

ABSTRACT

The problem of plastic waste is the problem that occurs in various countries in the world. The higher level of public consumption that produces plastic waste which is not balanced by good waste management causes plastic waste to be carried by the water flow through the river to the end in the ocean. One solution to prevent the flow of plastic waste so that it does not continue to flow into the ocean is by pairing a trash rack device on the water duct. But the installation of this trash rack raises a new problem, namely flooding caused by the value of the head loss caused by the installation of the trash rack. Therefore, it is necessary to change the design of the trash rack to ask for the resulting head loss value. To produce a minimum head loss value, changes in the shape of the bar, the angle and thickness of the bar are needed. With three design factors each of which has three levels, 27 experiments were carried out using CFX simulations to determine the value of head losses caused by each design. In the process of making data used the two-way ANOVA method to determine the level of significance. From the data processing that has been done, the optimal parameters produced are the third form for the bar shape, 45° for the angle, and 8 mm for the bar thickness. By making these design changes, the value of head loss can be reduced by 63.17% or from the previous value of 0.22535 m to 0.0830046 m.

Keywords: trash rack, head loss, ANOVA.