

HexPly® F263

Resin Systems for Advanced Composites

Product Data

Description

HexPly® F263 is a structural, heat resistant epoxy resin formulated for excellent translation of high modulus carbon fiber properties in typical aerospace applications. HexPly® F263 is a high temperature, aerospace grade, epoxy resin for HMG with a 350°F (177°C) core.

Features

Uncured

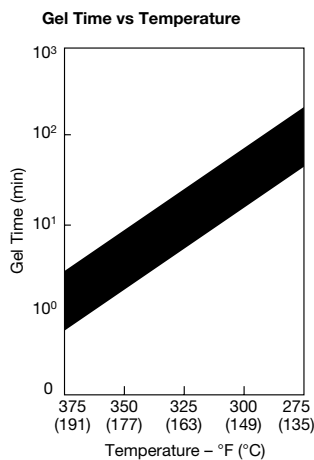
- Good Tack and Drape to Assist Layup and Assembly
- Adaptable for Use on Various Fiber and Weave Combinations
- Moderate Viscosity During Cure
- Resin System Lends Itself to a Simple Cure Cycle
- Long Shelf Life

Cured

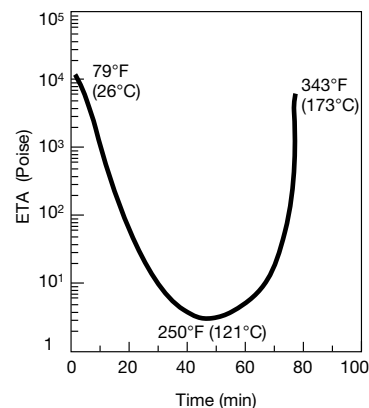
- High Strength Retention: -65°F to 350°F (-54° to 177°C)
- Excellent Translation of Carbon Fiber Properties
- Self-Extinguishing When Tested per F.A.R. 25.853

Neat Resin Properties

Specific gravity	1.267
T _g wet	271°F (133°C)
T _g dry	370°F (188°C)
Equilibrium moisture absorption	4.8%
Linear coefficient of thermal expansion	2.9 x 10 ⁻⁵ in/in/°F (1.6 x 10 ⁻⁵ cm/cm/°C)
Tensile strength	10.9 ksi (75 MPa)
Tensile modulus	0.62 msi (4.27 GPa)
Tensile strain	2.4%
Fracture toughness, K _{1C}	0.55 ksi √in (0.60 MPa √m)
Strain energy release rate, G _{1C}	0.43 in-lb/in ² (0.075 kJ/m ²)
Gel time @ 350°F (177°C)	2-9 min



Rheometrics Curve of F263
3.3°F (2°C)/min, 50% Strain, 10 rad/sec,
RDS-7700, 50 mm Plates

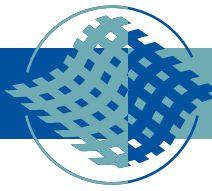


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HexPly® F263 Product Data

Availability

Form	Hexcel Designation	Fiber	Fiber Areal Wt. g/m ²	Weave	Count Warp x Fill	Available Widths Standard Width, in (cm)
Carbon Fabric	W3T282-42"-F263	T300	194	Plain	12.5 x 12.5	42" (106.7)
	W3C282-42"-F263	Celion				
	F3T584-42"-F263 F3C584-42"-F263	T300 Celion	370	8 Harness Satin	24 x 24	42" (106.7)
Glass Fabrics	120-38"-F263	450-1/2	115	Crowfoot MIL-C-9084 TYVIII	60 x 58	38", 44", 50", 60" (96.5, 111.8, 127, 152.4)
	1581-38"-F263	150-1/2	303	8 Harness Satin MIL-C-9084 TYVIII A	57 x 54	38", 44", 50", 60", 72" (96.5, 111.8, 127, 152.4, 182.9)
	7781-38"-F263	75-1/0	303	8 Harness Satin MIL-C-9084 TYVIII A	57 x 54	38", 44", 50", 60", 72" (96.5, 111.8, 127, 152.4, 182.9)
Carbon Tapes	T_095-12"-F263	Various	95	n/a	n/a	12", 3"-24" (30.5, 7.6-61)
	T_145-12"-F263	Various	145			
	T_190-12"-F263	Various	190			

Note: Alternatively, carbon and glass fabric weaves may be used with the HexPly® F263 Resin System. Also, HexPly® F263 carbon tapes may be produced with various carbon fiber types and tow sizes. In designating carbon tape, the second digit represents tow size and the third digit represents fiber source. Consult your nearest Hexcel Sales Representative for additional information.

Physical Properties

Property	Carbon Fabrics		Carbon Tapes			Glass Fabrics		
	W3T282 or W3C282	F3T584 or F3C584	95 g/m ²	145 g/m ²	190 g/m ²	120	7781	
Material description								
% Flow @ 350°F, 50 psi (177°C, 345 kPa)	9-22	9-22	11-24	11-24	11-24	15-30	10-30	
% Resin content (dry)	38-42	35-39	35-39	35-39	35-39	42-48	36-40	
Laminate	Cured thickness per ply – in (cm)	0.0072 (0.018)	0.0135 (0.034)	0.0039 (0.010)	0.0059 (0.015)	0.0078 (0.020)	0.0045 (0.011)	0.010 (0.025)
	% Fiber volume	61	62	55	55	55	38	45

Mechanical Properties (Autoclave Cure)

