SynCore® 9823.1

Syntactic Film

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

Features
Excellent Moisture Resistance
Lightweight Syntactic Core Material
Modified Epoxy
Widths up to 36" (0.914 m)
250°F/121°C Cure
Co-curable

Product Forms

	inches	mm
Film Thickness:	0.010 to 0.060 +/- 0.002	0.254 to 1.524 +/- 0.051
Film Widths:	Standard 12 inches (30.6 cm)	
Roll Lengths:	Up to 200 feet (61 m) depending on film thickness	
Reinforcing Carrier:	SynCore 9823.1 is typically supplied with a reinforcing carrier. 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 (1 mm) 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, we recommend removing the film material from the roll and letting it relax for a period of 24 - 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. An alternative product form for SynCore is 1 foot by 2 foot sheet stock and is highly recommended for thicknesses above 40 mils (1 mm).

Application

Storage Life - SynCore 9823.1 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 your 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 9823.1 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 - 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, SynCore 9823.1 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 @ 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

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

Compressive Strength (ASTM D695)

Test Temperature, F / °C	Dry psi	Dry MPa	Wet (See Note 1) psi	Wet (See Note 1) MPa
-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

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

Shear Strength[2] (ASTM D2344)

Test Temperature, °F / °C	Dry psi	Dry MPa	Wet[1] psi	Wet[1] MPa
-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 Modulus[3]

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

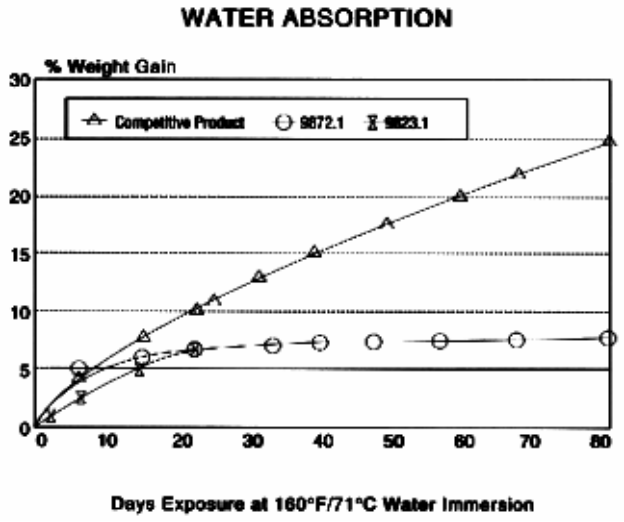
Flatwise Tensile Strength (ASTM C297)

Test Temperature, °F / °C	Dry psi	Dry MPa	Wet[1] psi	Wet[1] MPa
-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

Tension (ASTM D638)

Test Temperature, °F / °C	Strength psi	Strength MPa	Modulus psi	Modulus MPa	Elongation, %
-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	28.3	320,000	2,241	1.50
250 / 121	3,000	20.7	230,000	1,566	2.15

[1] Wet conditioning was attained by exposing the specimens to 95-100% relative humidity at 160°F / 70°C for 31 days.
[2] Sandwich panel made with 3 plies of DMS 2288 Type 1, Class 1 prepreg on each side of the SynCore.
[3] 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.

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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.