HexPly® 954-2A

350°F (177°C) curing cyanate resin

HEXCEL®

Product Data Sheet

Description

HexPly® 954-2A is a 350ºF (177ºC) curing toughened cyanate resin with low moisture absorption, and excellent microcracking resistance. HexPly® 954-2A is formulated for autoclave or press molding. Recommended cure is two hours at 350ºF (177ºC). The recommended lay-up procedure is HSP-L3. The recommended cure procedure is HSP-C1 or HSP-C3.

Typical applications for HexPly® 954-2A include primary and secondary aircraft structure, space structures, cryogenic tanks, or any application where impact resistance, light weight and excellent dielectric properties are required. HexPly® 945-2A can be impregnated via hot melt or solution technologies on all available fibers and fabrics.

Features

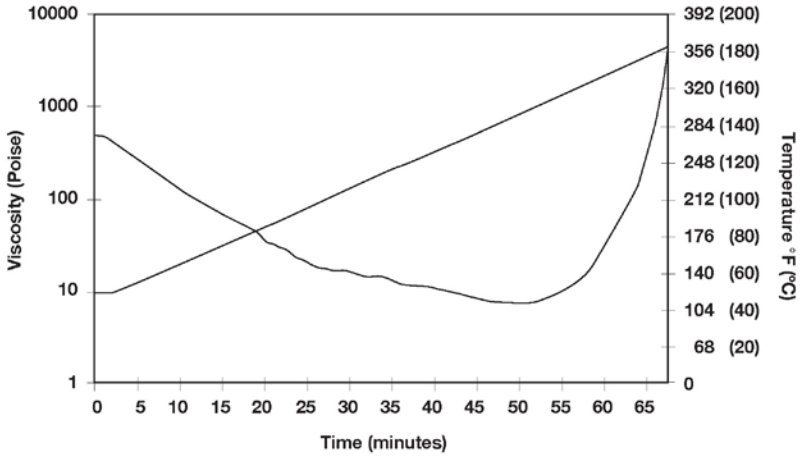
- Thermoplastic toughened cyanate resin
- Low moisture absorption
- Excellent resistance to microcracking
- High impact resistance
- Attractive electrical properties
- 350ºF (177ºC) cure
- Controlled flow processing
- Available on broad range of fibers and in forms including tape, fabric and tow
- Autoclave or press mold processable

Typical Neat Resin Properties

Properties		RT	325ºF (163ºC)	325ºF (163ºC) Wet	350ºF (177ºC)
Tensile Strength	**ksi**	10			
	MPa	*69*			
Tensile Modulus	**Msi**	0.44			
	GPa	*3.0*			
Tensile Ult. Strain	**%**	2.59			
Tensile Poisson Ratio		0.38			
Flexural Strength	**ksi**	16.9	13.5	11.9	12.6
	MPa	*117*	*93*	*82*	*87*
Flexural Modulus	**Msi**	0.44	0.35	0.34	0.35
	GPa	*3.0*	*2.4*	*2.3*	*2.4*
Tg (DMA- G')	**ºC**	191/376			
Density	**g/cc**	1.24			
CTE	**µin/in ºF**	28.2			

Note: Wet = Immersion at 160ºF for 7 days

HexPly® 954-2A Viscosity Profile [Ramp to 356°F (180°C)]



HexPly® 954-2A Neat Resin Dielectric Properties

Dielectric Properties	RT	325°F (163°C)
Unconditioned		
Dielectric Constant (Dk)	2.92	2.92
Loss Tangent (Df)	0.008	0.01
Moisture Conditioned* (1)		
Dielectric Constant (Dk)	3.13	3.29
Loss Tangent (Df)	0.01	0.02

Notes: Moisture Conditioned: 160°F (71°C) and 95% RH for 140 days. Tested to ASTM 2520D at 10.0 GHz.

