

LABSS INFORMATION PAPER INFOP09 - 2016 Version 4 – 30 April 2016

ALTERATIONS TO EXISTING DWELLINGS

Application of External Wall Insulation Systems to Timber Framed Timber Clad Buildings

Applicable to Domestic and Non-Domestic Buildings in relation to

Section 3: Environment

Clause 3.10.5 and 3.10.6 Precipitation and

Clause 3.15.1 and 3.15.5 Interstitial Condensation

BACKGROUND

A number of applications for external wall insulation (EWI) to Swedish type timber non-traditional house types have been submitted in some local authority areas in the recent past. On assessment the specification was of concern in relation to Mandatory Standards 3.10 and 3.15. The main concern being the direct fix of the EWI directly onto the existing timber cladding. Interstitial condensation calculations were submitted (see further comments on calculations below) but compliance had not been met. A response to applicants and agents provided a summary of the issues. (detailed below). Discussions have been held with The Solid Wall Insulation Guarantee Agency (SWIGA), TRADA, BBA, and National Insulation Association (NIA). In addition, the only systems with a BBA Certificate for similar installations have a drainage cavity behind the insulation.

3rd part accreditation from BBA or TRADA for this particular construction has NOT been provided to show the suitability of the system.

DECISION

Given the comments from both TRADA and BBA the consensus is that for adequate protection of the existing structure and cladding, a cavity should be provided.

For the existing properties which have been approved without a cavity but which have not yet had a completion certificate accepted, a statement from the installer should be provided to confirm that:

- An extended assessment regime, including additional testing for resistance to wind driven rain was undertaken to the existing structure and that the existing structure was fully inspected prior to installation and found to contain no defects,
- The new EWI system is constructed to eliminate the penetration of moisture from the outside to the existing timber cladding and timber structure, and
- A WUFI analysis* for condensation risk rather than the standard calculation method will be provided to show compliance with BS5250 and Mandatory Standard 3.15.

*Such analysis should be from an accredited source such as BBA, BRE, TRADA or equivalent.

TECHNICAL CONCERNS

The addition of external wall insulation (EWI) directly onto existing timber cladding on housing with limited vapour barriers has two main issues in showing compliance with the building regulations relative to moisture which are currently the subject of ongoing discussions between the installer and building standards. These issues are:

- Interstitial condensation may occur within the structure which can result in failure of the existing timber cladding and frame.
- Penetration of rainwater behind the insulation can cause similar failures.

Building standards have researched this area in detail and the issues around the above points are applicable to all properties of this type intending to use a direct fixing to the timber cladding and can be summarised as:

- 3rd party accreditation has not been provided from any supplier showing direct fixing to timber cladding as appropriate,
- The Solid Wall Insulation Guarantee Agency (SWIGA) stated that they will not guarantee a system which does not have 3rd party accreditation.

The possibility of the existing structure being adversely affected by moisture relative to interstitial condensation given the following statements within British Standards:

- Designers should be aware that BS EN ISO 13788 considers only the risks arising from the diffusion of water vapour through the building fabric; it does not take account of the much greater risk of condensation occurring as a result of air leakage, which transports water vapour through gaps, joints and cracks in the building fabric.
- The method is an assessment rather than an accurate prediction tool. It is suitable for comparing different constructions and assessing the effects of modifications. It does not provide an accurate prediction of moisture conditions within the structure under service conditions
- In some cases, airflow from the interior of the building into the structure is the major mechanism for moisture transport, which can increase the risk of condensation problems very significantly. This International Standard does not address this issue; where it is felt to be important, more advanced assessment methods should be considered

These issues stem from the fact that this is a direct fix to an existing timber property and, to date, there has been no 3rd party accreditation provided to building standards showing that this is an appropriate fixing method. The 3rd party accreditation which has been provided to building standards relates to insulation fitted to properties with a drained cavity behind the insulation which allows the frame to breathe and dry.

FEEDBACK FROM TRADA

PRECIPITATION

1. Industry recommendation would be to seek the installation of a drainage and ventilation cavity between the new and existing constructions. It was acknowledged that such a cavity does reduce the thermal benefit of the EWI. However, the rationale behind such provision (of a cavity) was the protection afforded to the existing timber frame and cladding by allowing any water penetration occurring behind the new EWI cladding to be drained and for ventilation to aid moisture removal both of which could have a detrimental effect on the original timber frame clad construction.
2. This was deemed necessary because of the inability to see and to maintain any deterioration caused by water penetration once covered by a cladding system.
3. The provision of a cavity was also deemed necessary because of the practicability of adequately sealing all potential points of water penetration likely to affect the existing timber frame and cladding.

INTERSTITIAL CONDENSATION

1. Little or no problems were anticipated with condensation risk particularly if there was little or no insulation within the existing timber frame. A specific condensation risk analysis should always be carried out on the specific site construction.

In summary, while TRADA did not exclusively prohibit the non-cavity construction, the on-going maintenance and repair of unseen problems arising within the timber frame and cladding caused by covering the existing construction were deemed high risk. The provision of a cavity would, in their view, eliminate many of these potential problems at source.

Excerpts from TRADA Guidance on cladding to timber frame buildings

Cladding for timber frame buildings

TRADA Wood Information Section 1 Sheet 49. Published December 2007.

Design requirements

To provide sufficient ventilation to the timber frame and drainage of any water that may penetrate the cladding, an adequately sized cavity should be provided between the external cladding and the timber frame structure. TRADA recommendations regarding external cavity ventilation and cavity widths, are included in the individual types of cladding that follow in this sheet.

For all cladding types, but especially where the cladding is self-supporting, allowance for differential movement between the cladding and the timber frame should be taken into account. Particular attention should be paid to details on buildings of four storeys or more. For further information, refer to the *Timber frame construction* book and *Multi-storey timber frame: a design guide*.

Other types

Other proprietary cladding types are available but are beyond the scope of this information sheet. The manufacturer's specification and third party approval guidance should be followed.

FEEDBACK FROM BBA

The BBA has only issued one Certificate to an external wall insulation system for direct application to timber frame and this is restricted to sheltered and moderate exposure zones (this Certificate is currently in the process of updating and will feature additional wording to make this abundantly clear).

Assessment of a system for such an application clearly requires an extended assessment regime, including additional testing for resistance to wind driven rain and a WUFI analysis for condensation risk rather than the standard calculation method. In addition, we would place great emphasis on the suitability of the detailing and practicability of achieving a water tight envelope.

Unless a system has been third party approved for this specific application taking these issues fully into account, I would have reservations about its suitability for use. This is of course, not to say that it will not be fit for this purpose, only that there must be an element of doubt