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Paper Information

Design and performance investigation of a thermal back-up system for hybrid drying

Author(s): T. A. Yassen, H. H. Al-Kayiem & K. Habib

Abstract:

A major setback in the solar drying technique is the lack of solar energy during cloudy and rainy days as well as during the night.

Thus, the hybrid solar – thermal drying techniques are feasible as a practical solution.

This paper presents the design, fabrication, and test of a thermal back-up unit comprising a burner and a gas to gas heat exchanger.

The test was accomplished with a feeding rate of 0.426 and 0.271 kg/hr of coal.

Results have shown that the temperature of the supplied hot air at the feeding rate of 0.426 kg/hr, was higher than the ambient temperature by 60°C maximum, while it is 40°C maximum with feeding rate of 0.271 kg/hr.

The decrease in the feeding rate of coal leads to a stable hot air temperature for a long time of burning.

The present thermal back-up unit is feasible for providing hot air suitable for the drying of any type of agriculture, forest, and food products.

The advantage of using such a system is important in the rural areas, where it operates and performs hybrid drying, free of electricity.

Keywords:

hybrid drying, thermal back up, solar drying, food products, agriculture products....

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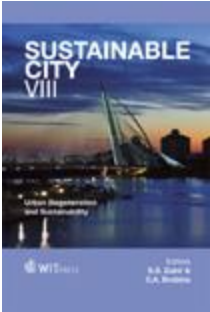
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