



**STRUCTURAL
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Tridek roofing may be used in areas rated as BAL 29 and BAL 40 provided the following installation procedures are adhered to:

BAL 29

AS3595 allows roof and walls with a non-combustible sheet steel. To achieve this BAL level the installation must allow for all joints to be covered, sealed, overlapped or butt joined. Complete protection must be given to isolate the foam core from ember attack. No gaps greater than 3mm. Tape or seal behind any flashings, and sealing with Firestop 360 would ensure an extra level of cover.

A copy of Fire Certification to Test Standard AS ISO 9705 is attached. This test relates to the conformity of the foam core to satisfy the current BCA requirements for a group 1 rating in accordance with BCA2005 specification C1.10a.

BAL 40

Roof and walls would comply but with the amendment to a maximum of 2mm gap allowance in lieu of 3mm. All flashings to be backed by 75mm mineral wool or other suitable ember protection material to isolate the foam core from embers. Firestop 360 for sealing.

The construction requirement is effectively the same for roofing in a BAL-19 or BAL-29 area. My understanding is the heat flux is between 19 and 29kW/m²

It is also my understanding that the assumed flame temperature under the new standard approved is 817°C or 1090 kelvin. The panel (as will any steel or timber framing) become unstable and would breakdown at this range.

(as a note: The extent and rate of heat release is limited primarily by ventilation. For example a foam of density 16kg/m³ requires over 150 times the volume of air to achieve complete combustion. Complete combustion of EPS is unlikely to occur so its full potential heat is rarely relevant).

An alternative to standard EPS core would be to use a PIR (polyisocyanurate foam).

PIR foam resin is judged that it would comply with FM Global requirements.

The foam test report conducted in accordance with ASTM E84-12. Test for Surface Burning Characteristics of Building Materials (UL 723, UBC 8-1, NFPA 255) is attached.

PIR foam is usually considered in higher risk fire applications and my understanding is that PIR cored panels will comply to BAL 40 as tested for Bushfire and Fire Resistance AS3959-2009.

If PIR foam core is used the thermal value is increased by approx. 15% over EPS.

Thermal Values.

Tridek Classic 125mm panel thickness. R 3.50

Acoustics Tridek.

PREDICTED ACOUSTIC PROPERTIES: TRIDEK WALL AND ROOFING PANELS:

Standard Tridek panel.

| | | |
|--------------------------|----------|----------------|
| 125 Classic Series panel | RW 26 db | RW + CTR 22 db |
|--------------------------|----------|----------------|

With the addition of a standard furring channel directly fixed to the panel skin, and 1 layer of 10mm Sound rated plasterboard:

| | | |
|--------------------------|----------|----------------|
| 125 Classic Series panel | RW 35 db | RW + CTR 30 db |
|--------------------------|----------|----------------|

With two layers of 10mm sound rated plasterboard, and a layer of 50mm polyester insulation

| | | |
|--------------------------|----------|----------------|
| 125 Classic Series panel | RW 40 db | RW + CTR 35 db |
|--------------------------|----------|----------------|

With the inclusion of 105mm glass wool insulation R2.0 batts to enable mild compression of the insulation by the plasterboard ceiling fixed by top hat or furring channels to underside of Tridek.

| | | |
|--------------------------|----------|----------------|
| 125 Classic Series panel | RW 52 db | RW + CTR 40 db |
|--------------------------|----------|----------------|

External sound absorption materials can be readily fixed to Tridek panel to increase acoustic effectiveness.



Fire Test Certificate

This is to certify that the specimen described below has been examined by BRANZ Ltd on behalf of

EPS Panel Division, PACIA
and
CSIRO Manufacturing and Infrastructure Technology

Test standard: AS ISO 9705

Specimen name: Sandwich Panel with an Expanded Polystyrene (EPS) core

Specimen description:

Insulating sandwich panel, nominal thickness 250 mm or less.
Panel core of Class SL (to AS 1366.3) expanded EPS.
Clad both sides with "Colorbond" steel, thickness 0.4 mm or greater.
Panel to panel junctions require steel angles fixed to the steel skins at not more than 300mm centres, with steel rivets. Ceiling panel to panels joins require a steel (stitch) rivet connecting the metal skins at not more than 1200 mm centres.

Orientation: N/A

Full descriptions of the test specimen and the complete results of the examination are given in the following Test Reports and Assessments:

CMIT-(c)-2003-201 CMIT-(c)-2004-089 CMIT-(c)-2004-368 CMIT-(c)-2004-469
BRANZ FAR 2489

Conditions of laboratory registration by IANZ do not allow assessments expressed by the Registered Laboratory to be covered by IANZ.

Regulatory authorities are advised to examine test reports and assessments before approving any product.

The assessed results were as follows:

Group Number 1 in accordance with BCA2005 specification Cl.10a

Smoke Growth Rate Index (SMOGR_{RC}) < 100.

Test Dates: 15/9/03, 23/1/04, 6/2/04, 6/9/04
22/9/04, 24/11/04, 6/12/04

Test Supervisor(s): N/A

This Certificate issued:

Certificate Number: 374

29 April 2005

Colleen Wade, Principal Scientist

*Fire Testing Supervisor
For BRANZ Limited*

SIPS walling:

Little testing has been done on SIPS panels in relation to the current Bushfire regulations.

However the code does require as in wall and roofing claddings that a skin of non-combustible material must be used. Regardless of what material is used externally the foam core must be protected. In discussions with a fire engineer from Exova Warringtonfire, it was stated in his opinion Sips panels could be used but would require a cladding of a non-combustible material such as steel or CFC sheeting minimum 6mm (BAL29 or 9mm BAL 40) placed on external face ensuring all panel joints were sealed with a fire rated sealant such as Firestop 360.

Predicted Acoustic data. **SIPs Walling.**

No provision within these figures for additional external wall cladding such as CFC sheeting or Corten steel.

16mm SIPs panel, 2 x layers of 16mm plaster both sides STC -41

| | | |
|-----------------|------------------------------------|--------|
| 11mm SIPs panel | No finish either face side | STC 22 |
| 11mm SIPs panel | 12mm plaster x 1 side | STC 28 |
| 16mm SIPs panel | 16mm plaster x 1 side | STC 29 |
| 16mm SIPs panel | 16mm plaster x 2 sides | STC 33 |
| 16mm SIPs panel | 16mm plaster x 2 layers both sides | STC 41 |

Decibel (db) loss of sound through SIPs wall structure, example 112mm wall with 2 x layers of 16mm plasterboard attached to one side. The opposing side based on 1 layer of 16mm plasterboard

| Frequency (Hz) | Transmission Loss (db) | Frequency (Hz) | Transmission Loss (db) |
|----------------|------------------------|----------------|------------------------|
| 125 | 31 | 800 | 61 |
| 160 | 31 | 1000 | 66 |
| 200 | 36 | 1250 | 69 |
| 250 | 39 | 1600 | 71 |