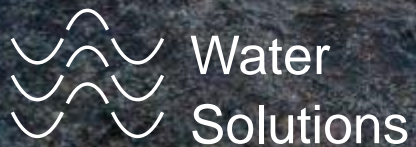


DuPont Water Solutions

Possibility Flows With Us

Aquatech, Amsterdam, 2023

Name: Maria Perez Macia



TRANSFORMING THE DIGITAL SPACE OF DESALINATION THROUGH THE DUPONT WATERAPP

Presenter: María Pérez-Maciá



Introduction | WaterApp

Applications



FT-Norm PRO

Don't run your reverse osmosis and ultrafiltration in the dark. Know your plant performance anytime from anywhere.

Go to app →



Design Software WAVE

Benefit from integrated software for water-treatment plant design

Go to app →

Desalination Tools



Invest to Save Calculator

Use the invest to Save Calculator to quantify your opex savings.

Calculate now →



Dry Seawater Sustainability Calculator

Use the Sustainability Calculator to see how Dry Seawater Reverse Osmosis elements reduce CO₂ footprint.

Calculate now →



Pretreatment Advisor

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Mobile devices



[Android](#)



[Apple](#)

[DuPont Water App \(DuPontWaterApp.com\)](https://DuPontWaterApp.com)

[Apps & Calculators \(dupont.com/water\)](https://dupont.com/water)



FT-Norm PRO | Introduction

Normalization tools

- Commonly used in the industry as a key mechanism to detect performance deviations in Reverse Osmosis systems
- Assist the user when deciding which corrective actions are to be applied, such as:
 - ✓ Cleaning in place
 - ✓ Mapping or probing pressure vessels
 - ✓ Verifying status of anti-scalant dosing system

DuPont launches FT-Norm PRO, the Next Generation normalization tool, to help users to maximize the potential of their installations

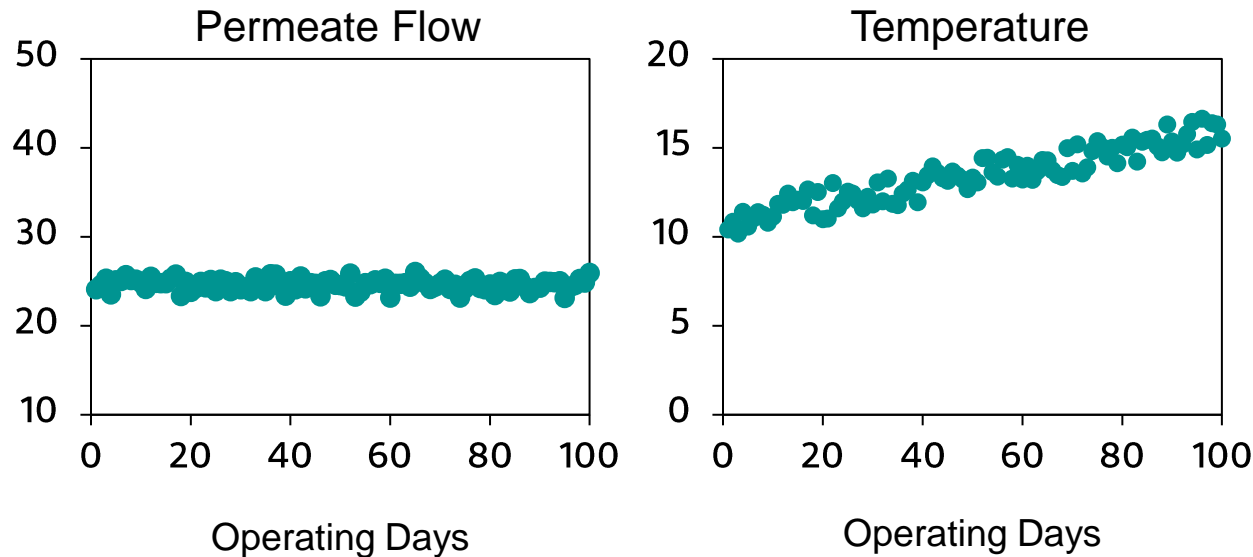
Check our video to learn more



FT-Norm PRO | Why data Normalization?

