

Wind turbine with record-breaking rotors

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The B75 blade is the world's largest fiberglass component cast in one piece. The manufacturing process posed several challenges for the project team. In particular, the mold had to consist of two parts so that it could be transported.

Siemens has produced the world's longest rotor blades for wind turbines. Measuring 75 meters in length, the blades are almost as big as the wingspan of an Airbus A380. Beginning this fall, the B75 rotor blades will be installed into a prototype six-megawatt offshore wind power system in Denmark's Østerild test station. As it moves, each rotor covers 18,600 square meters, which is the size of two and a half soccer fields. The tips of the blades move at up to 80 meters per second, or 290 kilometers per hour. The huge rotor was made possible by special technologies that enable Siemens to make extremely strong yet lightweight structures.

To produce the B75 rotor blade, [Siemens](#) uses the patented IntegralBlade process, in which the entire blade is poured as a single piece made of glass fiber-reinforced epoxy resin and balsa wood. As a result, the blade has neither seams nor bonded joints and is extremely robust. The gigantic rotor, which measures 154 meters, has to withstand huge air masses, as it is hit by the energy of 200 tons of air per second when the wind blows at a speed of 10 meters per second.

Thanks to another patented process, QuantumBlade, the rotor blade weighs 20 percent

less than conventionally produced blades. As a result, the nacelles, towers, and foundations can be made lighter as well, which reduces the facility's cost. The weight reduction is achieved by using specially designed blade profiles that are also shaped in a way that delivers maximum rotor performance at a range of different wind speeds.

Siemens has been manufacturing wind power plants for the past 30 years. The size and output of the associated technology has steadily grown during this time. Whereas the first [wind turbines](#) generated 30 kilowatts and had five-meter-long [rotor blades](#), the latest turbines can produce six megawatts of power. The first two six-megawatt turbines from Siemens (equipped with standard 60-meter rotor blades) are now being installed and tested at the Gunfleet Sands wind farm off England's south coast. Over the next several years, the Danish energy supplier Dong plans to install 300 gearless Siemens wind turbines off the British coast. These turbines will be equipped with the new record-breaking rotor blades. Wind power plants are part of Siemens' Environmental Portfolio, with which the company generated about $\$30$ billion in sales in business year 2011.

Provided by Siemens

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