

ABSTRACT

Automated River Cleaner is a proposed design to improve the cleanliness of the Citarum River. The main components of the Automated River Cleaner machine are vessel, trash screen, trash hook, conveyor, and trash container. In this study focus on discussing trash hook that are designed to transport floating garbage from rivers that have been collected in garbage filters, the machine works is adapted from a waterwheel that moves rotatively and the shape of the transporting gear from a garbage hook. Objects can move in rotation due to a moment of force or torque. The expected tooth shape is a tooth shape with a low drag force value. To determine the shape of the tooth that has the lowest drag force and determine the power needed, a Computational FLuid Dynamic (CFD) simulation is performed using ANSYS CFX. ANSYS CFX is one of the well-known CFD software, based on the Finite Volume Method (FVM) approach. To find out the material to be used, the selection process is carried out from several materials with Finite Element Method (FEM). Based on the design simulation results of the selected tooth shape is tooth shape 2 with the resulting drag force value is 34.52 N and the resulting torque value is 5320,75 N.m. So using the equation to find power, teeth with the first form require power of 2.782,75 Watt. In static structural simulation which has the smallest deformation value is the third design and the material chosen is Stainless Steel.

Keywords: *Trash Hook, Drag Force, Torque, Power, Material*