

FluoroGrip® – LS-1000 Lightning Strike Film

Industrial Uses

Type

LS-1000® – Is a high performance laminate applique system comprised of a 3 mil outer fluoropolymer film manufactured from ethylene-chlorotrifluoroethylene (Halar®*) and an underlying expanded copper foil sandwiched between 4-mil and 2-mil acrylic pressure sensitive adhesive designed for an easy peel-and-stick application. This applique product is designed to protect underlying composite surfaces from lightning with easy maintenance and repair features. LS 1000 has long term environmental resistance characteristics that allow it to be used in extreme outdoor environments including marine, desert and other severe locations.

LS-1000® – provides excellent lightning protection to underlying substrates via a sacrificial mode that restricts most damage to the LS 1000® applique film. After damage LS-1000® can simply be removed and replaced to provide the same quality lightning protection that the original material provided.

LS-1000® – is available standard with 3 mil FluoroGrip®-E, .004" expanded copper foil, and a new acrylic based pressure sensitive adhesive system developed for applications on supersonic aircraft. LS-1000® can also be customized to have a desired color, different gauge, weight or specific metallic foil, and customized adhesive systems for applications that may require specifications outside the scope of the offered product.

Uses

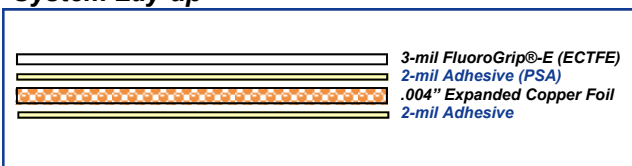
LS-1000® – applique films provides an excellent alternative to conventional embedded metallic foil composite materials used for constructing structures that are susceptible to lightning strikes. Current systems utilizing embedded metallic foils require costly maintenance and repair once the object incurs a lightning strike event.

LS-1000® acts as a sacrificial surface layer that protects underlying composites from severe lightning strike damage and can then be easily repaired by simply removing the damaged area of the applique and replacing it with a new section. No bus bars or electrical reattachment is required.

In addition, LS-1000® can provide desired aesthetics (e.g., color), foul resistance, outstanding resistance to cleaning solvents, oils, fuels, (and other fluids or chemicals that may be systematic to the desired application), UV protection, and finally environmentally friendly corrosion and weathering protection of any underlying surface or structure.

System can be custom designed to meet specific application requirements.

System Lay-up



Technical Data

Generic Description

3-mil FluoroGrip®-E (ECTFE) Film with 2-mil, High Temperature adhesive and expanded copper foil.

Physical Properties

General

	ASTM Method	Metric Value	Metric Units	English Value	English Units
Specific Gravity	D-792	1.68		1.68	
Yield (1mil film)		22	m ² /kg	115	ft ² /lb
Flammability	UL-94	V-0		V-0	
Water Absorption (24 hrs)		<0.01	%	<0.01	%

Available Thicknesses
(Film Only; Not Including Adhesive)

2 mil, 5 mil, 10 mil

Mechanical

	ASTM Method	Metric Value	Metric Units	English Value	English Units
Tensile Strength	D-882	55	MPa	8000	psi
Elongation, Ultimate	D-882	250	%	250	%
Tensile Modulus	D-882	1375	MPa	200000	psi
Initial Tear Strength, 1mil	D-1004	4.4	N	450	gm/mil
Propagating Tear Strength, 1mil	D-1992	11.6	N	>1200	gm/mil
Fold Endurance (M.I.T.)	D-2176	>250000	cycles	>250000	cycles

Electrical

	ASTM Method	Metric Value	Metric Units	English Value	English Units
Dielectric Strength, 1mil	D-149	216	kV/mm	5500	V/mil
Dielectric Constant, 1kHz	D-150	2.55-2.63		2.55-2.63	
Dissipation Factor, 1kHz	D-150	<0.005		<0.005	

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Industrial Uses

Uses (cont.)

Performance

FluoroGrip® – LS-1000 film has outstanding resistance to chemicals, weathering and high-energy radiation.

Note

Refer to FluoroGrip® installation manual and instruction guide for the use and installation of FluoroGrip® films, membranes and lining systems.

Minor wrinkling is a normal property resulting from the manufacturing process.

*Halar® is a registered trademark of Ausimont, USA, Inc.

Ordering Information

LS 1000 comes as tapes 1" to 6" or peel and stick applique 6" to 24" (larger widths may be available via custom order).

Form	Width
Tapes	1" to 6"
Applique Film	6" to 24" (larger widths can be custom ordered)

Color
Off-white (limited custom colors are available)

Technical Data

Physical Properties

Thermal

	ASTM Method	Metric Value	Metric Units	English Value	English Units
Melt Point	D-3418	240	°C	465	°F
Continuous Service Temp.*		A 150 S 164	°C	A 300 S 350	°F
Heat Sealing Temp.		245-260	°C	475-500	°F
Degradation Temp.*		A 164 S 178	°C	A 325 S 350	°F

* **A** = Acrylic Adhesive **S** = Silicone Adhesive

Adhesive Construction

	Adhesive	Liner
2mil	2mil Transparent Acrylic	5.5-mil Moisture Stable Polyethylene Coated Kraft release
4mil	4mil Transparent Acrylic	5.5-mil Moisture Stable Polyethylene Coated Kraft release

Adhesive Performance

	180° Peel, 2mil P.E.T./ss: 20 min. bond	350°F Shear, 1" x 1" x 1,000 gr., 2mil P.E.T./ss: 20 min bond
2mil	46 oz./inch	>24 hrs.
4mil	72 oz./inch	>24 hrs.

Expanded Copper Foil

Metal = Cu (Copper)
Original Metal Thickness = 2 (0.002")
2 Cu 4.5—75
Strand Width: 4.5 = 0.0045"
Long Way of Diamond: 75 = 0.075"

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