

## **ABSTRACT**

*One of the cooling system process that used in Air Conditioner (AC) is Ice Thermal Energy Storage (ITES). ITES has used in AC system as central system. In this research we design Temporary AC based on ITES as a single system with heat exchange principal between water and air in the system. On initial research we conduct the modelling process as a reference for system test with the limitation error 10 %. System tested with ice mass 1, 2, and 3 kg with water flow rate 0.3, 0.4, 2, and 3 LPM. Air temperature as the system result will compared with modelling result. When the error exceed 10 % then modelling process need a correction with added the heat-loss factor. In test result the lowest output of air temperature from the heat exchanger is 8 °C with ice mass 3 kg on the flow 3 LPM, and for the error between modelling and test system after the correction is 2.81 %. In modelling based on timework, system with flow 0,3 and 0,4 LPM can work  $\pm$  3 hours until the output temperature from heat exchanger has same point with the environment.*

**Keyword:** *ice thermal energy storage, heat exchange, modelling, ice mass, water flow rate*