

## ABSTRAK

Perkembangan industri pertambangan di Indonesia dua tahun terakhir sebanding terhadap kebutuhan alat berat salah satunya *excavator*. Dalam memenuhi kebutuhan pasar untuk segmen hemat bahan bakar PT XYZ meluncurkan produk pada tahun 2020 yang sudah dilengkapi dengan sistem *commonrail*. Hasil survey tim *Quality Assurance* tahun 2021, 13 dari 14 sampel bahan bakar yang diuji tingkat *cleanliness* dan *water content* dibawah standar emisi Euro 3. Hal ini terbukti dengan kasus kerusakan injektor pada 9 dari 729 unit yang sudah terjual. Peningkatan sistem filtrasi bertujuan mencegah kontaminan bahan bakar masuk ke dalam injektor. Pengujian dilakukan dengan metode eksperimen untuk dua model sistem filtrasi yaitu, *double stage filter* dan *triple stage filter* yang diambil sampel bahan bakar sebanyak 1 liter. Hasil pengujian bahan bakar sebelum filtrasi masuk kategori NAS 11, kemudian dengan sistem *double stage filter* tingkat kebersihan meningkat menjadi NAS 9 dan menggunakan sistem *triple stage filter* menjadi NAS 7. Sistem *triple stage filter* mampu meningkatkan kualitas bahan bakar lebih baik dibanding *double stage filter* dengan persentase rata-rata penurunan jumlah kontaminan adalah 91%, sedangkan *double stage filter* hanya 50%.

**Kata kunci:** sistem filtrasi, *cleanliness*, *water content*, biodiesel B30, filter bahan bakar



## **EXCAVATOR FUEL QUALITY ENHANCEMENT WITH TRIPLE STAGE FILTER FILTRATION SYSTEM**

### **ABSTRACT**

*The development of the mining industry in Indonesia is comparable to the need for heavy equipment in the last two years, one of which is excavators. In meeting market demand for the fuel-efficient segment, PT XYZ launched product in 2020 because it is equipped with a commonrail system. The results of the 2021 Quality Assurance team's survey, 13 out of 14 fuel samples tested for cleanliness and water content below Euro 3 emission standards. This is proven by cases of injector damage in 9 of the 729 units that have been sold. Improved filtration system aims to prevent fuel contaminants from entering the injectors. Tests were carried out using experimental methods for two models of filtration systems, namely, the double stage filter and the triple stage filter, which took a fuel sample of 1 liter. The results of the fuel test before filtration were in the NAS 11 category, then with the double stage filter system the level of cleanliness increased to NAS 9 and using the triple stage system to NAS 7. The triple stage filter system was able to improve fuel quality better than the double stage filter with an average percentage -the average reduction in the amount of contaminants is 91%, while the double stage filter is only 50%.*

**Keywords:** *Filtration system, cleanliness, water content, B30 biodiesel, fuel filter*

