



# SynCore® HC 9872.1

## Syntactic Film

Henkel Corporation  
Aerospace Group  
2850 Willow Pass Road  
P.O. Box 312  
Bay Point, CA 94565 USA  
**925.458.8000**  
Fax: 925.458.8030  
www.aerospace.henkel.com

### Description

SynCore 9872.1 is a toughened 350°F/177°C curing epoxy, low density syntactic core material with superior moisture resistance. SynCore 9872.1 is co-curable with a wide variety of 350°F/177°C curing epoxy prepreg systems. SynCore 9872.1 is supplied as a continuous film of controlled thickness, width, and density.

### Features

Excellent Moisture Resistance  
Lightweight Syntactic Core Material  
Modified Epoxy  
350°F/177°C Cure  
Co-curable with prepregs

### Product Forms

	<u>inches</u>	<u>mm</u>
Typical Film Thickness:	0.010 to 0.060 +/- 0.002	0.254 to 1.524 +/- 0.051
Film Widths:	Standard 12 inches (30.6 cm); other widths available as special order	
Roll Lengths:	Up to 200 feet (61 m) depending on film thickness	
Reinforcing Carriers:	SynCore 9872.1 is typically supplied with a reinforcing carrier. The standard carrier is a lightweight non-woven, Kevlar® mat.	

### Handling

This product is in film form and is ready to use as received. SynCore should be removed from cold storage and allowed to warm to room temperature (77°F/25°C) before removing the protective packaging. SynCore 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 SynCore to allow the user easy confirmation of removal.

SynCore in excess of 40 mils on roll stocks is inclined to form wrinkles due to natural tensions encountered during the winding operation. If roll stock is being used and wrinkles are encountered, we recommend removing the film material from the roll and letting it relax for a period of 24 to 48 hours at room temperature. Once material is cut from the roll, the balance of the material on the roll should be taped tightly to prevent the balance of the roll from relaxing.

## Application

**Storage Life** - SynCore 9872.1 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.

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

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

**Open Assembly Time** - SynCore 9872.1 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** - In general, SynCore 9872.1 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 SynCore 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 Mechanical Performance Properties

### Typical Uncured Properties

Gel time @ 350°F/177°C:	5-15 minutes
Volatiles @ 350°F/177°C, 60 min:	1% 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, 350°F/177°C:	25-50%

### Typical Cured Properties

Density, maximum (ASTM D792):	<b>lb/ft<sup>3</sup></b>	<b>kg/m<sup>3</sup></b>
for film 0.020 inch (0.508 mm) or less	49	785
for film 0.030 inch (0.762 mm) or greater	42	673

Coefficient of Thermal expansion:	52µm/m°C before T <sub>g</sub> (190°C)
	220µm/m°C after T <sub>g</sub> (190°C)

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

***Tensile Properties (ASTM D638-Dry)***

<u>Test Temperature, °F/°C</u>	<b>Strength</b>		<b>Modulus</b>		<u>Elongation, %</u>
	<u>psi</u>	<u>MPa</u>	<u>psi</u>	<u>MPa</u>	
-67/-55	4,700	32.4			
77/25	4,800	33.1	400,000	2,758	1.24
180/82	4,000	27.6	320,000	2,206	1.26
350/177	3,300	22.8	240,000	1,655	1.77

***Compressive Strength (ASTM D695)***

<u>Test Temperature, °F/°C</u>	<b>Dry</b>		<b>Wet<sup>1</sup></b>	
	<u>psi</u>	<u>MPa</u>	<u>psi</u>	<u>MPa</u>
-67/-55	10,500	72.4		
77/25	8,800	60.7	6,800	46.9
180/82	7,000	48.3	6,000	41.4
350/177	5,200	35.9	1,500	10.3

***Compressive Modulus***

<u>Test Temperature, °F/°C</u>	<u>psi</u>	<u>MPa</u>
77/25	375,000	2,586

***Shear Strength<sup>2</sup> (ASTM D2344)***

<u>Test Temperature, °F/°C</u>	<b>Dry</b>		<b>Wet<sup>1</sup></b>	
	<u>psi</u>	<u>MPa</u>	<u>psi</u>	<u>MPa</u>
-67/-55	6,000	41.4		
77/25	6,800	46.9	4,500	31.0
180/82	5,000	34.5	4,000	27.6
350/177	3,100	21.4	2,200	15.2

***Shear Modulus<sup>3</sup>***

<u>Test Temperature, °F/°C</u>	<u>psi</u>	<u>MPa</u>
-67/-55	167,000	1,151
77/25	150,000	1,034
180/82	115,000	793
350/177	100,000	689

***Flatwise Tensile Strength (ASTM C297)***

<u>Test Temperature, °F/°C</u>	<b>Dry</b>		<b>Wet<sup>1</sup></b>	
	<u>psi</u>	<u>MPa</u>	<u>psi</u>	<u>MPa</u>
-67/-55	3,000	20.7		
77/25	3,300	22.8		
180/82	2,800	19.3	2,800	19.3
300/150	2,500	17.2		
350/177	2,400	16.5		

### ***Tension (ASTM D638)***

<u>Test Temperature, °F/°C</u>	<u>Strength</u>		<u>Modulus</u>		<u>Elongation,%</u>
	<u>psi</u>	<u>MPa</u>	<u>psi</u>	<u>MPa</u>	
-67/-55	4,700	32.4			
77/25	4,800	33.1	400,000	2,758	1.24
180/82	4,000	27.6	320,000	2,206	1.26
350/177	3,000	22.8	240,000	1,655	1.77

<sup>1</sup> Wet conditioning was attained by exposing the specimens to 95-100% relative humidity at 160°F/ 71°C for 31 days.

<sup>2</sup> Sandwich panel made with 3 plies of DMS 2288 Type 1, Class 1 prepreg on each side of the SynCore.

<sup>3</sup> Based on calculated results.

### **Handling Precautions**

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

For industrial use only.

### **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. Empty containers retain product residue and vapors, so obey all precautions when handling empty containers.

### ONE PART

***WARNING!*** As with most epoxy based systems, this product may cause eye and skin irritation or allergic dermatitis. Contains epoxy resins.

SynCore<sup>®</sup> is a registered trademark of Henkel Corporation.

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Users should review the Materials Safety Data Sheet (MSDS) and product label for the material to determine possible health hazards, appropriate engineering controls and precautions to be observed in using the material. Copies of the MSDS and label are available upon request.

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