



## Aluminium Company, Chhattisgarh, India

**Q-SEP Model:** Q-SEP® 6008

**Total Q-SEP Membranes:** 52 (2 x 26)

**Permeate Flow:** 2 x 100m<sup>3</sup>/hr

**Application:** Cooling Tower Blowdown Recycle

### Project Background

The client is a partially integrated operation with its own captive bauxite mines, refinery and smelters, producing primary aluminum. The client is the first in India to have a captive power plant of capacity 270 MW, which was further expanded to 2010 MW in the year 2016.

### QUA Solution

The application involves treating cooling tower blow down to suit the reverse osmosis feed water conditions, by achieving the required turbidity and silt density index. Q-SEP Ultrafiltration modules have been successful with similar applications in different installations worldwide. Based on these successful operating references, the client chose QUA's Q-SEP® hollow fiber UF membranes as the pretreatment solution for the project. Another reason for their selection was the smaller membrane area offered by Q-SEP compared to other UF membranes.

Q-SEP modules have successfully met the plant's requirements due to their low fouling characteristics, uniform pore size distribution and large surface area which provide high operating efficiency and reliable operation.

The Q-SEP system follows a pretreatment process comprising of a clarifier, a multigrade filter, a basket strainer and precedes a reverse osmosis treatment system for tertiary treatment. The UF system comprises 52 modules of Q-SEP 6008 arranged in two trains with 26 modules each. Each train has 2 parallel rows of 13 Q-SEP modules each. The UF system is designed to operate in dead-end mode.

The UF system was commissioned in January 2015, and has been performing satisfactorily since then, and is able to provide a consistent permeate output of 100m<sup>3</sup>/hr in each train. The Trans-membrane pressure (TMP) has been consistently below 1 bar. Chemical Enhanced Backwash (CEB) is done once a day. The product water turbidity is consistently less than 0.2 NTU and the output SDI consistently below 3 since startup.

## About QUA

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

## Q-SEP® Hollow Fiber Membranes

Q-SEP® hollow fiber UF modules contain membranes manufactured with QUA's innovative patented "Cloud Point Precipitation" method. This process ensures a high pore density along the length of the fiber and uniform pore size distribution in the membrane. Q-SEP modules deliver superior performance characteristics and product water quality that surpass the quality from conventional UF modules. The narrow pore size distribution allows the membrane to produce water with a low silt density index (SDI). The lower product SDI leads to less frequent and easier cleaning of downstream RO membranes. In addition, the Q-SEP membranes provide an excellent rejection of bacteria and viruses.

Q-SEP UF membranes are made of modified hydrophilic polyether sulfone (PES) material that offers high fiber strength and excellent low fouling characteristics, resulting in higher membrane productivity. These hollow fiber membranes operate under a low transmembrane pressure in an inside-out flow configuration for superior performance. Applications of Q-SEP UF include pretreatment to RO systems (brackish and seawater applications), purification of surface and well water for potable applications, filtration of industrial water, and wastewater recycle and reuse.