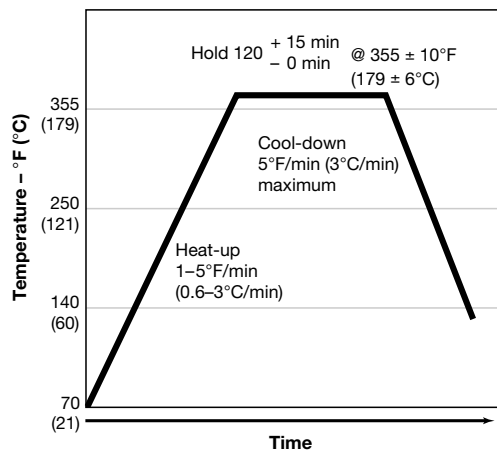
Property	Temp °F (°C)	Carbon Fabrics		Carbon Tapes			Glass Fabrics	
		W3T282	W3T584	T3T095	T3T145	T3T190	120	7781
Tensile strength, ksi (MPa)	75 (24)	82.6 (570)	88.4 (610)	180.8 (1247)	197.5 (1362)	196.3 (1353)	53.4 (368)	66.9 (461)
Tensile modulus, msi (GPa)	75 (24)	8.81 (60.7)	9.24 (63.7)	19.55 (134.8)	19.19 (132.3)	19.12 (131.8)	3.47 (23.9)	4.30 (29.7)
Tensile strain	75 (24)	9,762	10,024	9,267	10,345	10,142		
Tensile strength, ksi (MPa)	350 (177)	78.5 (541)	84.0 (579)		187.6 (1260)		38.1 (263)	55.8 (385)
Tensile modulus, msi (GPa)	350 (177)	8.37 (57.7)	8.78 (60.5)		18.23 (125.7)		2.94 (20.3)	3.46 (23.9)
Compression strength, ksi (MPa)	75 (24)	94.0 (648)	96.6 (666)	206.0 (1420)	193.3 (1333)	175.8 (1212)	68.7 (474)	71.2 (491)
Compression modulus, msi (GPa)	75 (24)						3.41 (23.5)	4.36 (30.1)
Compression strength, ksi (MPa)	160 (71)	83.4 (575)	84.9 (585)	182.7 (1260)	167.4 (1154)	171.8 (1185)		
Compression strength, ksi (MPa)	350 (177)						50.0 (345)	51.2 (353)
Compression modulus, msi (GPa)	350 (177)						3.11 (21.4)	3.83 (26.4)
Short beam shear, ksi (MPa)	-65 (-54)	10.50 (72)	9.46 (65)	18.92 (130)	17.99 (124)	17.76 (122)		
Short beam shear, ksi (MPa)	75 (24)	10.72 (74)	10.40 (72)	16.06 (111)	16.16 (111)	15.92 (110)		
Short beam shear, ksi (MPa)	270 (132)	8.05 (56)	6.99 (48)	10.87 (75)	10.48 (72)	10.96 (76)		
Short beam shear, ksi (MPa)	350 (177)	6.73 (46)	6.88 (47)		9.82 (68)			
Interlaminar shear, ksi (MPa)	75 (24)						2.99 (21)	3.37 (23)
Interlaminar shear, ksi (MPa)	350 (177)						2.24 (15)	2.61 (18)

All mechanical property values are based on the calculated fiber volume found on the previous table.

Reported property values are averages to which no statistical assurance should be associated. While Hexcel believes that the data contained herein are factual, the data are not to be taken as a warranty or representation for which Hexcel assumes legal responsibility. They are offered solely for your consideration, investigation, and verification.

Cure Cycle

Cure Procedure



- A. Apply vacuum of 22 inches (74 kPa) Hg minimum.
- B. Apply 85 + 15 – 0 psig (586 + 103 – 0 kPa) pressure for laminates.
- C. Apply 45 + 15 – 0 psig (310 + 103 – 0 kPa) pressure for sandwich.*
- D. Vent vacuum bag to atmosphere when pressure reaches 20 psi (138 kPa).
- E. During cool-down when the part temperature falls below 140°F (60°C), pressure can be relieved and the test panel removed from the autoclave and debagged.

* Typical for HRH 10-1/8-3.0 honeycomb.

Storage

HexPly® F263 prepreg should be sealed in a polyethylene bag and refrigerated, preferably below 32°F (0°C). Following removal from refrigerated storage, allow the prepreg to reach room temperature before opening the polyethylene bag to avoid moisture condensation. Shelf life: 6 months @ 0°F (-18°C), 3 months @ 40°F (4°C).



Shipping

Prepreg fabric and tape are generally shipped in sealed polyethylene bags in insulated containers packed with dry ice.

Disposal of Scrap

Disposal of this material should be in a secure landfill in accordance with state and federal regulations.

Handling and Safety Precautions

Hexcel recommends that customers observe established precautions for handling epoxy 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.

Airborne graphite as a result of sawing, grinding, etc., can present electrical shorting hazards; refer to NASA Technical Memorandum 78652. Material Safety Data Sheets (MSDS) have been prepared for all Hexcel products and are available to company safety officers on request from your nearest Hexcel Sales Office.

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.

For more Information

Hexcel is a leading worldwide supplier of composite materials to aerospace and other demanding industries. Our comprehensive product range includes:

- Carbon Fiber
- RTM Materials
- Honeycomb Cores
- Continuous Fiber Reinforced Thermoplastics
- Carbon, Glass, Aramid and Hybrid Prepregs
- Structural Film Adhesives
- Honeycomb Sandwich Panels
- Special Process Honeycombs
- Reinforced Fabrics

For US 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 click here: <http://www.hexcel.com/contact/salesoffices>.