

4711E EXPOL UNDERFLOOR & UNDERSLAB INSULATION

1. GENERAL

Masterspec sections must be customised to suit the project being specified, by removing irrelevant information and adding project-specific information and selections.

This section relates to **Expol** insulation range of pre-cut rigid expanded polystyrene (EPS) and extruded polystyrene (XPS) foam boards for use as thermal insulation for:

- timber frame floors
- under concrete slab

Modify / expand this clause to suit requirements of this specification section

Expol Tuff-Pod, polystyrene pods (EPS) are not covered in this section. Refer to Expol for advice.

1.1 RELATED WORK

Refer to 3111 FORMWORK FOR CONCRETE for insulation under concrete slabs.

Refer to 3112 REINFORCEMENT FOR CONCRETE for reinforcement

Refer to 3121 CONCRETE PLACEMENT for handling, placing and curing of concrete.

Include cross references only to other work sections where they include directly related work.

Documents

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC C/AS1	Fire safety
NZBC H1/AS1	Energy efficiency
AS 1366.3	Rigid cellular plastic sheets for thermal insulation - Rigid cellular polystyrene - Moulded (RC/PS - M)
NZS 3604	Timber-framed buildings
NZS 4218:2004	Energy efficiency - Small building envelope
NZS 4243.1	Energy efficiency - Large buildings - Building thermal envelope
AS/NZS 4671	Steel reinforcing materials
NZS 4859.1	Materials for the thermal insulation of buildings - General criteria and technical provisions

Delete from the DOCUMENTS clause any document not cited. List any additional cited documents. NZS 4218:2004 Energy Efficiency - Small Building Envelope, is recognised by NZBC, NZS 4218:2009 Thermal Insulation - Housing and Small Buildings, has not at the time of writing been recognised by NZBC. Consult with the BCA as to their requirements.

The following are related documents and if referred to in the work section need to be added to the list of DOCUMENTS.

NZBC E3/AS1	Internal moisture
NZBC B2/AS1	Durability
NZBC F2/AS1	Hazardous building materials
AS 1530.3	Methods for fire tests on building materials, components and structures - Simultaneous determination of ignitability, flame propagation, heat release and smoke release
NZS 3602	Timber and wood-based products for use in building
NZS 4200	Pliable building membranes and underlays
NZS 4220	Energy conservation in non-residential buildings
NZS 4246	Energy efficiency - Installing insulation in residential buildings
AS/NZS 4534	Zinc and zinc/aluminium-alloy coatings on steel wire
BRANZ BU 427	Improving thermal insulation
BRANZ BU 429	Calculating R-values for timber framed buildings
BRANZ BU 460	Internal moisture control
BRANZ publication	House insulation guide

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:

Expol Under Floor Insulation brochure

Expol Technical Product Guide

[BRANZ Appraisal 256](#) - Expol Insulation

Copies of the above literature are available from:

Web: www.expol.co.nz
Email: sales@expol.co.nz
Telephone: 09 634 3449 / 0800 863373
Facsimile: 09 634 0756

It is important to ensure that all personnel on site have access to accurate, up to date technical information on the many products, materials and equipment used on a project. In most cases individual products are not used in isolation, but form part of a building process. Also a particular manufacturer's and/or supplier's requirements for handling, storage, preparation, installation, finishing and protection of their product can vary from what might be considered the norm. Access to technical information can help overcome this potential problem.

Requirements

1.4 QUALIFICATIONS

Work to be carried out by tradesmen experienced, competent and familiar with the materials and techniques specified.

Performance

1.5 EXPOL INSULATION

Expol will contribute to meeting the requirements of **NZBC H1/AS1**: Energy efficiency, 2.0 Building thermal envelope. Install to **NZS 4218** for small building envelope, to **NZS 4243.1** for large buildings and to the **Expol** technical requirements.

Modify to suit requirements. NZBC H1 sets the level for thermal efficiency of residential buildings. This requires that the building performance index (BPI) of the complete envelope of a house does not exceed a set figure. NZBC H1 sets the minimum requirements. NZS 4218 and NZS 4243.1 provide a schedule, a calculation and a modelling method for determining insulation.

