

ABSTRACT

XYZ Ltd. is a producer engaged in the production of oil palm empty bunches briquettes. In 2020, XYZ Ltd. will produce 1,000 tons of oil palm empty bunches briquettes per month or around 12,000 tons annually for export worldwide. The total production capacity in its current condition has a gap to the target (needs) to be achieved, which is 2,000 tons per month or around 24,000 tons per year. The primary process that affects the amount of production capacity is the drying process. One alternative solution to increase productivity is using tools like an oven machine. Currently, the oven machine used has several problems, such as the lack of engine capacity and the lack of available tray holding capacity.

Reverse Engineering is analyzing an existing system to identify its elements and the interrelationships between them and to create documentation at a higher level of abstraction than currently exists. Reverse Engineering was chosen because it can be used to reconstruct the size of the oven machine geometry. Computer Aided Design (CAD) software obtains desired geometry sizes for fundamental metrology, surface scanning, 3D digitization, and design development. Furthermore, the thermal efficiency value of the heat propagation generated by the oven engine is simulated using Computational Fluid Dynamic (CFD) and Ansys software.

The results showed that the proposed design of the oven machine has a better mechanism, as well as a larger capacity for the engine and tray holding capacity. The production results of the proposed oven machine are more than the actual oven machine, with an increase of 14%. In addition, the drying process of the proposed oven machine is also shorter than the existing oven machine, with a time difference of 1,4 hours.

Based on the results obtained, this research is expected to help shorten the drying process time and increase the production capacity at XYZ Ltd.

Keywords – Reverse Engineering, Oven Machine, Computer Aided Design (CAD), Computational Fluid Dynamic (CFD), Ansys