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EXPERIMENTAL RESEARCH ON TRANSIENT REGIMES OF SOLAR AIR HEAT COLLECTORS

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Abstract

The operation of solar air heat collectors consists in a sequence of transient regimes, being conditioned by the availability in time of the solar resource. This paper presents the results of an experimental research on transient regimes of two types of solar air heat collectors. The absorbers of the collectors have different configurations and are made of different materials. One collector is a commercial passage air collector with the absorber made of aluminum. The other collector is an original through-pass air collector with the absorber consisting in a wire net made of soft steel. The quality of solar energy conversion on the active surfaces of the collectors was assessed by computing local and global conversion coefficients in order to compare the two constructive solutions. Heat fluxes and efficiencies of collectors were computed for estimating the additional latent heat to be stored by the less efficient collector for increasing its performance to the level of the more efficient collector. Using results of such a study, the capacity of a given collector to store solar energy by using phase changing materials (PCM) can be assessed.

Key words: air heating, solar collector, transient regimes

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