Diab supplies core materials for the worlds largest turbine blade

With the length of ten London buses, the 83.5m long wind turbine blade is the world's largest to date. A joint project between SPP Technology and Samsung Heavy Industries, the first prototype is currently exposed to thorough testing at the Fraunhofer Institute in Germany.

The record-breaking turbine blade is part of a project to develop a 7MW offshore wind turbine with a 171.2m diameter rotor. The new design will be used in the construction of twelve units in an 84MW offshore installation in the Korea Straits. A collaboration between Samsung and the Korea Southern Power Corporation, the installation is targeted to start in 2015, making it South Korea's first offshore wind energy project.

Commissioned by Samsung Heavy Industries, the first prototype for the blade was designed and manufactured by SSP Technology. The company was founded in 2001 by Rune Schytt-Nielsen and Flemming Sørensen, two pioneers in the field of wind turbine blades. Based on the Danish island of Funen, the company today has more than 130 experienced employees. Focus lies on wind turbine blade technology, mould manufacture and blade development, combining product quality and long lifecycles with low weight and increased stability.

When developing any wind turbine there are many things to consider. The load capacity, aerodynamics, structural performance and material options have to blend into an optimal combination that delivers a low-weight product with uniform quality and high productivity.

Tooling and testing are of vital importance to achieve this. When developing the geometry for the extraordinary large blade SSP Technology used aerodynamic and 3D CAD modeling. It was finally decided that the blade would be constructed using a flat-back profile at the maximum corde and a structural blade design concept of a carbon and glass fiber hybrid, materials able to provide the necessary strength, buckling and deflection resistance.

Having worked with Diab for many years prior to this project, SSP Technology's CTO Flemming Sørensen knew where they would find the material and knowledge they needed to produce the blade. Diab supplied all core materials used: *ProBalsa150* and *Divinycell H80* . The materials came with distinctive groovings to enable the Diab method of *core infusion*. Each blade skin was produced in a female mould using a combination of VARTM (vacuum assisted resin transfer moulding), pre-preg and hand lamination.

With support from Diab and within the requested 15 months and targeted budget, SSP Technology was able to produce the first complete prototype at the company's production site in Denmark. The blade was then transported to the Fraunhofer Institute for Wind Energy and Energy System Technology (IWES) in Bremerhaven, Germany, where it is currently undergoing testing and evaluation to prove the quality of the blade, including the SSP spar box and the root design developed by SSP Technology. The tests, which will be verified by the Norwegian firm DNV, include two months of static testing and a 25-year lifecycle fatigue test, which will last approximately six months. After the successful completion of the tests, the production of the three remaining prototype blades will begin.

www.ssptech.dk
YouTube: *www.youtube.com/watch?v=VTGA--zhkYE*