VIBRATORY WASTEWATER CASE STUDY

Application

Rinse water from vibratory finishing processes contains heavy metals, chemicals and oil & grease. The wastewater cannot be discharged into the public sewer system, and requires to either be disposed of with specialized waste management companies or be treated onsite.

Waste management companies are very expensive, thus used by companies having small volumes of wastewater. The existing practices to treat wastewater onsite include sand filters, coagulation, flocculation and clarifiers. These practices involve high amounts of chemicals which are very costly.

The company requires a wastewater treatment system that uses a limited amount of chemicals and delivers a permeate water quality that meets disposal requirements.

Fig 1: Feed and permeate water samples

	Feed	Permeate	Reject
TSS (ppm)	> 5,000	< 1	~ 50,000
COD (ppm)	> 3,000	< 500	~ 10,000
Oil & Grease (ppm)	> 200	< 5	~ 600

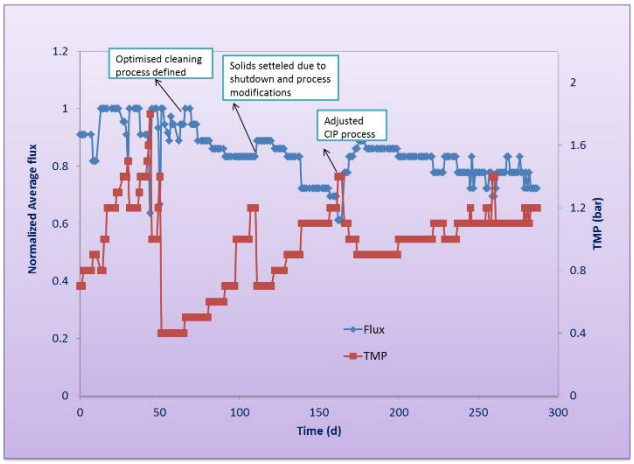

Fig 2: Filtration performance over time

Membrane System

The membrane skid is equipped with 25 CERA~DUR modules.

The CERA~DUR modules are designed to operate in crossflow in-out mode with ultrafiltration ceramic hollow fiber membranes having a pore size (D_{90}) of 30 nm.

The system was commissioned in Q4 2014, and the operating conditions are as follows:

- Feed water: 6-8m^3 per day
- Average flux: 40 LMH
- Transmembrane pressure (TMP): 1 bar

Results

- ✓ The system successfully met the discharge requirements with 100% retention of suspended solids and a permeate water containing < 1 ppm TSS and < 5 ppm of oil and grease.
- ✓ The system delivered a stable flux for more than 2 years, with no membrane replacements.
- ✓ The total annual operational expenses were reduced by over 40%, primarily driven by reduced disposal charges and maintenance costs.

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