

**DETERMINATION OF INTERFACIAL HEAT TRANSFER COEFFICIENT FOR A MIXED
CONVECTION HEAT TRANSFER IN A VERTICAL CHANNEL FILLED WITH
UNIFORMLY HEATED BLOCKS**

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ABSTRACT The interfacial convective heat transfer coefficient of a periodic porous medium under mixed convection heat transfer is determined computationally by using volume averaging method. The porous medium consists of square blocks in inline arrangement. The continuity, momentum and energy equations are solved in dimensionless form for a representative elementary volume of porous medium and the velocity and temperature fields for different values of Richardson and Reynolds numbers are obtained. Based on the obtained results, the interfacial convective heat transfer coefficient is calculated by using volume average method. The temperature of the solid phase is considered uniform and different than the inlet temperature. A detailed discussion on the effect of the governing dimensionless parameters (i.e. Reynolds, Richardson numbers, and porosity) on the local and average interfacial Nusselt number is done. It is concluded that the local interfacial convective heat transfer coefficient increases with Reynolds number, however the rate of increase depends on Richardson number and porosity. The study is performed for two values of porosity of 0.51 and 0.94.