



# HexPly® 8552

Epoxy matrix (180°C/356°F curing matrix)

## Product Data

### Description

HexPly® 8552 is a high performance tough epoxy matrix for use in primary aerospace structures. It exhibits good impact resistance and damage tolerance for a wide range of applications.

HexPly® 8552 is an amine cured, toughened epoxy resin system supplied with unidirectional or woven carbon or glass fibres.

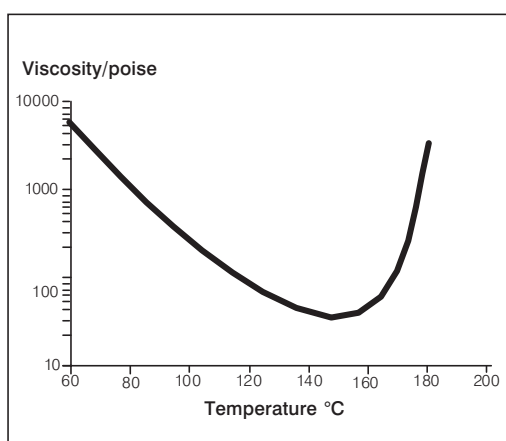
HexPly® 8552 was developed as a controlled flow system to operate in environments up to 121°C (250°F).

### Benefits and Features

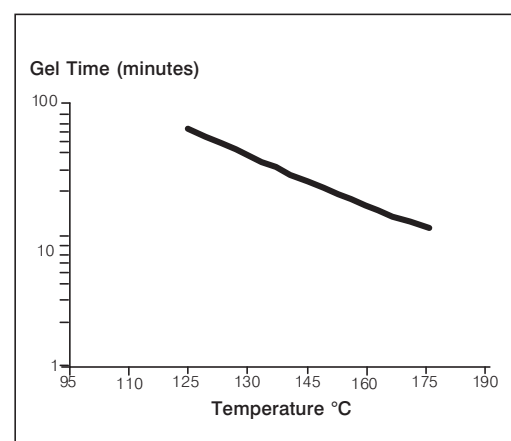
- Toughened epoxy matrix with excellent mechanical properties
- Elevated temperature performance
- Good translation of fibre properties
- Controlled matrix flow in processing
- Available on various reinforcements
- Excellent drape and tack

### Resin Matrix Properties

Rheology



Gel Time





# HexPly® 8552

## Prepreg Properties - HexPly® 8552 UD Carbon Prepregs

### Physical Properties

	Units	AS4	IM7
Fibre Density	g/cm <sup>3</sup> (lb/in <sup>3</sup> )	1.79 (0.065)	1.77 (0.064)
Filament count/tow		12K	12K
Resin density	g/cm <sup>3</sup> (lb/in <sup>3</sup> )	1.30 (0.047)	1.30 (0.047)
Nominal Cured Ply Thickness 8552 /35%/134	mm (inch)	0.130 (0.0051)	0.131 (0.0052)
Nominal Fibre Volume	%	57.42	57.70
Nominal Laminate Density	g/cm <sup>3</sup> (lb/in <sup>3</sup> )	1.58 (0.057)	1.57 (0.057)

