

Integrated HYDRAcap MAX UF & CPA3-LD RO system provides process water for chemical plant



Location:
Tangshan, China

Feed water source:
Ground water

Application:
Process use

Capacity:
19,200 m³/day

UF Design:
4 racks x 38 HYDRAcap MAX 60

RO Design:
4 x 174 CPA3-LD Single Pass,
Two Stage, 20:9 Array

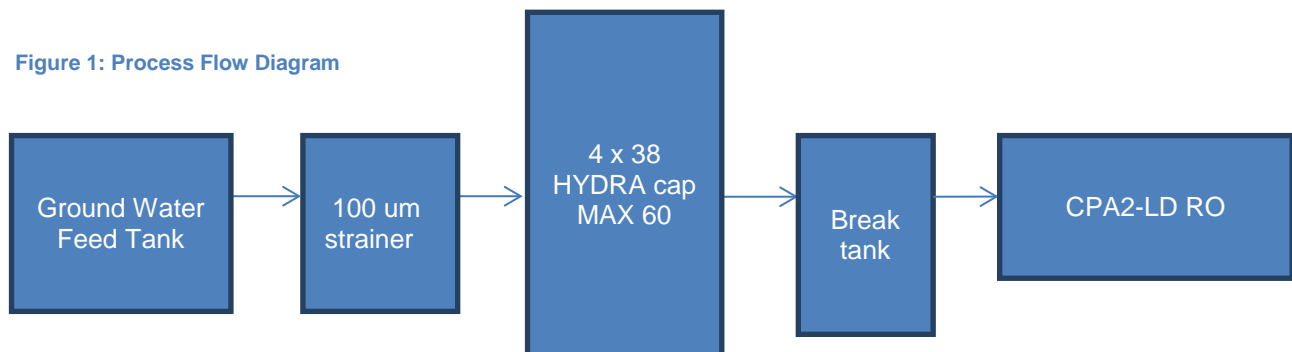
The Problem

In order to meet process water demands, a formaldehyde manufacturer in China is using an integrated ultrafiltration – reverse osmosis water system. Clean water is increasingly scarce in China. In order to minimize source water consumption, the ultrafiltration system utilizes a unique backwash-free operating process. The membranes are physically cleaned by air scouring for 1 minute. The modules are then drained, subsequently refilled and returned to filtration mode. This process decreases source water consumption by 3-4% compared to processes which use backwash.

The Solution

The RO elements are Hydranautics' CPA3-LD; selected to minimize fouling in the system. Hydranautics' LD technology minimizes differential pressure within the element through utilization of a special membrane chemistry and patented anti-microbial feed spacer, designed with a special geometry which reduces deposition of colloidal material.

Figure 1: Process Flow Diagram



	Ultrafiltration	Reverse Osmosis
Module Type	Hydranautics HYDRAcap® MAX 60	Hydranautics CPA3-LD
Flow Path	Outside to Inside	-
Membrane Area	78 m2 membrane	400 ft2
Membrane Material	TIPS PVDF	Low Differential Pressure CPA
Filtrate Flow Rate	19,200 m ³ /day	14,400 m ³ /day
Filtration Flux	78 l/mh	23.2 l/mh
Filtration Time	25 minutes	-
Recovery	98%	75%
Chemical Cleaning Frequency	One chlorine maintenance clean per day (200 ppm)	No CIP yet



Figure 1: Feed Turbidity (left) and UF Filtrate Turbidity (right)

UF Performance	
Feed Turbidity	3-5 NTU
Filtrate Turbidity	<0.1 NTU
Total Suspended Solids	<2 mg/L (Below Detection Limit)