PARAMETRIC NUMERICAL INVESTIGATION OF HEAT TRANSFER FROM CONVECTORS TO IMPROVE EFFICIENCY OF PANEL RADIATORS

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ABSTRACT

Panel radiators are one of the most used domestic and industrial heating devices all over the world. In the general design of radiators, the heating water is circulated in the hollow radiator and heat is transferred to the cooler surrounding air, and the working fluid exits at a lower temperature. Convectors help to increase the heat output of the radiators. There are several ways to make panel radiators thermally more efficient. One is by enlargement or optimization of convectors. The main goal of this study is to observe the effects of the dimensions of convectors on heat transfer and heat output. Firstly, the present convector dimensions used in a radiator, which is presently manufactured, were implemented in the code and simulations were performed. Afterwards the effects of different dimensions on the heat transfer were investigated. The main goal of the present study was to find an optimum arrangement to achieve the highest heat output. The distance between two convectors, size of the base of the convectors and convector tip width was investigated, and the highest heat transfer was obtained for 6.31 mm, 4 mm and 12 mm, respectively. It was observed that increasing the convector height and length has a degrading effect on heat transfer. A slight increase in heat transfer was observed with increasing convector thickness, and distance between two opposite fins increased the heat transfer to a certain value.