Process Chain for Industrialized Rotor-Blade Production Set in Motion

Automized pick-and-place process for stacked cuttings, large textile, and sandwich preforms. (Courtesy: Fraunhofer)

After the production portal was commissioned last spring, Fraunhofer IWES reached the next milestone in the BladeMaker joint research project: Steps are now integrated as the basis for a prototypical end-to-end process.

The first step is producing the first shear web with direct infusion, followed by shear web manufacturing with PUR foam-core elements, the production of the first half of the form tool, and the testing of a new gripper principle for handling cuttings.

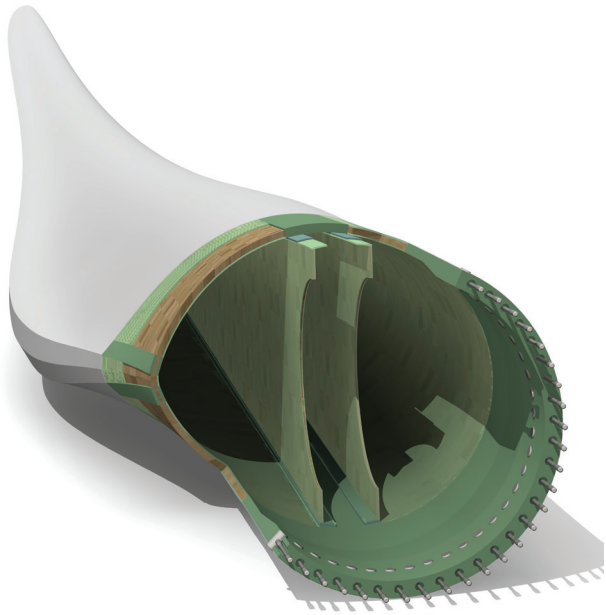
When the project is completed at the end of this year, all of the optimized processes will be merged and adapted to the production sequence. The 16 project partners have a goal of saving at least 10 percent in rotor-blade production along with noticeable quality improvements.

Production workflow automation should increase to about 60 percent. To achieve that, the industrial approach draws on new materials as well as optimized processes and illustrates the advantages of this production method, for example, taking a blade design developed by IWES. The blade design was based on a simplified turbine model with a capacity of 1.5 MW developed by IWES scientists.

A prime example from the field of process technology is the production of the blade mold without a master plug, which can save time by several weeks. The production of the mold for a rotor blade generally requires the creation of a master plug. Following this stage, the next step requires the form to be shaped manually in accordance with the blade geometry.

In combination with a project partner's corresponding CAD-CAM tools, the use of a computerized numerical control makes it possible to pass the design

Quality control for rotor-blade mold. (Courtesy: Fraunhofer)



One of the innovative approaches of the project is producing a shear web made from polyurethane. (Courtesy: Fraunhofer)

data on to the production planning team directly. The same should occur for all hardware-dependent processes. In the BladeMaker project, the mold for the 18-meter-long root segment of a 40-meter rotor blade has just been produced without a master plug. This direct tooling approach can save about two weeks of production time. The mold is completed with a carbon fiber-based electrical heating system.

CUTTING COSTS

The shear web is often manufactured as a sandwich construction, which results in high rigidity and low weight. This component is one of the central parts employed to increase the buckling strength of a blade. The aim in the BladeMaker project is to produce the core of the shear web from polyurethane (PUR). Instead of kits made from PVC, for example, large-scale elements are prefabricated and inserted. The advantage: cost savings. The shear webs produced in Bremerhaven, both conventional and adapted versions, were inserted with a special tool (shear web positioner) that ensures optimal positioning within the half shell.

INNOVATIVE GRIPPER PRINCIPLE

Another approach developed for the handling of stacked cuttings with high surface weights and fixed preforms is a gripper that grasps multiple flat cuttings and places them on a support. This allows for the next step of the shaping. The shaped stack is positioned precisely in the form tool using the gripper system.

"Robot-assisted cutting positioning, either directly or as a preform, translates to noticeable time savings, increases the precision, and ensures a consistent level of quality," said Christian Dörsch, the team lead.

Completion of the integration and demonstration of all of the sub-processes is expected by the end of 2017. The machines need to be set precisely. The changing of the process heads and the changeover to the next production step will be performed at the same machine space, so it demands exact coordination. There is still a ways to go before the proprietary BladeMaker blade segment can enter its "maiden voyage" along the entire process chain.

The demonstration center is already opening its doors to blade manufacturers, suppliers of materials for rotor-blade production, and the mechanical engineering industry for test runs. The aim is to identify possible additional cost savings in the production chain.

Source: Fraunhofer

For more information, go to www.windenergie.iwes.fraunhofer.de/

Vaisala Doubles Triton Production Capacity to Meet Growing Demand

Vaisala, a global leader in environmental and industrial measurement, has doubled production capacity at its Boulder, Colorado, operations center for the Triton Wind Profiler. Vaisala has increased capacity to meet the needs of wind-farm developers and operators for quick, reliable access to accurate hub-height wind-measurement data.