Without FT-Norm PRO

Apparent stable operation.....

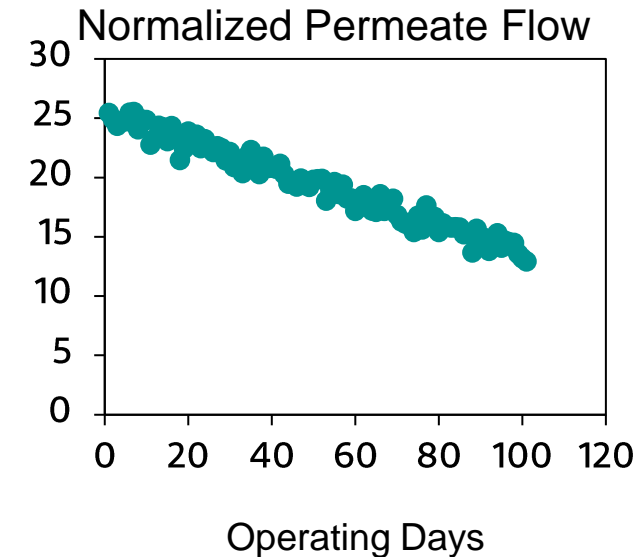


However,... **Temperature is increasing**

An increase in **temperature** (assuming the rest of operating parameters remain unchanged), **will result in a lower water viscosity**, and therefore, **permeate flow should be increasing** (around 3% for every 1°C drop).

With FT-Norm PRO

Potential performance issues can be easily identified



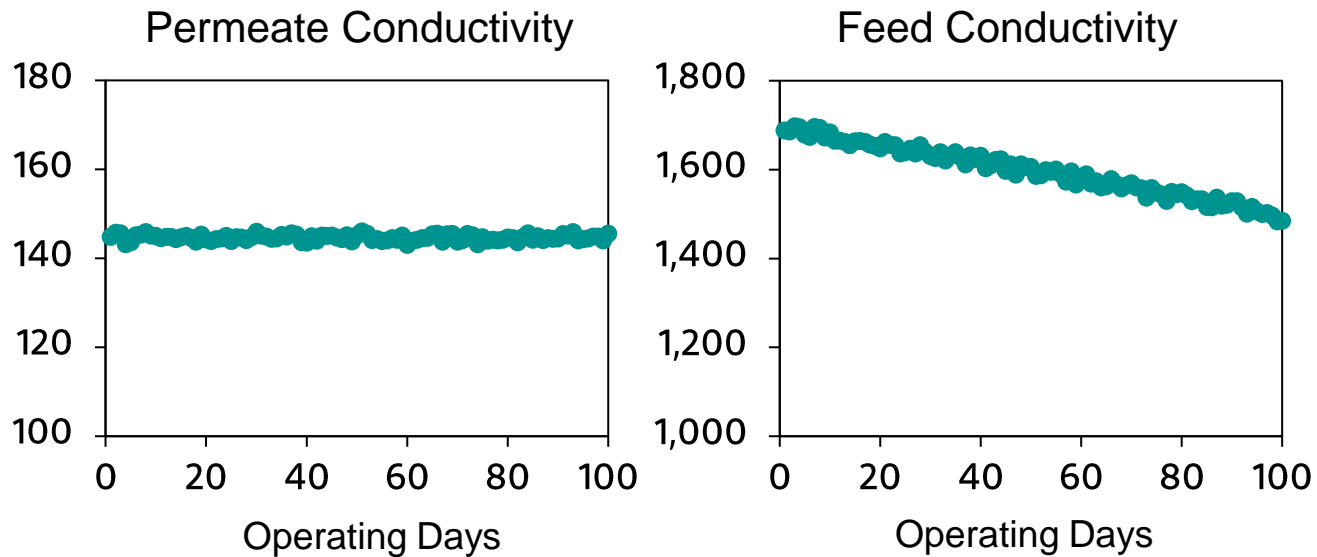
The **Normalized Permeate Flow** trend reveals a continuous decrease with time, indicating signs of membrane fouling or degradation, which could not be detected without using FT-Norm PRO



FT-Norm PRO | Why data Normalization?

