

The production process of wind turbine blades



Overview

Almost all wind blades are manufactured in five stages as shown in Figure 1, that is, Material Kitting, Component Prefabrication, Shell Fabrication, Blade Closing & Bonding, and Finishing.

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While the blades of a turbine may be one of the most recognizable features of any wind installation, they also represent one of the largest physical challenges in the manufacturing process. Turbine blades can reach up to 100 meters (328 feet) in length, and will continue to increase in size as the demand for renewable energy grows and as wind .

Due to the size and complexity of turbine blades, each blade must be crafted to the highest quality standards in order to ensure reliability. This fabrication process can be very costly and labor intensive, but a partnership between DOE, Sandia National Laboratories, TPI Composites, and Iowa State University helped establish advanced techniques .

Wind turbine blades are remarkable feats of engineering, transforming the power of the wind into clean electricity. The materials they are made from and the methods used to construct them have a profound impact on their power output, longevity, and overall sustainability.

The production of wind turbine blades is an intricate process that involves the use of substantial quantities of composite materials like fiberglass and carbon fiber. These materials are favored for their stiffness and durability but pose significant environmental challenges that conflict with the sustainability goals of renewable energy .

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The manufacturing evolution of wind-turbine blades

In fact, a new wind-turbine blade design and manufacturing document from the IEC (international standards organization, the International Electro-technical Commission) is currently under development. The aim is to ...



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