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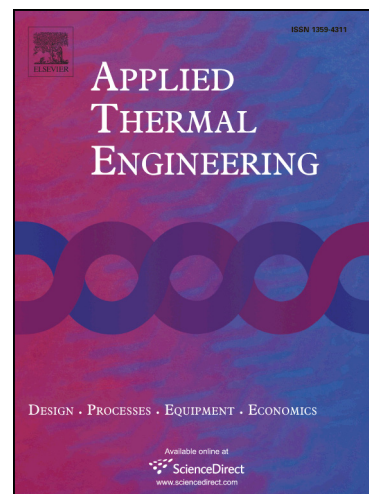
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Determination of radiative properties of polyester batting insulation material from hemispherical transmittance and reflectance measurements

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Abstract

This work presents a study on the thermal characterization of semi-transparent polyester batting insulation material for building application. This material is consisting of recycled plastic waste based polyester fibers with constant diameters. Thus, the effective thermal conductivity of this material is determined using fluxmeter devices. The radiative properties of the polyester batting (i.e. albedo, optical thickness, absorptance...) have been obtained for different thicknesses of the material with the inverse method, which is based on infrared experimental measurements of reflection and transmission in the wavelengths range of 2-21 μm using a Fourier Transform Infrared Spectrometer. Thus, the radiative conductivity is determined by the Rosseland model. The radiative conductivity varies as a function of material thickness; this variation is due to the fiber density effect.

Keywords: Insulation, Polyester batting, Radiative properties, Inverse method, Radiative conductivity.

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