

## SG 4538-013NICU-202

# LIGHTNING STRIKE PREPREG

### SALES AND DISTRIBUTION

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### DESCRIPTION

SG4538-013NICU-202 is a lightweight, conductive prepreg film composed of a nickel copper coated nylon non-woven mesh reinforcement impregnated with a toughened epoxy resin. It is designed for lightning and shielding protection of aircraft.

### 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
- ◇ Capable of providing Zone 2a direct effects lightning protection. See Appendix A
- ◇ Provides a high degree of electromagnetic shielding for electric and magnetic fields associated with lightning and high powered radio frequency transmitters. Far field shielding effectiveness has been measured at 80 dB (100 MHz) and 75 dB (1 GHz) per Mil-Std-285.

### PHYSICAL PROPERTIES

Form:	Modified epoxy impregnated knitted mesh
Resin Weight:	.030-.035 psf
Resin Color:	light gray opaque
Volatiles:	Less than 1%
Conductive Reinforcement:	Nickel copper nylon non-woven mesh
Reinforcement Mesh Weight:	.012 psf
Mesh Thickness:	.006" typical
Prepreg weight:	.046 psf typical
Separator:	paper, polyethylene
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:	54" width

## APPLICATION

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, remove the release paper
3. Apply the prepreg to the part or mold starting at one edge and proceed in a rolling motion.
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 better conformability.
5. Remove the poly liner from the prepreg by peeling it back over itself minimizing lift off. If lift off occurs or if air pockets are noticeable, pull the poly liners back over the area and use the squeegee or palm hand pressure to workout the air pocket.
6. Use standard debulking procedure for 10 minutes.
7. Continue the prepreg lay up.
8. Debulking after each 3-5 plies is recommended.

## RECOMMENDED CURE

DA4538 is designed to cure at 250°F or 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 a post cure at 350°F to achieve a higher Tg. Alternatively, a processing profile of 60-90 minutes at 350°F can be used to effect 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 occur, 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.

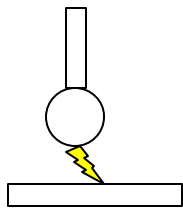
Manufactured by and in conjunction with Adhesive Prepregs for Composite Manufacturing, LLC

**Appendix A**  
**Strike Guard SG4538-013NICU-202**  
**Panel #8-Zone 2A Test Results**

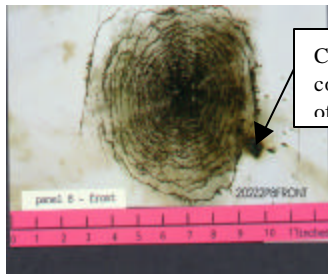
**DIRECT EFFECTS TESTING**

A 16" x 16" 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, SG4538-013NICU-202. Additionally, the test panel was coated to a 5 mil typical paint thickness.

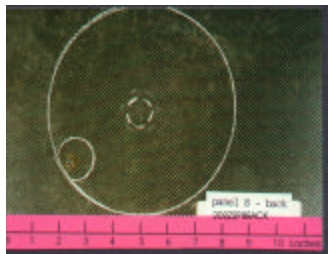


Jet Diverting Electrode 1" from test panel



Continuing components of b and c

**Front of panel** shows 7" diameter of thermal damage consisting of paint loss, prepreg conductive material sacrifice, resin loss and degradation emanating from the center outward. 1" diameter of some fiber damage. "Quarter tap test" detects diminishing progression of delamination outward to a 5-6" diameter.



**Rear of panel** shows no evidence of damage except for a small 1/2" diameter area of thermal damage, located at the 8 o'clock position, caused by the continuing b and c components. The inner most circle represents the 1" diameter of resin loss/partial fiber damage to the outer most ply on the opposite side.

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