

## The Convection Heater Numerical Simulation

**Authors :** Cristian Patrascioiu, Loredana Negoita

**Abstract :** This paper is focused on modeling and simulation of the tubular heaters. The paper is structured in four parts: the structure of the tubular convection section, the heat transfer model, the adaptation of the mathematical model and the solving model. The main hypothesis of the heat transfer modeling is that the heat exchanger of the convective tubular heater is a lumped system. In the same time, the model uses the heat balance relations, Newton's law and criteria relations. The numerical program achieved allows for the estimation of the burn gases outlet temperature and the heated flow outlet temperature.

**Keywords :** heat exchanger, mathematical modelling, nonlinear equation system, Newton-Raphson algorithm

**Conference Title :** ICTFE 2014 : International Conference on Thermal and Fluids Engineering

**Conference Location :** Venice, Italy

**Conference Dates :** April 14-15, 2014