

# CASE STUDY

## MICRODYN SpiraSep™ 960 UF

### Heavy Metal Wastewater



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#### Project Goal

Using spiral-wound polymeric UF membrane modules to treat wastewater highly concentrated with heavy metals to reduce fresh water consumption.

#### Feed

- Industrial Wastewater
- Feed TSS: 50-100 mg/L

#### Membranes

- MICRODYN SpiraSep™ 960-PES UF modules

#### Parameters Measured

- Operating flux: 27.2 l/mh (16 gfd)
- TSS removal

#### Objective

An airplane parts manufacturer recently decided to implement wastewater recycling at their facility in an effort to reduce fresh water consumption and minimize overall waste disposal. In order to reduce fresh water consumption by 75-80%, a significant upgrade of the existing wastewater treatment plant (WWTP) was needed. Due to the various manufacturing processes, such as metal cutting, finishing, cleaning, inspection, plating and painting, the plant wastewater is highly concentrated with heavy metals. The constituents of most concern are chromium, aluminum, iron, zinc and copper.

#### Materials & Methods

A submerged, spiral-wound ultrafiltration (UF) system was selected to replace the current precipitation and settling process. Due to the critical nature of the site's manufacturing process, two 100% process trains were designed to provide redundancy to the WWTP. The treatment process consists of a series of neutralization, chrome reduction and precipitation tanks prior to the UF system. Sodium hydroxide is injected to elevate the pH above 8, forming metal hydroxides that precipitate out of solution. Once precipitated, the heavy metals are then easily removed by the MICRODYN SpiraSep™ 960 UF membrane modules.

#### Results

The SpiraSep UF modules operated at a steady flux of 27.2 l/mh (16 gfd) on a feed stream contaminated with heavy metals (primarily chromium, aluminum, iron, zinc and copper) and total suspended solids (TSS) of 50-100 mg/L. The SpiraSep UF modules produced effluent with turbidity less than 0.1 NTU.

#### Conclusion

The airplane parts manufacturer selected SpiraSep UF modules as these low-fouling UF modules were able to handle the wastewater stream contaminated by heavy metals while producing consistent high quality effluent.



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