BUILD RIGHT

Retrofitting blown-in wall insulation

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WHEN OLDER NEW ZEALAND HOUSES ARE RETROFITTED WITH INSULATION, IT TENDS TO BE INSTALLED INTO ROOF AND UNDERFLOOR SPACES. HOWEVER, DON'T FORGET THE WALLS. OPTIONS TO INJECT OR BLOW IN INSULATION ARE AVAILABLE, BUT THEY DO HAVE RISKS.

UNLESS WALLS NEED RECLADDING or relining, it's generally not cost-effective to remove sound claddings or linings to install insulation. In these cases, an option that may be considered is injecting or blowing an insulation product into the wall framing cavities through holes drilled in either the interior lining or exterior cladding. Options include polystyrene (EPS) beads, polyurethane foam, urea formaldehyde (UFFI) foam, glasswool, macerated paper (cellulose) and mineral wool.

BRANZ has not Appraised any of these materials and there are a number of issues that do need to be satisfactorily addressed.

Work needs a building consent

Under the Building Act, a building consent must be obtained when retrofitting any external wall insulation. The consent application must cover all associated building work as well as the relevant information on the insulation system proposed.

As there are no Acceptable Solutions or Verification Methods for retrofitting external wall insulation, each consent application must specifically demonstrate that the relevant performance criteria of the Building Code are met and that the performance of the existing building will not be adversely affected by the installation of the insulation.

There is no requirement for R-value compliance with Building Code clause H1 *Energy efficiency* as, from a regulatory point of view, the thermal envelope is only being altered, not replaced.

Check framing and building paper

Before retrofitting blown or injected external wall insulation, check that:

- the wall framing is dry – if it's wet, this must be addressed before proceeding
- there is building paper in the wall.

These options are not suitable if there is no building paper or the building paper is damaged.

Are these options suitable?

Injected or blown-in insulation can only be retrofitted if there is undamaged wall underlay or building paper installed (older houses and houses with brick veneer cladding often did not have building paper). The wall underlay prevents the insulation coming into contact with the back face of the cladding and stops water leakage through the cladding wetting the insulation.

Injected insulation must not be installed into any drained and ventilated cavity – it will restrict the cavity drainage and drying.

Installation requirements

To inject or blow in insulation, holes must be drilled into each section of wall framing cavity separated by studs and dwangs.

While installing these insulation materials from the outside is less disruptive to the building occupier, it creates a higher risk to the weathertightness of the cladding and damages the wall underlay. E2/AS1 requires underlay to be undamaged, so any tears need to be repaired and holes taped.

Installing insulation from the inside has the advantage of not damaging the exterior cladding or the wall underlay, but redecoration may be needed.

With both application methods, it is not possible to visually determine the extent or density of the insulation injected into each section of wall cavity. Insufficiently dense insulation or gaps around the framing will reduce the thermal performance of the insulated wall. The density of EPS is fixed by the bead size and will not change. Urea formaldehyde foam shrinks as it cures, which will reduce the thermal performance.

Electrical safety

Electrical safety may also be compromised if existing wiring is encased by insulation, as heat dissipation of the wiring will be reduced, meaning the maximum current capacity to maintain a safe temperature will be reduced. The degree of encasement is difficult to confirm when insulation is injected into wall cavities.

A registered electrician should check and certify the wiring before and after retrofitting insulation to ensure it will not be overloaded.

The compatibility of the thermal insulation with the electrical wiring insulation must also be checked. Any TRS (tough rubber-sheathed) wiring will need to be replaced before retrofitting.

Note **For all insulation types see include www.dbh.govt.nz/retrofitting-insulation-guidance and BRANZ *Building Basics: Insulation*.**

See also BRANZ study reports SR 233 and SR 234, available from BRANZ shop on www.branz.co.nz.