

ABSTRAK

PENGARUH TEKANAN KERJA DAN AIR BAKU PADA UNIT PENGOLAHAN AIR KAPASITAS 100 GALLONS PER DAY SINGLE MEMBRAN SILVERTEC ULP

(Alier Jaddid Ramdhani, 2025, Proposal Skripsi; 51 halaman, 16 Gambar, 8 Tabel)

Air merupakan kebutuhan pokok yang vital dalam kehidupan, terutama untuk konsumsi. Kualitas air minum harus memenuhi standar yang ditetapkan, seperti yang tercantum dalam Permenkes No. 55/Menkes/Per/II/2023. Penelitian ini bertujuan untuk menguji pengaruh variasi tekanan kerja terhadap efektivitas unit pengolahan air minum berkapasitas 100 GPD (*gallons per day*) yang menggunakan sistem *reverse osmosis* (RO) dengan *single* membran Silvertec ULP-2012-100. Air baku yang digunakan berasal dari PDAM, dan pengujian dilakukan dengan tekanan kerja 4, 5, 6, 7 dan 8 bar. Dan dari hasil analisa sistem *Single* membran *Silvertec Reverse Osmosis* (RO) memenuhi parameter standar Permenkes No. 55/Menkes/Per/II/2023 pada tekanan optimal 6 bar, dengan hasil analisis meliputi *Total Dissolved Solids* (TDS): 23 mg/L, kadar Besi (Fe): 0.0067 mg/L, Mangan (Mn): 0,0039 mg/L, Klorida (Cl⁻): 4,6 mg/L, Nitrit (NO₂⁻): 0,1 mg/L. Hasil penelitian menunjukkan bahwa peningkatan tekanan kerja berpengaruh terhadap efisiensi rejeksi kontaminan dan kualitas air hasil olahan. Sistem RO ini terbukti mampu menurunkan kadar zat terlarut dan kontaminan hingga memenuhi standar air minum yang berlaku, menjadikannya solusi efektif untuk menghasilkan air minum isi ulang yang layak konsumsi.

Kata Kunci : *Air minum, membran, reverse osmosis, Tekanan kerja*

ABSTRACT

THE EFFECT OF WORKING PRESSURE AND RAW WATER ON A WATER TREATMENT UNIT WITH A CAPACITY OF 100 GALLONS PER DAY A SINGLE MEMBRANE SILVERTEC ULP

(Alier Jaddid Ramdhani, 2025, 51 Pages, 16 Pictures, 8 Tables)

*Water is a vital necessity in human life, especially for consumption purposes. Drinking water quality must meet established standards, as regulated in the Indonesian Ministry of Health Regulation No. 55/Menkes/Per/II/2023. This study aims to investigate the effect of varying working pressures on the performance of a 100 GPD (gallons per day) water treatment unit using a reverse osmosis (RO) system with a single Silvertec ULP-2012-100 membrane. The raw water used comes from the local PDAM (municipal water utility), with operating pressures set at 4, 5, 6, and 8 bar. And from the analysis results, the Silvertec Reverse Osmosis (RO) Single membrane system meets the standard parameters of Permenkes No. 55/Menkes/Per/II/2023 at an optimal pressure of 6 bar, with analysis results including Total Dissolved Solids (TDS), concentrations of Iron (Fe), Manganese (Mn), Chloride (Cl⁻), Nitrite (NO₂⁻), and the presence of *E. coli* bacteria. The results show that increasing the working pressure significantly affects the rejection efficiency of contaminants and the overall quality of the treated water. The RO system proved effective in reducing dissolved solids and harmful contaminants, making it a viable solution for producing safe, refillable drinking water that complies with drinking water quality standards.*

Keywords: *Drinking water, membrane, reverse osmosis, working pressure*