



LAMINATE, COPPER CLAD, FLUSH

ESF-M99L19-A

1. SCOPE

The material defined by this specification is a melamine coated copper clad laminate, which is self-extinguishing. The copper is flush with the base laminate.

2. APPLICATION

This specification was released originally for printed circuits in the windshield wiper.

3. REQUIREMENTS

3.0 STANDARD REQUIREMENTS FOR PRODUCTION MATERIALS

Material suppliers and part producers must conform to the Company's Standard Requirements For Production Materials (WSS-M99P1111-A).

3.1 SUBSTRATE (1.6 mm thick)

3.1.1	Water Absorption, max (ASTM D 570)	10%
3.1.2	Flexural Strength, min (ASTM D 790, lengthwise)	105 MPa
3.1.3	Impact Strength, Izod, min (ASTM D 256, notched, lengthwise)	27 J/m
3.1.4	Compressive Strength, min (ASTM D 495)	105 MPa
3.1.5	Dielectric Strength, min (ASTM D 229, short time)	14 kV/mm
3.1.6	Specific Gravity, min	1.40
3.1.7	Heat Deflection Temperature, min (ASTM D 648)	
	At 1820 kPa	205 °C

3.2 COPPER

3.2.1	Chemical Composition (ASTM E 53)	
	Copper + Silver	99.8 min

Date	Action	Revisions
2003 08 20	Revised	Para 3.0 inserted; Para 3.5, 3.6, 3.7, 3.8, 3.10, 4 deleted
1993 02 11	NGA1E10269419001	Reactivated & Updated A. Vallabhanath
1984 03 22	CF4N-RD888002116	Released

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Documents

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- 3.2.2 Thickness
(ASTM D 374, Method C)

To be specified on engineering drawing.

3.3 COMPOSITE

- 3.3.1 Bond Strength, min 125 g/mm of width

Test Method: Peel sufficient copper from the substrate to allow gripping with a clamp. Suspend laminate horizontally with peeled copper foil perpendicular to the laminate and pointing downward. Suspend a weight (including clamp) equivalent to 125 g/mm of width from the end of the foil. There shall be no loosening of the bond or any further peeling of the foil from the substrate after 10 minutes.

- 3.3.2 High Temperature Resistance Shall not blister

Test Method: Expose 20 minutes at 210 °C and 25 cycles of 1 h at - 29 °C and 1 h at 150 °C. There shall be no evidence of blistering and there shall be no more warp than specified on engineering drawing. This test may be run on parts or samples representative of parts.

- 3.3.3 Overall Thickness

To be specified on engineering drawing.

3.4 FLAMMABILITY (ISO 3795)

- Burn Rate, max Self-extinguishing