

3. The core of the evaporator is a bundle of horizontal aluminum tubes sealed by tube sheets at the front and rear ends by means of rubber grommets (Fig. 1). The rubber grommets also provide electrical insulation, preventing galvanic corrosion. The heat transfer load is evenly distributed between all tubes, making bundle performance approach single tube coefficients.

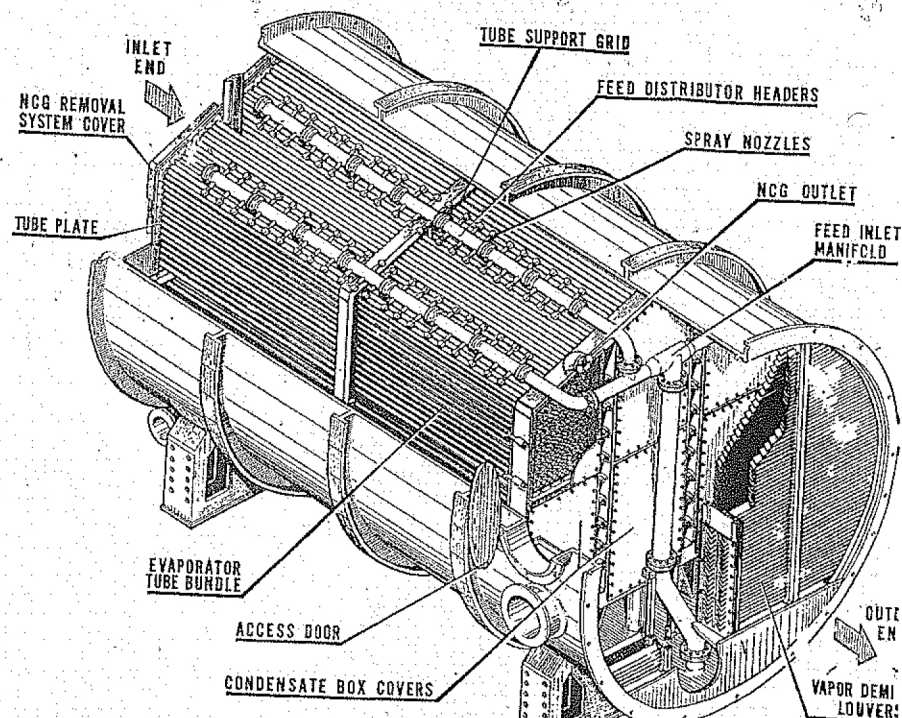


Fig. 1: Typical evaporator effect assembly.

4. The utilization of inexpensive aluminum tubes permits a large heat transfer area, thus reducing thermal loads as well as vapor velocities hence contributing to higher distillate purity. This allows a lower carry-over and a lower energy requirement. A special design prevents galvanic and pitting corrosion by insulation between different metals, ensuring film flow free of stagnation spots, and eliminating heavy metal ions by utilizing ion traps.
5. The use of generous heat transfer surfaces causes a reduction of heat fluxes and temperature differentials, thus an increase of thermal efficiencies. Consequently the evaporative condensers operate with overall temperature differentials, including thermal driving forces, boiling point elevations and non-condensable gases and fouling factors, as low as 1.5 – 2.5°C.
6. The operating temperatures are well below the saturation limits of problematic scalants found in sea and ground waters (Fig. 2). Scale is reduced to an insignificant level, enabling plants to operate for long periods – 5 years in some cases – between chemical cleanings. Low cost polyelectrolyte feed pre-treatment is convenient. Descaling simply consists of mild acid recirculation, using the plant's own recirculation pumps.
7. The reduced corrosiveness of seawater, at the low operating temperature and vacuum conditions (deaerated feed water), allows safe and economic use of corrosion proof materials and coatings both for piping and for vessels lining, as well as the use of