

Non-Homogeneous Problem of Thermal Stresses in the Context of Cylindrical Surface Heat Source

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Abstract: *This paper is concerned with inverse quasi-static thermal stress analysis in a thin circular cylinder due to internal heat generation under transient temperature conditions. The internal heat generation is taken as a cylindrical surface heat source in the annular region of the linear length of the cylinder and is situated concentrically inside the cylinder releases heat spontaneously at the time $t = \zeta$. The thin circular cylinder is subjected to known internal heat flux and the convection due to dissipation takes place through the upper surface and circular boundary surface. The unknown convective heat flux applied at the upper surface of cylinder are required to be determined. The integral transform methods are used for the analytical solution of non-homogeneous boundary value problem and illustrated graphically.*

Keywords: quasi-static , thermal stress , circular cylinder . heat generation, heat flux.