



HexPly® 954-2A

350°F (177°C) curing cyanate resin

Product Data

Description

HexPly® 954-2A is a 350°F (177°C) 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 350°F (177°C). 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 techniques on all available fibers and fabrics.

Features

- Thermoplastic toughened cyanate resin
- Low moisture absorption
- Excellent resistance to microcracking
- High impact resistance
- Attractive electrical properties
- 350°F (177 °C) 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

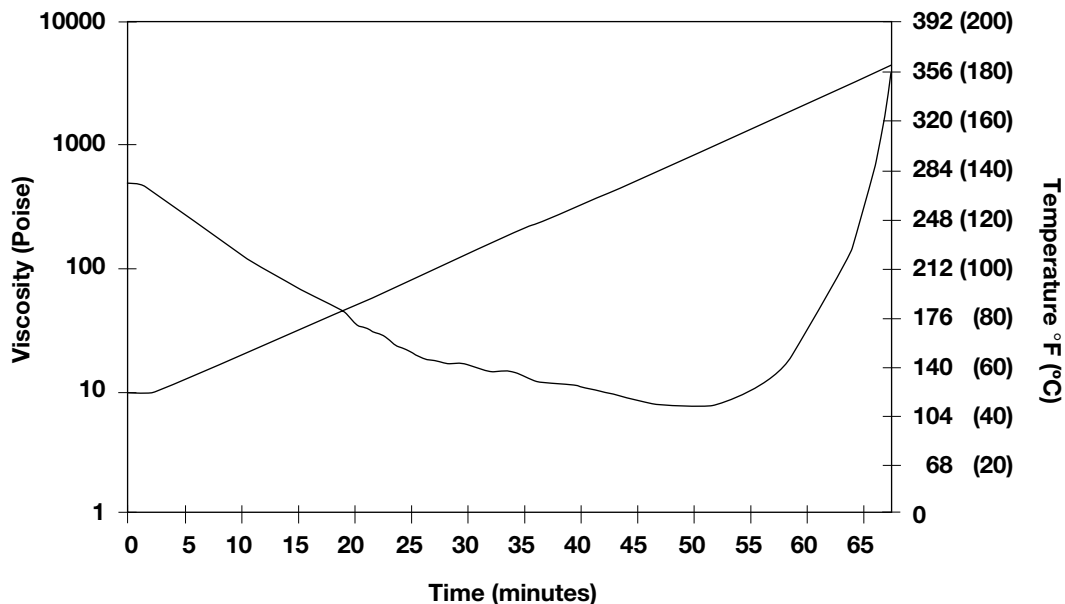
Properties		RT	325°F (163°C)	325°F (163°C) Wet	350°F (177°C)
Tensile Strength,	ksi	10			
	MPa	69			
Tensile Modulus,	Msi	0.44			
	GPa	3.0			
Tensile Ult. Strain,	%	2.59			
Tensile Poisson Ratio		0.38			
Flexural Strength,	ksi	16.9	13.5	11.9	12.6
	MPa	117	93	82	87
Flexural Modulus,	Msi	0.44	0.35	0.34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

Note: Wet = Immersion at 160°F 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 Shear 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	300°F (149°C)	325°F (163°C)	350°F (177°C)
0° Tensile Strength,	ksi	388			
0° Tensile Modulus,	Msi	23.2			
0° Compressive Strength,	ksi	206		145	149
Short Beam Shear Strength,	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	41.4			
CAI Strength,	ksi	30.0			
Mechanical Properties	WET	RT	300°F (149°C)	325°F (163°C)	350°F (177°C)
0° Compressive Strength,	ksi		205		
Short Beam Shear Strength,	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 160° F water
 (4) Wet = Equilibrium at 85% RH at 150° F (66° C)
 (5) Wet = 14 days immersion in 160° F (71° 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	325°F (163°C)	350°F (177°C)	375°F (191°C)	400°F (204°C)
0° Tensile Strength,	ksi	91				
0° Tensile Modulus,	Msi	4.1				
0° Tensile Strain,	%	2.8				
0° Comp. Strength,	ksi	85	63	62	55	53
0° Comp. Modulus,	Msi	4.3	4.3	4.5	4.2	4.3
0° Flexural Strength,	ksi	123				
0° Flexural Modulus,	Msi	4.1				
SB Shear Strength,	ksi	10.9	7.6	6.0	6.3	5.4
Mechanical Properties	WET*		300°F (149°C)	325°F (163°C)		
0° Comp. Strength,	ksi		50	46		
SB Shear Strength,	ksi		5.4	5.1		

* Wet: Immersed in water at 160°F (71°C) 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 significantly 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 other processes and equipment.



Quartz Fiber Reinforced 8 Harness Satin Fabric

Mechanical Properties	DRY	RT	325°F (163°C)	350°F (177°C)
0° Tensile Strength,	ksi	94		
0° Tensile Modulus,	Msi	3.2		
0° Tensile Strain,	%	3.5		
0° Comp. Strength,	ksi	75	59	54
0° Comp. Modulus,	Msi	3.4	3.4	3.1
0° Flexural Strength,	ksi	111		
0° Flexural Modulus,	Msi	3.0		
SB Shear Strength,	ksi	10.4	6.7	6.5
Mechanical Properties	WET*	300°F (149°C)	325°F (163°C)	
0° Comp. Strength,	ksi	52	50	
0° Comp. Modulus,	Msi	3.4	3.4	
SB Strength,	ksi	6.4	5.4	

* Wet: Immersed in water at 160°F (71°C) for 7 days.

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

Test performed at room temperature, ambient moisture content.

Important

Hexcel Corporation believes, in good faith, that the technical data and other information provided herein is materially accurate as of the date this document is prepared. Hexcel reserves the right to modify such information at any time. The performance values in this data sheet are considered representative but do not and should not constitute specification minima. The only obligations of Hexcel, including warranties, if any, will be set forth in a contract signed by Hexcel or in Hexcel's then current standard Terms and Conditions of Sale as set forth on the back of Hexcel's Order Acknowledgement.

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