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EXEL CROSSLITE ™
CARBON FIBRE TUBES

The EXEL CROSSITE™ is a range of carbon fibre tubes manufactured by pullwinding process. The tubes are made with a vinylester resin, but can also be supplied with various epoxy based hybrid resins.
By using these hybrid resins higher impact resistance is achieved.

In EXEL CROSSLITE™ tubes the crosswise fibres are used at the surface as well as in the structure to achieve a high crosswise strength.
These tubes are ideal in applications with very high demands for stiffness, strength, light weight and high-tech appearance.
In these tubes various carbon fibre reinforcements are used to reach the stiffness requirements.

HS, IM and HM-fibres can be combined in the structure, yielding stiffness values of 100-200 GPa.

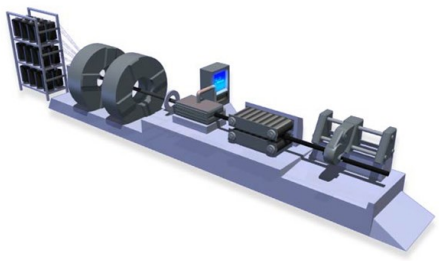
COLOUR OF EXEL CROSSLITE

Tubes are always black due to the colour of the carbon fibre. Note that the carbon fibre tubes cannot be used as insulators as carbon conducts electricity.

SOME APPLICATION IDEAS

Some application ideas: Support structures, robot arms, mass critical machinery items such as textile machine parts, telescopic poles, camera tripods, tool handles, kite tubes, microphone booms, Hi-Fi music stands, defence applications and many more.

PRINCIPLE DRAWING OF PULLWINDING PROCESS



In pullwinding process the fibers are impregnated with a thermoset resin and pulled through a heated die where curing takes place.
This process enables an accurate control of the crosswise and longitudinal fibres and thus properties of the final product by adjusting the amount of lengthwise and crosswise fibres.
The products are cut to length at the end of production line.

Exel Composites has a wide range of tubes available where various reinforcements and resin systems are being utilized to compose the optimized product for each application

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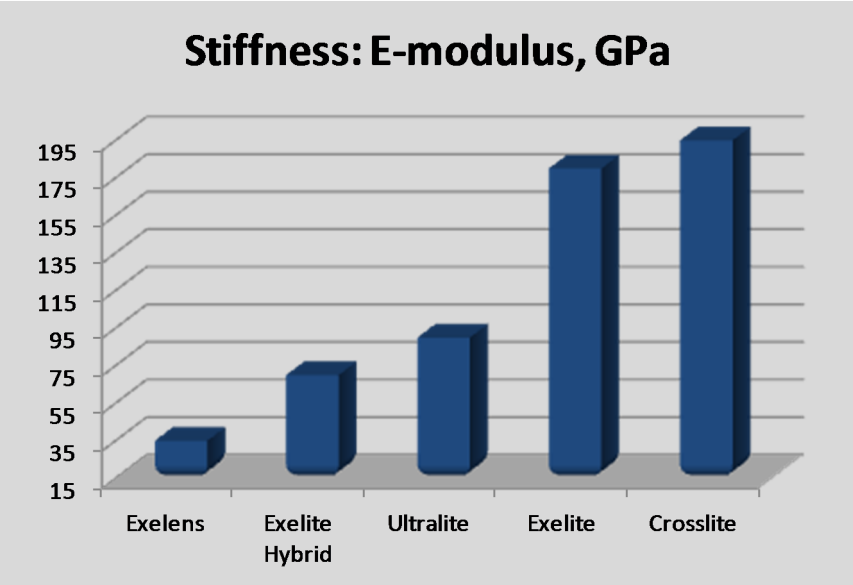
TECHNICAL DATA SHEET

Manufacturing Method	Pullwinding	
Structure	UCUCC or UCCUCC Reinforcement structure U = unidirectional fibers C = crosswise fibers	
Materials	Carbon fibre, vinylester resin (Epoxy also available)	
Diameter Range O.D.	10 –60 mm	
Wall Thickness	1,00 - 2,00 mm (typical)	
Colours	Black	
Fiber volume content	65 v-%	
Fiber weight content	75 w-%	
Surface finish	Crosslite ™	
Water absorption	<1,0w-%	
Fiber Type	HS Carbon	HM Carbon
Stiffness	100-120 GPa	120-195 GPa
Bending strength	>600 MPa	>600 MPa
Tensile strength	>800 MPa	>800 MPa
Density	1.65g/cm3	1.65g/cm3

Typical minimun production quantity for EXEL CROSSLITE™ tubes is 500 meters



PULLWINDING process enables the reduction of wall thickness and weight while retaining and improving stiffness and strength compared to conventional pultrusion.

Each product can be optimized according to application and requirements by combining suitable fibres and resin systems and utilizing certain amount of lengthwise and crosswise layers.

- **Exel Exelens™** for glassfibre tubes.
- **Exel Exelite Hybrid ™** for combination of glass– and carbon fibre tubes
- **Exel Exelite ™ , Ultralite, Crosslite ™** for various carbon fibre tube alternatives

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