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HYDRANAUTICS
Nitto Group Company

PHARMA GRADE WATER WITH ULTRAFILTRATION

Case study

HYDRAcap®MAX Ultrafiltration membrane provides a compact, less expensive and effective solution to Pharma Industry in Indonesia

The PROBLEM

Mahakam Beta Farma is a pharmaceutical and healthcare company in Pulogadung, Jakarta, Indonesia. They operate water treatment plants to produce pharma grade water. They required a compact plant since they did not have enough space to accomodate a pre-treatment system.

Indonesian pharma companies commonly use media filter, activated carbon filter, ion exchange softener, cartridge filter and high pressure pump followed by RO and EDI. This extensive treatment scheme is typically needed to remove turbidity, suspended solids and hardness, so that the RO can stably produce product water with less than 1 ppm of calcium hardness as required by the EDI. However, this solution is not suitable to the customer because it is expensive and occupies a large foot-print.

Moreover, this treatment scheme does not reduce bacterial counts which is not helpful as bacteria removal is crucial for pharma water.

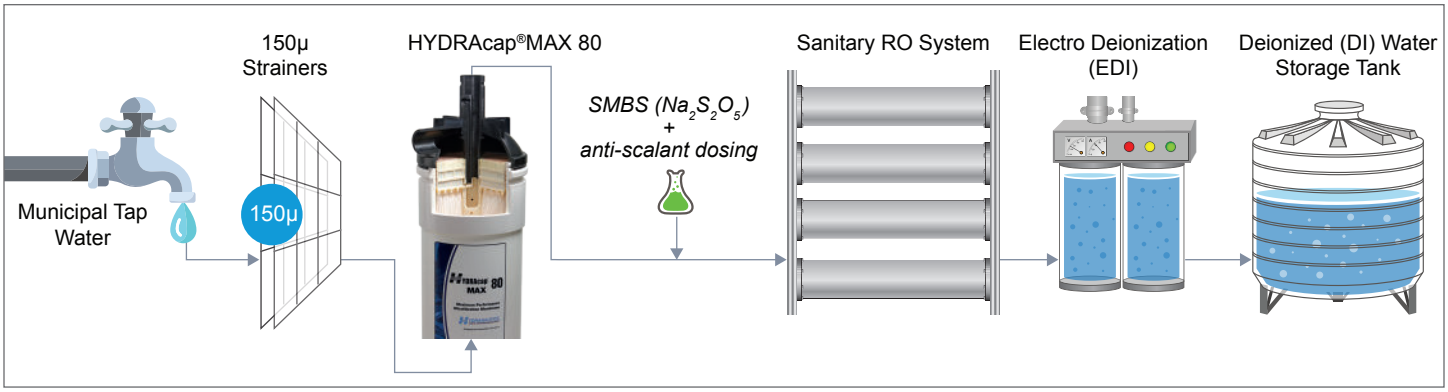
Location	Pulogadung, Jakarta, Indonesia
Feed water source	Municipal water
Application	Pharma grade water
Capacity	6 m^3/h
Start-up date	October 2016
UF Design	1 HYDRAcap®MAX 80 module

The SOLUTION

Hydranautics proposed a space-saving solution with their HYDRAcap®MAX80 capillary UF membrane. As a result, the RO pre-treatment only comprises a 150 micron prefilter and the UF membrane (see treatment scheme on the next page). Additionally, the novel treatment process for this UF does not require backwashing, so their is no BW pump or BW tank.

As shown in the block diagram, municipal tap water is filtered by the auto-strainer and then by the UF membrane. The UF filtered water is then processed by the RO and finally by the EDI.

SMBS and anti-scalant dosing is introduced in RO, to remove chlorine and to prevent scaling respectively. The HYDRAcap®MAX UF membrane produces excellent filtrate quality, see *UF System Performance* table on the next page.



In the past 18 months, UF feed pressure was stabilized between 0.4 to 0.45 bar. See the graph below.

After the filtration cycle is completed, membranes are physically cleaned by air scouring for 1.5 minutes. The solids are then drained from the module, which minimizes the water that is wasted, only about 2%, and maximizes source water utilization.

