

DISCUSSION PAPER

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1.0 External Insulation and Finish Systems - E.I.F.S

1.1 What is E.I.F.S?

E.I.F.S (“Exterior Insulation and Finish Systems”) is an exterior building wall product and is a system of materials. E.I.F.S provides insulation, weatherproofing and a finished surface in a single integrated product. There are various types of E.I.F.S and several ways of installing it, but E.I.F.S is usually applied to the outside of an external frame to create a durable and weatherproof barrier that will enhance the energy efficiency of the building, and is typically made up of:

1. Insulation: Medium Grade Expanded Polystyrene with Flame Retardant
2. A coating of a flexible cementitious material and alkaline resistant fiberglass mesh reinforcing for added strength and longevity.
3. A durable, crack-resistant topcoat or finish coat - typically an acrylic co-polymer product.
4. Other components typically used in EIF Systems include weatherproofing materials such as; sealants for openings and panel joints, flashing tapes and, breathable builder’s paper.

1.2 History

In 1952, the first patent was granted for expanded polystyrene insulation board and the first synthetic plaster, using water based binders was developed. The use of these two materials together commenced in the late 1950’s and was marketed throughout Europe. E.I.F.S answered a need in the European construction market for a material that could insulate older masonry structures and enhance their appearance.

The technology for E.I.F.S was transferred to the U.S by Dryvit. E.I.F.S quickly became popular with energy-conscious builders and buyers, particularly as it occurred during the oil crisis. .E.I.F.S began to be used almost exclusively for commercial buildings and was only gradually adopted for use in homes. By 1995 nearly 200million square feet of E.I.F.S were being installed annually. Today E.I.F.S contributes to 30% of the commercial market.

In 1995, the industry suffered a setback when a number of E.I.F.S clad homes were discovered with moisture damage behind the cladding. Similar scenarios have occurred in other countries where E.I.F.S has been adopted, including New Zealand. The damage incurred in these scenarios was typically caused by poor construction detailing and practices.

It should be noted that Expanded Polystyrene was not specifically invented for use as a wall material. Although it’s widely accepted that its inherent characteristics lend itself to various building applications, it was never originally assessed and tested strictly for the purpose of wall cladding. This initial lack of formality is why we have so many “Blackmarket” or non-BCA compliant polystyrene walls being erected in Australia. These panels can be bought direct from polystyrene manufacturers, who are careful to distance themselves from liability in the case of the failure of the cladding. These providers typically offer little or no understanding of these E.I.F Systems and do not provide technical advice/manuals etc..to assist with installation, nor have any of these suppliers sought to have any appraisal of their products.

1.3 Types of E.I.F.S Construction

There are two basic types of E.I.F.S construction; Barrier and Cavity (Water managed/Rain Screen). The Barrier System is mostly used in Australia and America. Barrier E.I.F.S are designed to divert all water from the exterior surface. Water Managed systems anticipate that some water will penetrate and incorporates water management features such as cavities, weep holes etc. As a result of “Leaky House” syndrome New Zealand has introduced standards for E.I.F.S into the Building Code, which addresses which method can be used in certain circumstances.

The most common problems associated with water intrusion in EIF systems are as follows:

Windows, doors and electrical outlets

Roof Flashings

Deck Flashings

Below Grade Installation

Projections, vents

These need to be addressed by all EIF System manufacturers and installers i.e. the above should be dealt with as penetrations of the EIF System.

1.4 Pre-finished Polystyrene or Plain (Raw/White) Polystyrene?

There are essentially two types of polystyrene that are used in E.I.F Systems :

Pre-finished and Raw (White).

Pre-finished (factory prepared panels) were developed to meet the demand in the building industry for faster build times. International and local trends indicate the increase in the outsourcing of pre-built and modular materials to alleviate pressures of rising on-site labour and OH&S costs. Using pre-prepared polystyrene cladding will save time for the renderer. In fact renderers will save up to 25% of time spent on a job due to the mesh and primer coats stages already being completed in house– this equates to significantly lower labour costs. It also removes the manual handling component for onsite renderers and the cost of purchasing and storing these materials. The nature of the surface of the pre-finished panel also allows for ease of acrylic render application, thereby further reducing labour costs and increasing time savings

It should be noted that the vast majority of E.I.F.S suppliers who have obtained CSIRO appraisals have done so with pre-finished polystyrene panels – not white/raw polystyrene.

3.0 E.I.F Systems and compliance

3.1 The B.C.A 2007

The use of E.I.F.S is regulated by the building code. However, since E.I.F.S is a relatively new type of wall cladding in Australia, the code does not refer to E.I.F.S specifically. In order to meet the requirements of the Building Code a manufacturer/supplier of E.I.F.S must present the building system in a form that a building surveyor can assess and satisfy him/herself that the material, form of construction or design meets the performance requirements of the BCA.

3.2 Compliance with the Performance Requirement

It should be noted that the “Deemed to Satisfy” provision specifically excludes plastics, foam (polystyrene) and composite timbers etc. Therefore

E.I.F Systems (polystyrene) must be viewed as an “Alternative Solution” and assessed on the basis of the provision of a CSIRO or equivalent appraisal to satisfy a building surveyor that the E.I.F system being proposed by a designer/architect is a fit and proper building material.

