

LOCTITE HC 9823.1 AERO

Syntactic Film

(KNOWN AS SynCore[®] HC 9823.1)

INTRODUCTION

LOCTITE HC 9823.1 AERO is a toughened 250°F/121°C curing, low density epoxy syntactic core material with superior moisture resistance. LOCTITE HC 9823.1 AERO is co-curable with a wide variety of 250°F/121°C curing epoxy prepreg systems. LOCTITE HC 9823.1 AERO is supplied as a continuous film of controlled thickness, width and density.

FEATURES

- Excellent Moisture Resistance
- Lightweight Syntactic Core Material
- Modified Epoxy
- 250°F/121°C Cure
- Co-curable

Product Forms

- Film Thickness: 0.020 to 0.060 inch (0.508 to 1.524 mm)
- Film Widths: Standard 12 inches (30.6 cm)
- Roll Lengths: Up to 200 feet (61 m) depending on film thickness
- Reinforcing Carrier: Supplied with a lightweight non-woven Kevlar[®] Mat reinforcing carrier

Handling

This product is in film form and is ready to use as received. Syntactic film should be removed from cold storage and allowed to warm to room temperature (77°F/25°C) before removing the protective packaging. Syntactic film has protective liners on it which must be removed prior to parts assembly (see "Applying" below). The liners will always be a contrasting color from the syntactic film to allow the user easy confirmation of removal.

Syntactic film in thicknesses exceeding 0.040 in/1.061mm on roll stock is inclined to form wrinkles due to natural tensions encountered during the winding operation. If roll stock is being used and wrinkles are encountered, Henkel recommends removing the film material from the roll and letting it relax for a period of 24 - 48 hours at room temperature (77°F/25°C). Once material is cut from the roll, the balance of the material on the roll should be taped lightly to prevent the balance of the roll from relaxing.

Application

Storage Life - LOCTITE HC 9823.1 AERO requires refrigerated storage. Store @ 0°F/-18°C or below for maximum storage life. Warranty life @ 0°F/-18°C or below is greater than 12 months. Store in sealed desiccated polyethylene bag provided. Allow adequate time for the container to warm to room temperature before opening for use.



LOCTITE HC 9823.1 AERO Syntactic Film (KNOWN AS SynCore® HC 9823.1)

Applying - Syntactic film is a pliable film with tack and drape. Syntactic film can be cut to any desired shape using ordinary razor knives or scissors. Razor knives with templates as guides work best. After cutting the syntactic film, remove the polyethylene release film by peeling it back from a corner. For thin syntactic films, a slight rub with dry ice on the polyethylene will assist in releasing the film from the syntactic film. Apply the syntactic film to your prepreg lay-up. Because of syntactic film's tack, all it takes is a light amount of pressure to secure the edge of the syntactic film to the prepreg stack. A Teflon tool is recommended to smooth the film. This tacks the syntactic film in place and prevents air entrapment. After the syntactic film is applied to prepreg lay-up, remove the coated release paper.

Henkel recommends trimming the syntactic film back about half an inch from the edge or damming the edge of the laminate to restrict resin flow.

Open Assembly Time - LOCTITE HC 9823.1 AERO may be used within the following schedule after removing from cold storage:

- @ 77°F/25°C at least 15 days
- @ 90°F/32°C at least 10 days

Curing - Cure is accomplished in one hour at 250°F/121°C using a heat-up rate of 2-20°F (1-12°C) per minute. In general, LOCTITE HC 9823.1 AERO is cured successfully using the cure cycle and bagging procedures recommended for co-curing epoxy prepreg systems.

Cleanup - Little cleanup should be required. However, uncured syntactic film may be removed effectively with ketone solvents in well ventilated areas. Saturate cloth or industrial wipes with solvent and apply just enough to do the job. Avoid contaminating uncured parts with spray or spillage. Wear respirators equipped with organic vapor cartridges, impervious rubber gloves, and safety goggles when handling solvents. Consult solvent container labels for skin and flammability warnings.