UF membranes are chemically cleaned once every day with 200 ppm sodium hypochlorite solution to remove biological foulants. After every 1440 hours (2 months) recovery cleaning is performed using stronger sodium hypochlorite solution.

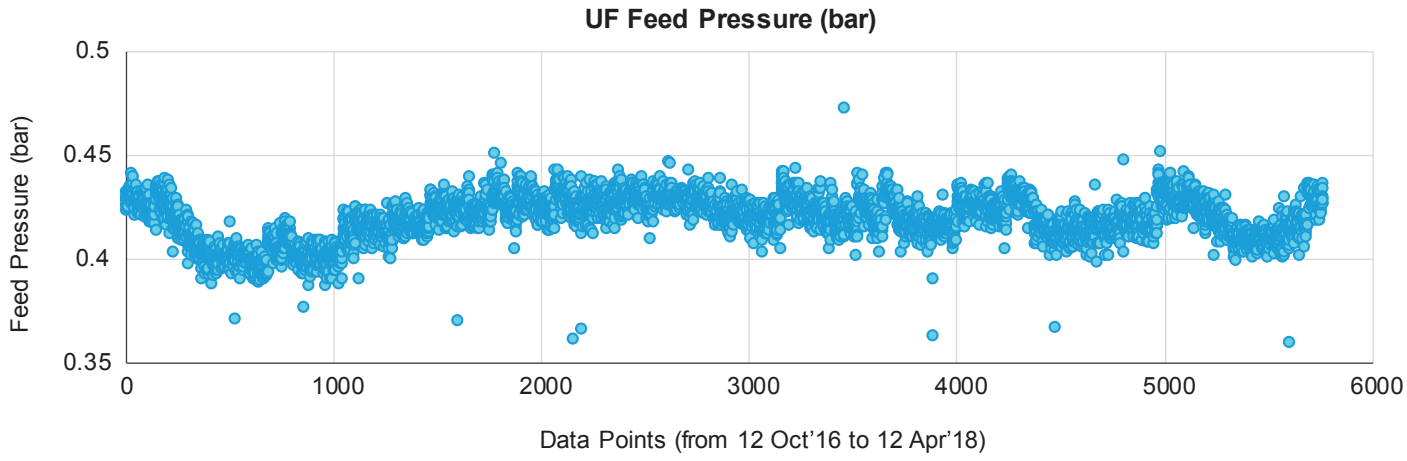
The permeate produced by the downstream RO contains less than 1 ppm Ca as required by the downstream EDI unit.

System Description

Module Type	HYDRAcap®MAX 80
Filtration flux	57 lmh
Filtration time	40 minutes
Recovery	98%
Module quantity	1

UF System Performance

Parameter	Value
Feed turbidity	< 5 NTU
Filtrate turbidity	< 0.1 NTU
Bacteria removal	> 5 log
Total suspended solids	< 1 mg/l *(below detection limit)*



The IMPACT

The HYDRAcap®MAX system offers a compact and less expensive solution compared to the commonly used treatment scheme. It consistently produces excellent filtrate quality, independent of the incoming feedwater quality.

Most importantly, the HYDRAcap®MAX system effectively removed the bacteria – a pre-requisite in the Pharma Industry – with reduced capital and operating costs.

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About Hydranautics

Since our founding in 1963, Hydranautics has been committed to the highest standards of technology research, product excellence and customer fulfillment. Hydranautics entered the Reverse Osmosis (RO) water treatment field in 1970 and is one of the most respected and experienced firms in the membrane separations industry. We joined the Osaka, Japan based Nitto Denko corporation in 1987 which was founded in 1918 and now has 117 companies in more than 20 countries, with over 30,000 employees worldwide. Our alliance with this global film industry giant boosts Hydranautics to a superior level of technological sophistication, product performance and customer response.

We are not simply product manufacturers; we are your membrane technology partners. As leaders of high quality membrane solutions, we believe our obligations extend beyond manufacturing and selling our products. Our skilled staff of technicians, engineers and service professionals assist in designing, operating and maintaining a robust, reliable and efficient membrane system to meet your requirements and exceed your expectations. Our support is offered from early stage conceptual design and engineering to start-up and maintenance, no matter the location globally whether it is on land or off-shore.

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