



# Non-combustible insulation solutions for re-cladding projects

How to meet the National Construction Code  
Deemed-to-Satisfy requirements





## Introduction

---

Buildings and fire safety continue to make headlines around the world and after every blaze the same questions are raised.

Why was the building at risk?

Were fire tests sufficient?

Was workmanship to blame?

How can we stop this happening again?

The lessons learnt encourage us to consider fire risk at the earliest stages of any building design. The use of non-combustible materials firstly reduces the likelihood of a fire and secondly prevents fire spreading, keeping fire risk at a minimum. Now that the re-cladding of non-compliant buildings is the focus for many large commercial and residential buildings, it is crucial that non-combustible products are selected to replace existing combustible insulation materials.

In this whitepaper, we review the requirements for insulation materials in retrofit applications where re-cladding projects are required to meet current new build construction standards and how specifying materials that are deemed non-combustible to AS 1530.1 as required by the National Construction Code (NCC 2019), can reduce time and risk.

## Global Outlook

---

Recent catastrophic fire events have compelled several national regulatory bodies to increase the stringency for fire testing of building materials and their level of performance for high risk applications. The following countries have already moved on this front:

- United Kingdom - in 2018, the Ministry of Housing, Communities, and Local Government announced the ban of combustible building elements for multiple building types, including high rises and those with high risk occupants such as aged care centres.
- Serbia - recent updates to the construction code include increasing the requirement for façades that are used on public buildings to be constructed of non-combustible materials.
- United Arab Emirates - as a result of catastrophic fires in high profile buildings in Dubai, Abu Dhabi, Sharjah and Ajman, the UAE has mandated that façades in excess of 15 metres high require insulation to be tested and deemed non-combustible.

## NCC Compliance Pathways for Re-Cladding

There are already enough safety issues around the way contemporary buildings are designed without adding extra fire risk. Taller constructions, lighter cheaper materials, more underground facilities and wider internal spaces have all contributed to the speed at which a blaze and smoke travels through a building compared to a traditional construction many years ago. Fire safety must be designed into buildings from the start.

### How to comply with the NCC

In the NCC 2019 Volume One, external walls have three pathways for compliance.

#### 1. Deemed-to-Satisfy (DtS) Solution

- A DtS Solution is achieved by following the applicable DtS Provisions as detailed in the NCC.

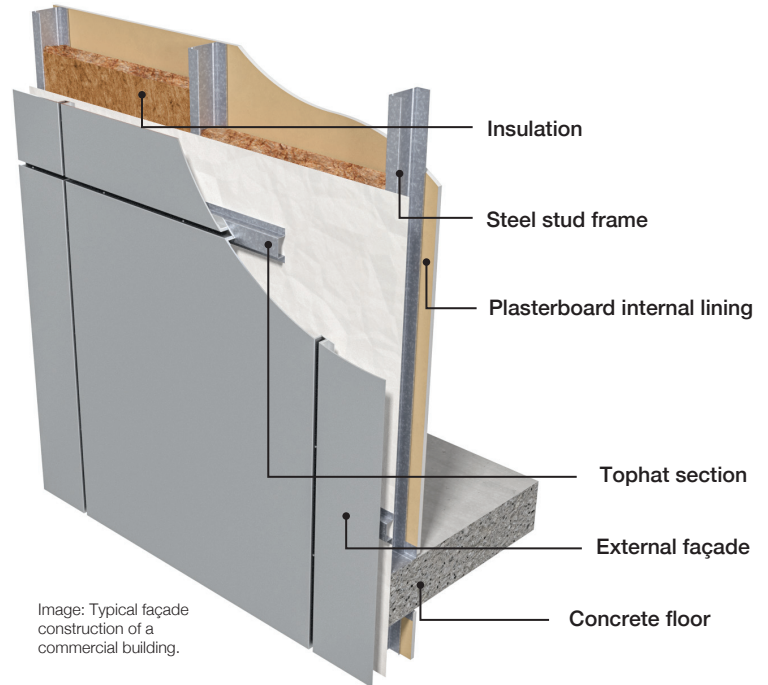
#### 2. Performance Solution

- A Performance Solution is a “tailored solution” that is designed and verified to meet the objectives of the relevant performance requirements.

