

CELSTRAN® CFR-TP PA6 CF60-03 - PA6

Description

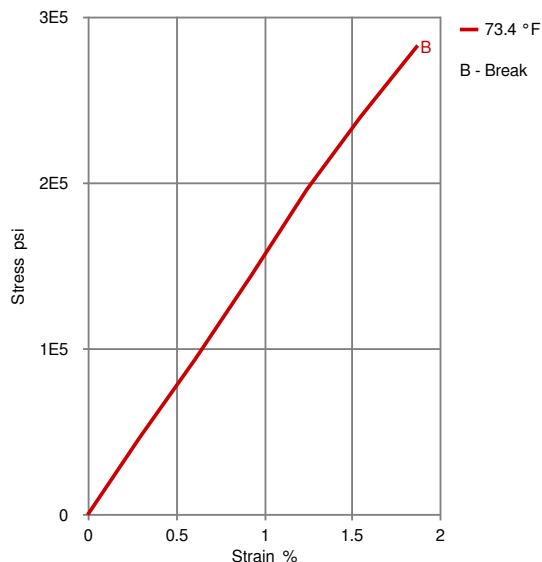
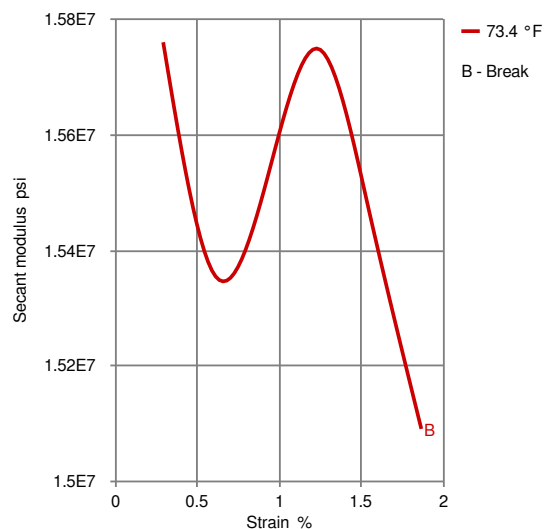
Polyamide 6 (nylon 6) continuous fiber (uni-directional) reinforced thermoplastic composite tape, 60% carbon fiber by weight. Celstran® CFR-TP PA6 CF60-03 is a 60% carbon fiber by weight polyamide 6 (nylon 6) continuous fiber (uni-directional) reinforced thermoplastic composite tape. This material exhibits a high strength-to-weight ratio, excellent toughness and impact resistance. It is well suited for industrial, automotive, and sporting goods applications where strength and toughness are critical as well as ease of processing. Alternate tape widths and thicknesses may be available.

Physical properties	Value	Unit	Test Standard
Density	90.3	lb/ft ³	ISO 1183
Fiber Content	60	% by wt.	-
Fiber Volume	48.5	% by vol.	-
Tape Thickness	0.00512	in	-
Tape Width	10.8	in	-
Tape Areal Weight	5.72	oz/yd ²	-
Fiber Areal Weight	3.45	oz/yd ²	-

Mechanical properties (Tape)	Value	Unit	Test Standard
Tensile Strength, 0°	277	ksi	ASTM D3039M
Tensile Modulus - Tape, 0°	14.5	Mpsi	ASTM D3039M
Tensile Strain at Failure, 0°	1.76	%	ASTM D3039M
Flexural Strength - Tape, 0°	151	ksi	ASTM D790/Tape
Flexural Modulus - Tape, 0°	14.2	Mpsi	ASTM D790/Tape
Flexural Strain at Failure, 0°	1.08	%	ASTM D790/Tape

Thermal properties	Value	Unit	Test Standard
Melting temperature, 10°C/min	428	°F	ISO 11357-1/-3
Glass transition temperature, 10°C/min	135	°F	ISO 11357-1,-2,-3

Diagrams

Stress-strain**Secant modulus-strain****Other text information****Compression molding****Celstran® CFR-TP Tape Laminate Processing Guidelines**

Celstran® CFR-TP can be molded using a heated platen compression molding press. A hardened steel, aluminum or flexible tooling can be used depending on the application. The tool should be treated with a mold release prior to molding.

The molding cycle consists of the following steps:

1. The platens should be heated above the polymer matrix melt temperature.
2. The individual lamina should be constructed and placed in the tool to achieve the desired laminate reinforcement orientation.
3. The tool is placed between the platens and the platens are closed to achieve a contact pressure on the tool less than 30 psi (2 bar).
4. The tool is allowed to rise in temperature until stabilizing at the initial temperature the platens were set to.
5. The pressure is increased to the desired amount and held for a recommended time.
6. Air and/or water cooling is initiated until the material reaches a temperature sufficiently below the melt and peak crystallization temperatures wherein the pressure is reduced to a contact pressure less than 15 psi (1 bar).
7. The tool is continually cooled until reaching a temperature, typically at or below the glass transition point, at which the pressure is completely removed and the part de-molded from the tool. It should be noted that the choice of tooling, geometry and heating/cooling mechanisms will greatly dictate processing conditions, and thus, optimization specific to the individual molders' capabilities is necessary. Additionally, the resin is what dictates the molding temperatures, whereas the sample thickness is what determines the time. As the thickness increases, the time at melt should also increase to account for the time for heat to conduct to the center of the laminate.

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Resin: PA6

Drying Time: 2 hours

Drying Temperature: 180°F, 82°C

Platen Temperature: 520°F, 271°C

Press Pressure: 84 psi, 5.8 bar

Time at Melt: 5 min

Cooling Rate: 15-30°F/min, 8-17°C/min

Material Removal Temperature: 175°F, 79°C

Characteristics

Special Characteristics	Chemical resistant, Fuel resistant
Product Categories	Tribological
Processing	Compression molding, Extrusion, Film extrusion, Injection compression molding, Injection molding, Porous sintering
Delivery Form	Tape

General Disclaimer

NOTICE TO USERS: Values shown are based on testing of laboratory test specimens and represent data that fall within the standard range of properties for natural material. These values alone do not represent a sufficient basis for any part design and are not intended for use in establishing maximum, minimum, or ranges of values for specification purposes. Colorants or other additives may cause significant variations in data values. Properties of molded parts can be influenced by a wide variety of factors including, but not limited to, material selection, additives, part design, processing conditions and environmental exposure. Any determination of the suitability of a particular material and part design for any use contemplated by the users and the manner of such use is the sole responsibility of the users, who must assure themselves that the material as subsequently processed meets the needs of their particular product or use. To the best of our knowledge, the information contained in this publication is accurate; however, we do not assume any liability whatsoever for the accuracy and completeness of such information. The information contained in this publication should not be construed as a promise or guarantee of specific properties of our products. It is the sole responsibility of the users to investigate whether any existing patents are infringed by the use of the materials mentioned in this publication. Moreover, there is a need to reduce human exposure to many materials to the lowest practical limits in view of possible adverse effects. To the extent that any hazards may have been mentioned in this publication, we neither suggest nor guarantee that such hazards are the only ones that exist. We recommend that persons intending to rely on any recommendation or to use any equipment, processing technique or material mentioned in this publication should satisfy themselves that they can meet all applicable safety and health standards. We strongly recommend that users seek and adhere to the manufacturer's current instructions for handling each material they use, and entrust the handling of such material to adequately trained personnel only. Please call the telephone numbers listed for additional technical information. Call Customer Services for the appropriate Materials Safety Data Sheets (MSDS) before attempting to process our products. The products mentioned herein are not intended for use in medical or dental implants.

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