

Corrosion and material selection in desalination plants

The construction and maintenance of a sea-water RO desalination plant requires a range of materials to satisfy the design and functional requirements of each component of the plant and also to provide the strength and durability to withstand a range of corrosive environmental challenges. The new plant in Adelaide is close to the water's edge and in the direct path of the prevailing winds straight off the sea throughout most of the year. The Wonthaggi plant planned for Victoria and the SSWA plant in Western Australia are close to the sea. So in addition to processing seawater, and the mechanically and chemically induced erosion and corrosion of the total plant operation, the exposure to sea air and other locally induced factors test the durability of the entire system. Loss of equipment, breakdowns, leaks, and contamination and potential personnel hazards may result from poor material selection.

Glass reinforced plastic (GRP, sometimes referred to as FRP) is an ideal material for pipes, and pre- and post-treatment water storage tanks used in desalination plants, due to its excellent erosion and corrosion resistant properties. In addition, ease of handling and construction, moderate cost, high strength and low weight, and low maintenance costs increasingly make GRP the tank system of choice throughout the world. The very low thermal conductivity of GRP compared to mild steel, stainless steel and concrete make GRP tanks most suitable for the Australian climate, limiting expansion and contraction of tanks in the extreme summer sun.

The picture below is of a 7.4 megalitre surge tank installed by FTC for the new generation desalination plant for Dubai Electricity and Water, Dubai UAE.

