HexPly® M77HF

quick cure epoxy system for industrial applications

HEXCEL®

Product Data Sheet

Description

HexPly® M77HF prepreg is a fiber-reinforced modified epoxy resin system specifically designed for bladder molding or sheet wrap tube applications. Unique chemistry provides fully cured parts in only three minutes at 300°F (149°C).

Features

- Quick cure, three minutes at 300°F (149°C)
- Available in wide variety of carbon or glass tapes and fabrics
- High temperature stability for hot de-mold
- Low viscosity, 10 poise at 230°F (110°C)

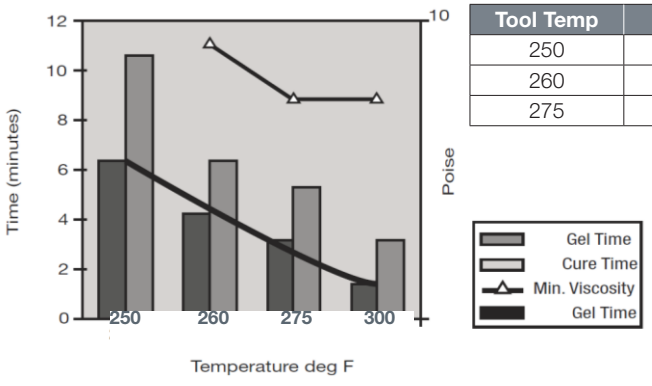
Applications

- Golf Shafts
- Bicycle Components
- Hockey Sticks
- Arrow Shafts
- Fishing Rods
- Prosthetics

Neat Resin Properties

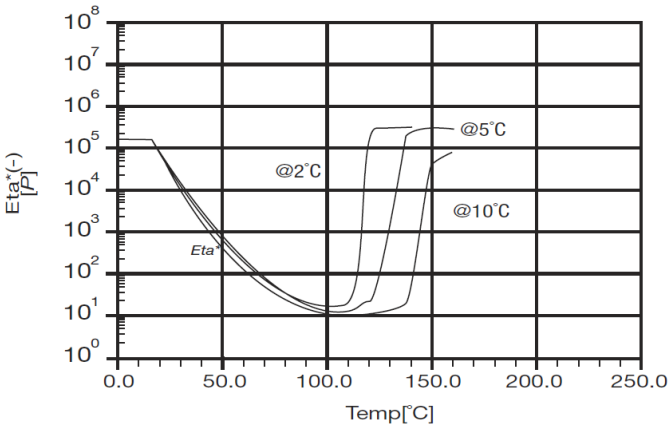
Neat Resin Property	HexPly® M77HF
Specific Gravity	1.34
Glass Transition Temperature-DMTA, °F (°C)	266 (130)
Tensile Strength, ksi (MPa)	11.8 (81)
Tensile Modulus, Msi (GPa)	0.50 (3.45)
Tensile Strain, %	3.7
K_{1C} Fracture Toughness, ksi-in$^{1/2}$ (MPa-m$^{1/2}$)	1.28 (1.41)
Cure Time at 300°F, minutes	3
Cure Time at 275°F, minutes	5
Cure Time at 225°F, minutes	30

Gel Time vs. Temperature



Tool Temp	Gel Time	Cure Time	in V (poise)
250	6.5	10	
260	4	6	8
275	3	5	5

Viscosity at Different Heat Up Rates



Availability

HexPly®M77HF is available in natural color, black and green and a wide variety of carbon or glass tapes and fabrics. The currently made products are:

Form	Hexcel Designation	Fiber	Fiber Areal Wt. g/m²	Weave	Count Warp x Fill	Widths Available In (cm)	Resin Content %
Glass Fabric	6543GL/M77HF-12G	SCG 75 1/2 x ECE 225 1/0	288	4H Satin	48 x 30	38 (96.5)	32
	6557GL/M77HF-12G	SCG 150 1/2 x ECE 225 1/0	180	4H Satin	57 x 30	38 (96.5)	33
	7781GL/M77HF-7B	ECDE 75 1/0	301	8H Satin	57 x 54	50 (127)	45
Carbon Fabric	W3X 282/M77HFS	3K 33MSI	197	Plain	12 x 12	50 (127)	40
Carbon Tape	AS4AGP6K/M77HF	6K	80	Tape	n/a	24 (61)	38
	AS4AGP12K/ M77HF	12K	120, 150	Tape	n/a	24 (61)	38
	IM2C-GS/M77HF	IM2C-GS	110	Tape	n/a	24 (61)	40

