



## Dow UF and RO Technology Produces Boiler and Process Water in Food Additives Industry



A plant in Spain in the Food Additives industry installed DOW™ Ultrafiltration (UF) modules and DOW FILMTEC™ reverse osmosis (RO) elements to treat well water with a high iron content. As a particularity of this plant, no CEB<sup>a</sup> systems are installed, and only periodic CIP<sup>b</sup> maintenance cleanings are needed.

DOW FILMTEC™ reverse osmosis elements treat the ultrafiltrate. The final product water is used as boiler feed as well as for some other uses in the industrial process. The cleaning frequency of the RO elements decreased significantly after the DOW™ Ultrafiltration membrane technology was substituted into the plant for conventional sand filtration pretreatment. Since its start-up date in February 2009, the plant is operating successfully.

### Fast Facts

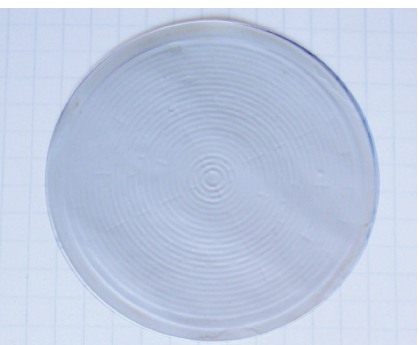
Country:	Spain
End-User:	Food Additives Industry
Feed Water Source:	Well water with high iron content
Product Water Quality:	SDI < 1.0 (Ultrafiltrate)
Temperature Range:	20 – 23°C
Start-Up Date:	February 2009

### Performance

Filtration Cycle Duration:	60 minutes
Operating Flux:	60 – 70 L/m <sup>2</sup> .h
Trans-Membrane Pressure (TMP) at 20°C:	0.5 – 0.6 bar
No Chemically Enhanced Backwash (CEB) needed.	



SDI Filter before UF System



SDI Filter after UF System

Membrane Type	DOW™ UF SFP-2860	DOW FILMTEC™ LE-440i & BW30LE-440
Total # of elements	60 (+20 spares)	180
Plant Capacity	200 – 220 m <sup>3</sup> /h	20 x 100 m <sup>3</sup> /h
Recovery	> 95%	75%
Design Flux	70 L/m <sup>2</sup> .h	27 L/m <sup>2</sup> .h

### Operating Conditions UF – Summary Table

Parameter	Frequency	Duration	Chemical Consumption
Filtration	–	60 min	None
Air Scour	Every 60 min	40 s	None
Backwash	Every 60 min	60 s	0.5 ppm NaOCl
Forward Flush	Every 60 min	100 s	None
CEB <sup>a</sup>	None	None	None
CIP <sup>b</sup>	When needed, typically once every 4–6 months.	3 h	2% Citric or Oxalic Acid 0.1% NaOH + 500 ppm NaOCl

<sup>a</sup>Chemically Enhanced Backwash

<sup>b</sup>Clean-in-Place