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CONCERTINA FOIL BATTS™ THE RADIANT HEAT BARRIER

THERMAL PERFORMANCE COMPARISON BETWEEN FIBREGLASS BATTS AND REFLECTIVE FOIL INSULATION IN CEILINGS IN QUEENSLAND HOUSES – 1981

GENERAL OVERVIEW by Tim Renouf – Wren Industries *SECRETARY OF AFIA – ALUMINIUM FOIL INSULATION ASSOCIATION

Examination of Research Project

Thermal Performance of Housing Units in Queensland - Phase 1: a study by the Department of Architecture and Building, University of Melbourne. AHRC Report 58, 1981.

Research Funding: The Australian Housing Research Council (AHRC).

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

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

(i) **75mm fibreglass** directly on the ceiling, and

(ii) **a single layer of reflective foil insulation** across the top of ceiling joists with a reflective airspace beneath.

The Report (275 pages in total) 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.

Conclusion

In warm to hot climates where winter heating is very low or non-existent, houses using foil insulations combined with natural ventilation can reduce or avoid the costs of airconditioning.

SPECIAL NOTE: The Building Code of Australia (BCA) Building Energy Efficiency Provisions (2007), **takes no account of the implications of the 1981 Report** – implications which are that bulk insulations should not be used in houses, in dominant hot climates.

External commentary by Prof. Richard Aynsley (not part of the 1981 report):

"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 values 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".

"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 trade practices legislation. Ignoring these effects would be detrimental to a wide range of aluminium foil insulation products and favour bulk insulation products in spite of the demonstrable consumer benefits of reflective insulation in Australia's warm climates."

Richard Aynsley: B.Arch (Hons I), MS (Arch Eng), PhD, Member ASHRAE
Former UNESCO Professor of Tropical Architecture, James Cook University, QLD
Dean, College of Technology, Southern Polytechnic State University, Marietta GA, USA
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