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Closed circuit desalination series no-2: new affordable technology for sea water desalination of low energy and high flux using short modules without need of energy recovery

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ABSTRACT

Closed circuit desalination (CCD) trials of Mediterranean Water, performed with a new technology unit of different configurations comprising four modules each of 1–4 membrane elements, reveal the RO energy range 1.8–2.8 kWh m^{-3} in the respective flux range 8–40 lmh for recovery up to 50%. Mediterranean trials RO energy of the new technology at flux of 13–14 lmh of conventional SWRO plants was found in the range 1.9–2.1 kWh m^{-3} with a plausible further improvement to 1.7–1.8 kWh m^{-3} expected with efficiency of feed pressurizing and concentrate recycling means of 85% and 60%, respectively. The extensive experimental data of Mediterranean water desalination trials by the new technology disclosed herein, reveal an extraordinarily energy efficient technology of high flux capability which operates without any need for energy recovery.

Keywords: Closed circuit desalination; Sea water; High flux low energy; Reduced fouling; High recovery; No energy recovery

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