

E-752-LT Epoxy Prepreg

Park's E-752-LT is a toughened; 177°C cure epoxy resin system with 157°C wet Tg for primary and secondary structural applications. E-752-LT is formulated for efficient processing in high volume Automated Fiber Placement (AFP) applications manufacturing. The resin system offers a combination of toughness, low moisture uptake and good mechanical properties. E-752-LT is formulated to laminate In Autoclave (AC), Out of Autoclave (OOA) and Press cure conditions.

Key Features & Benefits

- Toughened epoxy for primary and secondary aerospace structures
- Specifically designed for efficient AFP processing
- Controlled flow rheology specifically designed to facilitate a wide range of processing for AC, OOA and Press cures
- Processes in OOA without the need for extensive bagging and pre-vacuum procedures
- Wet DMA Tg of 157°C
- Dry DMA Tg of 220°C
- Capable of low laminate void content < 1%

Product Forms

- Available AFP product forms
 - o 3.18 mm +/-0.13 mm
 - o 6.35 mm +/-0.13
- Unidirectional (UD) Tape up to 1.2 m width
- Woven fabric prepreg up to 1.5 m width

Applications / Qualifications

- Primary and Secondary Aerospace Structures fabricated with AFP processes
- Wings / Control Surfaces / Airframes
- Turbofan Engine Components
- Nacelles/ Fan Reversers
- Air Ducting
- Fairings

For Information about Park's materials:

Newton, KS +1.316.283.6500
info@parkaerospace.com
www.parkaerospace.com



Aerospace Composite Materials

Properties

E-752-LT Epoxy Prepreg

Reinforcement	HTS45	AS4 GP	IMS65	HTS40	HTS40
	12K	12K	24K	3K8HS	3KPW
	UD Tape	UD Tape	UD Tape	Fabric	Fabric
Fabric Area Weight (gsm)	145±5	145±5	145 ±5	370±5	193±8
Prepreg Resin Content (%)	35±2	35±2	33±2	37±2	38±3
Resin Flow 177°C, 345 kPa (%)	8-20	8-20	8-20	8-20	8-20

Note:

Flow values are for general guidance and may change per customer specifications

Other fiber types and product forms are available upon request

Test data represents typical values and is not intended to be used for customer specifications

0° Compressive Modulus	[0°] ₈	RTA	SRM 1R-94	msi	GPa	17.1	117.9
90° Compressive Strength	[0°] ₁₆	RTA	SRM 1R-94	ksi	MPa	49.5	341
90° Compressive Modulus	[0°] ₁₆	RTA	SRM 1R-94	msi	GPa	1.4	10.0
±45° Inplane Shear Strength*	[±45°] _{2s}	RTA	ASTM D3518	ksi	Mpa	12.6	87
±45° Inplane Shear Modulus	[±45°] _{2s}	RTA	ASTM D3518	msi	GPa	0.6	4.3
Open Hole Tensile Strength	[(0°/45/90/-45) _s] ₂	RTA	ASTM D5766	ksi	Mpa	53.5	369
Open Hole Tensile Modulus	[(0°/45/90/-45) _s] ₂	RTA	ASTM D5766	msi	GPa	7.5	51.9