Without FT-Norm PRO

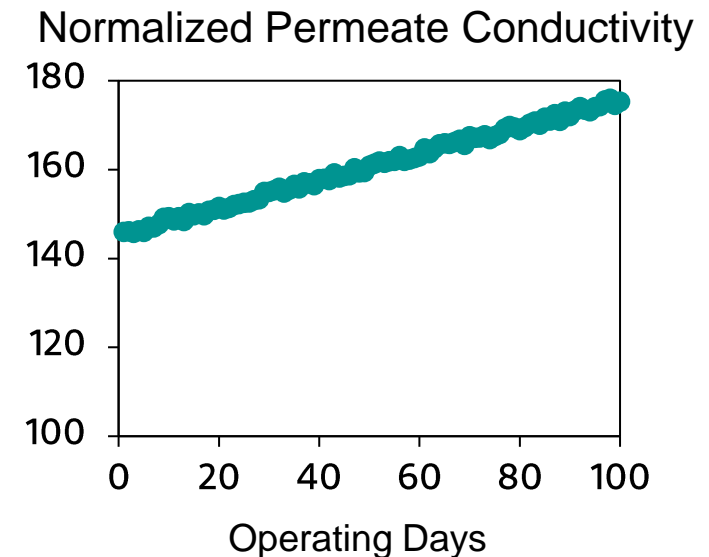
Apparent stable operation.....



However... **Feed Conductivity** is decreasing
A **decrease in feed water conductivity** (assuming the rest of operating parameters remain unchanged), should result in a **Lower Permeate Conductivity** as well.

