



**Driving Zero Liquid Discharge at a
Leading Steel Manufacturer with
Q-SEP® Q-Connect**



Client: Leading Steel Manufacturer, India

Plant Capacity: 345 m³/hr

Steel manufacturing depends heavily on water, making efficient water management essential. To support its zero liquid discharge (ZLD) goals, client aimed to improve effluent treatment and increase water reuse across the plant.

The facility required a reliable ultrafiltration (UF) system that could consistently treat industrial effluent and protect downstream RO systems, ensuring stable and efficient ZLD operations.

Challenges:

The effluent treatment plant handles highly variable industrial effluent, making consistent treatment a challenge. The system needed to manage fluctuating water quality, remove suspended solids and turbidity to protect RO membranes, deliver 345 m³/hr of consistent flow rate, and fit within a limited footprint, while ensuring reliable long-term operation.

A robust, space-efficient ultrafiltration solution was critical to meet these demands.

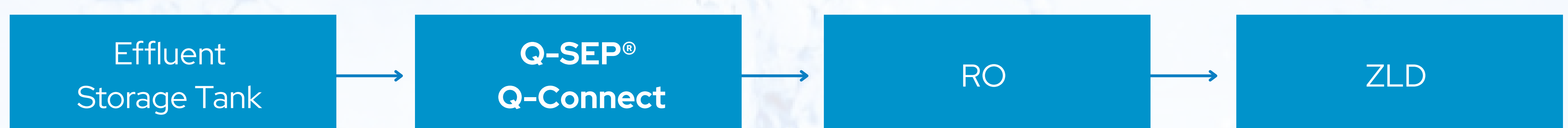
QUA's Solution:

Aquatech, the OEM partner, installed 126 Q-SEP[®] Q-Connect 10012 ultrafiltration modules designed for high-flow industrial applications. The pre-engineered Q-Connect[®] rack system simplifies installation while delivering reliable performance and optimizing plant space.

The system features advanced outside-in hollow fiber PVDF membranes known for their mechanical strength, chemical resistance, and durability under demanding conditions. Its innovative header design connects adjacent module end caps to form integrated headers, eliminating external piping, reducing leak points, and minimizing installation complexity. The vertical, compact configuration makes it ideal for high-capacity plants with limited installation space.

Additionally, the plant is designed to operate without the need for a backwash system, resulting in a reduced overall footprint, simplified operation, and lower maintenance requirements while maintaining efficient and reliable performance.

Flow Diagram:



Results:

The installation of QUA's Q-SEP[®] Q-Connect ultrafiltration system delivered strong operational and sustainability benefits. The system consistently achieves the design capacity of 345 m³/hr while maintaining excellent water quality with product turbidity between 0.06-0.08 NTU. This high level of filtration effectively removes suspended solids and colloids, significantly reducing RO membrane fouling and improving downstream system reliability.

With the successful deployment of 126 Q-SEP[®] Q-Connect 10012 modules, the plant benefits from stable long-term performance and simplified installation through the pre-engineered rack design. The system also supports the plant's zero liquid discharge (ZLD) initiative, helping reduce freshwater consumption. It also eliminates liquid waste discharge, reinforcing client's commitment to responsible industrial operations.