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Experimental Investigation of Twisted Bladed Savonius Wind Turbine Rotor

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Abstract

The present investigation is aimed at exploring the feasibility of Savonius wind turbine blades for power generation, which has hitherto been limited to water pumping and grain grinding work. In this project, an attempt has been made to develop a twisted blade for its use in Savonius wind turbine rotors. The objective is to reduce the negative torque and the self-starting characteristics of a single stacked rotor system while maintaining a high rotational speed so that such a rotor system can be used for electricity generation. Tests have been carried out of semicircular (curved) and twisted blades both in a three bladed rotor system. Aerodynamic performance of these blades have been evaluated in a low speed wind tunnel on the basis of starting torque, power output and rotational speed at various setting angles and gap widths. Experimental investigation shows the potential of the twisted bladed rotor in terms of smooth running, higher coefficient of performance and self-starting capability as compared to that of the semicircular bladed rotor.

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