With FT-Norm PRO

Potential performance issues can be easily identified

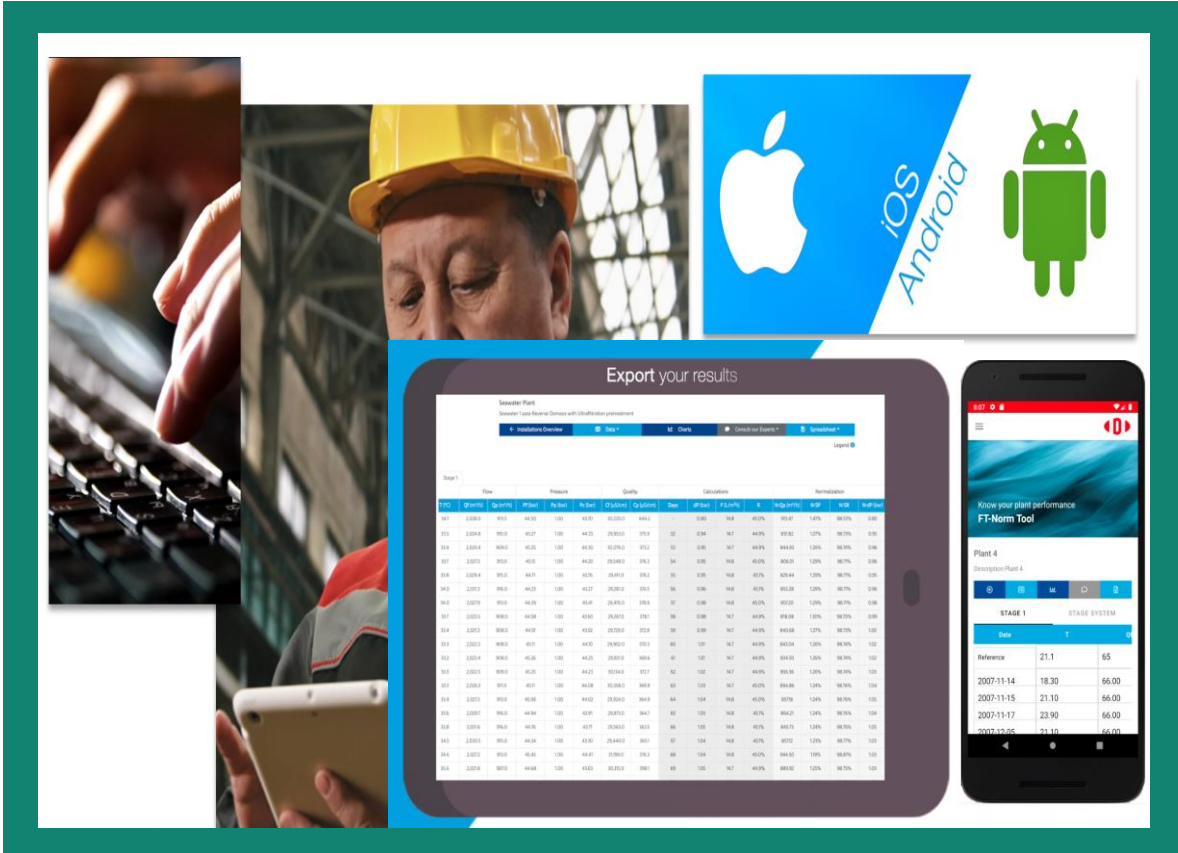


The **Normalized Permeate Conductivity** trend reveals a continuous increase with time, indicating signs of membrane degradation or operational problems, which could not be detected without using FT-Norm PRO

FT-Norm PRO | Key Features

NEW FT-Norm PRO

- ✓ Web-based
- ✓ Available for PCs and mobile devices
- ✓ Compatible with Apple and Android
- ✓ Customizable charts for easier data interpretation
- ✓ Data can be imported from existing files and exported in excel and pdf
- ✓ Option to print reports
- ✓ Users can save one or more installations
- ✓ Users can share their installations with other users
- ✓ Capability to directly request DuPont support



FT-Norm PRO | Key Technical Features



- ✓ Up to 3-stage systems
- ✓ Compatible with all Reverse Osmosis
- ✓ Available in Chinese and English
- ✓ Metric/International/Imperial units
- ✓ Addition of Differential Pressure normalization
- ✓ Option to manually add key events: CIP, Replacement, Preservation, etc.



FT-Norm PRO

Edit installation ✕

Installation name

Description

Stages

City

Country*

Stage1

Active Area (ft²) per membrane

Number of Elements per Pressure Vessel

Pressure Vessels

Product Type

Settings

Flow m³/h m³/d gpm

Pressure bar psig

Feed Quality μS/cm mg/L

Permeate Quality μS/cm mg/L

Temperature °C °F

Flux l/mh gfd

Save

Know your plant performance

FT-Norm PRO

Seawater Plant

Seawater 1 pass RO with UF pretreatment

← Installations Overview
☰ Data ▾
📊 Charts
💬 Consult our Experts ▾
📄 Spreadsheet ▾

Tablet view
Classic view
Legend ⓘ

Stage 1

		Flow		Pressure			Quality		Calculations				
Date	T (°C)	Qf (m ³ /h)	Qp (m ³ /h)	Pf (bar)	Pp (bar)	Pc (bar)	Cf (μS/cm)	Cp (μS/cm)	Days	dP (bar)	F (L/m ² h)	R	
Reference		34.1	2,028.0	913.0	44.50	1.00	43.70	45,580.0	906.0	-	0.80	14.8	45.0%
2020-08-0	00:00:00	34.6	2,028.0	913.0	44.50	1.00	43.70	46,020.0	904.0	0	0.80	14.8	45.0%
										-	-	-	-

save data

ⓘ Data can be imported from former FT-Norm spreadsheet using the copy-paste function selecting a column from the file. To import dates, data must be formatted on the spreadsheet as 'yyyy-mm-dd'.

