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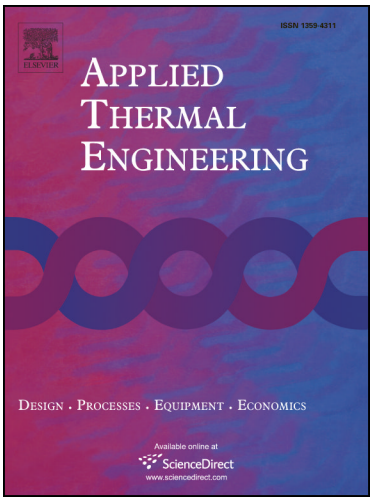

Experimental and numerical analysis on total heat recovery performance of an enthalpy wheel under high temperature high humidity working conditions

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ACCEPTED MANUSCRIPT

Experimental and numerical analysis on total heat recovery performance of an enthalpy wheel under high temperature high humidity working conditions

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Highlights

Performance of enthalpy wheels under HTHH working conditions was investigated.

Influence of key parameters on the heat recover performance was analyzed.

The performance under HTHH working conditions was compared with common working conditions.

The temperature, humidity, and water content distributions are different from common working conditions.

The feasibility of applying EWs to recover total heat from HTHH waste gas was validated.

Abstract

Enthalpy wheels (EWs) have been extensively used for total heat recovery from ventilation air. Despite there being many studies reporting on their performances under common working conditions with a small temperature and humidity ratio difference (ΔT < 20 °C, $\Delta\omega$ < 15 g kg^{-1}), there are few studies reporting on their performances under high temperature high humidity (HTHH) working conditions. This study aims to investigate the total heat recovery performance of an EW under HTHH working conditions. A mathematical model is

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