Expert Opin Environ Biol 2018, Volume 7
DOI: 10.4172/2325-9655-C4-030

6th International Conference on
GREEN ENERGY AND EXPO
August 29-31, 2018 | Toronto, Canada

Investigation of device performance for recycling double-pass cross-corrugated solar air collectors

Chii-Dong Ho, Ching Fang Hsiao and Chien Chang Huang
Tamkang University, Taiwan

The recycling double-pass cross-corrugated device introduced was proposed in aiming to determine the optimal operating condition of an economic consideration in terms of both heat transfer efficiency improvement and power consumption increment. The fairly good agreement between experimental measurements and theoretical predictions was achieved under various recycle ratios and mass flow rates. Applications of the cross-corrugated absorber plate into the solar air collector to conduct recycling operations were investigated experimentally and theoretically and solved numerically using the Newton method. Air flowing simultaneously over the wavelike corrugated absorbing plate and in-between both wavelike cross-corrugated absorber plate and transverse bottom could strengthen the convective heat-transfer coefficient due to the turbulence enhancement. A considerable device performance improvement of recycling double-pass cross-corrugated solar air collectors was achieved as compared among various designs including the single-pass and flat-plate double-pass configurations.

cdho@mail.tku.edu.tw