Click on the button below to import data from single stage FT-Norm file. [Use this template](#) to import data from original FT-Norm file.
*Note: current data will be erased and replaced with the import data spreadsheet.

import data



FT-Norm PRO | Alicante II Case Study

Country: Spain

End-user: Mancomunidad
Canales de Taibilla (MCT)

Technology: DuPont FilmTec™ SWRO

Total # of elements: 6,272

Plant capacity: 65,000 m³/day

Start-up date: 2008

Feed water quality: 41,000 ppm TDS,
5 ppm B

Product water quality: <250 µS/cm
TDS, <1 ppm B

Temperature range: 14-30 °C

Pretreatment: Dual media filters



14+ years

of consistent performance operating durable membranes
without replacement

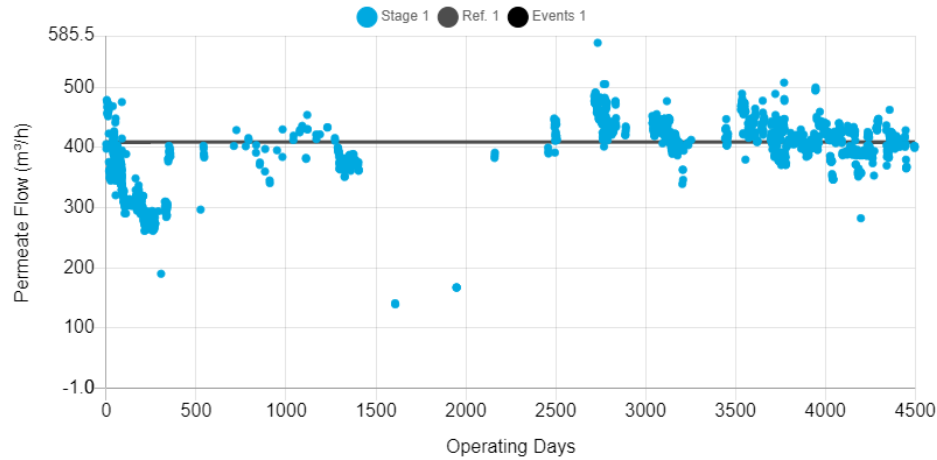


FT-Norm PRO | Alicante II Case Study

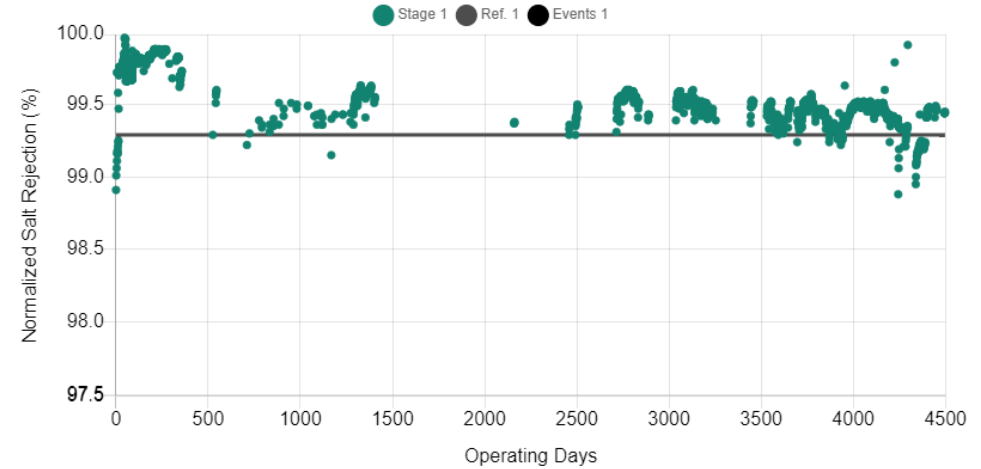
Select Plots

- N-Qp
- N-SP
- N-SR
- N-dP
- dP
- T
- Qf
- Qp
- Pf
- Pp
- Pc
- Cf
- Cp
- R
- F

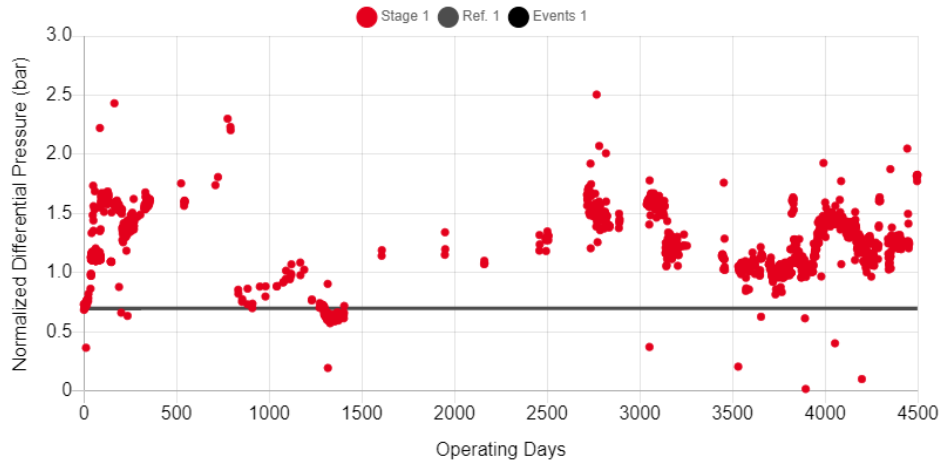
Normalized Permeate Flow



Normalized Salt Rejection



Normalized Differential Pressure



- Permeate flow has remained very stable during the last 12 years.
- Excellent quality of the produced permeate with salt passage below the expected values.
- Normalized pressure drop values have been quite stable and within acceptable values.



DuPont WaterApp

DuPont WaterApp

Access the most advanced tools to support your water treatment applications

Applications



FT-Norm PRO

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Go to app →



Design Software WAVE

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Desalination Tools



Invest to Save Calculator

Use the invest to Save Calculator to quantify your opex savings.

Calculate now →



Dry Seawater Sustainability Calculator

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<https://dupontwaterapp.com/>



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Proven durability



West Mediterranean
14 years without replacements
Capacity 70,000 m³/d



East Mediterranean
10 years without replacements
Capacity 400,000 m³/d



Pacific
8 years without replacements
Capacity 150,000 m³/d



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Size of the installation

Size of the installation v

Price per element

Price per element (DuPont™) \$ v

Price per element (alternative) \$ v

Price per element (replacement)

Price per replacement (DuPont™) \$ v

Price per replacement (alternative) \$ v

Replacement rate

	DuPont™		Alternative	
Year 1	0	%	0	%
Year 2	0	%	12	%
Year 3	0	%	12	%
Year 4	0	%	12	%
Year 5	0	%	12	%
Year 6	0	%	12	%
Year 7	0	%	12	%