1.6 DURABILITY

Expol EPS insulation to comply with **NZBC B2/AS1** Table 1, Durability requirements of nominated building elements.

50 years For **Expol** Under Floor
50 years For **Expol** Under Concrete

Refer to the Manufacturer's literature for additional requirements.

Delete under floor or under concrete depending on system specified.

EPS is an inert, organic material, and therefore will not rot and is highly resistant to mildew. It provides no nutritive value to plants, animals, micro organisms or rodents. EPS will last the life of most buildings in which it is used, provided it does not suffer physical damage.

NOTE: Refer to Expol website for a downloadable version of Expol Limited technical product guide, for KPA ratings.

2. PRODUCTS

Materials

2.1 EXPOL UNDER FLOOR INSULATION - TIMBER FLOOR R1.4

Expol Under Floor, flame retardant polystyrene panels (EPS) to AS 1366.3, and to NZS 4859.1. All panels are 60mm thick.

Designed specifically for insulating between the joists of timber floor homes and buildings. Typical installation material R-Values are; 1.4 Expol Under Floor, 2.8 double layer Expol Under Floor.

2.2 EXPOL BLACK INSULATION - TIMBER FLOOR R1.8

Expol Black, flame retardant polystyrene panels (EPS) with added graphite to AS 1366.3, and to NZS 4859.1. All panels are 60mm thick.

Designed specifically for insulating between the joists of timber floor homes and buildings. Typical installation material R-Values are; 1.8 Expol Black. 3.6 double layer Expol Black.

- 2.3 **EXPOL THERMASLAB INSULATION - CONCRETE SLAB**
Expol Thermaslab, polystyrene sheets (EPS) to AS 1366.3, and to NZS 4859.1.
Manufactured from two grades, H grade and S grade in various thickness.
Expol manufactures a number of different densities and it is important that the correct density is supplied for the particular application. Refer to SELECTIONS for options available and contact Expol on 0800 86 33 73 for advice on suitable grade and thickness of polystyrene to suit the project.
- 2.4 **EXPOL PLATINUM BOARD - CONCRETE SLAB**
Expol Platinum Board, polystyrene sheets (EPS) with added graphite for enhanced insulation benefits, manufactured to AS 1366.3.
Various thicknesses available, refer to SELECTIONS for available options and corresponding R Values.
- 2.5 **EXPOL-X - CONCRETE SLAB**
Expol-X, extruded polystyrene sheets (XPS).
Various thicknesses available refer to SELECTIONS for available options and corresponding R Values.

Components

- 2.6 **WIRE GUARD - TIMBER FLOORS**
Expol Wire Guard, a paper strip used to separate exposed electrical cables from **Expol** under floor insulation.
Separation is needed due to the fact that the wires are insulated by a PVC plastic that incorporates a plasticizer to increase the elastic properties. The polystyrene in some cases reacts to the plasticizer and degrades the elastic.
- 2.7 **FIXINGS - TIMBER FLOORS**
Expol non corrosive nylon fixings with a stainless steel nail to secure panels.

3. EXECUTION

Conditions

- 3.1 **DELIVERY**
Keep materials dry in transit. Take delivery of materials in an undamaged in condition. Reject all damaged materials.
- 3.2 **STORAGE**
Accept materials undamaged and dry and store in a location that protects them from the weather and damage. Avoid distortion, stretching, puncturing and damage to edges of sheet materials. Do not use damaged sheets.
- 3.3 **HANDLING**
Wear protective clothing as necessary and when handling, avoid delamination or distortion of the rectangular form. Maintain full thickness unless compression is an installation system requirement.
- 3.4 **PROTECT**
Do not subject the polystyrene to prolonged saturation or exposure to sunlight. Do not allow the polystyrene come into contact with solvents.
EPS is a closed cell material and does not readily absorb water, unless subjected to prolonged saturation. Even in this situation it maintains its shape, size, structure, physical appearance and approximately 85% of its insulation value.

