

Closed circuit cooling for fatty acids distilled from olive pomace

THE CHALLENGE

The case is framed in oil waste extracting plants that plays a major role in oil industry. Only 20% of olive milling in the mills is virgin olive oil, the remaining 80% is wet fatty pomace or “alpeorujo” that is taken to these plants for its recovery and use.

This process requires to cool plant water for motors, compressors and other equipment using evaporative cooling towers. It is currently the most efficient and sustainable technology that exists to achieve this objective.

In this case, given the scarcity of water in Andalusia, the client needed to cool clean plant water without having losses due to evaporation and to keep intact its physicochemical properties.

The installation had also an aqueous effluent with acidic pH from evaporators that represents a discharge for the plant. This resource is reused in this cooling process.



THE SOLUTION

The proposed solution is to use a closed-circuit cooling tower, in which clean plant water is cooled as it goes through a tubular heat exchanger. At the same time distillate water from the evaporators, with an acidic pH is used outside as a cooling fluid.

In this way, the cooling tower evaporation water from the cooling, falls on the acid effluent. So, it is achieved both cooling the clean water and concentrating a waste that would incur additional cost for the extractor.

Construction materials selection became key since at low pHs and high conductivities any metallic part would suffer high corrosion. It was considered the tubular heat exchanger should be in 316 stainless steel, the support structure in 304 stainless steel and the rest of the cooling tower (casing, collection basin and ferrule) in polyester reinforced with fiberglass, GRP.



RESULTS

- A compact and long-life cooling tower to be able to resist acidic water corrosion.
- Efficient plant water cooling at low cost.
- Part of the acid distillate evaporation, which means a lower disposal cost.
- The cooling tower has removable walls that allow inspection and interior cleaning.

CLIENTS BENEFITS

- Saving space by housing a tubular heat exchanger inside the cooling tower.
- Water savings by preserving evaporation clean water inside the tubes.
- Corrosion resistant materials.
- Easy cleaning and maintenance.

