



INSULATION COUNCIL OF AUSTRALIA AND NEW ZEALAND

Senate Inquiry: Energy Efficient Homes Package

Response to Dr. Richard Aynsley's comments received 23/06 at 5.33pm

ICANZ disagrees with most of Dr Aynsley's comments and observations. Given the short time afforded by the Senate Committee secretariat we have insufficient time to respond comprehensively to the range of issues and non-specific research references raised by Dr Aynsley but will do in due course. In particular Adjunct Professor Tony Isaacs was not available for anything other than brief comments. In the interim we submit the following comments.

ICANZ members have a large vested interest in foil insulation.

ICANZ members, CSR Bradford Insulation and Fletcher Insulation are the largest local manufacturers and providers of insulation products to the Australian and New Zealand Building, Residential, Commercial, Industrial and HVAC markets. Included in this, CSR Bradford and Fletcher Insulation provide around 60 million m² of reflective insulation products - approx **75% of reflective foil market** needs - with current capacity to increase this to 90 million m² where market opportunities exist. **ICANZ members are the largest suppliers of reflective foil insulation products in Australia.** It is very much in the interest of ICANZ members to promote the credible and effective use of reflective foil insulation.

Yet despite the clear opportunity to utilise existing and spare foil insulation capacity in Australia with potentially substantially greater profit margins than bulk insulation, from the outset ICANZ members strongly opposed the inclusion of reflective foil products in the Home Insulation Program for installation across ceiling areas. This is because:

- a) It is conductive to electricity and potentially hazardous as we have tragically seen.
- b) It does not provide a safe walkway for homeowners and tradesmen to move around the ceiling space once installed
- c) It is very difficult to install correctly to achieve theoretical thermal benefits
- d) It is not long lasting due to dust accumulation and moisture damage and so we maintain it cannot be guaranteed for the life of the home

For over 50 years ICANZ members have been recommending the use of foil products as a vapour barrier to manage condensation and weatherproofing of buildings. It also has insulation properties but limited as noted above. ICANZ members therefore consider their reflective foil insulation products to be a good additive to bulk insulation but a poor alternative in most building applications.

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Bulk insulation is effective in warm climates.

Condensation can be a major issue in buildings. That is why we manufacture and supply reflective foil vapour barrier products in conjunction with bulk insulation. But condensation is a design and use issue, not a product issue. Condensation can occur with bulk insulation, with reflective foil insulation or with no insulation at all. Correct design to avoid the risk of condensation will take into account the type or combination of insulation (such as glasswool and reflective foil) to be used, its location and the use of ventilation. In climates where airconditioning is used extensively, ceiling insulation provides the most effective location for energy savings. ICANZ members do not recommend foil insulation for use across ceiling joists. A combination of ceiling insulation, roof insulation and ventilation is commonly employed to achieve best results. There are references in the Building Code of Australia relating to insulation and condensation. The Australian Building Codes Board and the Australian Institute of Architects are currently developing a handbook that will provide further guidelines to avoid condensation in buildings.

Some particular comments:

Supporting evidence: Dr Aynsley's submission:

The supporting evidence from Tony Isaacs is astounding as there are no supporting references to any of his claims – only the output from a discredited Home Energy Rating software. (see Kordjamshidi et al, 2007; Williamson 2000; Williamson et al, 2001 for research discrediting the results of our HER software

ICANZ Comment:

There are no supporting references because the claims need no support. They are common sense. For example, reflective insulation stops more heat gain through a roof than it stops heat loss of reflective foil insulation but this will only produce better performance than bulk insulation if the overall balance of heat gain (conduction, convection, radiation) and heat loss of the reflective foil barrier is better. This is a principal that needs no academic references to give it validity.