#### 3. Combination of DtS and Performance Solution

- A combination of DtS and Performance Solutions may be used to satisfy performance requirements.

Verification of compliance can be achieved by providing evidence of suitability, an approved verification method, expert judgement by industry bodies such as NATA accredited testing facilities and Fire Engineers, or a combination of all of the above.



## NCC Deemed-to-Satisfy Compliance Pathway

### Non-Combustibility

In Section C of the NCC 2019 Volume One, Performance Requirement CP2 requires certain building elements, such as external walls, must be non-combustible. Compliance with CP2 can be achieved as follows:

- The DtS Provisions in C1.9 require buildings of type A or B construction to have external walls that are made of components that are “non-combustible” as determined by testing in accordance with AS 1530.1 Combustibility test for materials. Currently, construction type C does not require a specific test on materials to permit use. Table 1 below summarises the construction types and DtS pathways.

**Table 1: Building Classifications and Associated Construction Types, as per the NCC**

Building Classification	Description	Construction Type Required as per NCC				
		Rise in Storeys				
		1	2	3	3 or greater	4 or greater
Class 2	Apartment building	C	B		A	
Class 4	Office building	C	C	B		A
Class 6	Shopping centre	C	C	B		A
Class 9a	Health care building	C	B	A		A
Class 9b	School	C	B		A	
Class 9c	Aged care centre	C	B		A	

Type A and B construction - external walls with non-combustible components.

## What is Considered to be an External Wall?

An “external wall” is defined in the NCC 2019 Volume One as “an outer wall of a building which is not a common wall”. A “common wall” is defined as “a wall that is common to adjoining buildings”. A building element is considered to be part of an external wall if it is integral to the construction of the wall.

The following elements are considered to be part of an external wall:

- Façade covering (external cladding)
- Framing
- Insulation
- Internal lining (e.g. plasterboard) of an external wall
- Spandrels
- Sarking

## Knauf Insulation Tested Solutions

---

Knauf Insulation products have been tested in accordance with AS 1530.1 and AS 1530.3 in independent accredited laboratories. Under the testing criteria in Clause 3.4 of AS 1530.1, all tested Knauf Insulation glasswool products achieved a non-combustible rating. In addition, Knauf Insulation glasswool products have been tested to AS 1530.3. The test determines indices relating to performance when exposed to fire. Knauf Insulation glasswool products manufactured with ECOSE® Technology achieve the following fire indices in accordance to AS 1530.3:

- Ignitability: 0
- Spread of Flame: 0
- Heat evolved: 0
- Smoke Developed: 0-1

As determined by these fire performance tests, Knauf Insulation glasswool with a nominal thickness of 25-140mm, R-value range from 0.7 - 4.0, and density range from 7 to 32kg/m<sup>3</sup> can be safely used where non-combustible material is required for external wall applications.

- Knauf Insulation Acoustic
- Earthwool® Wall batt
- DriTherm® Cavity Slab

As Knauf Insulation glasswool products meet the DtS provisions of the NCC 2019, they do not require an AS 5113 full-scale test, in addition to sprinkler requirements.

### Evidence of Compliance

Knauf Insulation works with the following independent, third-party testing facilities to conduct testing and assessments of their products:

- IGNIS labs undertake testing of building materials for reaction to fire and fire resistance. They have strong ties with some of Australia's leading universities, giving them the capacity to complete fire research and development in fire safety and building product research.
- CodeMark, a building product and system certification scheme owned by the ABCB.
- WarringtonFire Australia is an ISO 17025 Accredited Laboratory and has been accredited by NATA for a comprehensive range of capabilities for reaction to fire testing and fire resistance testing across most global standards.

