FOIL BATT FACTS No. 3
AUGUST 2009
CONCERTINA FOIL BATTS™ THE RADIANT HEAT BARRIER

INSULATION & "BREATHING" FOR CLAD WALLS

BENEFITS OF USING CONCERTINA FOIL BATTS INSULATION IN PLACE OF FIBROUS BATTS COMBINED WITH FOIL WRAP = TOTAL R-VALUE 2.5

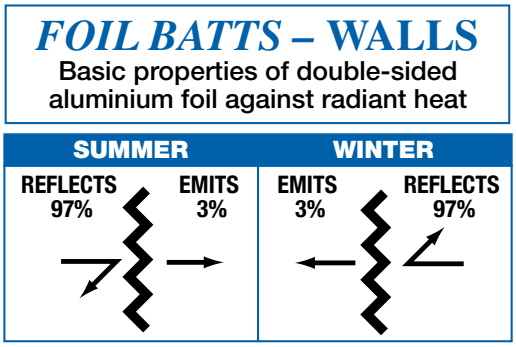
Ignorance exists about what is the correct technique to thermally insulate clad walls, either timber or fibre-cement, and also permit effective breathing. Sarking is a material in continuous roll form commonly used for waterproofing behind clad walls to prevent moisture penetrating into timber wall framing and fibre insulation batts. Sarking must be impermeable to liquid moisture but still allow free flow of water vapour from the inner surface of the cladding to vapourise and dissipate. Fire retardant breather building papers or white Tyvek are possibly the best examples of breathable and waterproof sarking materials.

Breather foil is another option and is conventional anti-glare house wrap foil with one pure visible aluminium surface facing inwards, and has machine pin-pricked holes. Two types of anti-glare foil exist: single-sided foil with coloured plastic on the opposite side, and double-sided foil which is laminated to paper and has one surface with an ink coating.

In clad walls this product breathes to its best ability with adjacent airspaces on ***both*** sides of the foil wrap, airspaces which greatly assist moisture vapour to freely migrate inwards and outwards of clad wall structures unimpeded. If moisture is trapped behind timber claddings, subsequent moisture vapour build-up can cause warping of the timbers. Fibre cement claddings - such as Hardie Plank and Blue Board - do not claim to be waterproof, also need breathing airspaces, and breather foil is specifically listed as an option in James Hardie cladding manuals.

Enhanced airspaces behind claddings can be formed by dishing or depressing *breather foil* between studs Double-sided foils, paper-based (such as Bradford 733), are stiffer and will maintain the shape of dished air pockets better than plastic foils. Dished air pockets can also produce extra thermal performance to the overall Total wall R-value, compared to foil pulled tight (well formed airspaces behind clad walls can also be created by fixing narrow width battens over foil wraps). James Hardie wall cladding manuals as well as texts from fibre batt manufacturers and energy advisor centres show dished *breather foil* in clad walls in conjunction with fibre batts. This is effectively **impossible to achieve and misleading to consumers.**

When R1.5 or R2.5 fibre batts are part of clad wall insulation systems (and brick veneer), they are inserted into the stud cavity, **and make contact with the inner foil surface**, unless the batt is stapled or strung in a manner which would create a formed airspace against the foil surface. – this is impossible. In walls, 20mm is the minimum airspace width for optimising



thermal performance of foil. Also the fibre batts will indent the foil into the cladding profile thereby eliminating the two breathing air-pockets, as well as canceling 100% of the foil's thermal performance R-value, both for the visible inward aluminium airspace as well as the outward anti-glare airspace.

Simple "kitchen physics": bring your hand away from a cooked chicken wrapped in foil – you feel nothing. Same story for fibre batts in walls – there must be an airgap, otherwise summer heat is transmitted into Batts.

Extract from the Building Code of Australia (Energy Efficiency Provisions), clause 3.12.1.1(b) states: *Where required, reflective insulation must be installed with - (i) the necessary airspace, to achieve the required R-value between a reflective side of the reflective insulation and the building lining or cladding.*

When fibre batts are used in clad walls, moisture trapped between foil wraps and claddings will be harder to escape and vapourise compared to stud cavities with generous airspaces. Even with greater permeable breather materials, there is the ever present risk of moisture forming in the matrix of the fibre batts, particularly in humid climates, which increases the risk of slumping and degradation in thermal performance. The Insulation Materials Standard AS/NZS4859.1:2002 / Amendment 1:2006 (referenced in BCA) - clause 2.3.1 states that: *the moisture content of materials will affect their thermal performance.*

Insulating clad walls with *Breather foil (eg. Bradford 733)*:

- 1 FOIL BATT = TOTAL R2.6 (Winter)
- 2 FOIL BATT = TOTAL R3.3 (Winter)

Refer: Design Drawings-1, Total R-values.

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