Typical Mechanical Properties (Various Fibers)

Property		Fibers (Average Values)			
		G40-800	M55J	M60J	K1100
0 Tensile Strength	**ksi**	438	297	284	176
	MPa	*3017*	*2048*	*1958*	*1213*
0 Tensile Modulus	**Msi**	23	47	51	81
	GPa	*159*	*324*	*352*	*558*
0 Comp Strength	**ksi**	219	130	126	38
	MPa	*1510*	*896*	*869*	*262*
0 Comp Modulus	**Msi**	23	42	47	81
	GPa	*158*	*290*	*324*	*558*
0 Flex Strength	**ksi**	-	150	150	69
	MPa	-	*1034*	*1034*	*476*
0 Flex Modulus	**Msi**	-	37	42	62
	GPa	-	*255*	*290*	*427*
0 IL Sheer Strength	**ksi**	16.14	11.0	11.6	3.5
	MPa	*111*	*76*	*80*	*24*

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

Mechanical Property Summary (IM7 Fiber)

Mechanical Properties	DRY	RT	300ºF (149ºC)	325ºF (163ºC)	350ºF (177ºC)
0° Tensile Strength	ksi	388			
0° Tensile Modulus	Msi	23.2			
0° Compressive Strength	ksi	206		145	149
Short Beam Shear Modulus	ksi	14.5	9.20	8.50	7.20
In-Plane Shear Modulus	Msi	0.62			
90° Flexural Strength	ksi	12.7			
OHC Strength	ksi	41.1			
CAI Strength	ksi	30.0			
Mechanical Properties	**WET**	**RT**	**300ºF (149ºC)**	**325ºF (163ºC)**	**350ºF (177ºC)**
0° Compressive Strength	ksi		205		
Short Beam Shear Modulus	ksi		7.00	6.70	7.20
In-Plane Shear Modulus	Msi		0.42	0.40	
OHC Strength	ksi		34.2	32.50	31.3

Notes: *(1) (45, 0, -45, 90) 2S lay-up per BMS 8-276*

(2) Specimens impacted and tested per BMS -276 at 1500 in-lbs/in.

(3) Wet = 1 week immersion in 160º F water

(4) Wet = Equilibrium at 85% RH at 150º F (66º C)

(5) Wet = 14 days immersion in 160º F (71º C) water

All of the above data was generated using 145 g/m2 material.

Laminates used were between 56-60% fiber volume, and the resulting data was not normalized.

S-2 Glass Fiber Reinforced 8 Harness Satin Fabric

Mechanical Properties	DRY	RT	325ºF (163ºC)	350ºF (177ºC)	375ºF (191ºC)	400ºF (204ºC)
0° Tensile Strength	ksi	9.1				
0° Tensile Modulus	Msi	4.1				
0° Tensile Strain	%	2.8				
0° Compressive Strength	ksi	85	63	62	55	53
0° Compressive Modulus	Msi	4.3	4.3	4.5	4.2	4.3
0° Flexural Strength	ksi	123				
0° Flexural Modulus	Msi	4.1				
Short Beam Shear Strength	ksi	10.9	7.6	6.0	6.3	5.4
Mechanical Properties	**WET**	**RT**	**300ºF (149ºC)**	**325ºF (163ºC)**		
0° Compressive Strength	ksi		50	46		
Short Beam Shear Modulus	ksi		5.4	5.1		

** Wet: Immersed in water at 160ºF (71ºC) for 7 days.*

The data tested has been obtained from carefully controlled samples considered to be representative of the product described. Because the properties of this product can be signficantly affected by the fabrication and testing techniques employed and since hexcel does not control the conditions under which its products are tested and used, Hexcel cannot guarantee that the properties listed will be obtained with processes and equipment.

Quartz Fiber Reinforced 8 Harness Satin Fabric

Mechanical Properties	DRY	RT	325ºF (163ºC)	350ºF (177ºC)
0° Tensile Strength	**ksi**	94		
0° Tensile Modulus	**Msi**	3.2		
0° Tensile Strain	**%**	3.5		
0° Compressive Strength	**ksi**	75	59	54
0° Compressive Modulus	**Msi**	3.4	3.4	3.1
0° Flexural Strength	**ksi**	111		
0° Flexural Modulus	**Msi**	3.0		
Short Beam Shear Strength	**ksi**	10.4	6.7	6.5
Mechanical Properties	**WET**	**RT**	**300ºF (149ºC)**	**325ºF (163ºC)**
0° Compressive Strength	**ksi**		52	50
0° Compressive Modulus	**Msi**		3.4	3.4
Short Beam Shear Modulus	**ksi**		6.4	5.4

** Wet: Immersed in water at 160ºF (71ºC) for 7 days.*

Dielectric Properties	20.7 GHz	44.5Ghz
Dielectric Constant (Dk)	3.22	3.32
Loss Tangent (Df)	0.006	0.006

Test performed at room temperature, ambient moisture content.

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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