

## Rotor blade for innovative tidal generator

### VAP® highlights

- Integral production in one infusion step
- Homogenous fiber volume content in all thickness areas
- Optimum dry form drapability in extreme geometries
- High reproducibility
- Fewer process and assembly steps
- Lower weight
- High dynamic load capacity and operational safety
- Implementation of intelligent blade design



Testing a prototype of the SCHOTTEL tidal generator

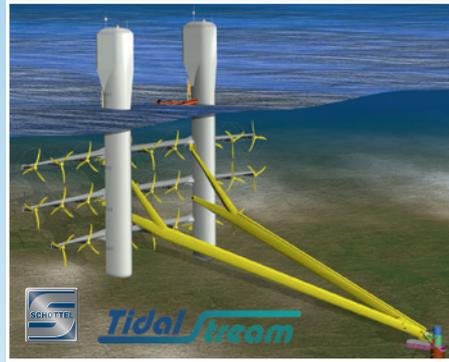
## Small is beautiful

Tidal energy systems are an attractive option in the renewable energy mix. To lower energy costs, the power output of tidal generators is usually raised per foundation and marine cable by using larger rotors. This, however, increases not only the load on the units but also maintenance costs and system complexity.

In its STG 50 Tidal Generator, the SCHOTTEL Group has taken another approach. Unlike individual large systems anchored to the sea bed, its solution involves an array of turbines mounted to a Triton platform from Tidal Stream Ltd. and equipped in each case with a three-blade 3.5 - 4.5 m-diameter rotor rated at 50 kW. The turbines are simple and robust, are cooled by the ambient water and dispense with complex subsystems.

## Intelligent VAP® rotor blade

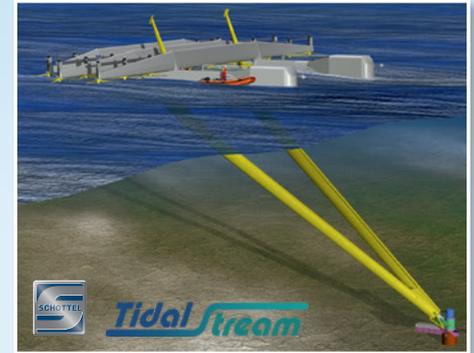
At flow speeds of up to 5 m/s, the rotors of tidal generator are subjected to high dynamic loads. In response, an intelligent, heavy-duty CFC



rotor blade has been developed and produced by Avantgarde Technologie GmbH for the SCHOTTEL Group using VAP® technology and process engineering support from Composyst GmbH. To limit the shearing forces that can occur at overspeed, the intelligent blade adjusts in shape to enlarge its pitch angle. This significantly reduces thrust augmentation and keeps the load exerted on the turbine and the supporting structure at a low level.

The high load capacity and thus operational safety of the weight-reduced rotor blades is achieved in an integral production concept

realized in the VAP® process for highly reliable infusion results. In fact, VAP® delivers mechanical design implementation in aviation quality. The CFC preforms are dry-stacked and can be optimally draped even in the extreme geometry areas of the blade. By using a VAP® membrane system by Trans-Textil GmbH, Avantgarde Technologie also achieves homogeneous fiber volume content in the blade.



Accordingly the blade offers reliable structural properties from its innovative load transfer hub to its tip.



Plant development  
Turbine production



Development & VAP® fabrication  
of the rotor blades



VAP® application technology  
& process support



VAP® membrane systems