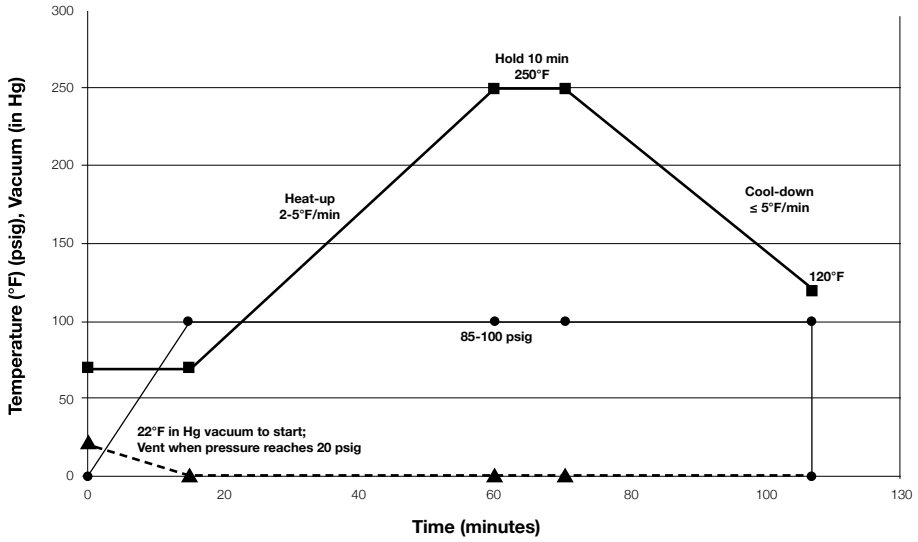
Mechanical Properties

Prepreg	CHS/M77HF; 35%;150AW	MS40/M77HF; 31%;120AW	IM4/M77HF; 31%;120AW	CHS24K/M77HF; 36%;150AW
Fiber	AS4C	MS40	IM4	T600
FAW (gsm)	150	120	120	150
Tensile Strength, ksi (GPa)	336 (2.32)	372 (2.56)	323 (2.23)	329 (2.27)
Tensile Modulus, Msi (GPa)	18.1 (125)	26.7 (184)	21.1 (145)	17.1 (118)
Compression Strength, ksi (GPa)	218 (1.50)	233 (1.61)	222 (1.53)	240 (1.65)
Compression Modulus, Msi (GPa)	16.9 (117)	24.3 (168)	20.0 (138)	17.8 (123)
Short Beam Shear, ksi (MPa)	12.2 (84.1)	12.2 (84.1)	12.4 (85.5)	12.9 (88.9)
Flexural Strength, ksi (Gpa)	191 (1.32)	193 (1.33)	203 (1.40)	214 (1.48)
Flexural Modulus, Msi (GPa)	16.9 (117)	24 (165)	19.2 (132)	16.5 (114)

1. Normalized to 55% fiber volume 2.75°F, dry.

Cure Cycle

HexPly® M77HF is designed to be cured using bladder molding, cello wrap, compression molding, or autoclave conditions. The standard autoclave cure is 10 minutes at 250°F (121°C) with 85 psig minimum pressure.



Alternative Cure Cycles:

1) 3 minutes at 300°F (149°C)
2) 6 minutes at 260°F (127°C)
3) 10 minutes at 250°F (121°C)

Storage

Shelf Life: 18 months at 0°F (-18°C) *(maximum, from date of manufacture)*

Out Life: 30 days at 73°F (23°C)

Tack Life: 10 days at 73°F (23°C)

Storage Conditions

HexPly® M77HF prepregs should be stored as received in a cool dry place or in a refrigerator. After removal from refrigerator storage, prepreg should be allowed to reach room temperature before opening the polythene bag, thus preventing condensation. (A full creel in its packaging can take up to 48 hours).

Precautions for Use

The usual precautions when handling uncured synthetic resins and fine fibrous materials should be observed, and a Safety Data Sheet is available for this product. The use of clean disposable inert gloves provides protection for the operator and avoids contamination of material and components.

Shipping

Prepreg is generally shipped in a sealed polyethylene bag in refrigerated transportation or in containers with dry ice.

Disposal of Scrap

Disposal of this material should be in a secure landfill in accordance with state and federal regulations.

For more information

Hexcel is a leading worldwide supplier of lightweight composite materials to aerospace and industrial markets. Our comprehensive range includes:

- HexTow® carbon fibers
- HexForce® reinforcements
- HiMax® multiaxial reinforcements
- HexPly® prepregs
- HexMC®-i molding compounds
- HexFlow® RTM resins
- HexBond® adhesives
- HexTool® tooling materials
- HexWeb® honeycomb
- Acousti-Cap® sound attenuating honeycomb
- Engineered core
- Engineered products
- Polyspeed® laminates & pultruded profiles
- HexAM® additive manufacturing

For U.S. quotes, orders and product information call toll-free 1-800-688-7734. For other worldwide sales office telephone numbers and a full address list, please go to:

https://www.hexcel.com/contact

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