

# EXEL EXELENS™ GLASSFIBRE TUBES

The EXEL EXELENS™ name stands for high quality glassfibre tubes with very good surface finish, manufactured by pullwinding process.

The Exelens nonwoven surface, whilst providing excellent finish and deep colours, also improves other properties such as UV- and chemical resistance.

Further increased chemical resistance is obtained by utilizing a vinylester instead of a polyester resin. FDA compliant resin system can be used also.

EXEL EXELENS™ tubes have a high glass content for superior mechanical performance and they do not incorporate fillers unless needed for fire performance.

## SUPERIOR PRODUCT FEATURES

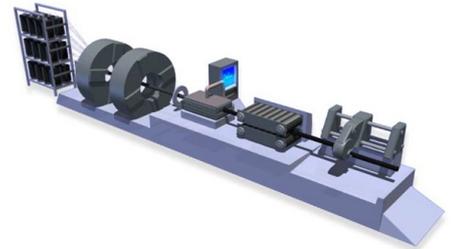
In EXEL EXELENS™ products many essential features are combined: chemical and electrical resistance, thermal stability, high strength and stiffness, low weight and other tailoring possibilities according to requirements, e.g. fire performance and anti-static surface.

EXEL EXELENS™ tubes are warm and pleasant to touch, clean, hygienic, corrosion free and they have an excellent weight to strength ratio.

## SOME APPLICATION IDEAS

Telescopic poles, tool handles, antenna tubes, portable light-weight structures, hand rails, lamp posts, flag poles, fence posts, sprayer tubes, caravan awnings, tent tubes, working tents, exhibition stands, furniture 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

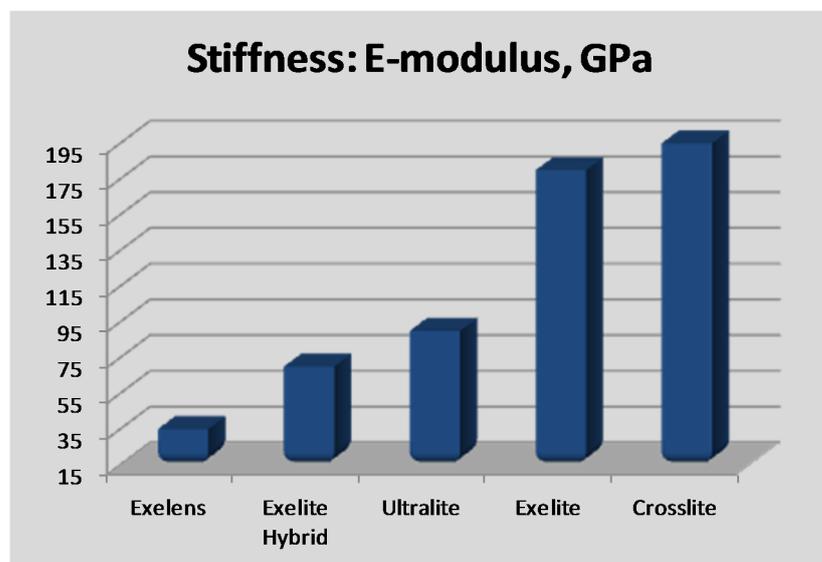
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## TECHNICAL DATA SHEET

Manufacturing Method	Pullwinding
Structure	UCUV or UCUCUV Reinforcement structure: UCUV (75 ± 3 w-%) U = unidirectional fibers C = crosswinded fibers V = Surface finish: Nonwoven veil (Exelens)
Materials	Glass fibre, polyester resin
Diameter Range O.D.	4 –250 mm
Wall Thickness	1,50 - 4,00 mm
Colours	RAL Code
Fiber volume content	58 v-%
Fiber weight content	75 w-%
Surface finish	Exelens™
Water absorption	<2 w-%
Fibre Type	Glass fibre
Stiffness	35 GPa
Bending strength	> 450 MPa
Tensile strength	> 500 MPa
Density	1.9g/cm <sup>3</sup>

Typical minimum production quantity for EXEL EXELENS™ tubes is 1000 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 HS™, Ultralite, Exelite IM™ and Exelite HM™** for various carbon fibre tube alternatives