Celanese
The chemistry inside innovation™

CELSTRAN® CFR-TP PPS CF60-01

CELSTRAN® CFR-TP

Celstran® CFR-TP PPS CF60-01 is a 60% carbon fiber by weight PPS (polyphenylene sulfide) continuous fiber (uni-directional) reinforced thermoplastic composite tape. This material exhibits a high strength-to-weight ratio, excellent chemical and flame, smoke, and toxicity or (FST) performance, and long-term heat stability. It is well suited for aerospace, oil/gas, sporting goods and industrial applications where demanding weight, chemical and FST performance is necessary. Alternate tape widths and thicknesses may be available.

Product information

Fiber volume content	53	%	ISO 11667
Tape thickness	0.13	mm	ISO 16012
Tape width	263	mm	ISO 16012
Tape areal weight	205	g/m^2	
Fiber areal weight	123	g/m^2	

Typical mechanical properties

Tensile modulus, Tape 0°	101000	MPa	ASTM D 3039 M
Tensile strength, Tape 0°	2030	MPa	ASTM D 3039 M
Tensile strain at failure, Tape 0°	1.79	%	ASTM D 3039 M
Flexural modulus, Tape 0°	105000	MPa	ASTM D 790
Flexural strength, Tape 0°	1220	MPa	ASTM D 790
Flexural strain at failure, Tape 0°	1.2	%	ASTM D 790

Thermal properties

Melting temperature, 10°C/min	280	°C	ISO 11357-1/-3
Glass transition temperature, 10°C/min	90	°C	ISO 11357-1/-3

Physical/Other properties

Density	1550	kg/m^3	ISO 1183

Characteristics

Processing	Injection Moulding, Thermoforming, Compression moulding, Selective reinforcement
Delivery form	Tape

Additional information

Compression molding

Processing

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.

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.

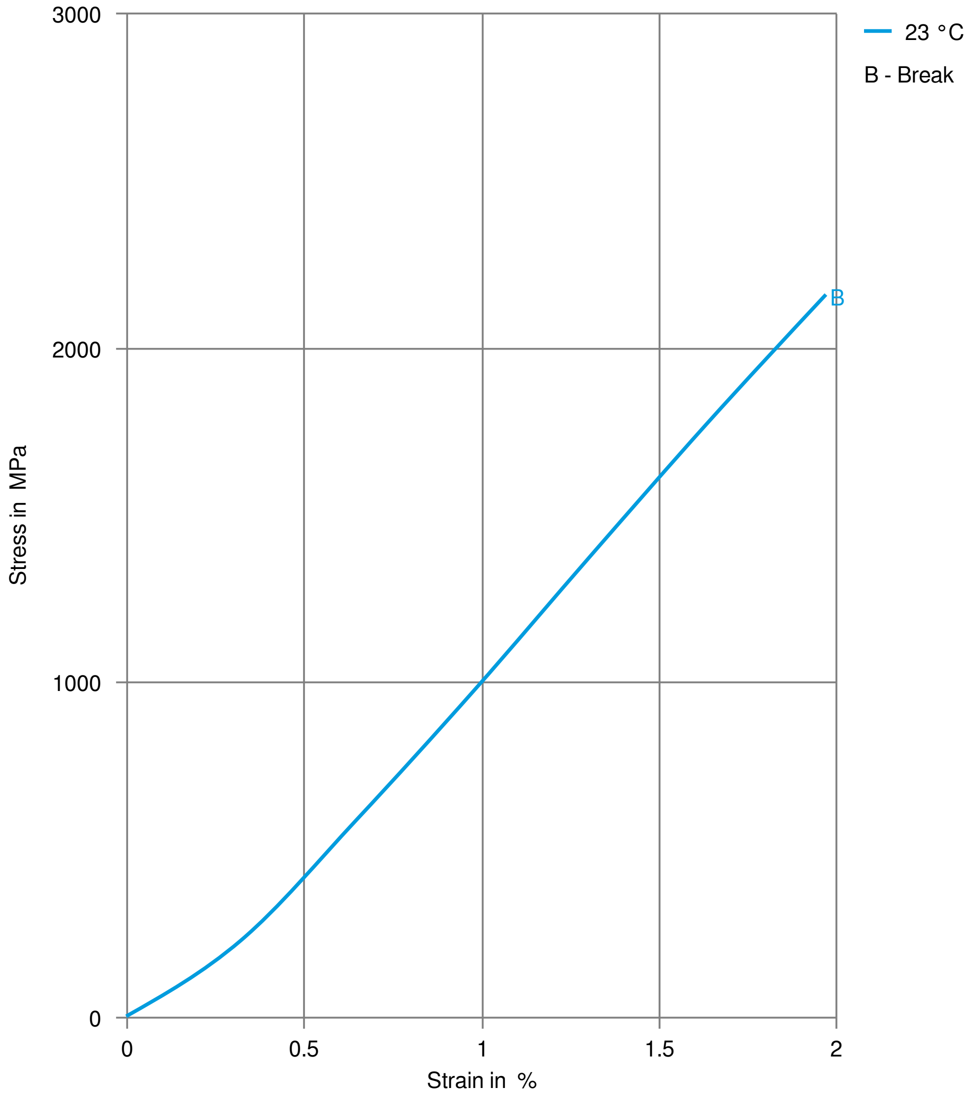
Resin: PPS
Drying Time: It is normally not necessary to dry PPS
Drying Temperature: It is normally not necessary to dry PPS
Platen Temperature: 620°F, 327°C
Press Pressure: 84 psi, 5.8 bar
Time at Melt: 5 min
Cooling Rate: 15-30°F/min, 8-17°C/min
Material Removal Temperature: 175°F, 79°C

Celanese
The chemistry inside innovation™

CELSTRAN® CFR-TP PPS CF60-01

CELSTRAN® CFR-TP

Stress-strain



Celanese
The chemistry inside innovation™

CELSTRAN® CFR-TP PPS CF60-01

CELSTRAN® CFR-TP

Secant modulus-strain