Autoclave Cure Cycle: 3°F/min to 350°F, 2 hrs at 350°F at 45psi and full vacuum

Normalized to 0.14 mm CPT except for IPS

**IPS value reported at 5% strain*

Compressive, Tensile and OHT are reported average of 3 lots

Properties



Aerospace Composite Materials

Properties

HTS40E13 3KPW /E-752-LT @ 38% RC, 193 gsm FAW, Autoclave							
Property	Layup	Condition	Test Method	Units		Avg.	
0° Tensile Strength	[0°] ₁₄	RTD	ASTM D3039	ksi	MPa	148	1020
		-75°F - CTD				150	1034
		250°F - RTD				153	1055
		250°F - ETW				130	896
0° Tensile Strength	[0°] ₁₄	RTD	ASTM D3039	ksi	MPa	137	944
		-75°F - CTD				132	910
		250°F - ETW				116	800
0° Tensile Modulus	[0°] ₁₄	RTD	ASTM D3039	msi	GPa	9.3	64
		-75°F - CTD				9.5	66
		250 Dry				9.2	64
		250°F - ETW				8.8	61
90° Tensile Modulus	[0°] ₁₄	RTD	ASTM D3039	msi	GPa	9.1	63
		-75°F - CTD				9.2	64
		250°F - ETW				9.1	63
0° Compressive Strength	[0°] ₁₆	RTD	ASTM D3039	ksi	MPa	140	962
		250°F - RTD				114	786
		250-Humid				75	517
		RTD - MEK				107	738
90° Compressive Strength	[0°] ₁₆	RTD				111	765
0° Compression Modulus	[0°] ₁₆	RTD	ASTM D3039	msi	GPa	8.7	60
		-75°F - CTD				8.4	58
		250°F - RTD				8.8	61
		250°F - ETW				8.6	59
		RTD - MEK				8.4	58
90° Compression Modulus	[0°] ₁₆	RTD	ASTM D3039	msi	GPa	8.7	60
		250°F - ETW				8.8	61
±45° Inplane Shear Strength	[+45°/-45°] _{2s}	RTD	ASTM D3518	ksi	MPa	18.2 ^{*1}	125
		-75°F - CTD				17.9 ^{*2}	123
		250°F - ETW				10.9 ^{*2}	75
±45° Inplane Shear Modulus	[+45°/-45°] _{2s}	RTD	ASTM D3518	msi	MPa	0.7	5
		-75°F - CTD				1.0	7
		250°F - ETW				0.4	3
Interlaminar Shear Strength	[0°] ₂₄	RTD	ASTM D2344	ksi	GPa	13.2 ^{*3}	91
G _{1c}	[0°] ₂₂	RTD	ASTM D5528	in-psi	kJ/m ²	2.7	0.47
Open Hole Tensile Strength	[+45°/0°/-45°/90°] _{2s}	RTD	ASTM D5766	ksi	MPa	53.1	366
		-75°F - CTD				53.6	370
Open Hole Tensile Modulus	[+45°/0°/-45°/90°] _{2s}	RTD	ASTM D5766	msi	GPa	6.9	48
		-75°F - CTD				7.4	51
Open Hole Compressive Strength	[+45°/0°/-45°/90°] _{2s}	RTD	ASTM D6484	ksi	MPa	45.8	316
		250°F - ETW				33.9	234
Open Hole Compressive Modulus	[+45°/0°/-45°/90°] _{2s}	RTD	ASTM D6484	msi	GPa	6.7	46
		250°F - ETW				6.0	41
Compression After Impact	[+45°/0°/-45°/90°] _{2s}	RTD	SRM 2R094	ksi	MPa	34	234

Autoclave Cure Cycle: 3°F/min to 350°F, 2 hrs at 350°F at 45psi and full vacuum

Normalized to 54.42% V_f except for 90° lamina properties, IPS, ILSS, G_{1c} and CAI

*1 IPS value reported at 5% strain *2 IPS value reported at failure strength *3 At 6:1 span: mixed failure modes

ETW: Saturated at 160°F/85%RH to equilibrium and then tested at 250°F 5-10 minutes after reaching equilibrium



IMS65E23/E-752-LT @ 33% RC, 145 gsm FAW, OOA							
Property	Layup	Condition	Test Method	Units		Avg.	
0° Tensile Strength	[0°] ₈	RTA	ASTM D3039	ksi	MPa	422	2909
0° Tensile Modulus	[0°] ₈	RTA	ASTM D3039	msi	GPa	23.4	161.7
0° Compressive Strength	[0°] ₈	RTA	SRM 1R-94	ksi	MPa	235	1619
0° Compressive Modulus	[0°] ₈	RTA	SRM 1R-94	msi	GPa	21.2	146.5
90° Compressive Strength	[0°] ₁₆	RTA	SRM 1R-94	ksi	MPa	44.6	307
90° Compressive Modulus	[0°] ₁₆	RTA	SRM 1R-94	msi	GPa	1.5	10.2
0°/90° Compressive Strength	[0°/90°] _{2s}	RTA	SRM 1R-94	ksi	MPa	147	1016
0°/90° Compressive Modulus	[0°/90°] _{2s}	RTA	SRM 1R-94	msi	GPa	11.8	81.3
0° Intelaminar Strength	[0°] ₁₆	RTA	ASTM D2344	ksi	MPa	17.9	123
±45° Inplane Shear Strength*	[±45°] _{2s}	RTA	ASTM D3518	ksi	MPa	12.7	88
±45 Inplane Shear Modulus	[±45°] _{2s}	RTA	ASTM D3518	msi	GPa	0.7	4.8
Open Hole Tensile Strength	[0°/45°/90°/-45°] _{3s}	RTA	ASTM D5766	ksi	MPa	88	606
Open Hole Tensile Modulus	[0°/45°/90°/-45°] _{3s}	RTA	ASTM D5766	msi	GPa	9.37	64.8

Oven Cure Cycle: 4°F/min to 265°F, 4 hrs at 265°F, 1.5°F/min to 350°F and 2 hrs at 350°F at 27" Hg

