# Nonstationary axisymmetric thermoelasticity problem for a rigidly fixed circular plate

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*The study focuses on a new closed solution for the axisymmetric dynamic problem of the thermoelasticity theory for a rigidly fixed circular isotropic plate in the case of a temperature change on its face surfaces. The mathematical formulation of the problem under consideration includes linear equations of motion and heat conduction in a spatial statement with respect to the components of the displacement vector, as well as the temperature change functions. Not self-adjoint equations were investigated in an unrelated formulation. First, we considered the initial-boundary heat conduction problem without taking into account the deformation of the plate; next, we examined the thermoelasticity problem under the action of a given (definite) temperature change function. Then, we refined the calculation relations of the heat conduction problem taking into account the change in the structure shape. To solve the problems, the mathematical apparatus of separation of variables was used in the form of finite integral transformations — Fourier, Hankel transforms, and generalized integral transformation. At the same time, at each stage of the investigation, we performed a procedure to reduce the boundary conditions to a form that allows the corresponding transformation to be applied. Findings of the research show that the calculated design relations make it possible to determine the stress-strain state of a rigidly fixed circular plate for an arbitrary axisymmetric temperature external action.*

***Keywords:*** *circular plate, thermoelasticity theory, nonstationary temperature effect, finite integral transformations*

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