

ALUMINIUM PAINT: An Effective Radiant Barrier For Low-Income Tropical Roofing

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Abstract

In the context of research, seeking economical means of reducing downward heat transfer into typical residential houses in the English-speaking Caribbean (in which the predominantly used roof cladding is corrugated galvanised sheet steel), the authors found that long-established, internationally-accepted thermal property values were not necessarily applicable to the materials currently in local use. In particular, discrepancies were identified between the published and the measured thermal emissivity values for aluminium paint and oxidised galvanised steel, and the research investigation clearly identified lower-than-previously-accepted values for the emissivity of locally produced aluminium paint. This lower emissivity indicates potential for the use of such paint as a bonded-on radiation barrier (RB) to reduce the heat radiated downward from the underside of such cladding. Published values ^(1,2,5) give the longwave emissivity of oxidised galvanised steels as being less than 0.30, while that of aluminium paints is given as between 0.27 to 0.67.

This paper presents the methodology and results of steady-state, longwave emissivity testing of (a) aluminium paint and (b) oxidised galvanised steel, which were respectively measured at (a) 0.22 to 0.24, and (b) 0.40 to 45.