

A Short Review of Australian Housing Research Council Project 58 (1981)

By: Tim Renouf, AFIA and Prof. Richard Aynsley PhD, (USA)

Publication examined: “Thermal Performance of Housing Units in Queensland” Phase1; A study by the Department of Architecture and Building, University of Melbourne. AHRC Report 58, 1981. Research project funded by The Australian Housing Research Council.

Research Team: A.Coldicutt (Team Leader), T.Isaacs, T.Williamson, S.Coldicutt, E.Coldicutt, F.Moschini. The Project Committee also included a member of CSIRO, Division of Building Research.

Review Summary:

In warm to hot climates where winter heating is very low or non-existent, – quoting Prof. Aynsley: “Horizontal reflective foil airspaces in roofs have the unique characteristic of having a greater resistance to heat flow down than up. They act as one-way valves for summer heat flow, restricting daytime heat gain while facilitating night time heat loss. This is important because indoor discomfort in the evening which inhibits sleep can be very debilitating”. *Houses using reflective aluminium foil insulations combined with natural ventilation can readily avoid air-conditioning.*

The 1981 Australian Housing Research Council federally funded report examined the thermal performance of ceiling insulation in housing units across Queensland. Four locations were selected: Brisbane, Rockhampton, Townsville and Longreach. Two types of ceiling insulation were compared:

1. 75mm fibreglass directly on the ceiling, and;
2. A single layer of reflective foil insulation across the top of ceiling joists with an airspace beneath.

The 275 page Report explicitly concluded that only foil insulation should be used. The central reason was that fibrous insulations had a greater resistance to heat flow up than foils, causing houses to stay hotter longer by trapping heat in the often difficult to ventilate (stagnant heat zone) between the top of door heads and ceilings. Foil, on the other hand, stopped heat penetration successfully during the day and released accumulated heat beneath the ceiling during night time because of the foil’s inherently lower resistance to heat flow up compared to bulk insulation.

Quoting Prof. Aynsley again: “If energy efficiency regulations as a matter of convenience ignore the beneficial effects of horizontal reflective airspaces in roofs of houses in warm climates, then the situation could be actionable under Australian trade practices legislation. Ignoring these effects would be detrimental to the wide range of reflective aluminium foil insulation products available and favour bulk insulation products in spite of the demonstrable consumer benefits of reflective insulation in Australia’s warm climates.”

Quotations from:

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