### Performance Solution

Knauf Insulation glasswool is DtS and there is no requirement within the NCC 2019 to test the products using AS 5113. Appendix A of AS 5113 states that AS 5113 classification is not required for external walls that comply with the NCC DtS provisions.

## Recognising Combustible Materials

---

The best practice method for determining whether an external façade system includes combustible insulation materials is to extract a sample from the façade for testing to AS 1530.1. In general, insulation products can be grouped into two main categories (non-combustible and combustible) based on the raw material composition used, as illustrated in Table 2 below:

**Table 2: Combustibility of Common Insulation Products:**

Material Type	Combustibility	Raw Material
Glass Mineral Wool	Non-combustible	Recycled and virgin glass
Rock Mineral Wool	Non-combustible	Basalt and other types of rock
PIR (Polyisocyanurate)	Combustible	Thermoset plastics
PUR (Polyurethane)	Combustible	Thermoset plastics
EPS	Combustible	Thermoplastics
XPS	Combustible	Polystyrene

## What is Knauf Insulation Glasswool Made From?

### Manufacturing Process

Knauf Insulation products made using ECOSE® Technology benefit from a binder which has no added formaldehyde. The ECOSE® Technology binder is based on rapidly renewable materials instead of traditional petro-based chemicals.

ECOSE® Technology has been developed for Knauf Insulation's glasswool and rock mineral wool products to improve safety and sustainability whilst maintaining the thermal, acoustic and fire performance.

Knauf Insulation products are a distinctive, natural shade of brown, with no added dyes, bleaches or artificial colours. Knauf Insulation glasswool is also less dusty and has a much softer feel whilst maintaining its rigidity and stiffness properties.

The ECOSE® Technology binder is less energy intensive than the formaldehyde binders used in traditional glasswool insulation. Knauf Insulation glasswool with ECOSE® Technology is certified by Eurofins as an 'outstanding material' according to the VOC (Volatile Organic Compounds) Indoor Air Quality emissions regulations and has been awarded Eurofins Indoor Air Comfort Gold Standard.



## Knauf Insulation

Knauf Insulation is a global leader in the manufacture of glasswool products.

Knauf Insulation offers a range of warranted, thermal and acoustic systems for walls, roofs, and floors. Knauf Insulation glasswool is appraised by BRANZ and CodeMark for compliance with AS/NZS 4859.1 and deemed non-combustible in accordance with AS 1530.1.

Knauf Insulation glasswool utilises advanced proprietary manufacturing technology and ECOSE® Technology with no added formaldehyde, resulting in the only glasswool insulation in Australia to be awarded Eurofins Air Comfort Gold certification, based on ultra-low VOC (Volatile Organic Compounds) emissions.



## REFERENCES

- 1 Australian Building Codes Board. "How to Comply with the NCC." ABCB.  
<https://www.abcb.gov.au/-/media/Files/Resources/Education-Training/HowToComplyWithTheNCC.pdf>
- 2 Australian Building Codes Board. "CodeMark Certification Scheme." ABCB.  
<https://www.abcb.gov.au/Product-Certification/CodeMark-Certification-Scheme>
- 3 QBCC fact sheet.  
[http://www.qbcc.qld.gov.au/sites/default/files/What\\_type\\_of\\_building\\_is\\_it.pdf](http://www.qbcc.qld.gov.au/sites/default/files/What_type_of_building_is_it.pdf)
- 4 Gowling WLG . 2018. The Ban On Combustible Materials In The External Wall Of Buildings – What You Need To Know - Real Estate and Construction - UK.  
<https://www.mondaq.com/uk/construction-planning/764326/the-ban-on-combustible-materials-in-the-external-wall-of-buildings-what-you-need-to-know>
- 5 National Construction Code, 2020. Fire performance of external walls and cladding. Advisory note 2020.2.2.  
Canberra: Australian Building Codes Board, pp.3 - 4.

**KNAUF**INSULATION