### Mechanical Properties

Test	Units	Temp °C (°F)	Condition	AS4	IM7
0°Tensile Strength	MPa (ksi)	-55(-67)	Dry	1903 (267)	2572 (373)
		25(77)	Dry	2207 (320)	2724 (395)
		91(195)	Dry	-	<b>2538 (368)*</b>
90°Tensile Strength	MPa (ksi)	-55(-67)	Dry	-	174 (25.3)
		25(77)	Dry	81 (11.7)	64 (9.3)
		93(200)	Dry	75 (10.9)	<b>92 (13.3)*</b>
0°Tensile Modulus	GPa (msi)	-55(-67)	Dry	134 (19.4)	163 (23.7)
		25(77)	Dry	141 (20.5)	164 (23.8)
		91(195)	Dry	-	<b>163 (23.7)*</b>
90°Tensile Modulus	GPa (msi)	-	-	-	-
		25(77)	Dry	10 (1.39)	12 (1.7)
		93(200)	Dry	8 (1.22)	<b>10 (1.5)*</b>
0°Compression Strength	MPa (ksi)	-55(-67)	Dry	1586 (230)	-
		25(77)	Dry	1531 (222)	1690 (245)
		91(195)	Dry	1296 (184)	1483 (215)
0°Compression Modulus	GPa (msi)	-55(-67)	Dry	124 (18)	-
		25(77)	Dry	128 (18.6)	150 (21.7)
		91(195)	Dry	122 (17.7)	162 (23.5)
0° ILSS (Shortbeam shear)	MPa (ksi)	-55(-67)	Dry	164 (23.8)	-
		25(77)	Dry	128 (18.5)	137 (19.9)
		91(195)	Dry	122 (14.7)	<b>94 (13.6)*</b>
		25(77)	Wet	117 (16.9)	115 (16.7)
		71(160)	Wet	84 (12.2)	<b>80 (11.6)**</b>
		91(195)	Wet	78 (11.3)	-
In-plane Shear Strength	MPa (ksi)	25(77)	Dry	114 (16.6)	120 (17.4)
		93(200)	Dry	105 (15.2)	<b>106 (15.4)*</b>

**Bold 93°C (200°F)**

**Bold\* 104°C (220°F)**

**Bold\*\* 82°C (180°F)**

**Prepreg Properties - HexPly® 8552 Woven Carbon Prepregs (AS4 Fibre)**

**Physical Properties**

	Units	AGP193-PW	AGP 280-5H
Fibre Type	-	AS4 3K	AS4 3K
Fibre density	g/cm <sup>3</sup> (lb/in <sup>3</sup> )	1.77 (0.065)	1.77 (0.065)
Weave	-	Plain	5HS
Mass	g/m <sup>2</sup> (oz/yd <sup>2</sup> )	193 (5.69)	286 (8.44)
Weight Ratio, Warp : Fill		50 :50	50 :50
Nominal cured ply thickness @ 37% resin content	mm (inch)	0.195 (0.0076)	0.289 (0.0114)
Nominal Fibre Volume	%	55.29	55.29
Nominal Laminate Density	g/cm <sup>3</sup> (lb/in <sup>3</sup> )	1.57 (0.057)	1.57 (0.057)

**Mechanical Properties**

Test	Units	Temp°C (°F)	Condition	AGP193-PW	AGP280- 5H
0°Tensile Strength	MPa (ksi)	-55(-67)	Dry	766 (111)	828 (120)
		25(77)	Dry	828 (120)	876 (127)
		91(195)	Dry	-	903 (131)
90°Tensile Strength	MPa (ksi)	-55(-67)	Dry	710 (103)	752 (109)
		25(77)	Dry	793 (115)	800 (116)
		93(200)	Dry	759 (110)	772 (112)
0°Tensile Modulus	GPa (msi)	-55(-67)	Dry	66 (9.5)	70 (10.2)
		25(77)	Dry	68 (9.8)	67 (9.7)
		91(195)	Dry	-	69 (10)
90°Tensile Modulus	GPa (msi)	-55(-67)	Dry	66 (9.6)	67 (9.7)
		25(77)	Dry	66 (9.5)	66 (9.5)
		93(200)	Dry	68 (9.8)	65 (9.4)
0°Compression Strength	MPa (ksi)	-55(-67)	Dry	959 (139)	-
		25(77)	Dry	883 (128)	924 (134)
		91(195)	Dry	759 (110)	<b>752 (109)</b>
0°Compression Modulus	GPa (msi)	-55(-67)	Dry	60 (8.7)	-
		25(77)	Dry	60 (8.7)	64 (9.3)
		91(195)	Dry	61 (8.8)	<b>67(9.7)</b>
0° ILSS (Shortbeam shear)	MPa (ksi)	-55(-67)	Dry	101 (14.6)	-
		25(77)	Dry	84 (12.2)	79 (11.4)
		91(195)	Dry	70 (10.2)	-
		25(77)	Wet	75 (10.9)	69 (10)
		71(160)	Wet	72 (10.4)	-
		91(195)	Wet	59 (8.5)	-

