

## عنوان مقاله:

Thermal-insulation performance of low density polyethylene (LDPE) foams: Comparison between two radiation thermal conductivity models

## محل انتشار:

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## خلاصه مقاله:

The loss of energy especially in industrial and residential buildings is one of the main reasons of increased energy consumption. Improving the thermal insulation properties of materials is a fundamental method for reducing the energy losses. Polymeric foams are introduced as materials with excellent thermal insulation properties for this purpose. In the present study, a deep theoretical investigation is performed on the overall thermal conductivity of low-density polyethylene (LDPE) foams. The thermal conductivity by radiation is predicted using two different methods. The most appropriate model is selected in comparison with experimental results. The results show that the theoretical model has an appropriate agreement with the experimental results. The effects of foam characteristics including foam density, cell size, and cell wall thickness on the overall thermal conductivity are investigated. The results indicate that by decreasing the cell size and increasing the cell wall thickness, the overall thermal conductivity is decreased significantly. Also, there is an optimum foam density in order to achieve the smallest thermal conductivity. The lowest overall thermal conductivity achieved in the studied ranges is 30 mW/mK at foam density of 37.5 kg.m<sup>-3</sup>, cell size of 100  $\mu$ m, and cell wall thickness of 6  $\mu$ m.

## کلمات کلیدی:

LDPE, Radiated thermal conductivity, Thermal-insulation, Polymeric foams

## لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/866977>

