

ABSTRAK

Penelitian ini bertujuan untuk menguji performa *incinerator* dengan diaper sebagai jenis sampah yang dibakar. Sampah merupakan salah satu permasalahan yang akan terus dihadapi oleh manusia, sehingga perlu adanya metode yang tepat dalam proses penanganan sampah. *Incinerator* mampu mereduksi sampah secara massal dan mengubahnya menjadi abu. Penelitian ini menggunakan metode eksperimental dengan oli bekas dan minyak jelantah sebagai variasi bahan bakar. Variasi dua pemasukan udara bertingkat juga menjadi variasi terhadap kecepatan udara, variasi yang digunakan adalah dengan bukaan rendah (6 m/s), sedang (8 m/s) dan tinggi (10 m/s). Hasil penelitian menunjukkan bahan bakar oli bekas dengan debit udara 6 m/s, 8 m/s, dan 10 m/s memperoleh nilai rata rata temperatur 376 °C, 405 °C dan 452 °C dengan laju pembakaran 97 menit, 75 menit, dan 56 menit. dan abu yang dihasilkan sebanyak 1,01 kg, 0,8 kg, dan 0,6 kg. Variasi kedua dengan bahan bakar minyak jelantah memperoleh hasil rata rata temperatur pembakaran 325 °C, 354 °C dan 387 °C dengan laju pembakaran 120 menit, 107 menit, dan 86 menit. dan abu yang dihasilkan sebanyak 1,2 kg, 1,08 kg, dan 0,85 kg. Variasi bahan bakar dan debit udara dengan dua pemasukan udara bertingkat mendapatkan hasil yang cukup signifikan terhadap temperatur pembakaran, laju pembakaran. sedangkan untuk abu sisa pembakaran dianggap kurang signifikan. namun untuk efisiensi performa *incinerator* sangat efisien.

Kata kunci : *Incinerator*, Oli bekas, Minyak jelantah, konveksi udara bertingkat.

ABSTRACT

This study aims to examine the performance of an incinerator using diapers as the type of waste being burned. Waste is one of the ongoing problems that humanity will continue to face, necessitating the development of appropriate methods for waste management. Incinerators are capable of mass waste reduction and converting it into ash. This research uses an experimental method with used oil and used cooking oil as variations of fuel. The variations also include two levels of air intake, which influence the air velocity. These variations are set to low (6 m/s), medium (8 m/s), and high (10 m/s) air intake speeds. The results show that when using used oil as fuel, with air velocities of 6 m/s, 8 m/s, and 10 m/s, the average temperatures achieved were 376°C, 405°C, and 452°C, with combustion times of 97 minutes, 75 minutes, and 56 minutes, respectively. The ash produced amounted to 1.01 kg, 0.8 kg, and 0.6 kg. In the second variation using used cooking oil as fuel, the average combustion temperatures were 325°C, 354°C, and 387°C, with combustion times of 120 minutes, 107 minutes, and 86 minutes, respectively. The ash produced amounted to 1.2 kg, 1.08 kg, and 0.85 kg. The variations in fuel type and air intake rate with two-level air intake had a significant impact on combustion temperature and combustion rate. However, the amount of ash remaining after combustion was considered to be less significant. Overall, the incinerator performance was highly efficient.

This study aims to examine the performance of an incinerator using diapers as the type of waste being burned. Waste is one of the ongoing problems that humanity will continue to face, necessitating the development of appropriate methods for waste management. Incinerators are capable of mass waste reduction and converting it into ash. This research uses an experimental method with used oil and used cooking oil as variations of fuel. The variations also include two levels of air intake, which influence the air velocity. These variations are set to low (6 m/s), medium (8 m/s), and high (10 m/s) air intake speeds. The results show that when using used oil as fuel, with air velocities of 6 m/s, 8 m/s, and 10 m/s, the average temperatures achieved were 376°C, 405°C, and 452°C, with combustion times of 97 minutes, 75 minutes, and 56 minutes, respectively. The ash produced amounted to 1.01 kg, 0.8 kg, and 0.6 kg. In the second variation using used cooking oil as fuel, the average combustion temperatures were 325°C, 354°C, and 387°C, with combustion times of 120 minutes, 107 minutes, and 86 minutes, respectively. The ash produced amounted to 1.2 kg, 1.08 kg, and 0.85 kg. The variations in fuel type and air intake rate with two-level air intake had a significant impact on combustion temperature and combustion rate. However, the amount of ash remaining after combustion was considered to be less significant. Overall, the incinerator performance was highly efficient.

Keyword : Incinerator, Used oil, Waste cooking oil, Multilevel air convection.