

CASE STUDY

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# Efficiently reducing cost of disposal by treatment of waste water using Zero Liquid Discharge System



# Concentrating waste water with Multiple Effect Evaporator

Case Study | General Chemicals Industry

A client was operating a batch kettle as an evaporator for concentrating waste water. The organic solvents were entirely coming into the distillate and increasing BOD load on the ETP plant. The precipitated salts when separated carried a lot of water, increasing the cost of disposal. The higher energy costs were tolerated as the capacity was small.

Technoforce supplied a **Zero Liquid Discharge (ZLD) system** when the facility was undergoing expansion. A **stripper column** removed most of the volatiles from the feed stream so that subsequently when the water was evaporated, it contained less organics. This reduced COD load on the ETP. The evaporator was **multiple effect type (MEE)** with a **thermo-compressor** which reduced the energy need. The downstream **sludge dryer** removed the balance water, converting the solids into a **dry powder** which is cheaper and easier to dispose off.

The operating cycle of the evaporator depends upon how efficiently the scaling of the tubes is controlled. A fine-tuned **axial flow pump** in the recirculation loop of the evaporator not only reduced the pumping energy, but also ensured true suppression of boiling inside the tubes. This significantly extended the operating cycle between two cleaning steps. The scaling in the evaporators was quantified and monitored by a separate **software module**. The weakest parts of the whole system - the tube to tube-sheet welding joints - were executed using **automatic orbital welding** process to make them more reliable as compared to the manually welded joints.

This system practically addressed all the problems associated with the older system.

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## Our Expertise

Evaporation

Drying

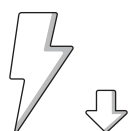
High Vacuum Distillation

Extraction

Crystallization

Zero Discharge Systems

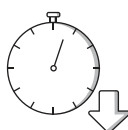
**TECHNOFORCE™**



**50 %**  
Less power required



**70 %**  
Less energy required



**200%**  
Improvement in descaling cycle