HexPly® 996

350°F (177°C) curing cyanate siloxane matrix

HEXCEL®

Product Data Sheet

Description

HexPly® 996 is a 350ºF (177ºC) curing cyanate siloxane resin with a 330ºF (165ºC) glass transition temperature. Standard cure is two hours at 350ºF (177ºC). HexPly® 996 can be autoclave and press cured. HexPly® 996 can be impregnated on all available fibers and fabrics. The recommended lay-up procedure for HexPly® 996 is HSP-L3. The recommended cure procedure is HSP-C1 or HSP-C6.

Typical applications for HexPly® 996 are primary and secondary space structures where the optimum dimensional stability and lowest moisture absorption are required.

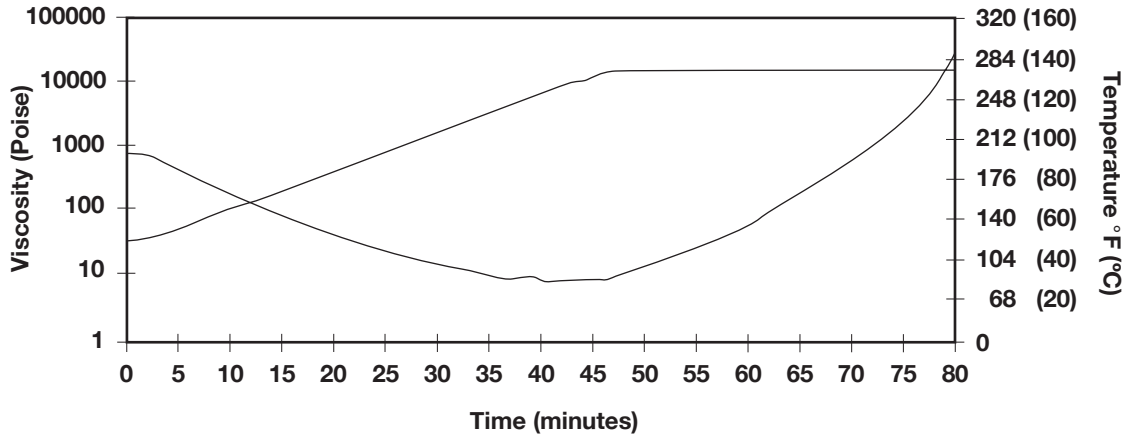
Features

- Lowest moisture absorbing cyanate resin system available
- Attractive electrical properties
- Good dimensional stability
- 350ºF (177ºC) cure
- Available in a broad range of reinforcements for both tapes and fabrics
- Good microcracking resistance
- Low outgassing

Typical Neat Resin Properties

Properties		RT
Tensile Strength	**ksi**	7.4
	MPa	51
Tensile Modulus	**Msi**	0.43
	GPa	3.0
Strain %		1.7
Compression Strength	**ksi**	19.1
	MPa	132
Flexural Strength	**ksi**	11.0
	MPa	76
Flexural Modulus	**Msi**	0.47
	GPa	3.2
G1 C (in-lbs/in^2)		2.36
Density (g/cc)		1.146
Tg, (RDS Torsion G1) ºC		169

HexPly® 996 Viscosity Profile



HexPly® 996 Neat Resin Outgassing

Outgassing	NASA Limits	996
TML%	1.0	0.17
CVCM%	0.1	0.01
WVR%	-	0.1

Tested per ASTM 595

Thermal Cycle Evaluation

Materials	0 Cycles # cracks/in.	10 Cycles # cracks/in.	50 Cycles # cracks/in.	100 Cycles # cracks/in.
996/M55J, 0°	0	0.25	0.25	0.25
996/M55J, 90°	0	0	1.25	1.25
954-3/M55J, 0°	0	0	0	0
954-3/M55J, 90°	0	0	1.25	1.25

Notes: Laminate configuration is (45, -45, 0, 90)4S
Thermal cycle: -250°F (-157°C) to 250°F (121°C) @ 10°F/min., 5 min. hold

Dimensional Stability: Neat Resin

Property	996
CTE, ppm/°F, 58°F - 78°F	31.96

Dimensional Stability: HexPly® M55J/996

Property	Unidirectional Laminate	Quasi-isotropic Laminate-1	Quasi-isotropic Laminate-2
Fiber Volume, %	59.3	59.0	63.1
CTE, µ/in/°F,	0° orient. -0.533	-0.118	-0.119
58°F - 78°F	90° orient. +20.50		

Typical HexPly® 996 Outlife Data

Property	Day 1	Day 7	Day 14	Day 21
Tack	IV	III	III	III
Drape	pass	pass	pass	pass
Flow, %	15.4	13.9	15.9	14.7
Tg, ºC	169.7/169.4	171.1/170.6	170.0/169.6	170.9/170.4
SBS, ksi	10.4/10.1	10.9/10.6	10.5/10.4	10.6/10.4

HexPly® 996 Neat Resin Dielectric Properties (9.375 Mhz)