+ add year
- remove year

Calculate



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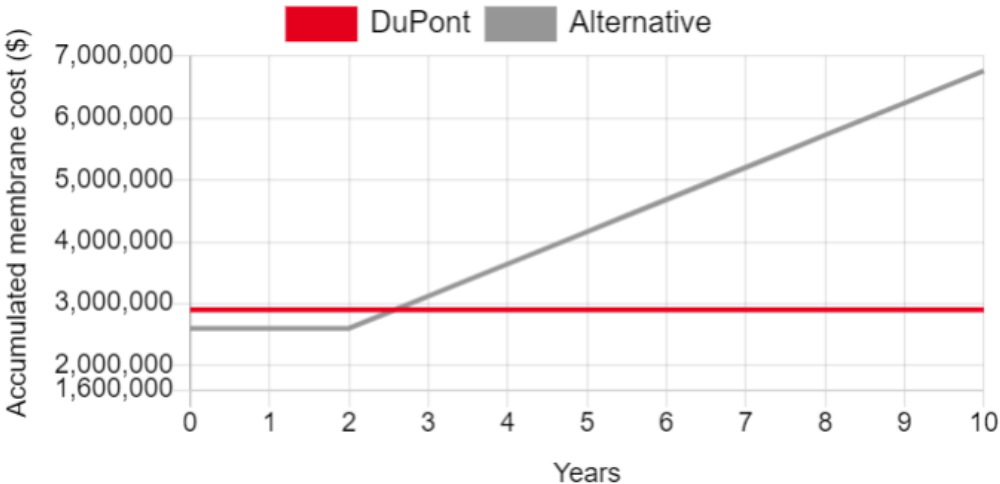
Financial Impact

	DuPont™	Alternative
Initial Cost (year 0)	2,900,000 \$	2,600,000 \$
Replacements Cost (over 10 years)	0.0 \$	2,800,000 \$
TOTAL COST	2,900,000 \$	5,400,000 \$

Sustainability Impact

 **7,000** Less membranes replaced

Evolution of Membrane Expenses



46%
Lower membrane cost

2 years
Payback

7,000
Less membranes replaced

DuPont WaterApp | Dry SW Sustainability Calculator

DuPont WaterApp

Access the most advanced tools to support your water treatment applications

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Dry Seawater Sustainability Calculator

Sustainability Tool

Number of elements Shipping destination

Calculate

 CO₂ saved: 130,000 kg

Which is equivalent to:



310,000 Miles driven



140,000 Pounds of coal burned



2,100 Trees grown for 10 years

Source: <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>



DuPont WaterApp | Pretreatment Advisor

DuPont WaterApp

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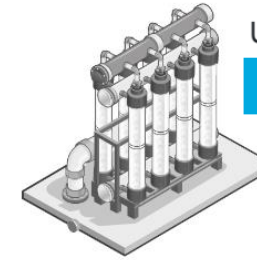


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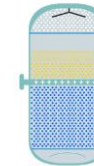
What do you want to achieve?

Prevent the negative effects of biofouling in Reverse Osmosis? ⓘ	No <input checked="" type="checkbox"/>	Yes
Pathogenic bacteria removal? (coliforms) ⓘ	≤ 2 log <input type="checkbox"/>	≥ 4 log
Pathogenic virus removal? (enteric) ⓘ	≤ 3 log <input type="checkbox"/>	≥ 4 log
Water quality (Turbidity)? ⓘ	0.1 NTU <input type="checkbox"/>	0.01 NTU
Organics removal (TOC)? ⓘ	5% <input type="checkbox"/>	34%
Lower Silt Density Index production? ⓘ	3.2 <input type="checkbox"/>	2.6
Reduce footprint? ⓘ	No <input checked="" type="checkbox"/>	99%
Improve plant availability (reduce downtime)? ⓘ	95% <input type="checkbox"/>	> 98%
Operate reverse osmosis at higher flux ⓘ	< 14 lmh <input type="checkbox"/>	> 14 lmh



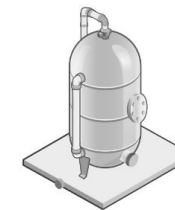
Ultrafiltration

See what products fits on your installation



DuPont™ B-Free™

Show me more about DuPont™ B-Free™



Sand Filtration



DuPont WaterApp | Desal Advisor

DuPont WaterApp

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Desalination Tools

Click on your desired **membrane type** of the seawater desalination plant below to find the best solution for your need.*



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DuPont WaterApp | Desal Advisor

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Click on your desired **membrane type** of the seawater desalination plant below to find the best solution for your need.*

First Pass
Seawater Reverse Osmosis

SWRO

×

First Pass
Seawater Reverse Osmosis

What is your top priority?

