

**STUDI EVALUASI EFISIENSI PEMAKAIAN AIR  
UNTUK OPERASIONALISASI  
OPEN RECIRCULATING COOLING WATER SYSTEM  
PADA INDUSTRI TEKSTIL  
(Studi Kasus Pada Industri Tekstil PT. X)**

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Abstract

A lot of industrial use water in their process to support their operational. One of the systems that use a lot of water in a textile industry is the cooling water system. In this system, water is taken from water source (etc: deep well). The water is then flown into a condenser that is connected with a chiller and is used as a media to decrease the temperature of the production machine, room, and all the equipment that is used in the industry. There is two kind of Cooling water system: 1.) *Once through system*, which a cooling system that runs water through the system once, then the water discarded. 2.) *Recirculation system*, which is a cooling system that circulates water so it will be reused. The advantage of once through system is that the system can run well cause the quality of the water can be maintained. But the disadvantage is the use of water will be very big or will be squandered. On the contrary using the recirculation system can save more water. This study will evaluate the efficiency of water using in the open recirculation cooling water system. The statistic test result taken from three units of the textile industry, shows that the changes of the debit are comparable to the changes of concentration and the changes of the temperature ( $\Delta T$ ) from the water bait hardness and the blow down water. To reach an optimal level of the temperature in the cooling system can be done by adjusting the water bait debit and the blow down. To establish the optimization in the blow down can be done by analyzing the regression and the correlation between debit cycles and the temperature changing ( $\Delta T$ ). The graph shows that debit cycles will be optimal when the temperature changing ( $\Delta T$ ) is optimal too, that is when the  $\Delta T=5^{\circ}\text{C}$ . The evaluation of the efficiency is done by comparing the amount of water that is been use between the once through system and the open recirculation system in the optimum level. Without counting the debit, we can also count the efficient by using the optimality of the system. In the once through system the cycles is considered as 1 (one), cause there is no cycles in this system. The optimal cycles in cooling system in Weaving unit, the Spinning unit and the Diesel unit is 2,6; 2,5; and 2,5. Because of that the calculation of the efficient evaluation of the water using in the cooling system of PT. X in the Diesel and Spinning unit is 60% and in the Weaving unit is 62%.

(key words : cycles, debit, hardness, delta T, efficiency)