

**DESIGN OF OVERSHOT WATERWHEEL AS HOUSEHOLD-SCALE
HYDROPOWER PLANT**

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ABSTRACT

Based on the flow, the ferris wheel is divided into 3 namely: overshot type waterwheel, undershot type water wheel, and breastshot type waterwheel. On the overshot type of water wheel, water is inserted into the motion through the upper wheel of the wheel. This type of waterwheel purely utilizes the heavy force of water to operate. This research aims to find out the design and manufacture and results of overshot waterwheel testing, and to know the effect of increased load power on overshot wheel performance. The research was conducted in Cempaka Village Pakis Village Panti District Jember district by utilizing irrigation flow. The research method used in the form of experimental methods by making windmills based on potential. The result of making the wheel is then tested to find out the performance of the overshot wheel. The design of the overshot wheel based on the potential obtained from the results of the energy potential survey is 433.2 watts. The results of the power test were 35.64 watts of overshot waterwheel. Test results at a water fall altitude of 1.2 m were obtained with a loadless voltage of 198.2 volts, a frequency of 46.27 Hz, turbine rotation of 114.62 rpm, 2.97 Nm of torque and 10% turbine efficiency. Along with the addition of load power to the generator resulted in the wheel rotation, voltage, frequency, torque, and ferris wheel power decreased.

Keywords: *waterwheel, overshot, performance*