



INDUSTRIAL WATER

Custom RO Systems Help Plating Company Reuse Wastewater

IFM was brought in to aid a plating and metal finishing company reduce their waste discharge to the city. The client was unhappy with the surcharges coming from the city that came along with treatment of their metal-laden wastewater which included high concentrations of copper, nickel, zinc, and chrome. In addition to this, the high cost of process water from the city made it necessary to find a solution to clean the wastewater to a point of reuse. Work was conducted with the client to design, shape, size, and install a reverse osmosis (RO) system in the space available.

the client, pleased with the performance of the system, decided to upgrade to a 20gpm RO, and eventually a 40 gpm RO due to the achievement of the systems to produce large amounts of clean, recyclable permeate water. Each system was designed and built for high-pressure situations, having an operating range of approximately 250-450 psi.

The system was run in a closed loop until the feed TDS (total dissolved solids) and pressure reached a preset limit, at which point the system loop is flushed with city



Image 1: 40GPM Rental RO Membrane System

An initial rental installation consisted of a 12-15 gpm RO system which included three process tanks (RO feed, permeate, and concentrate), pretreatment cartridge filtration, and a preceding acid feed which prohibited scaling of the membranes by the highly-metallic water. Once the system start-up was complete

water. This way, both the concentrate and permeate streams were able to be reused in the process with a recovery of 50-75%. With the initial system feed water having a TDS concentration of 3,000 ppm of <2 NTU, the Filmtec BW30-XFR-400-34i RO membranes were able to achieve a maximum level of 95% rejection.

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According to data collected on-site, given 16 separate sampling times, an average of 94.9% TDS removal was observed with the feed stream averaging 3074.87 ppm and permeate concentrations around 156.4 ppm. Please refer to the data below:

	RO Feed TDS (ppm)*	RO perm. TDS (ppm)
	6910	115
>	5000	100
	300	7
	3800	60
	270	5
	2500	55
	320	8
	650	10
>	5000	80
	308	X
	3600	1400
	190	27
	11300	250
	300	4
	5400	140
	3350	85
Average	3074.875	156.4

Average TDS removal: 0.949 94.914%

*Values listed as >5000 were evaluated at 5000 ppm

Each system was built for longevity, with a system shut-down permeate flush included to increase membrane life and efficiency. Operation and maintenance manuals were tailored to the system and included detailed cleaning instructions. As of now the original membranes have lasted 6 months through the use of proper operating and cleaning practices and schedules followed. The rental contract between IFM and the client included monthly preventative maintenance visits by a certified R.O. technician.

For more information about the RO rental equipment, as well as other available equipment that can be tailored to the user's water quality needs, please refer to the contact information at the bottom of this page.