



CF3350

Film Adhesive, Electrically and Thermally Conductive

www.emersoncuming.com

Key Feature:	Benefit:
<ul style="list-style-type: none"> High conductivity, electrical and thermal 	<ul style="list-style-type: none"> Superior grounding and minimum thermal resistance to heat sink
<ul style="list-style-type: none"> Uniform bond line 	<ul style="list-style-type: none"> Predictable performance and void free
<ul style="list-style-type: none"> Custom preforms 	<ul style="list-style-type: none"> Clean, easy application with no waste
<ul style="list-style-type: none"> Adhesion with flexibility 	<ul style="list-style-type: none"> Suitable for many material combinations with CTE mismatches: metals, ceramics, polymers

Product Description

Emerson & Cuming CF3350 is a silver bearing, epoxy film adhesive. Also containing rubberized particles, CF3350 offers an excellent balance of strength, adhesion and flexibility.

Applications

Emerson & Cuming CF3350 is used for bonding all types of circuit board materials to metal backplanes and heat sinks. High frequency fluoropolymer and ceramic circuits bonded to copper, brass, Kovar and aluminum are typical application substrates. In most cases, these metals are protected with a gold plate finish. The high electrical and thermal conductivity of CF3350 ensures a reliable RF ground plane. High manufacturing yields require excellent electrical continuity and mechanical performance. CF3350 offers void free electrical continuity and uniform bond line adhesion.

Emerson & Cuming film adhesives are widely used for an array of electrical, mechanical and thermal assembly applications. The application of a film adhesive ensures consistent, void-free, bondlines. Void free assemblies evenly dissipate heat in thermal applications, particularly when compared to mechanical (screw or clip) techniques or the use of liquid adhesive mediums. Electrically conductive films provide electrical continuity and ensure reliable RF ground plane performance. Customer specific, die cut preforms provide additional benefits in precision, convenience and waste minimization.

Properties of Material As Supplied

Property	Value
Chemical Type	Epoxy Film
Appearance	Gray/Tan Film backed by clear polyester liner
Thickness	2 or 4 mils (± 0.5 mils)
Work Life	3 months @ Room Temperature
Storage Life	9 months @ 5°C (41°F)
DSC Peak Exotherm Temperature (Ramp Rate = 10°C/min.)	177.5° ± 5°C

Cure Schedule

Cure at any one of the recommended cure schedules.

Temperature	Cure Time
°C	Minutes
125	120
137	50
150*	30*
175	10

* Most recommended cure schedule. All temperatures measured at the adhesive and do not include ramp-up time.

Instructions For Use

Thoroughly read the instructions for use in this Technical Data Sheet before using. Observe all precautionary statements that appear on the product label and/or the Material Safety Data Sheet (MSDS).

Once the film adhesive is removed from frozen or cold temperature storage, the product is ready to use when it has reached ambient room temperature. While cleaning of substrates is not mandatory, an organic solvent (e.g. Isopropanol) wipe is recommended to remove any oils that might interfere with the bonding process or electrical interface.

Films need applied pressure during cure to promote proper wetting of substrate surfaces. Common industry practices include the use of spring clamps, lamination presses, dead weights, and vacuum bagging. The technique to apply pressure will vary by application and customer preference. However, the recommended cure pressure for CF3350 is from 5 to 60 psi depending on the materials being bonded and their size. For large surface area applications, a load distribution material is recommended between one of the pressure plates and the bonding part in order to equalize the applied pressure over the entire area.

After fixturing, the parts are then cured at an elevated temperature. The specified temperatures and times refer to the bondline values. It should be noted that large mass assemblies will take longer time to achieve bondline temperature.

Sample & Prototype

Sheet stock samples of CF3350 can be requested through your Emerson & Cuming representative.

For optimum preform part design, contact Emerson & Cuming Customer & Product Support (1-800-TECHWAY) and request the standard release specification for **DIE CUT PREFORMS: Minimum Design Requirements**. This document reviews tolerance recommendations for various geometries.

Properties of Material after Application - All values typical.

Property	Test Method	Unit	Value
Tensile Lap Shear Strength aluminum to aluminum @ 25°C	TP-414	PSI	3,400 (4 mil thickness)
gold to gold @ 25°C		PSI	3,500 (4 mil thickness)
Volume Resistivity @ 25°C	TP-413	Ohm-cm	0.0002
Thermal Conductivity	TP-410 Laser Flash Diffusivity	W/m°C	7.0
Thermal Resistance for 1 sq. cm area @ 10 psi assembly pressure: 50 µm Bondline (2 mil) 100 µm Bondline (4 mil)	TP-410 Laser Flash Diffusivity	°C/W	0.15
		°C/W	0.23
Thermal Resistance = Bondline Thickness / Thermal Conductivity + Contact Resistance			
Storage Modulus	TP-411 (DMA)	MPa	
-40°C			
0°C			
25°C			
100°C			
150°C			4000
			3000
			2400
			680
			60
Glass Transition Temperature	TP-411 (DMA)	°C	90
Coefficient of Thermal Expansion	TP-388 (TMA)	10 ⁻⁶ /°C	65
α^1		10 ⁻⁶ /°C	150
α^2			
pH			6.0
Ionic Data			
Chloride		ppm	50
Sodium		ppm	30
Potassium		ppm	5
Temperature Range of Use		°C	-40 to 180

Storage and Handling

The storage life of CF3350 is 9 months at 5°C. For best results, store in original, tightly covered containers in clean, dry areas. Usable shelf life may vary depending on method of application and storage conditions. CF3350 becomes brittle below -5°C. If material goes below this temperature, it should be handled gently and the entire package should be warmed to room temperature before opening. This will minimize the possibility of fracturing in the brittle state or allowing condensation to collect on the product.

a number of ways including skin rashes and an itching sensation. Handling this product at elevated temperatures may also generate vapors irritating to the respiratory system. Good industrial hygiene and safety practices should be followed when handling this product. Proper eye protection and appropriate chemical resistant clothing should be worn to minimize direct contact. Consult the Material Safety Data Sheet (MSDS) for detailed recommendations on the use of engineering controls and personal protective equipment.

Health and Safety

CF3350, like most epoxy compounds, possesses the ability to cause skin and eye irritation upon contact. Certain individuals may also develop an allergic reaction after exposure (skin contact, inhalation of vapors, etc.) which may manifest itself in

Attention Specification Writers

The values contained herein are considered typical properties only and are not intended to be used as specification limits. For assistance in preparing specifications, please contact Emerson & Cuming Quality Assurance for further details.

US – 03 March 2007 (based on TB revised Daniel Blazej 3 March 2007)

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