Property	RT	250ºF
Dielectric Constant	3.54	3.45
Loss Tangent	0.008	0.012

HexPly® 996/M55J Mechanical Summary

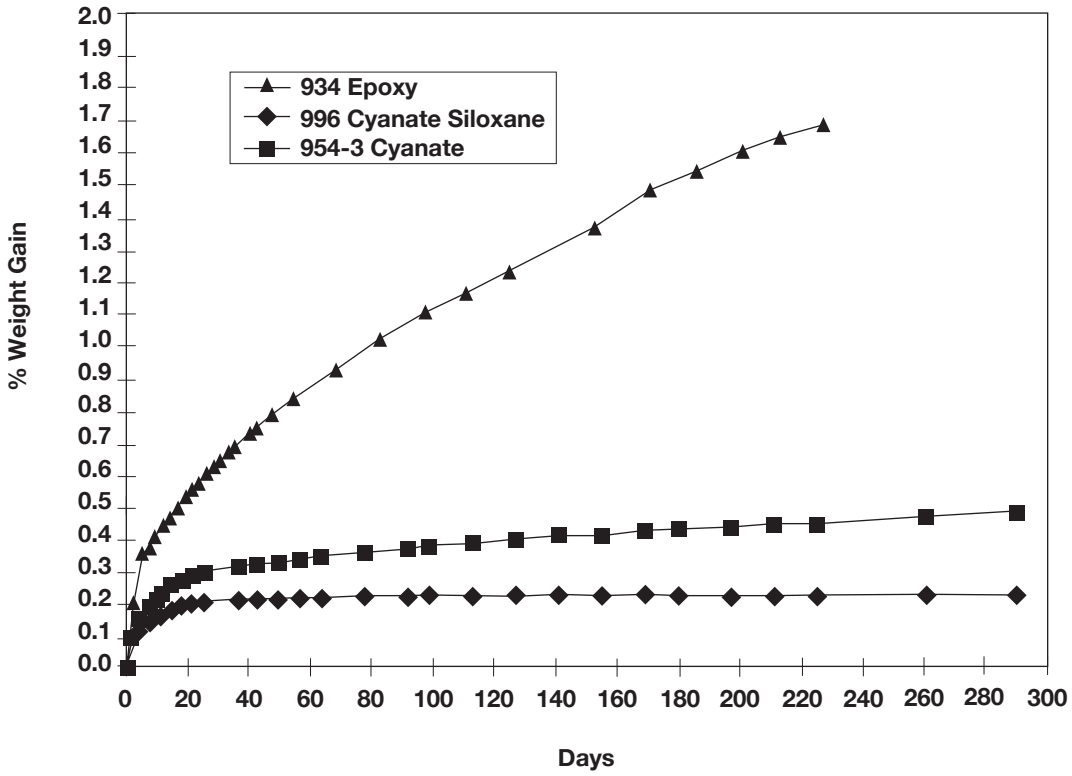
Property		Method	-67ºF/dry Avg	RT/dry Avg	180ºF/wet Avg
0º Tension Strength	**ksi**	ASTM 3039	289	286	270
0º Tension Modulus	**Msi**	"	46.67	45.95	46.39
90º Tension Strength	**ksi**	ASTM 3039	5.8	6.1	5.7
0º Comp. Strength	**ksi**	SACMA SRM-1R94	136.3	129.1	114.5
0º Comp. Modulus	**Msi**	"	45.88	49.46	48.00
SBS Strength	**ksi**	ASTM 2344	12.6	10.7	7.8
In-Plane Shear Strength	**ksi**	SMR-7R94	n/a	10.9	n/a
In-Plane Shear Modulus	**Msi**	"	n/a	0.62	n/a
Tg ºC (RDS Torsion, G1)		T-41	n/a	169.6	160.4

Typical Mechanical Properties (Various Fibers)

Property		Fibers (Average Values)			
		M40J	M55J	M60J	K13C2U
0 Tensile Strength	**ksi**	336	292	294	241
	MPa	*2316*	*2013*	*2027*	*1661*
0 Tensile Modulus	**Msi**	29.6	44.9	50.0	78.4
	GPa	*204*	*310*	*345*	*540*
0 Comp. Strength	**ksi**	168	127	128	50.7
	MPa	*1158*	*876*	*882*	*350*
0 Comp. Modulus	**Msi**	26.3	41.4	48.1	77.2
	GPa	*181*	*285*	*332*	*532*
0 IL Shear Strength	**ksi**	11.0	9.4	11.7	7.1
	MPa	*76*	*65*	*81*	*49*

Notes: 0 degree tensile and compression values are normalized to 60% fiber volume. All testing performed at RT.

Neat Resin Moisture Absorption at RT/50% RH
(compared to HexPly® 934 epoxy and HexPly® 954-3 cyanate)



Handling and Safety Precautions

Hexcel recommends that customers observe established precautions for handling resins and fine fibrous materials. Operators working with this product should wear clean, impervious gloves to reduce the possibility of skin contact and to prevent contamination of the material. Material Safety Data Sheets (MSDS) have been prepared for all Hexcel products and are available to company safety officers on request from the nearest Hexcel Sales Office.

Prepreg Storage Life

	Definition	Time
Tack Life	The time, at room temperature, during which prepreg retains enough tack for easy component lay-up.	10 days at RT (23°C/73°F
Out Life	The maximum accumulated time allowed at room temperature between removal from the freezer and cure.	14 days at RT (23°C/73°F)
Shelf Life	The maximum storage life for HexPly prepreg, when stored continuously, in a closed moisture proof bag at -18°C/0°F.	6 months at -18°C/0°F (maximum, from date of manufacture)

To accurately establish the exact expiration date, consult the box label.

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 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® honeycombs
- 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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