



Beverage Manufacturing - India

FEDI Model: FEDI-2-DV-30X

Flow: 10 m³/hr

No. of Stacks: 5

Conductivity: <0.1 μS/cm

Application: High purity water for boiler make-up

Project Background

An award-winning beverage manufacturer in India required a demineralized water system for its power plant boiler application in its manufacturing facility in Daman, India. The client is a global producer of a wide range of alcoholic and non-alcoholic beverages. Since Daman is a water-stressed region, the client was required to reduce their fresh water intake at their manufacturing facility. They were looking for a reliable process scheme to recycle and reuse the plant effluent being generated from many sources such as cooling tower blow-down, boiler blowdown and wastewater from the bottle washing process. The combined effluent is a harsh mix of high hardness, silica and total dissolved solids.

The beverage manufacturer appointed a renowned consultant to evaluate and recommend a reliable pretreatment and demineralization

process to achieve the required final product water quality suitable for boiler make up water. The scheme finalized consisted of pretreatment followed by two pass RO followed by electrodeionization as a final polisher.

Clarifier → MGF → Ultrafiltration



II Pass RO → Electrodeionization

Though the selected scheme comprised of two pass RO, the consultant decided to design the electrodeionization system to tolerate high hardness upto 2 ppm as CaCO₃ in the feed. This required correct selection of the EDI technology to ensure that the system would not require frequent chemical cleaning on account of presence of high hardness and would provide a consistent and reliable operation. After detailed

evaluation of various EDI options, the customer found QUA® Fractional Electrodeionization (FEDI®) to be most suitable for their requirement, due to its capability to operate at higher hardness in comparison to other conventional EDI technologies.

QUA Solution

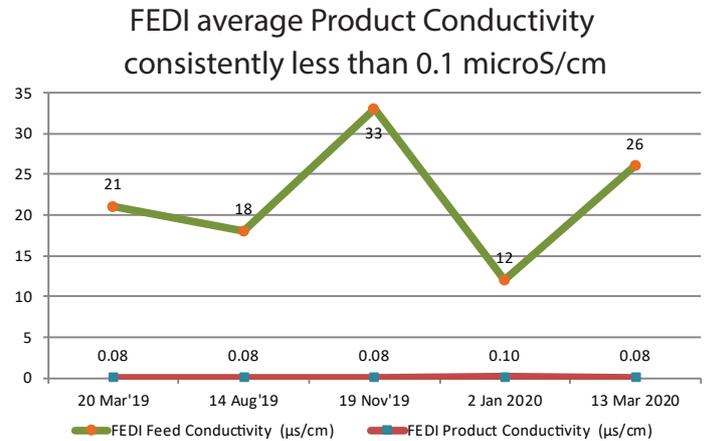
Based on the consultant's specifications, QUA supplied 5 FEDI-2-DV-30X stacks for this application requiring 10 m³/hr of product flow.

The FEDI system has been in operation since March 2019 on a continuous basis, and has been consistently providing high-quality water since start-up. The product water quality has been consistently less than 0.1 microS/cm, which meets the client's requirement for high purity water.

The FEDI units have required limited maintenance since startup and provide a consistent product flow of 10 m³/hr. The client has been using the FEDI

treated water for boiler make-up and has been able to reduce their fresh water intake, for a more sustainable, long-term solution.

The following graph shows the product water conductivity trend:



About QUA

QUA is an innovator of advanced membrane technologies that manufactures and provides filtration products to address the most demanding water challenges.

FEDI® Electrodeionization

Electrodeionization is a continuous, chemical-free process that removes ionized and ionizable impurities from the feed water using DC power. EDI is most commonly used to treat Reverse Osmosis (RO) permeate and replaces Mixed Bed (MB) ion exchange; producing high purity water of up to 18 M Ω.cm. EDI eliminates the need to store and handle hazardous chemicals required for MB ion

exchange resin regeneration and associated waste neutralization steps. EDI also has lower space requirement, low operating cost, and a quick payback; and provides constant uninterrupted high-quality water for the process.

QUA's Fractional Electrodeionization (FEDI) is an advancement of the EDI technology, that was developed to address the limitations of conventional EDI. FEDI is a patented two stage process that operates in a dual voltage configuration that reduces hardness scaling that may occur in conventional EDI. FEDI's unique design maintains an acidic condition in the first stage and basic condition in the second stage of the EDI concentrate chamber. This patented design reduces mineral scaling in the first stage and enhances silica removal in the second stage.