**Bold 93°C (200°F)    Bold\* 104°C (220°F)    Bold\*\* 82°C (180°F)**

# HexPly® 8552

## Prepreg Properties - HexPly® 8552 Woven Carbon Prepregs (IM7 Fibre)

### Physical Properties

	Units	SPG 196-P	SPG 370-8H
Fibre Type	-	IM7 6K	IM7 6K
Fibre density	g/cm <sup>3</sup> (lb/in <sup>3</sup> )	1.77 (0.064)	1.77 (0.064)
Weave	-	Plain	8HS
Mass	g/m <sup>2</sup> (oz/yd <sup>2</sup> )	196 (5.78)	374 (11.03)
Weight Ratio, Warp : Fill		50 :50	49 :51
Nominal cured ply thickness @ 37% resin content	mm (inch)	0.199 (0.0078)	0.380 (0.0150)
Nominal Fibre Volume	%	55.57	55.57
Nominal Laminate Density	g/cm <sup>3</sup> (lb/in <sup>3</sup> )	1.56 (0.056)	1.56 (0.056)

### Mechanical Properties

Test	Units	Temp°C (°F)	Condition	SPG 196-PW	SPG 370-8H
0°Tensile Strength	MPa (ksi)	-55(-67)	Dry	979 (142)	965 (140)
		25(77)	Dry	1090 (158)	1014 (147)
		91(195)	Dry	-	-
90°Tensile Strength	MPa (ksi)	-55(-67)	Dry	862 (125)	903 (131)
		25(77)	Dry	945 (137)	959 (139)
		93(200)	Dry	<b>979 (142)*</b>	<b>879 (130)*</b>
0°Tensile Modulus	GPa (msi)	-55(-67)	Dry	85 (12.3)	86 (12.5)
		25(77)	Dry	85 (12.3)	86 (12.4)
		91(195)	Dry	-	-
90°Tensile Modulus	GPa (msi)	-55(-67)	Dry	80 (11.6)	81 (11.7)
		25(77)	Dry	80 (11.6)	81 (11.7)
		93(200)	Dry	<b>79 (11.5)*</b>	<b>79 (11.5)*</b>
0° ILSS (Shortbeam shear)	MPa (ksi)	-55(-67)	Dry	-	-
		25(77)	Dry	88 (12.7)	90 (13)
		91(195)	Dry	<b>69 (10)*</b>	<b>74 (10.8)*</b>
		25(77)	Wet	80 (11.6)	83 (12.1)
		71(160)	Wet	<b>61 (8.8)**</b>	<b>63 (9.1)**</b>
		91(195)	Wet	-	-

**Bold 93°C (200°F)**

**Bold\* 104°C (220°F)**

**Bold\*\* 82°C (180°F)**

### Typical Neat Resin Data

Colour	Yellow	
Density	1.301 g/cc	(0.0470 lb/in <sup>3</sup> )
Glass Transition Temperature, Tg dry	200°C	(392°F)
Glass Transition Temperature, Tg wet	154°C	(309°F)
Tensile Strength	121 MPa	(17.5 ksi)
Tensile Modulus	4670 MPa	(0.677 msi)



## **Curing Conditions**

### **Cure cycle for monolithic components**

1. Apply full vacuum (1 bar).
2. Apply 7 bar gauge autoclave pressure.
3. Reduce the vacuum to a safety value of 0.2 bar when the autoclave pressure reaches approximately 1 bar gauge.
4. Heat at 1-3°C/min (2-8°F/min) to 110°C ± 5°C (230°F ± 9°F)
5. Hold at 110°C ± 5°C (230°F ± 9°F) for 60 minutes ± 5 minutes.
6. Heat at 1-3°C/min (2-8°F/min) to 180°C ± 5°C (356°F ± 9°F)
7. Hold at 180°C ± 5°C (356°F ± 9°F) for 120 minutes ± 5 minutes.
8. Cool at 2 - 5°C (4-9°F) per minute
9. Vent autoclave pressure when the component reaches 60°C (140°F) or below.