Accurate's credentials

The AccuRate software is not in any sense discredited. Neither Ms Kordjamshidi nor Dr. Williamson's research papers suggest that the physics of heat flow as embodied in the algorithms of the AccuRate simulation software are wrong. They question the way in which the simulation is used to provide a ranking of buildings, but this is an issue with the NatHERS scheme and its underlying parameters and has nothing to do with the ability of the AccuRate software to correctly model the performance of a building.

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Furthermore, the administrator of the NatHERS scheme – the Department of Climate Change Energy Efficiency and Water – required that AccuRate be validated against the best simulation software in the world through the BESTEST process. DCCEE have a number of academic papers written by CSIRO about this validation. In addition AccuRate's temperature predictions have been compared with a range of real buildings in Australia and has been found to reproduce real temperatures with impressive accuracy. I am sure DCCEE would be happy to provide this material if required

AS2627 - Dr Aynsley's submission:

There was a very extensive cost benefit appraisal of optimum economic R-Values for houses in specific locations throughout Australia which resulted in AS 2627. While there are always assumptions made that can be argued, this was a consensus document, and the R-Values provided in that standard are way below those proposed under the new BCA requirements.

Tony Isaacs's Comment:

In the past I have been a representative of both Melbourne University and the Victorian Ministry on the committee BD 58 which produced AS2627. I was research assistant to Alan Coldicutt who developed the methodology and am very familiar with its methodology. AS2627 does not provide a fixed set of recommendations that are forever set in stone. Instead it provides a methodology for determining the economic optimum insulation level based on climatic severity and balancing the cost of insulation with the energy savings it produces that was intended to be updated over time.

AS 2627's recommended R values are lower than the R values in the BCA because it is based on prices which are over 25 years old. The graph in the submission which shows a broad economic optimum zone uses the identical methodology to AS 2627.

Addressing technical issues and product use

The most appropriate venue to raise these issues is through Standards Australia BD 058 committee and in particular through the expert technical committee.

Representation on these committees is comprehensive and draws together industry, research, academia and Government. Dr Aynsley has in the past attended and presented similar views on a number of occasions but his observations have not been accepted by either the majority of BD058 or the technical committee.

ICANZ produces an 'Insulation Handbook Part 1: Thermal performance' which is regularly reviewed and updated to address new applications and issues raised by users. This publication provides a guide to the use of insulation in the most common building types and is now widely used throughout the building industry. ICANZ will continue to



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research and publish information that addresses and educates the building industry about the best use of insulation.

Yours sincerely,

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ICANZ CEO

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Press Release

TRPs: useful benefits and a promising future

In opposition to the entire technical and scientific community, certain manufacturers of TRPs (Thin Reflective Products) claim that their slender insulation products have the same thermal resistance as the thick ones currently in use.

APPMR members are, however, concentrating their efforts on promoting the **real benefits of TRPs**, since they do not see this particular battle as worthwhile.

Overstating thermal resistance values is unnecessary because the real and recognized benefits of TRPs already assure **their future in the building insulation market**.

Some explanations

Whether we like it or not, the 21st century will be shaped by increasingly important stakes - i.e., the need for decreased dependence on fossil fuels, reduced home-heating costs and drastically reduced greenhouse gas emissions.

In France, research carried out in the frame of the Grenelle Environment Round Table has demonstrated the fundamental importance of building construction, given that it is responsible for 42% of energy losses and 23% of greenhouse gas emissions (2/3 housing and 1/3 service sector).

Out of a total stock of 30.7 million existing residences, of which 17.3 million are individual houses, a significant proportion (about 2/3) were built before the first insulation regulations of 1974 and an even greater proportion (about 85%) before the 1990's, when insulation regulations started to become seriously ambitious.

To satisfy the objectives of the Grenelle Environment Round Table, the thermal resistance requirements of new constructions are going to be greatly increased once again. Furthermore, improving the insulation of existing buildings represents a fundamental goal. In the long run, say by 2040 or 2050, nearly 30 million existing residential units should be better insulated, not to mention buildings in the service sector.