3.3 Building Permits

Based on the above it should not be possible for a building surveyor to issue a building permit where the polystyrene products nominated are not supplied by a company who has had their products approved by CSIRO or equivalent.

3.4 CSIRO/Other Appraisals

It should be noted that even though these appraisals ensure compliance with the Performance Requirements, it is only to a very basic standard.

E.I.F Systems should ensure a watertight external building fabric that does not rely solely on the acrylic render system to keep moisture out of the building face.

This would include the supply and installation of joint sealants, breathable builders paper, proper flexible flashing tape and sealant systems for all openings and tanking solutions (where applicable) in tandem with the installation of the polystyrene panels.

The CSIRO does not test polystyrene products which incorporate the above materials. For example, the water penetration tests are done on a fully rendered panel that has no openings or changes to building elements i.e this test does not simulate the real world of domestic construction.

4.0 Current Practices

4.1 Builders (DBU/DBM)

Allow the installation and Render of E.I.F Systems by others, or themselves that fail to meet the Performance requirements of the BCA either deliberately or inadvertently

4.2 Designers/Architects

Prescribe non-compliant E.I.F systems in two ways:

- By nominating E.I.F. systems in a generic or non specific manner, i.e. the specification will call for merely “polystyrene foam” or “75mm Polystyrene Foam” without nominating an E.I.F. System supplier whose product meets the performance Requirement.
- By nominating an E.I.F. System supplier whose products have not been appraised and therefore whose products fails to meet the Performance Requirements.

4.3 Renderers

Current practice sees hundreds of rendering businesses both small and large supplying, installing and rendering polystyrene walls for builders, developers and owner builders that do not meet the Performance Requirement.

These renderers tend to mainly purchase raw/plain polystyrene sheets from the manufacturer in the manner described on page 2. Installation is performed in an ad hoc way, or as they see fit. There is also a general belief by this sector that the render system seals the face of the building – nothing could be further from the truth.

These renderers epitomise the polystyrene cladding industry in that they do not hold any of the building licences required by the Building Commission, which means they are not offering warranty insurance to owner builders.

If these companies supply, install and render polystyrene panels for a DBU or DBM, these builders are incorrectly assuming that the wall system being installed is a fit and proper building material that meets the Performance Requirement of the BCA.

4.4 Owner Builders

The vast majority of owner builders who use an E.I.F System are deliberately or inadvertently purchasing either directly or through renderers, polystyrene products that fail to meet the Performance Requirement of the BCA. They are generally unaware of the obligation on a contractor who has been engaged to install and/or render to supply a warranty insurance policy for works over the value of \$12,000.00.

They are, in the main, unaware of the fact that the majority of polystyrene products offered in the market place do not meet the Performance Requirement of the BCA. Therefore, they are unaware that an insurer will decline cover on a claim on damage to a building where a building material that fails to meet the Performance Requirement has been installed.

4.5 E.I.F.S Manufacturers

There are only a handful of companies nationally whose products have been appraised by the CSIRO or equivalent or have had their product accredited by the Building Commission.

The vast majority of suppliers of both pre-finished and, in the main, raw (white) polystyrene panels have not undertaken, and do not intend to undertake an appraisal.

These non-BCA compliant products can be purchased from the polystyrene sheet manufacturer or direct from distributors (who purport to be selling a legitimate system) and from E.I.F System (non BCA compliant) suppliers.

Some of these suppliers believe they are complying with the BCA., as the polystyrene panels have been manufactured according to an Australian Standard (AS1366 – which sets out the minimum properties for the manufacture of Expanded Polystyrene) This has little relevance to its compliance with the Performance Requirements as a wall cladding system within the BCA. This is a tactic often used to divert customers from querying the products concerned as to their compliance/non-compliance with the BCA.

In another example these companies tend to believe that because there is no specific E.I.F Standard within the Building Code they do not have to meet any performance requirements, therefore testing is unnecessary. As has been stated this is a false assumption as these E.I.F System Polystyrene Products fall within the “Alternative Solution” category and must be appraised as being fit and proper building materials by an independent authority to meet the Performance Requirements of the BCA.

These types of companies are in fact selling black market products that have no place on a building. They are either deliberately or inadvertently offering their products to builders, developers and owner builders as legitimate building solutions.

4.6 Building Surveyors/Inspectors

Building permits are being issued by the thousands each year, where polystyrene products that fail to meet the Performance requirements of the BCA have been specified on the plans.

Building Permits should only be issued when the Building Surveyor has determined that the E.I.F System specified does, in fact comply with Performance Requirements.

If a non-BCA compliant E.I.F System has been specified or an architect/designer has merely referred to polystyrene in a general/generic fashion then the building surveyor should return the relevant plans back to the architect/designer, so that an E.I.F. System that meets the Performance Requirement can be specified – only then can a building surveyor issue a building permit.

At least one inspection of a buildings external fabric including the E.I.F. System should take place prior to the application of any render, paint, or architectural finish. (New Zealand performs 4 inspection points for an E.I.F. System). This will ensure that the building surveyor has complete control over the materials employed in the external building fabric.

