



Flooding & Insulation

STEPS TO IMPROVE THE FLOOD RESILIENCE
OF BUILDINGS



*Low Energy –
Low Carbon Buildings*

Flooding & Insulation

Introduction

This Technical Bulletin examines current guidance for improving the flood resilience of our buildings and details the recommendations for insulation.

The Risks

According to the Insurance Council of Australia the National Flood Information Database (NFID) has identified over 316,000 properties that have some risk of flooding¹. See Figure 1:

In partnership with each of the State Governments, the general insurance industry has developed and licensed the National Flood Information Database (NFID). NFID is an address database containing 11.3 million property addresses, overlaid with the known flood risk according to government flood mapping.

The vast majority of properties in Australia have little or no flood risk. Approximately 2.8% of properties have some risk of flooding.

Figure 1

Floods and Building Design

An Australian guidance document entitled “Reducing Vulnerability of Buildings to Flood Damage: Guidance on Building in Flood Prone Areas” produced for the Hawkesbury-Nepean FloodSafe Project in New South Wales, highlights the need for building design to be considered for building in flood prone areas². See Figure 2:

While there are building codes for other natural hazards including bushfires, earthquakes and cyclones, there is currently no Australian standard for building in flood prone areas.

The result is that flooding is often neglected as a design consideration for houses and the majority of contemporary houses are highly vulnerable to component damage and severe structural failure when exposed to floodwaters.

Figure 2

The selection of appropriate building materials is listed as an important measure to improve the flood resilience of buildings³. See Figure 3:

The aim is to provide a reduction in potential damages to traditional buildings, through better designs and more careful selection of materials.

Figure 3

The Guidance

According to the FloodSafe report, wall insulation material selection should be considered amongst the highest of priorities for the lower storey of a building⁴. Product characteristics such as non-absorbance and shape integrity once wet are highlighted among the key selection criteria⁵. See Figure 4:

5.5.2 Design suggestions

Flood compatible insulation:

- is waterproof;
- is not damaged or does not suffer reduced effectiveness as a result of immersion;
- has negligible absorbance;
- drains and dries quickly;
- is resistant to retaining silt which may attract moisture and/or reduce the effectiveness of the insulation; and
- maintains its shape and is not likely to slump or move out of position.

Figure 4

The document presents a range of alternative materials for resistance against a medium duration flood⁶. See Figure 5:

Table 4.3.1.3 Materials for 96-Hour Immersion

Component	Suitable	Mild Effects	Marked Effects	Severe Effects
INSULATION	<ul style="list-style-type: none"> • plastic/polystyrene boards • closed cell solid insulation 	<ul style="list-style-type: none"> • reflective foil perforated with holes to drain water if used under timber floors 		<ul style="list-style-type: none"> • materials which store water and delay drying • open celled insulation (batts etc)
Suitable:	These materials or products are relatively unaffected by submersion and flood exposure and are the best available for the particular application.			
Mild Effects:	These materials or products suffer only mild effects from flooding and are the next best choice if the most suitable materials or products are too expensive or unavailable.			
Marked Effects:	These materials or products are more liable to damage under flood than the above category.			
Severe Effects:	These materials or products are seriously affected by floodwaters and have to be replaced if inundated.			

Figure 5

The FloodSafe guidance document deems “wool” batts (ie. those “made from materials such as glass fibre, polyester, sheep’s wool and rockwool (spun molten rock)”⁵) as undesirable⁷. See Figure 6:

“Wool” batts are not desirable as they can take extended periods to dry out after immersion.

They can lose their shape, slump and retain silt which may significantly reduce their effectiveness. Some forms may even deteriorate as a result of immersion. There are similar problems with loose fill materials especially cellulose fibre which will deteriorate significantly when wet.

Figure 6

The Solution

Kingspan Insulation can confirm that the *Kingspan Kooltherm*[®] range falls into the recommended category of closed-cell solid insulation. In addition, *Kingspan AIR-CELL Permifloor*[®] is a perforated reflective foil insulation solution designed specifically for suspended floors.

For detailed information on available Kingspan products for floor and wall applications and other installation advice please contact us.

¹ Insurance Council of Australia:

www.insurancecouncil.com.au/.../Insurance%20Council%20-%20Consumer%20Tips%20Flood%20Insurance.pdf, p. 3

² Reducing Vulnerability of Buildings to Flood Damage: Guidance on Building in Flood Prone Areas:

http://www.ses.nsw.gov.au/multiattachments/9022/DocumentName/Building_Guidelines.pdf, p. 2

³ Reducing Vulnerability of Buildings to Flood Damage: Guidance on Building in Flood Prone Areas, p. 4:

⁴ Reducing Vulnerability of Buildings to Flood Damage: Guidance on Building in Flood Prone Areas, p. 24

⁵ Reducing Vulnerability of Buildings to Flood Damage: Guidance on Building in Flood Prone Areas, p. 96

⁶ Reducing Vulnerability of Buildings to Flood Damage: Guidance on Building in Flood Prone Areas, p. 60

⁷ Reducing Vulnerability of Buildings to Flood Damage: Guidance on Building in Flood Prone Areas, p. 97

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