Normalized to 5.4 mil CPT except for SBS and IPS

*IPS value reported at 5% strain

HTS40E13 3K8HS /E-752-LT @ 37% RC, 370 gsm FAW, OOA							
Property	Layup	Condition	Test Method	Units		Avg.	
0° Tensile Strength	[0°] ₈	RTA	ASTM D3039	ksi	MPa	152	1045
0° Tensile Modulus	[0°] ₈	RTA	ASTM D3039	msi	GPa	9.9	88.3
90° Tensile Strength	[0°] ₈	RTA	ASTM D3039	ksi	MPa	139	956
90° Tensile Modulus	[0°] ₈	RTA	ASTM D3039	msi	GPa	9.5	84.7
0° Compressive Strength	[0°] ₁₆	RTA	ASTM D6641	ksi	MPa	116	802
0° Compressive Modulus	[0°] ₁₆	RTA	ASTM D6641	msi	GPa	9.1	81.1
0° Compressive Strength	[0°/90°] _{2s}	RTA	ASTM D6641	ksi	MPa	116	801
0° Compressive Modulus	[0°/90°] _{2s}	RTA	ASTM D6641	msi	GPa	9.3	82.9
0° Intelaminar Strength	[0°] ₁₆	RTA	ASTM D2344	ksi	MPa	10.7	74
±45° Inplane Shear Strength*	[±45°] _{2s}	RTA	ASTM D3518	ksi	MPa	13.3	92
±45 Inplane Shear Modulus	[±45°] _{2s}	RTA	ASTM D3518	msi	GPa	0.7	6.2
Open Hole Tensile Strength	[0°/45°/90°/-45°] _s	RTA	ASTM D5766	ksi	MPa	61	419
Open Hole Tensile Modulus	[0°/45°/90°/-45°] _s	RTA	ASTM D5766	msi	GPa	7.1	63.5

Oven Cure Cycle: 4°F/min to 265°F, 4 hrs at 265°F, 1.5°F/min to 350°F and 2 hrs at 350°F at 27" Hg

Normalized to 5.4 mil CPT except for SBS and IPS

*IPS value reported at 5% strain

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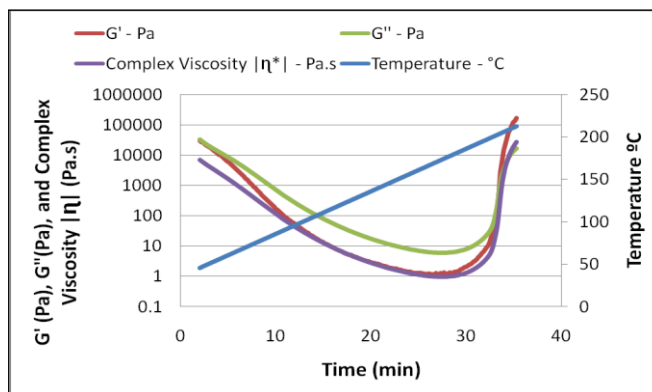
Processing Guideline

Prepreg Storage Life

Tack Life: Contact Park Engineering
Out Life: Contact Park Engineering
Shelf Life: 12 months @ -18°C

Note: The following guidelines are provided to assist the users of Park materials with general recommendations for successful processing. The recommendations are for general review purposes only and process adjustments may be required to achieve optimum results in your specific manufacturing environment. Consult Park's Technical Engineering for recommendations.

E-752-LT Cure Scan Rheology 0.05% Strain, 1Hz 5°C/min Wide Process Controlled Flow Window



Autoclave Cure	Out of Autoclave Cure
Apply full vacuum 686mm Hg typical and pressure of 2.0 bar.	Apply full vacuum (686mm Hg typical) for 5 minutes minimum prior to heat up.
Ramp Temperature at 0.6-2.2°C/min to 177 °C ± 2.8°C.	
When leading thermocouple reaches 107°C, vent vacuum to atmosphere and increase pressure to 6.2±.35 bar.	Ramp Temperature at 0.6-2.2°C/min to 129°C ± 2.8°C.
Dwell at 177°C for 120±10 minutes (dwell time begins when lagging thermocouple reaches 171°C).	Dwell at 129°C ± 2.8°C for 260±10 minutes (dwell time begins when lagging thermocouple reaches 127°C).
Ramp down at 2.2°C / minute.	Ramp down at <4.4 °C/minute.
Release pressure after temperature is below 66°C.	Remove panels after temperature is below 49°C.
Remove panels after temperature is below 49°C.	
Out of Autoclave Cure Post Cure Oven	
Ramp Temperature at 0.6-2.2°C/min to 129°C ± 2.8°C.	
Ramp Temperature at 0.6-1.1°C/min to 177°C ± 2.8°C.	
Dwell at 177°C for 120±10 minutes (dwell time begins when lagging thermocouple reaches 174°C).	
Ramp down at <4.4°C/minute.	
Remove panels after temperature is below 49°C.	

