

Material datasheet

Duralite Carbon 0.25 - 1.0 mm

Material				VALUE	
LAYUP	TEST CONDITION	ACCORDING TO STANDARD	UNIT	LONGITUDINAL	TRANSVERSAL
Fiber	-	-	-	Carbon	
Weaving style	-	DIN ISO 9354	-	Twill 2/2	
Weight	-	DIN EN 12127	g/m ²	200	
Yarn	-	DIN EN 12654-2/3	K	3	
Yarn density	-	DIN EN 1049-2	1/cm	5	5
Weight rate	-	-	%	50	50
Polymer	-	-	-	Thermoplastic Polyurethane	
Fiber content	-	-	vol.-%	45	
Thickness per layer	-	-	mm	0.25	
Material density	-	ISO 1183-1	g/cm ³	1.46	

Mechanical				VALUE	
PROPERTIES	TEST CONDITION	ACCORDING TO STANDARD	UNIT	LONGITUDINAL	TRANSVERSAL
Flex	23 °C, dry	ISO 14125	GPa	42	
Strength	23 °C, dry	ISO 14125	MPa	740	

Thermal				VALUE	
PROPERTIES	TEST CONDITION	ACCORDING TO STANDARD	UNIT	LONGITUDINAL	TRANSVERSAL
Glass transition temperature	10 K/min	ISO 11357-2	°C	94	

Legend: - : Not relevant, dry : dry as manufactured,

The values in the datasheet are for this specific composition only, the characteristics of composites depend on the reinforcement level and the fibre orientation. Non-standard thickness may also alter some or all of these properties. The data listed here fall within the normal range of product properties, but they should not be used to establish specification limits nor used alone as basis of design. The underlying tests were conducted at room temperature and with 2 mm specimen thickness.

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Processing guidelines for **Duralite** Carbon

STORAGE/HANDLING

Storage time: unlimited

As the matrix material is sensitive to surface moisture the sheets will be delivered in sealed packages. In order to prevent moisture condensation on the cold sheet surface the sealed packages should be stored in the working area until a temperature equilibrium is reached. The material should be processed within 2 hours after opening of the sealing. Otherwise the material should be dried prior to processing (4 hours, 90°C). The use of dust masks and ventilation whilst cutting, milling, drilling etc. is advised.

HEATING

Forming temperature: between 210°C and 230°C

Heating devices like a hot air oven can be used. Heating cycles should be short to avoid Material oxidation (surface colour browning).

SHEET TRANSFER

Sheet transportation: max. 2-3 sec.

The sheet should be transferred within seconds. Circulation of cool air in the processing environment reduces the sheet temperature considerably and will lead to a reduction of fabric formability and wrinkles. Manual transfer is not recommended as it causes fabric distortion and polymer distribution caused by the sticky resin to gloves. For obtaining maximum processing stability an automatic transport of the sheet is recommended.

PRESS FORMING

Press speed: > 50 mm/s (1st step)

Closing speed: 5 mm/s (2nd step)

The recommended closing speed of the press is at least 50 mm/s and should be reduced to approx. 5 mm/s during the last part (10 mm) of the forming. Local clamping forces should be applied to prevent fabric wrinkling during moulding. The clamping forces and arrangements depend on the fabric type, the material thickness and the complexity of the part.

COOLING

Consolidation pressure: 5 bar - 100 bar

Extraction temperature: 110°C

The consolidation pressure varies over the surface of a formed part, depending on part geometry and tool material. The tool temperature should both guarantee good formability/flow and stable product extraction. Aluminium and steel can be used from 60°C up to 80°C; product extraction is then possible without any additional cooling cycle. The consolidation time depends on the material thickness, the tool temperature and the tool materials. Recommended for a laminate thickness of 2,0 mm and the aforementioned conditions is a cooling time of about 30 seconds.

When and where to apply **Duralite** Carbon

GENERAL DESCRIPTION

Within the Duralite Mix, TPU distinguishes itself from alternative resin systems by its specific physical properties. The TPU resin is tough which results in an excellent impact and fatigue behaviour and is applicable from -30°C up to 90°C constantly. In addition the Duralite Mix is easy to mould, obtaining an excellent surface quality. Duralite Mix can easily be bonded with common adhesive

APPLICATION AREAS

Typical application environments are within healthcare applications, sports devices and technical orthopedics: like braces, sole plates- and all-round reinforcements as well as other medical applications and/or devices..



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