Application Expol Under Floor insulation - timber floor

For retro-fit under existing and for new ground and upper floors. All panels are concave cut on both sides to allow for a compression of up to 20mm for ease of installation and to ensure a snug fit between most standard joists.

- 3.5 **SECURE PANELS NEW FLOORS**
Nail two fixings at opposite corners per panel, flush with the top of the joist to ensure the panel sits just below the underside of the floor.

3.6 FIT PANELS
Friction fit **Expol** Under Floor panels between floor joists, with one face touching the underside of the floor. Select the correct panel width for the correct joist space. Ensure width of panel is oversize to create a snug fit. Trim edges of panel when oversize by cutting one or more of the con-cer-tina edges. Ensure separation from electric cabling. Install to **Expol** Technical literature and to [BRANZ Appraisal 256](#) - Expol Insulation.
Panels will self support between joists with a friction fit. The flexi cut edge allows the panels to be cut down to size when floor joists vary in size.

3.7 SECURE PANELS EXISTING FLOORS
With panels in place, nail two fixings under opposite corners per panel, to ensure the panel sits secure and flush with the underside of the floor.
Panels will self support between joists with a friction fit, but it recommended that they have two fixings. Particularly loose panels and those subject to wind.

3.8 ELECTRICAL CABLES
Separate all electrical cables from **Expol** Under Floor insulation using **Expol** Wire Guard, applied to the joist area to separate the cables from polystyrene. Take extreme caution when working around electrical cables.

CAUTION: Electrical cables and equipment partially or completely surrounded with bulk thermal insulation may overheat and fail. For cables installed prior to 1989 ensure all insulation is fitted leaving the cables exposed. When fitting around down lights or other electrical appliances, leave a 150mm clearance around the appliance and comply with [NZBC C1/AS1](#), Part 9, 9.4.

3.9 PIPES AND PLUMBING
Cut the panel and notch around difficult areas to accommodate obstacles. A polyurethane foam material may be used to seal off more difficult areas. Ensure all air gaps are sealed around the outside perimeter to retain maximum insulation.
Modify this clause for areas that require regular service access, removable panels or larger clearances may have to be allowed.

Application Expol Thermaslab/Platinum Board/Expol-X insulation - concrete slab

3.10 LAY POLYTHENE
Lay polythene layer to [NZS 3604](#): clause 7.5.4, Damp-proof membrane.
Modify or delete this clause when specified elsewhere as in 3111 FORMWORK FOR CONCRETE. Polyethylene is often described as "polythene" in New Zealand. A subgrade damp-proof membrane is sometimes described as a vapour barrier.
NOTE: This clause describes the minimum acceptable membrane for damp-proofing under a concrete floor slab, as set out in NZS 3604.

3.11 INSTALL EXPOL THERMASLAB/PLATINUM BOARD/EXPOL-X
Install the polystyrene sheets once the polythene DPM has been laid. Place the polystyrene sheets on top of the polythene DPM and butt together. Do not place the polystyrene under any footings or thickenings. Cut holes in the polystyrene with a sharp knife to accommodate any services. Lay reinforcing steel mesh over the polystyrene on mesh chairs

3.12 REINFORCEMENT
Lay welded reinforcing mesh. Bars to AS/NZS 4671. Grade 300E deformed, other than for ties, stirrups and spirals, unless shown otherwise on the drawings. Welded reinforcing mesh to AS/NZS 4671.
Modify or delete this clause when specified elsewhere as in 3112 REINFORCEMENT FOR CONCRETE. Providing more detail on types of bars and mesh as appropriate.

3.13 PRE-PLACEMENT INSPECTION
Do not place concrete until all excavations, boxing and reinforcing have been inspected and passed by the Building Consent Authority.
Add any requirements for inspection by a chartered professional engineer, building certifier or contract administrator.

Completion

3.14 CLEANING
Remove debris, unused materials and elements from the site. Clean soiled or marked work. Replace damaged, cracked or marked elements. Leave the whole of this work to the standard required by following the execution procedures.

