



Robotic Filament Winding Systems


Rethinking lightweight construction

XFK ^{IN} 3D

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- 42m Fibres
- 67gr Fibre content
- 63gr Resin content
- 58gr Aluminium bushing
- Waste 0,25gr (Offcut)



**Ultimate Load Strength 93kN
with a total mass of only 188 gr**

Our robotized manufacturing winding machine allows GRADEL to produce systemic and integrative lightweight components, parts & structures. GRADEL re-thinks entirely the lightweight construction and processing method. The robotized machine can wind structures, provide completely new innovative opportunities.



Specification	Description
• 9 axis robot cell	Multi-axis industrial robot with extended axis for rotating and or sliding the robot Work volume : 4 x 2 x 2,5m (L x B x H) Turning table with pan & tilt function. Ø of table ~ 800 mm Other options are possible according customer specifications
• Min & max volume of parts to be winded	Length x Width x Height: minimum volume of a part: 60 x 60 x 60 mm Examples of maximum dimensions of a part positioned on the pan & tilt table: type A: 560 x 560 x 1000 Examples of maximum dimensions of a part fix positioned parts (no pan & tilt table): type B: 1400 x 150 x 2200 type C: 2000 x 1200 x 1000
• Winding Speed	The winding speed of the TCP will be adjusted between 600 and 30 000 mm/min
• Impregnation System	<ul style="list-style-type: none"> - Compact & innovating heavy duty impregnation system - Separated resin & hardener injectors - Controlled mixing system - Different roving materials and size (6k up to 50k) - Different possible mixing ratio at continuous calibrated flow - Continuous & constant controlled working system - Cleanable and low maintenance
• Post processor	Compatible with different CAE software's
• Safety functions	Protection cell compliant with safety and CE CE marking