Typical Physical Performance Properties

Typical Uncured Properties

Gel time @ 250°F/121°C:	25-35 minutes
Volatiles @ 250°F/121°C, 60 min:	2% by weight maximum
Flexibility @ 77°F/25°C:	pliable and drapable
Working life @ 77°F/25°C:	15 days
Flow at 50 psi/0.34 MPa, 250°F/121°C:	40±10%

Typical Cured Properties

<u>Density, maximum (ASTM D792):</u>	<u>lb/ft³</u>	<u>g/cm³</u>
for film 0.020 inches (0.508 mm) or less	49	0.79
for film 0.030 inches (0.762mm) or greater	42	0.67



LOCTITE HC 9823.1 AERO

Syntactic Film

(KNOWN AS SynCore[®] HC 9823.1)

Typical Mechanical Performance Properties

Compressive Strength (ASTM D1621)

<u>Test Temperature, F/°C</u>	Dry		Wet ¹	
	<u>psi</u>	<u>MPa</u>	<u>psi</u>	<u>MPa</u>
-67/-55	12,500	86.2	-	-
77/25	9,000	62.0	6,500	44.8
180/82	7,500	51.7	4,500	31.0
250/121	5,000	34.5	2,400	16.5

Moisture absorption after immersion in 160°F/71°C water at equilibrium - 7% weight gain.

Compressive Modulus

<u>Test Temperature, F/°C</u>	<u>psi</u>	<u>MPa</u>
-67/-55	200,000	1,380

Shear Strength³ (ASTM D2344)

<u>Test Temperature, °F/°C</u>	Dry		Wet ¹	
	<u>psi</u>	<u>MPa</u>	<u>psi</u>	<u>MPa</u>
-67/-55	7,100	49.0		
77/25	8,900	61.4	4,200	29.0
180/82	7,300	50.3	1,600	11.0
250/121	3,000	20.7	700	4.8

Shear Modulus⁴

<u>Test Temperature, °F/°C</u>	<u>psi</u>	<u>MPa</u>
-67/-55	162,800	1,123
77/25	145,200	1,001
180/82	123,400	851
250/121	83,900	578

Flatwise Tensile Strength (ASTM C297)

<u>Test Temperature, °F/°C</u>	Dry		Wet ¹	
	<u>psi</u>	<u>MPa</u>	<u>psi</u>	<u>MPa</u>
-67/-55	3,000	20.7		
77/25	4,000	27.6	3,300	22.8
180/82	3,800	26.2	3,100	21.4
250/121	1,500	10.3	1,300	9.0

LOCTITE HC 9823.1 AERO Syntactic Film (KNOWN AS SynCore® HC 9823.1)

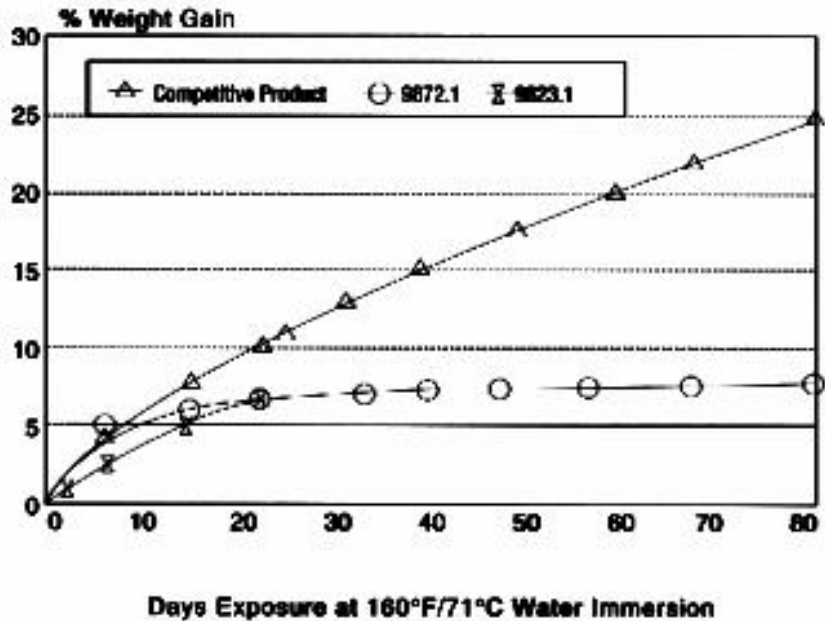
Tension (ASTM D638)

