

Assessment of Wastewater Reuse Potential for an Enamel Coating Industry

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Abstract : In order to eliminate water scarcity problems, effective precautions must be taken. Growing competition for water is increasingly forcing facilities to tackle their own water scarcity problems. At this point, application of wastewater reclamation and reuse results in considerable economic advantageous. In this study, an enamel coating facility, which is one of the high water consumed facilities, is evaluated in terms of its wastewater reuse potential. Wastewater reclamation and reuse can be defined as one of the best available techniques for this sector. Hence, process and pollution profiles together with detailed characterization of segregated wastewater sources are appraised in a way to find out the recoverable effluent streams arising from enamel coating operations. Daily, 170 m³ of process water is required and 160 m³ of wastewater is generated. The segregated streams generated by two enamel coating processes are characterized in terms of conventional parameters. Relatively clean segregated wastewater streams (reusable wastewaters) are separately collected and experimental treatability studies are conducted on it. The results reflected that the reusable wastewater fraction has an approximate amount of 110 m³/day that accounts for 68% of the total wastewaters. The need for treatment applicable on reusable wastewaters is determined by considering water quality requirements of various operations and characterization of reusable wastewater streams. Ultra-filtration (UF), Nano-filtration (NF) and Reverse Osmosis (RO) membranes are subsequently applied on reusable effluent fraction. Adequate organic matter removal is not obtained with the mentioned treatment sequence.

Keywords : enamel coating, membrane, reuse, wastewater reclamation

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