Boiler Feed Water Solutions

Sugar Cane Industry, Brazil



Leadership in Filtration

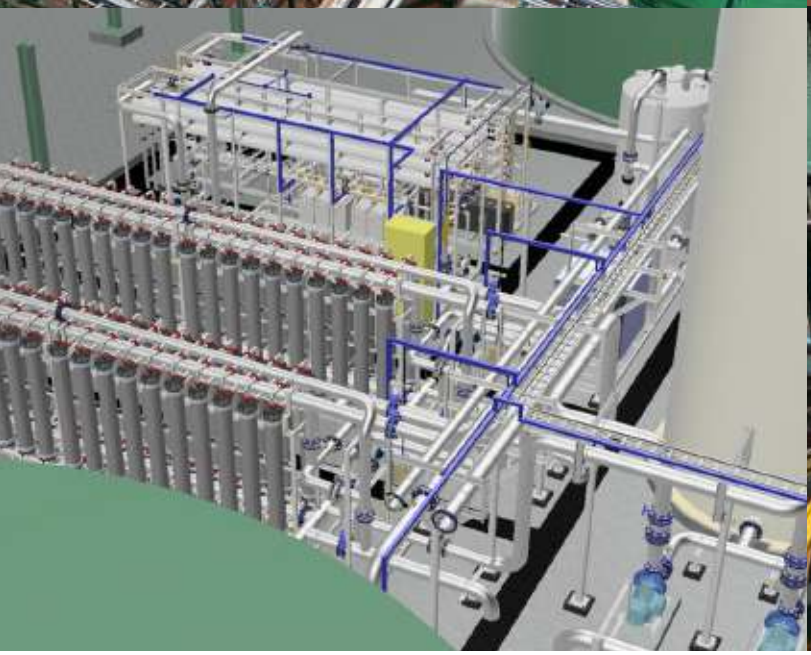
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Boiler Feed Water Solutions: Sugar Cane Industry, Brazil

The Client
Fluid Brazil (OEM), Bom Sucesso Agroindustria SA (end user)

New Multi-Tech water treatment system
An integrated solution with PureULTRA II UF modules providing feed water to MICRODYN RO elements

Outcome
Significant reduction of Turbidity, SDI, TDS, and TSS values resulting in highly pure feed water and a biofilm-free boiler interior

THE CUSTOMER

Fluid Brazil, a prominent original equipment manufacturer in the Brazilian water purification industry, has a longstanding partnership with MANN HUMMEL. The need for water purification in Brazil's sugar cane industry is of global significance, considering that Brazil is the world's leading sugar cane exporter, accounting for 21% of global production. The end user, Bom Sucesso Agroindustria SA, a sugar cane mill in the Goiatuba/GO region of Brazil, works closely with Fluid Brazil to address the numerous water challenges they confront on a regular basis.

THE CHALLENGE

While surface water is a convenient and reliable water source for steam boilers, it contains high levels of contaminants such as sediments, clays, dissolved minerals, salts, organic matter from vegetation and wildlife, algae, bacteria, protozoa, viruses, and artificial pollutants. A comprehensive water filtration system is necessary to deliver hardness-free, highly demineralized feed water for efficient and reliable operation. Bom Sucesso Agroindustria SA only treated the feed water to discharge in compliance with local regulations. After consulting with our customer, Fluid Brazil, the challenge was to design a system that could produce a higher purity output, lower maintenance costs, and protect the boiler's interior from disruptive biofilm buildup - additionally aiming to create a reliable and stable technology that could operate chemical-free and with low turbidity in the inlet with minimal operational support.

FAST FACTS

Location:
Goiatuba (GO), Brazil

Technology:
Ultrafiltration, Reverse Osmosis and EDI

Application
High-Pressure Boiler

Plant capacity:
UF: 350 m3/h RO: 55 m3/h

Start-up date
April 2023

Water Type
Surface Water (River)

# of Elements
UF: 80 – RO: 96



THE SOLUTION

MANN+HUMMEL's Water & Membrane Solutions (WMS) product experts and engineers worked with Fluid Brazil to carry out the engineering and start-up details at the plant and devised a plan with Bom Sucesso Agroindustria SA to create a joint solution that satisfies all needs. The design outcome is an incredibly effective membrane solution that integrates UF and RO technologies.

The solution includes (80) PureULTRA UF II PHF-107-V modules as a pretreatment of an RO system, with (96) MICRODYN RO 8040-BW-400 elements. The result is a permeate with extremely low concentration of Total Dissolved Solvents (including hardness) and other pollutants.

> Raw water passed through UF and RO membranes, with some water used industrially, all monitored remotely by WMS.

Membrane Model: PureULTRA UF II PHF-107-V

Number of Skids:	2
Number of Membranes per Skid:	40
Operating Mode:	Dead-End

Membrane Model: MICRODYN RO 8040-BW-400

Number of Skids:	1	1st Step Feed Flow (Ultrafiltered + 2nd Step Waste):	90.2 m^3/h
First Step Arrangement:	6:4	1st Step Permeate Flow / 2nd Step Feed:	63.2 m^3/h
Second Step Arrangement:	4:2	1st Step Tailing Flow (Disposal):	27 m^3/h
Number of Membranes per Vessel:	6	2nd Step Waste Flow (100% Recycled in the 1st	
Total Number of Vessels:	16	Step feed:	8.2 m^3/h
Total Quantity of Membranes:	96	2nd Step Permeate Flow:	55 m^3/h
Ultrafiltered Feed Flow:	82 m^3/h	Recovery:	67%



THE RESULT

The integrated multi-tech water treatment system has successfully reduced contaminant concentration in the boiler, effectively lowering the risk of scaling. This achievement meets the customer's expectations of chemical-free, high purity feed water and allows for easy operation with minimal staff involvement.

The graphic on the right provides a detailed comparison between the original raw water analysis and the high-quality results achieved. It also outlines the reduction and removal of specific contaminants, further demonstrating the system's effectiveness in delivering highly purified water.



Raw water analysis

TSS: 40 mg/L
TDS: 95 mg/L
Turbidity: 40 NTU
Total Hardness: 78 mg/L of CaCO3

UF pass results

TSS: <3.0 mg/L
Turbidity: <1.0 NTU

EDI final pass results

TDS: <50 ppb
Total Hardness: <100 ppb



The multi-tech system was designed to meet the customer's expectations and has successfully achieved all objectives.

Complete our contact form to connect with a product expert

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Learn more about our Solutions for Boiler Feed Water & more on our website

BOILER FEED WATER →