



Ablefilm ECF561E

Film Adhesive, Flexible Electrically Conductive

Key Feature:	Benefit:
High conductivity, electrical and thermal	Superior grounding and minimum thermal resistance to heat sink
Uniform bond line	Predictable performance and void free
Custom preforms	Clean, easy application with no waste
Adhesion with flexibility	Suitable for many material combinations with CTE mismatches: metals, ceramics, polymers

Product Description:

Emerson & Cuming's Ablefilm ECF561E is a silver bearing, epoxy film adhesive using a glass fabric carrier. This "B-staged" film is available in standard size of 5 mils

ECF561E is formulated with a rubber modified epoxy that provides resiliency for bonding materials with severely mismatched coefficients of thermal expansion. When used for substrate attach, Ablefilm ECF561E acts as an electrical ground plane. Electrical conductivity is exhibited over a range of frequencies, up to the gigahertz range.

Applications:

Emerson & Cuming ECF561E is used for bonding all types of circuit board materials to metal backplanes and heat sinks. High manufacturing yields require excellent electrical continuity and mechanical performance. ECF561E offers void free electrical continuity and uniform bond line adhesion.

Emerson & Cuming "B-staged" film adhesives are widely used for an array of electrical, mechanical and thermal assembly applications. Typically, these film products are die cut by Emerson & Cuming's fabrication network. 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. The capability of die cutting unique part geometries provides the additional benefit of controlled adhesive flow, particularly important for precision electronic assemblies.

Properties of Material As Supplied:

Property	Value
Chemical Type	Rubberized Epoxy Film
Appearance	Gray Film backed by clear polyester liner
Work Life	4 days @ 25C
Storage Life	1 year @ -40 C

Cure Schedule:

Cure at any one of the recommended cure schedules.

Temperature	Cure Time
°C	Minutes
125	120
150	60

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 are contained in individual Material Safety Data Sheets (MSDS).

ECF561E has a work life of four days at room temperature. Useful life can be extended with refrigeration.

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 (i.e. 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 ECF561E is between 5 to 60psi. For large surface area applications, a rubberized silicone pad 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:

Samples of ECF561E can be requested through your Emerson & Cuming representative. Depending on the specific application, prototype performance can be approximated with rough cut pre-form parts. Alternately, your Emerson & Cuming representative may be able to arrange for CAD designed prototype parts.

For optimum pre-form 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.

"Our service engineers are available to help purchasers obtain best results from our products, and recommendations are based on tests and information believed to be reliable. However, we have no control over the conditions under which our products are transported to, stored, handled, or used by purchasers and, in any event, all recommendations and sales are made on condition that we will not be held liable for any damages resulting from their use. No representative of ours has any authority to waive or change this provision. We also expect purchasers to use our products in accordance with the guiding principles of the Chemical Manufacturers Association's Responsible Care® program."

Storage and Handling:

The storage life of ECF561E is 1 year at -40°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. ECF561E becomes brittle below -5°C. If material goes below this temperature, it should be handled gently and entire package should be warmed to room temperature before opening. This will eliminate the possibility of breaking it in the brittle state or allowing condensation to collect on the product.

Properties of Material After Application:

Property	Test Method	Unit	Value
Tensile Lap Shear Strength aluminum to aluminum @ 25°C	MT-6	psi	2,000
gold to gold @ 25°C		psi	2,100
Volume Resistivity @ 25°C	PT-15	Ohm-cm/0.5 sq.in.	0.001
Thermal Conductivity @121°C	PT-40	W/m°C	1.60
Glass Transition Temperature (Tg)	MT-9	°C	47
Coefficient of Thermal Expansion α^1 Below Tg α^2 Above Tg	MT-9	ppm/°C ppm/°C	100 380
Weight Loss @300°C	PT-20	%	0.55%

Health and Safety:

ECF561E, 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 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.

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.

Medical Implantable Disclaimer

"In the event this product is intended by you for use in implantation in the human body, you are hereby advised that National Starch (or Emerson & Cuming) has not performed clinical testing of these materials for implantation in the human body nor has National Starch (Emerson & Cuming) sought, nor received, approval from the FDA for the use of these material in implantation in the human body. It is YOUR responsibility, as a manufacturer of any such device, to ensure that all materials and processes relating to the manufacture of any medical device fully comply with all applicable federal, state and local laws, rules, regulations and requirements as well as any such laws, rules, regulations, directives or other orders of any foreign country where such product is sold. If you have not undertaken the necessary investigations to ensure compliance you are advised NOT TO USE this product in the manufacture of any device which is to be implanted in the human body. No representative of ours has any authority to change the foregoing provisions."



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