

Steady- State Impulse Heating and Related Thermal Stresses

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Abstract: *The present manuscript deals with the heat transfer and thermal stress analysis of thick circular plate under steady temperature conditions. A circular plate is subjected to impulse heat flux applied on the upper surface. Heat dissipates by convection from the lower boundary surface into the surrounding. The thick curved surface of circular plate is thermally insulated. The integral transform methods are used for heat transfer analysis to determine temperature changes. The theory of linearized thermoelasticity based on solution of Navier's equation in terms of Goodier's thermoelastic displacement potential, Michell's function, and the Boussinesq's function for cylindrical co-ordinate system have been used to discussion and analysis of thermal stress. The results for temperature change, displacement and stresses have been computed numerically and illustrated graphically for different isotropic solid material.*

Keywords: Heat transfer analysis, Steady state, Impulse heating, Thermal Stress analysis