

### ***Abstract***

*The rapid population growth has an impact on the increasing need for drinking water. In swamp areas, the need for drinking water cannot be met immediately because it still contains organic compounds that make the water unfit for consumption. Peat water contains dissolved organic compounds that cause the water to turn brown and have an acidic character, so it needs special processing before it is ready for consumption. For peat water to be used by the community for drinking water, it is necessary to find an easy and cheap way to treat peat water. The use of a filtration device is one of the solutions that must be done in peat water treatment. The purpose of this study was to determine the effect of flow patterns, speed, and pressure on the filtration process with variations in the type of membrane and filtration arrangement. This research method was carried out by simulation using ANSYS 14.5 series. The simulation process begins with designing a filtration device with the following types: two-filter, three-filter, and four-filter. Then the simulation was performed by entering the value of the peat water properties into the regulatory equation. The results of this study indicate that the collaboration of two membranes with different holes in type-2 and 3 filters produces a good filtration rate. However, in type-4 filters, the use of a similar membrane is highly recommended. This filtration rate is influenced by the presence of a cross-flow reversal (CFR) region that appears, when using different filtration membranes at low pressure it doesn't matter. However, in other cases of systems operating at high pressure, CFR that appears tends to decrease the filtration rate, this is because CFR inhibits the flow rate in the filtration process.*

*Keywords: swamp areas, peat water, type of membrane, filtration arrangement, ANSYS 14.5*