

*Pashab, S., Arif, A.F.M., Zubair, S.M., Efficiency of longitudinal composite fins with thermal interface studied through plane thermal nondimensional finite element, Heat Transfer Engineering. 34(7), pp. 629-641, 2013.*

Abstract:

The use of dimensional analysis and dimensionless parameters is very common in the field of heat transfer; nevertheless the concept of dimensionless finite element formulation been applied to a limited type of thermo-fluid problems. This paper uses a non-dimensional finite element formulation for studying longitudinal composite fins with interface resistance. Two non-dimensional governing parameters have been identified, one each for coating and interface, that completely govern the coating and interface resistance effects. The presented results, for the considered range of geometric, material and operating conditions, permit to identify the limiting values of the two non-dimensional parameters for which the coating and interface effects become negligible. It is found that the coating and interface effects are similar for considered constant and variable thickness profile longitudinal composite fins over the studied range of non-dimensional material, geometry and operating condition parameters.