This extra inspection would deter builders, developers and owner builders from ignoring the approved plans based on complying E.I.F Systems in search of cheaper, inferior and non compliant E.I.F Systems.

We believe that issuing building permits where non-BCA compliant or generic polystyrene products have been specified, places liability for the failure of these E.I.F Systems in the hands of the building surveyor – this would be an untenable position. Recent legal cases of “Leaky House” Syndrome in New Zealand demonstrate the enormous financial impact on Councils and Building inspectors where their responsibilities have been ignored.

The building surveyor has a specific and enduring responsibility to the owners/occupiers of dwellings. Amongst these responsibilities is to ensure that the specification and utilisation of an E.I.F System is in accordance with the Performance Requirement of the BCA 2007.

5.0 E.I.F System Suppliers – What to look for!

5.1 BCA Compliance

A product that complies with the performance requirements of the BCA e.g. CSIRO appraisal, a Building Commission Product Accreditation or Code Mark

5.2 Adequate Technical Data

- i. Architectural Specification
- ii. Construction Details
- iii. Step by Step Visual Guide to Installation
- iv. Installation Manual (Text)

5.3 Appropriate Builder Licences

- i. DB-L (Cladding) – See Point 4
- ii. DB –M
- iii. CB-L (Non-structural Fit Out)
- iv. DB –U

5.4 Warranty Insurance

Ability to offer Warranty Insurance Policies to both DBM (Developers) and Owner Builders

5.5 Consumer Law

In the situation where a company who supplies, installs and renders the E.I.F System, consumer law dictates that contracts for these works cannot be split i.e supply from one company and install and render by another. However, this is common practice by some E.I.F System suppliers. For example company (A) is contacted by an Owner/Builder who then submits a quotation for the materials only. Attached to this quote from company (A) will be a quote from another company (B) for the installation and the rendering works.

These types of split contracts should be avoided by owner builders. Apart from the illegalities described above, there exists a general weakness of the warranty where rectifications are required – which company (A) or (B) is required to assess and rectify issues on site? Current practice sees company (A) pushing the customer back to company (B) – this is poor practice designed to complicate warranty issues and leave the customer, particularly owner builders extremely bewildered.

This poor compliance to building industry legislation is also apparent in the negligible take up of building licences by either Company (A) or (B) anywhere in this state, (as is required by the Building Commission). This means that the vast majority of both owner/builders and DBM (Developers) are not being supplied with Warranty Insurance as is required by law.

A difficult scenario may arise for the owner/builder as the suppliers of these “Blackmarket” E.I.F Systems are affected by insolvency and in the instance of the failure of the E.I.F System on a home – Warranty Insurance will not be available. As these suppliers have not equipped themselves with an appropriate building licence, through which they could purchase the appropriate Warranty Insurance Policy on behalf of the Owner/Builder - this situation seems inevitable.

In addition these same companies typically market non-BCA compliant building products. This has the combined effect of no insurance cover in the instance of the demise or insolvency of the supplier and potentially no Building/Contents insurance as insurers may decline on a claim if they were aware that a part or all of the external building fabric failed to meet the Performance requirements of the BCA.

The effect of these two failures of the system would leave an owner/builder in a devastated position where all funding required to repair any damage large or small would have to be funded by the home owner.

6.0 The Future:

6.1 A Highly Regulated Environment

- All E.I.F. Systems complying with the Performance Requirement of the BCA.
- Architects and Designers only specifying E.I.F.Systems which comply with the Performance Requirement of the BCA.
- Building Surveyors (Municipal and Private) only issuing Building Permits where BCA Compliant E.I.F.Systems have been specified
- Building Surveyors inspecting the installation of BCA. compliant E.I.F.Systems to ensure that the manufacturer's installation instructions have been followed and that the E.I.F. System being used is the same system which was originally specified by the architect/designer. This inspection would take place before the application of the acrylic render system.
- Builders (DBM) and Owner Builders using E.I.F.Systems which comply with the Performance Requirement of the BCA, which are installed by contractors who have the correct Building Licence.(DBU or DB-L Cladding)
- Builders (DBM) and Owner Builders always being issued warranty insurance by contractors who have the correct Building Licence
- Builders (DBU) only utilising E.I.F.Systems which comply with the Performance Requirement of the BCA.
- Renderers only installing E.I.F.Systems which comply with the Performance Requirement of the BCA. They must also seek to obtain the appropriate Building licences when performing work for DBMs or Owner Builders so that they may fulfil their obligations to supply Warranty Insurance.
- All Installation Contractors only installing E.I.F.Systems which comply with the Performance Requirement of the BCA. They must also seek to obtain the appropriate Building licences when performing work for DBMs or Owner Builders so that they may fulfil their obligations to supply Warranty Insurance.
- All consumers i.e. owners of domestic dwellings rightfully confident that the E.I.F. System systems employed on their residence meets the Building Code of Australia –in other words, the consumer is getting what they paid for!
- Provide training in E.I.F.S installation through relevant Training Centres i.e. Tafe., in order to supply accredited E.I.F installers to the industry