### **Cure cycle for honeycomb sandwich components**

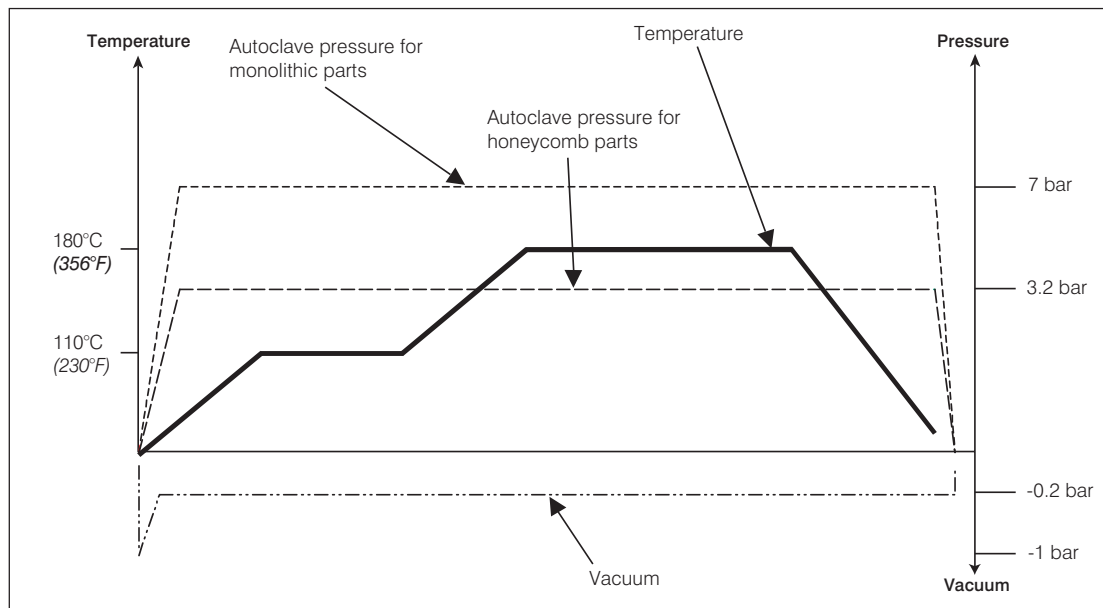
1. Apply full vacuum (1 bar).
2. Apply 3.2 bar gauge autoclave pressure.
3. Reduce the vacuum to a safety value of 0.2 bar when the autoclave pressure reaches approximately 1 bar gauge.
4. Heat at 1-3°C/min (2-8°F/min) to 110°C ± 5°C (230°F ± 9°F)
5. Hold at 110°C ± 5°C (230°F ± 9°F) for 60 minutes ± 5 minutes.
6. Heat at 1-3°C/min (2-8°F/min) to 180°C ± 5°C (356°F ± 9°F)
7. Hold at 180°C ± 5°C (356°F ± 9°F) for 120 minutes ± 5 minutes.
8. Cool at 2 - 5°C (4-9°F) per minute
9. Vent autoclave pressure when the component reaches 60°C (140°F) or below.

Note: For both cure cycles – at each stage, use the temperature shown by the leading thermocouple.

Heat-up rates are dependent on component thickness, eg, slow heat-up rates should be used for thicker components and large tools. Accurate temperature measurements of the component should be made during the cure cycles by using thermocouples.

Performance testing should accompany alternative cure cycles to ensure suitability for the particular application.

## **Curing Cycle for Honeycomb and Monolithic Components**





## HexPly® 8552 Product Data

### Prepreg Storage Life

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Tack Life:	10 days at RT (23°C/73°F)
Out Life:	30 days at RT (23°C/73°F)
Shelf Life:	12 months at -18°C(0°F) (from date of manufacture)

### Definitions:

Shelf Life:	The maximum storage life for HexPly® Prepreg, upon receipt by the customer, when stored continuously, in a sealed moisture-proof bag, at -18°C(0°F). To accurately establish the exact expiry date, consult the box label.
Tack Life:	The time, at room temperature, during which prepreg retains enough tack for easy component lay-up.
Out Life:	The maximum accumulated time allowed at room temperature between removal from the freezer and cure.

### Precautions for Use

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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.

### Important

All information is believed to be accurate but is given without acceptance of liability. Users should make their own assessment of the suitability of any product for the purposes required. All sales are made subject to our standard terms of sale which include limitations on liability and other important terms.

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