Test Temperature, °F/°C	Strength		Modulus		Elongation
	psi	MPa	psi	MPa	%
-67/-55	4,100	28.3	430,000	2,986	1.00
77/25	4,700	32.3	380,000	2,606	1.35
180/82	4,100	28.5	320,000	2,241	1.50
250/121	3,000	20.7	230,000	1,566	2.15

Note:

1. Wet conditioning was attained by exposing the specimens to 95-100% relative humidity at 160°F/71°C for 31 days.
2. Fluid exposure conditioning was obtained by exposure to Jet A, Jet Fluid Oil, and JP-5 for 30 days at 77°F/25°C.
3. Sandwich panel made with 3 plies of DMS 2288 Type 1, Class 1 prepreg on each side of the syntactic film.
4. Based on calculated results

WATER ABSORPTION





LOCTITE HC 9823.1 AERO

Syntactic Film

(KNOWN AS SynCore® HC 9823.1)

Handling Precautions

Do not handle or use until the Material Safety Data Sheet has been read and understood. For industrial use only.

DISPOSAL INFORMATION

Dispose of spent remover and paint residue per local, state and regional regulations. Refer to HENKEL TECHNOLOGIES MATERIAL SAFETY DATA SHEET for additional disposal information.

PRECAUTIONARY INFORMATION

General:

As with most epoxy based systems, use this product with adequate ventilation. Do not get in eyes or on skin. Avoid breathing the vapors. Wash thoroughly with soap and water after handling.

Before using this product refer to container label and HENKEL TECHNOLOGIES MATERIAL SAFETY DATA SHEET for additional precautionary, handling and first aid information.

Note

The data contained herein are furnished for information only and are believed to be reliable. We cannot assume responsibility for the results obtained by others over whose methods we have no control. It is the user's responsibility to determine suitability for the user's purpose of any production methods mentioned herein and to adopt such precautions as may be advisable for the protection of property and of persons against any hazards that may be involved in the handling and use thereof. In light of the foregoing, **Henkel Corporation specifically disclaims all warranties expressed or implied, including warranties of merchantability or fitness for a particular purpose, arising from sale or use of Henkel Corporation's products. Henkel Corporation specifically disclaims any liability for consequential or incidental damages of any kind, including lost profits.** The discussion herein of various processes or compositions is not to be interpreted as representation that they are free from domination of patents owned by others or as a license under any Henkel Corporation patents that may cover such processes or compositions. We recommend that each prospective user test his proposed application before repetitive use, using this data as a guide. This product may be covered by one or more United States or foreign patents or patent applications.

Rev. 9/2013

Henkel Corporation Aerospace | 2850 Willow Pass Road | Bay Point, CA 94565
PHONE: +1.925.458.8000 | FAX: +1.925.458.8030 | www.henkel.com/aerospace

Trademark usage

Except as otherwise noted, all trademarks in this document are trademarks of Henkel Corporation in the U.S. and elsewhere. ® denotes a trademark registered in the U.S. Patent and Trademark Office.

The data contained herein are furnished for information only and are believed to be reliable. We cannot assume responsibility for the results obtained by others over whose methods we have no control. It is the user's responsibility to determine suitability for the user's purpose of any production methods mentioned herein and to adopt such precautions as may be advisable for the protection of property and of persons against any hazards that may be involved in the handling and use thereof. In light of the foregoing, **Henkel Corporation specifically disclaims all warranties expressed or implied, including warranties of merchantability or fitness for a particular purpose, arising from sale or use of Henkel Corporation's products. Henkel Corporation specifically disclaims any liability for consequential or incidental damages of any kind, including lost profits.** The discussion herein of various processes or compositions is not to be interpreted as representation that they are free from domination of patents owned by others or as a license under any Henkel Corporation patents that may cover such processes or compositions. We recommend that each prospective user test his proposed application before repetitive use, using this data as a guide. This product may be covered by one or more United States or foreign patents or patent applications.