3.15 PROTECT
Protect new work from damage.

4. SELECTIONS

4.1 EXPOL UNDER FLOOR INSULATION - TIMBER FLOORS

Location: ~
Brand: **Expol Under Floor**
Layers: ~
Size: ~
R value: ~
Options:
Layers: Single, Double
Size: 1200mm x 360mm x 60mm
1200mm x 410mm x 60mm
1200mm x 470mm x 60mm
1200mm x 560mm x 60mm
R value: 1.4 (single), 2.8 (double)
The product is intended to be compression fitted between the framing members of buildings and the boards are normally supplied in sizes and thicknesses for this purpose. Boards of other dimensions can be supplied to meet the specific requirements of a building.

4.2 EXPOL BLACK INSULATION - TIMBER FLOORS

Location: ~
Brand: **Expol Black**
Layers: ~
Size: ~
R value: ~
Options:
Layers: Single, Double
Size: 1200mm x 360mm x 60mm
1200mm x 410mm x 60mm
1200mm x 470mm x 60mm
1200mm x 560mm x 60mm
R value: 1.8 (single), 3.6 (double)
The product is intended to be compression fitted between the framing members of buildings and the boards are normally supplied in sizes and thicknesses for this purpose. Boards of other dimensions can be supplied to meet the specific requirements of a building.

4.3 EXPOL THERMASLAB INSULATION - CONCRETE SLAB

Location: ~
Brand: **Expol Thermaslab**
Size: 2400mm x 1200mm
Grade: ~
Thickness: ~
kPa: ~
R value: ~
Modify to suit the project specified and refer to Expol on 0800 86 33 73 for advice on suitable grade and thickness.
Options:
Thickness 40mm, 50mm, 75mm, 100mm
other thickness supplied on request.
The R value is related to thickness and grade of the polystyrene.
Refer to the table below:

<i>Grade:</i>	<i>Thickness:</i>	<i>Compressive strength KPA:</i>	<i>K Value:</i>	<i>R Value:</i>
<i>H</i>	<i>40mm</i>	<i>135</i>	<i>0.036</i>	<i>1.11</i>
<i>H</i>	<i>50mm</i>	<i>135</i>	<i>0.036</i>	<i>1.39</i>
<i>H</i>	<i>75mm</i>	<i>135</i>	<i>0.036</i>	<i>2.08</i>
<i>H</i>	<i>100mm</i>	<i>135</i>	<i>0.034</i>	<i>2.78</i>

S	40mm	85	0.038	1.05
S	50mm	85	0.038	1.31
S	75mm	85	0.038	1.97
S	100mm	85	0.038	2.63

Refer to Expol Limited Technical product guide for information on EPS properties.

4.4 EXPOL PLATINUM BOARD INSULATION - CONCRETE SLAB

Location: ~
Brand: **Expol Platinum Board**
Size: 2400mm x 1200mm
Thickness: ~
kPa: ~
R value: ~

Modify to suit the project specified and refer to Expol on 0800 86 33 73 for advice on a suitable thickness.

Options:

Thickness: 40mm, 50mm, 75mm, 100mm
other thickness supplied on request.

The R value is related to thickness of the polystyrene.

Refer to the table below:

Thickness:	Compressive strength kPa:	K Value:	R Value:
40mm	105	0.032	1.25
50mm	105	0.032	1.56
75mm	105	0.032	2.34
100mm	105	0.032	3.13

Refer to Expol Limited Technical product guide for information on EPS properties.

4.5 EXPOL-X INSULATION - CONCRETE SLAB

Location: ~
Brand: **Expol-X**
Size: 2500mm x 600mm
Thickness: ~
kPa: ~
R value: ~

Modify to suit the project specified and refer to Expol on 0800 86 33 73 for advice on a suitable thickness.

Options:

Thickness: 30mm, 40mm, 50mm

The R value is related to thickness of the polystyrene.

Refer to the table below:

Thickness:	Compressive strength kPa:	K Value:	R Value:
30mm	250	0.032	1.00
40mm	250	0.032	1.25
50mm	250	0.032	1.55

Refer to Expol Limited Technical product guide for information on XPS properties.