

## 4711E EXPOL UNDERFLOOR & UNDERSLAB INSULATION

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

### 1. GENERAL

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

- timber frame floors
- under concrete slab

*Modify or extend the above description to suit the project being specified.*

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

#### Related work

### 1.1 RELATED SECTIONS

Refer to FORMWORK FOR CONCRETE for insulation under concrete slabs.

Refer to REINFORCEMENT FOR CONCRETE for reinforcement

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

*Include cross references to other sections where these contain related work.*

#### Documents

### 1.2 DOCUMENTS REFERRED TO

Documents referred to in this section are:

NZBC C1/AS1	Part 9, Outbreak of fire
NZBC H1/AS1	Energy efficiency, 2.0 Building thermal envelope
NZS 3604	Timber framed buildings
AS 1366.3	Rigid cellular plastic sheets for thermal insulation - Rigid cellular polystyrene - Moulded (RC/PS - M)
NZS 4218	Energy efficiency – Small building envelope
NZS 4243	Energy efficiency – Large buildings
AS/NZS 4671	Steel reinforcing materials
NZS 4859.1	Materials for the thermal insulation of buildings - General criteria and technical provisions

Brnz Appraisal Certificate No. 256 (2006)

Documents listed above and cited in the clauses that follow are part of this specification.

However, this specification takes precedence in the event of it being at variance with the cited document.

*Delete from the DOCUMENTS clause any document not cited. List any additional cited documents.*

#### RELATED DOCUMENTS

*Refer to the following related documents when preparing this section:*

NZBC E3/AS1	Internal moisture
NZBC B2/AS1	Durability
NZBC F2/AS1	Hazardous building materials
AS 1530	Methods for fire tests on building materials, components and structures
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
AS/NZS 4534	Zinc and zinc/aluminium-alloy coatings on steel wire
BRANZ Bulletin 357	Thermal insulation of houses
BRANZ Bulletin 427	Improving thermal insulation
BRANZ Bulletin 429	Calculating R-values for timber framed buildings
BRANZ Bulletin 460	Internal moisture control
BRANZ publication	House insulation guide

### 1.3 MANUFACTURER'S DOCUMENTS

Manufacturer's documents relating to work in this section are:

**Expol** Under Floor Insulation brochure

**Expol** Under Concrete Floor Insulation brochure

Copies of the above literature are available from:

Web: [www.expol.co.nz](http://www.expol.co.nz)

Email: [sales@expol.co.nz](mailto: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 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 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 under technical information, EPS properties, all about plastics, for KPA ratings.*

## 2. PRODUCTS

### Materials

### 2.1 EXPOL UNDER FLOOR INSULATION – TIMBER FLOOR

**Expol** Under Floor, flame retardant polystyrene panels (EPS) to AS 1366.3, and to NZS 4859.1. All panels have 20 mm ridges in addition to the 55 mm thickness.

*Designed specifically for insulating between the joists of timber floor homes and buildings. 20 mm ridges are designed to create a 20 mm air space for additional insulation. This air space must be sealed to work efficiently as insulation.*

### 2.2 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.*

## Components

2.3 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.*

2.4 FIXINGS – TIMBER FLOORS  
Expol non corrosive nylon fixings with a stainless steel nail to secure loose panels or to support panels where the under floor is subject to wind. Most panels will self support.  
*For new homes the fixings are nailed flush with the top of the joist creating the correct position for the placement of the panel. For retro fitting in existing homes, fixings are for any loose panels and high wind areas.*

### 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 con-cer-tina cut on both sides to allow for a compression of up to 20 mm for ease of installation and to ensure a snug fit between most standard joists.*

3.5 FIT PANELS  
Friction fit **Expol** Under Floor panels between floor joists, with the 20 mm ridges 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 Certificate No. 256 (2006).  
*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. An R-Value of R 1.4 can be taken for **Expol** Under Timber Floor Insulation in typical installations.*

3.6 SECURE LOOSE PANELS  
Secure loose panels with **Expol** non corrosive nylon fixings.

3.7 SUPPORT PANELS - WIND  
Secure panels with **Expol** non corrosive nylon fixings when the under floor is subject to wind.

3.8 INSULATING NEW FLOORS  
Nail two fixings at opposite corners per panel, flush with the top of the joist to ensure the panel sits flush with the underside of the floor.

- 3.9 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 150 mm clearance around the appliance and comply with NZBC C1/AS1, Part 9, 9.4.

- 3.10 PIPES AND PLUMBING H1/AS1  
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.

#### **Application Expol ThermaSlab insulation – concrete slab**

- 3.11 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 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 and NZBC E2/AS1: External moisture, 12.2 Damp-proof membranes (DPM).*

- 3.12 INSTALL EXPOL THERMASLAB  
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

- 3.13 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 REINFORCEMENT FOR CONCRETE. Providing more detail on types of bars and mesh as appropriate.*

- 3.14 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**

- 3.15 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.
- 3.16 PROTECT  
Protect new work from damage.

#### **4. SELECTIONS**

- 4.1 EXPOL UNDER FLOOR INSULATION – TIMBER FLOORS  
Location: ~  
Brand: **Expol** Under Floor  
Size: ~

R value: 1.4  
 Size options: 1200 mm x 360 mm x 55 mm  
 1200 mm x 410 mm x 55 mm  
 1200 mm x 470 mm x 55 mm  
 1200 mm x 560 mm x 55 mm

*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 THERMASLAB INSULATION – CONCRETE SLAB

Location: ~  
 Brand: **Expol** Thermaslab  
 Size: 2400 mm x 1200 mm  
 Grade: S  
 Thickness: 40 mm  
 KPA: 85  
 R value: R1.05

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

Size options: 1800 mm x 1200 mm

3600 mm x 1200 mm

Thickness options 25 mm or 40 mm  
 other thickness supplied on request.

*The R value is related to thickness and grade of the polystyrene.*

*Refer to the table below:*

<u>Grade:</u>	<u>Thickness:</u>	<u>Compressive strength</u>		<u>K Value:</u>	<u>R Value:</u>
			<u>KPA:</u>		
H	25 mm	135		0.036	0.69
H	40 mm	135		0.036	1.11
S	25 mm	85		0.038	0.65
S	40 mm	85		0.038	1.05

*Refer to <http://www.plastics.org.nz/page.asp?id=491> for information on EPS properties.*