The increase in demand for Triton comes from a growing wind industry that has widely adopted remote sensing systems for measuring wind, allowing faster development, better financing, and more efficient wind-farm operations.

The remote sensing system's versatility, ruggedness, mobility, and ultra-lower power requirements make it a dependable choice for collecting wind-resource measurements, especially as wind-farm developers continue their push into more remote territories around the world where the installation of met masts is often impractical.

A Triton Wind Profiler. (Courtesy: Vaisala)

Wind developers use Triton to measure wind speeds at prospective wind-farm sites because the remote sensor offers accurate data at the heights of today's taller turbines while helping them overcome many hurdles. Triton's mobility and online data recording allow developers to quickly collect the wind information needed to conduct assessments and make decisions about viable sites, rather than waiting for met towers to be planned, permitted, and constructed.

Wind-farm operators are taking advantage of the same Triton features to help optimize their wind-generation assets more cost-effectively. The Triton has many operational applications, such as indicative power performance testing, turbine wake studies, and verification of met masts. In all of these cases, Triton helps operators perform a more robust analysis generally at a much lower cost and time commitment.

"We are witnessing a global shift toward remote sensing away from traditional met masts," said Pascal Storck, head of Renewable Energy at Vaisala. "This is driven in part by new standards and acceptance for power performance testing, but primarily from the simple fact that remote sensing, especially SoDAR systems like Triton, offer a faster, more cost-effective means of reliably recording wind measurements for our industry's ever-taller turbines."

"Vaisala has continuously been improving Triton manufacturing through the application of lean manufacturing principles," Storck said. "To meet increasing demand from our customers, we were able to quickly scale up our capacity. It helps considerably that Vaisala has been a leader in manufacturing high-quality weather measurement equipment for over 80 years."

"With global wind capacity growing year on year, and allocations for farm development anticipated in even more remote and challenging locations in 2017, Triton will continue to offer its users the accurate wind-resource data necessary to design better, more efficient wind farms," he said.

Source: Vaisala

For more information, go to www.vaisala.com/energy

Vestas Gets Orders for a Total of 88 MW

An order has been placed by evn naturkraft Erzeugungsgesellschaft m.b.H. for 33 MW of V112-3.3 MW and V126-3.3 MW turbines for the Sommerein wind-power plant in Lower Austria.

The project will employ a customized solution consisting of V112-3.3 MW turbines with a hub height of 140 meters and V126-3.3 MW turbines with a hub height of 137 meters, demonstrating the versatility of Vestas' product portfolio.

The order includes supply and commissioning of the wind turbines along with a VestasOnline Business SCADA solution.

The turbines will be installed in Sommerein in Lower Austria with wind-turbine delivery and commissioning expected to begin in the first quarter of 2018.

"To achieve the lowest cost of energy at the Sommerein site, evn naturkraft Erzeugungsgesellschaft m.b.H. needed a customized wind solution, and our versatile 3 MW platform enables exactly that through different hub heights and rotor diameters, offering superior annual energy production for the site," said Nils de Baar, president of Vestas Central Europe. "Together with our long-term customer evn naturkraft Erzeugungsgesellschaft m.b.H., we look forward to raising the bar for low-wind site performance."

V112-3.3 MW turbines like this one are part of the Austrian 33 MW order. (Courtesy: Vestas)

NORDIC REGION

Ortum has placed an order for 14 V126-3.45 MW turbines with Power Optimized Modes to 3.6 MW, demonstrating the competitiveness of Vestas V126-3.45 MW in the Nordic region.

The order is for the Ånstadblåheia wind park in the municipality of Sortland, continuing the momentum Vestas has built in Norway. The contract includes supply and installation of the wind turbines, as well as a 5-year Active Output Management 5000 (AOM5000) service agreement. Delivery of the wind turbines is expected to begin in the third quarter of 2018. With combined orders of close to 1,500 MW in Norway, Sweden, and Finland, the V126-3.45 MW and the previous 3.0 MW and 3.3 MW rating variants are proving how the right technology can provide a strong business case in the Nordic region.

"Ånstadblåheia is an excellent wind site and yet another milestone in our strategy to expand within renewable energy," said Philippe Stohr, vice president of Wind Power at Fortum. "Vestas' continuous technology development, as we see it in V126-3.45 MW's performance, was key in our decision to choose Vestas for the project."

"Building on our good relationship from Solberg wind park in Sweden, we are proud that Fortum has again chosen Vestas and opted for our V126-3.45 MW for their Ånstadblåheia wind power plant in Norway," said Klaus Steen Mortensen, president at Vestas Northern Europe. "Vestas has the industry's most versatile products, and this project underlines our ability to provide the right technology solutions for the challenging market conditions of the Nordic region."

Source: Vestas

For more information, go to www.vestas.com