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(54) Title: HIGH PRESSURE SPIRAL WOUND MEMBRANE MODULE

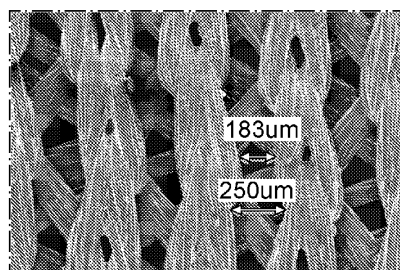


FIG. 4

(57) Abstract: A spiral wound membrane module has a brackish water RO or NF membrane combined with a permeate carrier having a narrow spacing between membrane contacting elements. The membrane may have water permeability (A-Value) of at least 8×10^{-5} cm/s/bar at 25 °C. The membrane may have salt diffusion rate (B-Value) of at least 0.5×10^{-5} cm/s at 25 °C. The permeate carrier may have a density of 54 wales per inch or more of a gap between adjacent ribs of 215 um or less. The permeate carrier may have a channel cross-sectional area of 16×10^{-9} m² or more. Water is fed to the module at a high feed pressure, for example a pressure of at least 50 bar, optionally up to 120bar. Retentate may be discharged at a concentration of 100 g/L, 130g/L, or 150g/L or more.

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