

***DESIGN OF MICROHYDRO TURBINE VORTEX TYPE WITH
VARIATIONS OF STRAIGHT, CURVED, AND ARCH FINNED BLADE***

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ABSTRACT

Electricity is a source of energy used in everyday life to meet the needs of every human being. The increasing human population causes the need for electrical energy to increase. Excessive use of fossil energy results in reduced energy availability at this time. Issues about global warming, air pollution, and also the effect of greenhouse gases also encourage the advancement of research on more environmentally friendly sources of electrical energy. PLTMH is a solution to meet the needs of electrical energy while reducing the use of fossil energy. This study aims as an effort to meet the electricity demand and to determine the effect of the shape of the straight, curved, and finned blades on the performance of the vortex turbines. This research was conducted on September 26, 2020 at Cempaka Hamlet, Pakis Village, Panti District, Jember Regency by utilizing the Cempaka Hamlet irrigation channel. The research method used is an experimental method by making turbines based on the existing potential. Then the turbine performance test is carried out from the turbine manufacturing results. The results showed that the best performance was found in the straight blade with a torque of 9,77 Nm, a frequency of 49,6 Hz, 188.44 rpm rotation of the turbine, a voltage of 220,5 volts and turbine power 192,7 watt. The vortex turbine's performance has an efficiency of 51,2% of the potential power of 376 watts.

Keywords: Energy, Blade Shape, Vortex, Performance