

ABSTRAK
PENGARUH TEKANAN FLUIDA TERHADAP UNIT PENGOLAHAN AIR
MINUM MENGGUNAKAN MEMBRAN *REVERSE OSMOSIS*, *POST*
CARBON* DAN *BIO CERAMIC

(Yuniar Lia, 2025, 52 Halaman, 27 Tabel, 23 Gambar, 4 Lampiran)

Air Minum Isi Ulang (AMIU) menjadi alternatif utama masyarakat dalam memenuhi kebutuhan air minum yang lebih terjangkau dibandingkan Air Minum Dalam Kemasan (AMDK). Namun, kualitas AMIU sering kali diragukan karena tidak semua depot memenuhi standar kesehatan sesuai Peraturan Menteri Kesehatan Nomor 492/Menkes/Per/IV/2010. Penelitian ini bertujuan untuk menganalisis pengaruh tekanan fluida pada unit pengolahan air minum berbasis teknologi *Reverse Osmosis* (RO) dengan membran *Silvertec* ULP 2012-100, *Post Carbon* dan *Bio Ceramic* menggunakan bahan baku air PDAM. Sistem RO dipilih karena kemampuannya dalam menyaring kontaminan hingga level molekuler melalui membran nonporous. Penambahan filter *Bio Ceramic* bertujuan untuk memecah molekul air, sedangkan *Post Carbon* meningkatkan rasa dan kualitas air. Penelitian ini menganalisis pengaruh tekanan fluida terhadap pengolahan air minum menggunakan teknologi *Reverse Osmosis* (RO) *Silvertec* ULP 2012-100, *Post Carbon* dan *Bio Ceramic* dengan bahan baku air PDAM. Penelitian ini juga mengidentifikasi kualitas air minum yang dihasilkan sesuai standar Permenkes No. 492 Tahun 2010. Penelitian dilakukan di Laboratorium Teknik Energi Politeknik Negeri Sriwijaya dengan variasi tekanan fluida (3,4,5,6,7 bar). Hasil penelitian menunjukkan bahwa tekanan fluida (3,4,5,6,7 bar) yang digunakan pada Unit Pengolahan Air Minum menggunakan teknologi membran *reverse osmosis*, *post carbon* dan *bio ceramic* berpengaruh terhadap kualitas air minum, baik secara fisika (pH, TDS) maupun kimia (Fe, Mn, Cl) dengan hasil paling optimum ditunjukkan pada tekanan 5 bar. 2. Air minum yang dihasilkan pada sistem pengolahan air minum menggunakan membran *reverse osmosis*, *post Carbon* dan *bio ceramic* pada tekanan 5 bar telah memenuhi seluruh parameter kualitas air minum sesuai dengan Permenkes No. 492/Menkes/Per/IV/2010.

Kata Kunci : AMIU, *Reverse Osmosis*, Tekanan Fluida, Kualitas Air Minum.

ABSTRACT
THE EFFECT OF FLUID PRESSURE ON DRINKING WATER
TREATMENT UNITS USING REVERSE OSMOSIS, POST CARBON AND
BIO CERAMIC FILTERS

(Yuniar Lia, 2025, 52 Pages, 27 Tabels, 23 Figures, 4 Attachment)

Refill Drinking Water (AMIU) has become the main alternative for communities to meet their drinking water needs at a more affordable cost compared to Bottled Drinking Water (AMDK). However, the quality of AMIU is often questioned, as not all refill depots comply with health standards as stated in the Regulation of the Minister of Health No. 492/Menkes/Per/IV/2010. This study aims to analyze the effect of fluid pressure on drinking water treatment units based on Reverse Osmosis (RO) technology using the Silvertec ULP 2012-100 membrane, Post-Carbon, and Bio-Ceramic filters, with raw water sourced from the local water utility (PDAM). The RO system was chosen due to its ability to filter contaminants down to the molecular level through a nonporous membrane. The addition of a Bio-Ceramic filter aims to break down water molecules, while the Post-Carbon filter improves the taste and overall quality of the water. This research analyzes the influence of fluid pressure on the performance of the water treatment system employing Silvertec ULP 2012-100 RO membrane, Post-Carbon, and Bio-Ceramic filters using PDAM water as the raw source. The study also evaluates the quality of the treated drinking water against the standards set by Minister of Health Regulation No. 492 of 2010. The study was conducted at the Energy Engineering Laboratory, State Polytechnic of Sriwijaya, using variations in fluid pressure (3, 4, 5, 6, and 7 bar). The results show that fluid pressure variations in the drinking water treatment unit using RO membrane, Post-Carbon, and Bio-Ceramic filters affect the water quality in both physical (pH, TDS) and chemical (Fe, Mn, Cl) parameters, with the most optimal results obtained at 5 bar. The drinking water produced by the treatment system at 5 bar using RO membrane, Post-Carbon, and Bio-Ceramic filters meets all the quality parameters required under the Regulation of the Minister of Health No. 492/Menkes/Per/IV/2010.

Keywords: *Refill Drinking Water (AMIU), Reverse Osmosis, Fluid Pressure, Drinking Water Quality.*