

## **Thermal conductance of interleaving fins**

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### **Abstract**

Interleaving fins can significantly increase the heat transfer by increasing the effective area per unit base area. The fins are separated uniformly by a gap, which is filled with a flow medium to control the heat flux. The heat flux between the plates depends strongly on the thermal conductivity of the fin material and the medium between them as well as the dimensions. In earlier studies empirical a fitting method is used to determine the total effectiveness of the fins. However, it required complete characterization of the fins for each new set of operating conditions. In this paper, a simplified analytical model, but still preserving the main physical traits of the problem is developed. This model reveals the dimensionless parameter group containing both material properties and the fin geometry that govern the heat transfer. Rigorously testing of the model using a numerical finite element model shows an accuracy within 2 % over a large parameter space, varying both dimensions and material properties. Lastly, this model is put to test with previously measured experimental data and a good agreement is obtained.