The **EXEL EXELITE™ HYBRID** is a range of tubes made by pullwinding process where both glass fibres and carbon fibres are utilized. EXEL EXELITE™ HYBRID tubes are made with a vinylester resin, but also various epoxy based hybrid resins can be used.

Hybrid structure targets for both high performance and economical solution that can be reached by optimizing the structure and fibre types.

EXEL EXELITE™ HYBRID tubes are used in applications where high stiffness, low weight and competitive costs are requirements.

**COLOUR OF EXEL EXELITE HYBRID**
EXEL EXELITE™ HYBRID tubes can be coloured according to your choise of RAL chart. Note that the carbon fibre tubes cannot be used as insulators as carbon conducts electricity.

**SOME APPLICATION IDEAS**
telescopic poles, barriers, tool handles, fences, roll up systems, defence applications and many more.

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.
EXEL EXELITE™
HYBRID FIBRE TUBES

TECHNICAL DATA SHEET

Manufacturing Method
Pullwinding

Structure
UCUN or UCUCUN

Reinforcement structure
U = unidirectional fibers
C = crosswinded fibers
N = Exelens nonwoven veil

Materials
Carbon and glass fibre, vinylester resin (Epoxy also available)

Diameter Range O.D.
4 – 250 mm

Wall Thickness
1,00 - 4,00 mm * thicker on request

Colours
RAL Code

Fiber volume content
58 v-%

Fiber weight content
75 w-%

Surface finish
Exelens™

Water absorption
<2,0w-%

Additional fibers
Glass Fibre

Stiffness
70 GPa

Bending strength
>500 MPa

Tensile strength
>600 MPa

Density
1.8g/cm³

Typical minimum 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 glass fibre tubes.
- Exel Exelite Hybrid™ for combination of glass- and carbon fibre tubes
- Exel Exelite™, Ultralite, Crosslite™ for various carbon fibre tube alternatives