And since most heat loss takes place at the surface-level, this will no doubt provide manufacturers of insulation and related products, as well as installation contractors, with a considerable amount of business for several decades (see the numerous declarations of the FFB [*Fédération française du batiments* / French Building Federation] and the CAPEB [*Confédération de l'Artisanat et des Petites Entreprises du Bâtiment* / Confederation of Cottage Industries and Small Construction Businesses]).

The stakes are high, the goals are ambitious, the potential consequences will be severe if unattained, and all the actors involved have been mobilized, particularly by the Grenelle Environment Round Table and their imminent application ... Everyone is therefore partially responsible for their success.

This environmentally focused vision appeals to numerous actors, especially manufacturers. This is natural and healthy since a good blend of ecology and economics is one of the keys to sustainable development.

However, a problem arises when certain players break the rules of the game: whereby, in the hopes of competing with thick insulations and taking some of their market share, certain TRP manufacturers have greatly overstated their products' insulation performance, using a series of artificial non-sanctioned techniques.

Manufacturers united under APPMR (Association for the Promotion of Thin Reflective Products) denounce and resist this approach.

- They refuse to artificially overstate the thermal resistance (R-value) of their products simply to increase their sales.
- They deplore that the debate only revolves around R-values (or similar ones), thereby overlooking the real benefits of Thin Reflective Products, which should be promoted.

Even if TRPs are not actually as thermally resistant as certain manufacturers claim, they nonetheless have **very real benefits for** insulation systems.

- They have a good thermal efficiency/thickness ratio.
- They are supplied in rolls and are very easy to install.
- TRPs installed on interior surfaces are vapour barriers, such as the K-Way®, which protect insulation from water vapour that may migrate from inside the house and keep the (thick) insulation dry.
- TRPs installed on the exterior of a building, such as a screen under the roof, must breathe adequately (HVP – High Vapour Permeability such as Gore-tex®). They protect the insulation surface from air movement under the roof tiles, prevent superficial heat loss, and their reflective surface helps improve summer comfort in the attic.
- In addition to their intrinsic thermal resistance and that of associated air cavities, all TRPs act as air barriers while also contributing to the thermal efficiency of buildings by greatly improving the air sealing of surfaces and preventing parasitic heat loss.

These real “plusses” are all in line with the objectives of the Grenelle Environment Round Table and, given the large number of houses in need of renovation, many with limited space and surface depth, there is no doubt that TRPs, as well as other insulation products, will be called upon to perform without excessive performance claims!

The APPMR is convinced that it can act in good faith together with all the other TRP manufacturers who wish to contribute as much value as possible to surface component thermal efficiency (undoubtedly on the U-value).

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The APPMR – Association for the Promotion of Thin Reflective Products

[Association pour la Promotion des Produits Minces Réfléchissants]

Established in January 2008 by several small and medium sized businesses in the French Thin Reflective Product market, the APPMR unifies manufacturers who respect the legitimacy of official bodies and submit their products to recognized evaluation procedures (Technical Notice from GS 20 or even GS 5, European Technical Agreement...).

Members of APPMR are torn by the public debate which has developed between laboratories and official bodies that sanction orthodox practices and several manufacturers that oppose them by denying the generally recognized theories of the international scientific community on hygrothermic performance of insulation and building surfaces.

APPMR members thereby consider themselves to be unduly disadvantaged by the manufacturers in question:

- thermal performance values: they compare these with the results of unofficially measured tests (tests said to be “in-situ”);
- claimed usage: they prescribed that in most cases their products have to be used for roof installations, and those products fail to allow sufficient water vapour permeability for proper hygrothermic performance of surfaces.

By denouncing the position of these manufacturers, the APPMR aims to:

- collectively defend its members against their allegations;
- evaluate the real advantages of TRPs and promote their use in applications which correspond to their confirmed performance;
- be recognized by laboratories and official bodies as a representative intermediary.

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