

## SG 4528-015CU-101V

# LIGHTNING STRIKE PREPREG

### SALES AND TECHNICAL SUPPORT

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### DESCRIPTION

SG4528-015CU-101V is a lightweight, conductive, surfacing film composed of a non-woven metallic copper mesh impregnated with a toughened epoxy resin plus an ultra lightweight veil for outstanding surfacing capability. It is designed for lightning and shielding protection of aircraft, equipotential ground planes and as a counterpoise for antenna installations.

### FEATURES

- ◇ Dual Co-cure capabilities between 250°F and 350°F, post curable to 350°F
- ◇ Epoxy formulation results in a tough outer shell with outstanding surfacing capabilities
- ◇ Extremely low volatile content contributes negligible surface porosity
- ◇ Excellent tack and handling properties for ease of lay-up
- ◇ Excellent environmental performance from -65°F to 300°F
- ◇ Compatible with a wide range of other epoxy prepreg systems
- ◇ Non-woven foil mesh qualified at most all composite aircraft manufacturers
- ◇ Capable of providing Zone 1A and Zone 2A direct effects lightning protection-Ref. Appendix A
- ◇ Provides a high degree of electromagnetic shielding for electric and magnetic fields associated with lightning and high powered radio frequency transmitters

### PHYSICAL PROPERTIES

Form:	Modified epoxy impregnated non-woven mesh
Resin Weight:	.035 psf typical
Resin Color:	Dark gray opaque
Volatiles:	Less than 1%
Metallic Mesh:	Copper, 110(C11000)
Metallic Mesh Weight:	.015 psf
Veil Thickness	.003" typical
Veil Weight	.002 psf
Prepreg weight:	.052 psf typical
Release Separators:	Paper release on the veil side, polyethylene release on the Metal mesh side.
Tack:	Medium
Gel time:	10-12 minutes at 250°F
Out Time:	30 days at 75° F
Shelf Life:	One year at 0° F Four months at 40° F
Availability:	Up to 36" width
No Veil Edge:	An optional 1" no veil edge is available for overlapping adjacent plies

## APPLICATION

The purpose of this application procedure is to insure that the veil side of the prepreg is laid up so that it is the outer most ply of the part. The following procedure applies to a part laid up in a female mold.

1. Remove material from cold storage at least 20 hours prior to use to allow for stabilization at lay up temperature conditions. Keep the prepreg sealed to prevent moisture from condensing on the prepreg. If details are cut and replaced in cold storage, the prepreg must be placed in sealed containers. Shorter stabilization times can be used with these details.
2. Cut the material to size, peel back part of the release paper, this will expose the veil side of the prepreg.
3. Apply the prepreg to the mold starting at one edge and proceed in a rolling motion and peeling away the release paper as the prepreg is applied to the mold.
4. Next using a semi-flexible roller squeegee, and starting in the center, proceed, in a uniform manner to push out any air pockets toward the outer edges. Alternately, palm hand pressure can be used to increase resin tack and effect conformability.
5. Remove the polyethylene from the prepreg by peeling it back over itself minimizing lift off. If lift off occurs or if any air pockets are noticeable, place the poly liners back over the area and use the squeegee or hand pressure to workout the air pocket.
6. Use your standard debulking procedure for 10 minutes.
7. Continue the prepreg lay up.
8. Debulking after each 3 plies is recommended.

## RECOMMENDED CURE

SG4528-015CU-101V is designed to cure between 250°F and 350°F. Cure at 250°F takes place in one hour at 250°F, however, cure times and temperatures can be extended to 90 minutes and post cures at 350°F to achieve a higher Tg. Alternatively, a processing profile of 60-90 minutes at 350°F can be used to affect a cure.

## STORAGE

Store prepreg at 0°F for maximum shelf life.

## CLEAN UP

The prepreg resin can be removed from non-bonding areas with ketones or methylene chloride solvents. Be sure to follow all the material safety data sheet guidelines for the solvent to be used.

## CAUTION

This material contains epoxy resins and amines, which may cause irritation to sensitive skin. Avoid contact with eyes or skin. If skin contact occurs, wash as soon as possible with soap and water. If contact with eyes occurs, flush with water for 15 minutes. Do not handle this material until the material safety data sheet has been read and understood. The user of this material is required to use the necessary protective equipment as directed by the applicable state and federal laws when handling, curing, and grinding this material.

## IMPORTANT NOTICE

Information in this data sheet has been obtained under controlled laboratory conditions and is believed to be accurate. Properties listed are typical values and are not intended for use in preparing specifications. Actual values may vary. No warranty is expressed or implied for which APCM or AM&E assumes legal responsibility. APCM or AM&E cannot be responsible for misapplication or handling and use under conditions beyond its control and under no circumstances shall be liable for incidental or consequential damage resulting from handling or use of this material.

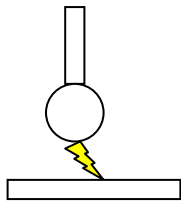
Manufactured by and in conjunction with Adhesive Prepregs for Composite Manufacturing, LLC.

**Appendix A**  
**Strike Guard SG4528-015CU-101V**  
**Panel #070904-1, Zone 2A Test Results**

**DIRECT EFFECTS TESTING**

A 18" x 18" panel was subjected to a Zone 2A (swept stroke) direct effects attachment using a peak current amplitude current of 100 Ka. Testing was conducted at the facilities of Lightning Technologies, Inc. Typical strike test set up is shown below.

The composite panel consisted of a base of 3 plies of carbon fiber (total thickness of .035" typical) and a top or outer ply of Strike Guard Lightning Protection prepreg SG4528-015CU-101V. Additionally, the test panel was coated to a 4 mil average paint thickness.



Jet Diverting Electrode 1" from test panel



Panel shows an approximate 4" diameter of thermal damage in the outer most ply only and consisting of carbon fiber "tufting" for 1/2" diameter, resin loss for 1 1/2" diameter, and complete metal mesh loss for a 4" diameter.

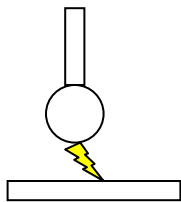
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**Appendix A Continued**  
**Strike Guard SG4528-015CU-101V**  
**Panel #070804-1, Zone 1A Test Results**

DIRECT EFFECTS TESTING

A 18" x 18" panel was subjected to a Zone 1A direct effects initial attachment using a peak current amplitude current of 200 Ka. Testing was conducted at the facilities of Lightning Technologies, Inc. Typical strike test set up is shown below.

The composite panel consisted of a base of 3 plies of carbon fiber (total thickness of .035" typical) and a top or outer ply of Strike Guard Lightning Protection prepreg, SG4528-015CU-101V. Additionally, the test panel was coated to a 4 mil average paint thickness.



Jet Diverting Electrode 1" from test panel



Panel shows an approximate 9" diameter of thermal damage in the outer most ply consisting of carbon fiber "tufting" for 1" diameter, resin loss for 2" diameter, and complete metal mesh loss for a 8-9" diameter. 2<sup>nd</sup> ply damage was limited to approximately 1" resin loss and 1/2" diameter fiber damage. No 3<sup>rd</sup> ply damage incurred.

Note: the current return was skewed to the top edge due to the test setup.

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