

Quantitative Changes in Biofilms of a Seawater Tubular Heat Exchanger Subjected to Electromagnetic Fields Treatment

Authors : Sergio Garcia, Alfredo Trueba, Luis M. Vega, Ernesto Madariaga

Abstract : Biofilms adhesion is one of the more important cost of industries plants on wide world, which use to water for cooling heat exchangers or are in contact with water. This study evaluated the effect of Electromagnetic Fields on biofilms in tubular heat exchangers using seawater cooling. The results showed an up to 40% reduction of the biofilm thickness compared to the untreated control tubes. The presence of organic matter was reduced by 75%, the inorganic mater was reduced by 87%, and 53% of the dissolved solids were eliminated. The biofilm thermal conductivity in the treated tube was reduced by 53% as compared to the control tube. The hardness in the effluent during the experimental period was decreased by 18% in the treated tubes compared with control tubes. Our results show that the electromagnetic fields treatment has a great potential in the process of removing biofilms in heat exchanger.

Keywords : biofilm, heat exchanger, electromagnetic fields, seawater

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