



Winding machine with two movable platforms

Photos: Roth / J. Lachwa

# RUN 'N' ROLL

## ENERGY

### Filament winding plant for the manufacture of rotor blades

**In close cooperation with its customer Enercon in Aurich, one of the technology leaders in the wind turbine sector, Roth Composite Machinery (formerly known as EHA Composite Machinery) from the Hessian town of Steffenberg developed Filament Winding Plants for the manufacture of fiber-reinforced plastics (FRP) rotor blade components for Enercon wind turbines.**

An increasing number of wind turbines are being installed in low-wind regions (onshore). For this application, plants with large rotor diameters are used, demanding special logistic requirements.

Roth Composite Machinery could get involved owing to its experience of more than 50 years in the manufacture of Filament Winding Plants (e.g. large-scale FRP containers or in the aerospace industry) with suitable know-how for the new technology with regard to the production of rotor blades.

The newly established manufacturing method enables the production of the rotor blades in segments so that they can be transported on overland routes with a small degree of efforts. Due to the design of the blades and the high rate of pre-assembly in the factory, a quick on-site installation is possible.

#### Layer structure

The machine applies glass fibre fabrics being impregnated by epoxy resin alternately with glass rovings. In the areas of the flanges, local thickness increase is reached by mounting. In this technologically advanced manufacturing process, Roth combines its three core businesses filament winding, winding technology as well as impregnation.

#### Machine concept

- Structure of the winding machine:
- drive stand for initiating the torque
  - flexible tailstock for the fixture of different mandrel lengths
  - tool: 3D-mandrel
  - movable platforms for the impregnating process and the material application



Roving impregnating station

When manufacturing products of this size, carrying the glass fibre material on a movable platform enables a nearly continuous material flow. The person operating the machine can optimally observe and control the process. Furthermore, material can be refilled without loss of time. With a rail length

of almost 50 meters, components with diameters of approximately three meters and a length of about 20 meters can be produced. Final stages of product processing include the polymerization oven as well as demoulding.

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### **Know-how and advisory service**

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As general contractor, Roth has the know-how for the conception of complete production processes from the filament winding technology to the demoulding. This includes recommendations for the material selection – for example the kind of fibre – as well as the detailed analysis and solutions with regard to refinement in the production process. Thereby, the product determines the manufacturing procedure.

Further information:

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*Observing and controlling the winding process*