

## **Determination of Thermal Conductivity of Plaster Tow Material and Kapok Plaster by Numerical Method: Influence of the Heat Exchange Coefficient in Transitional Regime**

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**Abstract :** This article presents a numerical method for determining the thermal conductivity of local materials, kapok plaster and tow plaster. It consists of heating the front face of a wall made from these two materials and at the same time insulating its rear face. We simultaneously study the curves of the evolution of the heat flux density as a function of time on the rear face and the evolution of the temperature gradient as a function of time between the heated face and the insulated face. Thermal conductivity is obtained when reaching a steady state when the evolution of the heat flux density and the temperature gradient no longer depend on time. The results showed that the theoretical value of thermal conductivity is obtained when the material has reached its equilibrium state. And the values obtained for different values of the convective exchange coefficients are appreciably equal to the experimental value.

**Keywords :** thermal conductivity, numerical method, heat exchange coefficient, transitional regime

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