- Deal with high fouling water
- Get the lowest energy consumption
- Reduce energy consumption while keeping a good permeate quality
- Improve permeate quality while keeping a good energy consumption
- Achieve the best permeate quality

← Previous

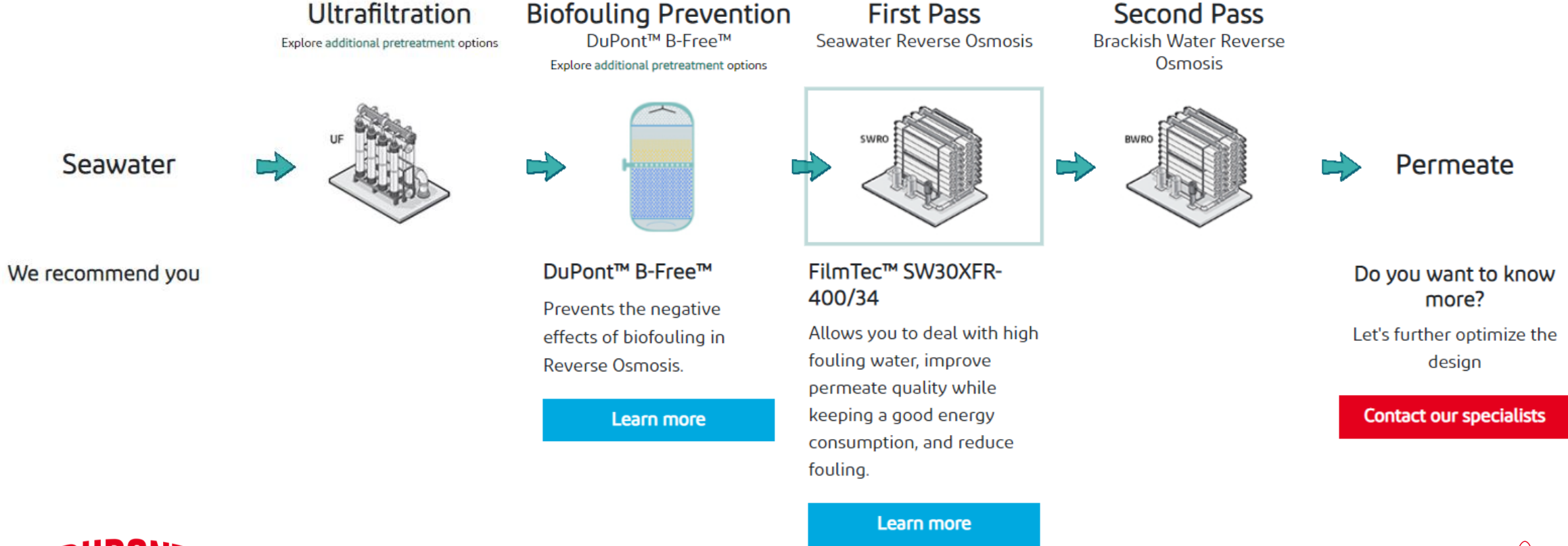
Next →



DuPont WaterApp | Desal Advisor

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Access the most advanced tools to support your water treatment applications



DuPont WaterApp

Access the most advanced tools to support your water treatment applications

Welcome to the DuPont WaterApp! Get free access to a broad range of user-friendly digital tools that can help you, from optimizing membrane cost and carbon footprint in Desalination plants, to calculating when you need your next ion exchange resin replacement.

Applications



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New Tool: Sustainability Navigator

Come tomorrow, Tuesday 7th, at 11:30h to the DuPont Water Solutions booth (#106, Hall 1) to get all the details about the new launch!

Don't miss it!



Sustainability Navigator

Assist users in estimating certain sustainability indicators during use phase

Calculate now →





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