80:1	4.4:1	3.46:1
Density, (Mixed)(lbs/gallon)	10.29	11.0	10.29
(lbs/in^3)	0.044	0.047	0.044
Specific Gravity (g/cc)	1.23	1.31	1.23
Vixcosity			
Resin (cps)	thixotropic	thixotropic	thixotropic
Hardener (cps)	50-60	50-60	50-60
Mixed (cps)	100,000-150,000	50,000-70,000	20,000-56,000
Work Life (minutes)	180-220	16	83
Tack Free Time (minutes)	5-6 hours	45-60	3-3 1/2 hours
Demold Time (hours)	16-24	2	8-10
Color			
Resin	Black	Black	Black
Hardener	Amber	Amber	Amber
Mixed	Black	Black	Black
Shelf Life (Months - Unopened at 25°C/77°F)	12	12	12

PHYSICAL PROPERTIES	**ES-215-IHG**	**ES-215-1**	**ES-215-2**
Ultimate Tensile Strength (psi)(ASTM D-638.91)	4,938	7,101	3,593
Tensile Modulus (psi)(ASTM D-638.91)	645,100	803,400	559,900
Tensile Elongation(psi) (ASTM D-638.91)	0.9168	1.198	0.939
Ultimate Compressive Strength(psi) (ASTM D-965.91)	21,690	21,700	20,820
Compressive Modulus (psi) (ASTM D-965.91)	241,600	227,100	250,200
Ultimate Flexural Strength (psi) (ASTM D-790.92)	8,416	8,108	9,253
Flexural Modulus (psi) (ASTM D-790.92)	428,400	339,700	379,100
CTE (in/in/F)	0.0000163	0.00000031	0.000000203
H D T @ 66 psi (°C/°F) (ASTM D-648.82)	194/382	149/301	153/307
H D T @ 264 psi (°C/°F) (ASTM D-648.82)	187/368	136/277	142/288
Notched Izod Impact Stren (in-lb/ft) (ASTM D-256.93A)	3.61	5.68	4.28
Moisture Absorption (%) (ASTM D-570.88)	0.163	0.492	0.342
Hardness (Shore D)	88-90	88-90	87-88
Shrinkage (in/in)	nil	0.006	nil

CONTINUED ON REVERSE

Recommended Cure Schedule: 24 hours @ 25°C/77°F
2 hours @ 66°C/150°F
1 hour @ 93°C/200°F
1 hour @ 121°C/250°F
1 hour @ 149°C/300°F
3 hours @ 177°C/350°F

THIS SYSTEM DOES NOT CONTAIN VCHD OR MDA

HEAT ENVIRONMENT SYSTEMS

Always refer to the Product Bulletin for the specific laminating resin or casting resin used.

Insure proper curing temperatures are met by installing a thermocouple directly in center of tool.

Always allow tools made with ADTECH high-temp systems to get at room temperature before subjecting them to post-cure (24 hours is sufficient). This will prevent excessive exotherm and shrinkage from occurring.

When taking tools through a preliminary or post-cure phase, always place the tool in a room temperature oven and increase temperature at a rate of 5°F/minute. The heating rate should not exceed 5°F per minute.

When cooling tools, always allow the tool to remain in the heat environment and decrease temperature at a rate of 10°F/minute. Do not remove tool from the heat environment until the tool has reached 100°F. Removing a tool heated above 100°F can result in thermal shock and warpage. The cooling rate should not exceed 10°F per minute.

If you have questions, always request technical advice from your Sales Representative or directly from ADTECH Plastic Systems Corp. at (517)543-7510.