

Reverse Osmosis System Analysis for FILMTEC™ Membranes

ROSA 9.0.0 ConfigDB u399339_282

Project: Eng on line forum

Case: 1

Terry Fagg,

9/17/2016

Project Information:

Case-specific: Just a muck around plant

System Details

Feed Flow to Stage 1	20.00 m³/h	Pass 1 Permeate Flow	8.00 m³/h	Osmotic Pressure:	
Raw Water Flow to System	20.00 m³/h	Pass 1 Recovery	40.00 %	Feed	24.21 bar
Feed Pressure	61.45 bar	Feed Temperature	25.0 C	Concentrate	41.20 bar
Flow Factor	0.85	Feed TDS	34284.03 mg/l	Average	32.70 bar
Chem. Dose	None	Number of Elements	10	Average NDP	27.90 bar
Total Active Area	408.76 M²	Average Pass 1 Flux	19.57 l/mh	Power	42.68 kW
Water Classification: Seawater with Conventional pretreatment, SDI < 5				Specific Energy	5.33 kWh/m³

Stage	Element	#PV	#Ele	Feed Flow (m³/h)	Feed Press (bar)	Recirc Flow (m³/h)	Conc Flow (m³/h)	Conc Press (bar)	Perm Flow (m³/h)	Avg Flux (l/mh)	Perm Press (bar)	Boost Press (bar)	Perm TDS (mg/l)
1	SW30XHR-440i	2	5	20.00	61.11	0.00	12.00	59.97	8.00	19.57	0.00	0.00	84.97

Pass Streams (mg/l as Ion)					
Name	Feed	Adjusted Feed	Concentrate		Permeate
			Stage 1	Stage 1	Total
NH4+ + NH3	0.00	0.00	0.00	0.00	0.00
K	399.00	399.00	664.16	1.32	1.32
Na	10000.00	10469.02	17429.03	30.70	30.70
Mg	1292.00	1292.00	2152.89	0.88	0.88
Ca	412.00	412.00	686.53	0.27	0.27
Sr	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00
CO3	0.00	0.00	0.00	0.00	0.00
HCO3	0.00	0.00	0.00	0.00	0.00
NO3	0.00	0.00	0.00	0.00	0.00
Cl	19000.00	19000.00	31634.67	51.05	51.05
F	0.00	0.00	0.00	0.00	0.00
SO4	2712.00	2712.00	4519.80	0.74	0.74
SiO2	0.00	0.00	0.00	0.00	0.00
Boron	0.00	0.00	0.00	0.00	0.00
CO2	0.00	0.00	0.00	0.00	0.00
TDS	33815.01	34284.03	57087.08	84.97	84.97
pH	7.60	7.60	7.60	7.60	7.60

*Permeate Flux reported by ROSA is calculated based on ACTIVE membrane area. DISCLAIMER: NO WARRANTY, EXPRESSED OR IMPLIED, AND NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, IS GIVEN. Neither FilmTec Corporation nor The Dow Chemical Company assume any obligation or liability for results obtained or damages incurred from the application of this information. Because use conditions and applicable laws may differ from one location to another and may change with time, customer is responsible for determining whether products are appropriate for customer's use. FilmTec Corporation and The Dow Chemical Company assume no liability, if, as a result of customer's use of the ROSA membrane design software, the customer should be sued for alleged infringement of any patent not owned or controlled by the FilmTec Corporation nor The Dow Chemical Company.

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Design Warnings

-None-

Solubility Warnings

-None-

Stage Details

Stage 1 Element	Recovery	Perm Flow (m ³ /h)	Perm TDS (mg/l)	Feed Flow (m ³ /h)	Feed TDS (mg/l)	Feed Press (bar)
1	0.11	1.06	53.02	10.00	34284.03	61.11
2	0.10	0.93	66.56	8.94	38334.62	60.81
3	0.10	0.80	85.09	8.01	42782.83	60.55
4	0.09	0.67	110.82	7.21	47517.66	60.33
5	0.08	0.54	146.76	6.54	52359.56	60.14

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Scaling Calculations

	Raw Water	Adjusted Feed	Concentrate
pH	7.60	7.60	7.60
Langelier Saturation Index	-6.48	-6.48	-6.06
Stiff & Davis Stability Index	-7.46	-7.46	-7.27
Ionic Strength (Molal)	0.70	0.71	1.21
TDS (mg/l)	33815.01	34284.03	57087.08
HCO ₃	0.00	0.00	0.00
CO ₂	0.00	0.00	0.00
CO ₃	0.00	0.00	0.00
CaSO ₄ (% Saturation)	20.45	0.00	37.44
BaSO ₄ (% Saturation)	0.00	0.00	0.00
SrSO ₄ (% Saturation)	0.00	0.00	0.00
CaF ₂ (% Saturation)	0.00	0.00	0.00
SiO ₂ (% Saturation)	0.00	0.00	0.00
Mg(OH) ₂ (% Saturation)	0.07	0.00	0.12

To balance: 469.02 mg/l Na added to feed.