

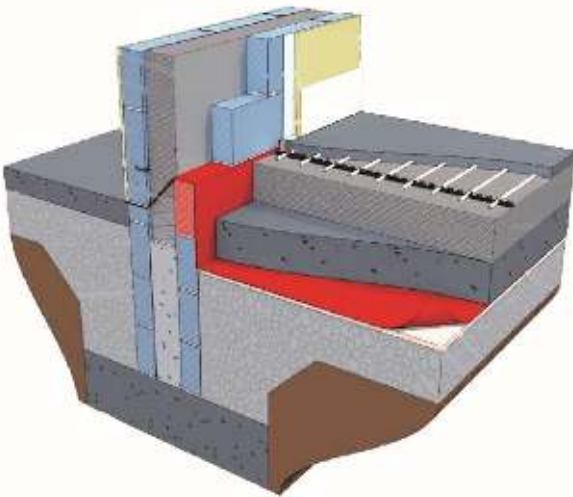

**IRISH AGRÉMENT BOARD
CERTIFICATE NO. 22/0430**

Smet Building Products Limited
93A Belfast Road,
Newry, Co Down.
BT34 1QH
T: +44 (0)28 3026 6833
E: info@smetnuildinproducts.com
W: www.smetbuildingproducts.com

baseTherm® Floor Insulation System

NSAI Agrément (Irish Agrément Board) is designated by Government to issue European Technical Approvals.

NSAI Agrément Certificates establish proof that the certified products are '**proper materials**' suitable for their intended use under Irish site conditions, and in accordance with the **Building Regulations 1997 and subsequent amendments**.



SCOPE

This Certificate relates to the baseTherm® Floor Insulation System, a pumpable, light-weight screed mortar consisting of EPS beads, fast-drying cements and Isostay proprietary additive mixed on site using a purpose-built mobile EPS mortar delivery system to meet the requirements of I.S. EN 16025-1^[1] and I.S. EN 16025-2^[2].

The product is used as a thermally insulating, non-structural, bound expanding polystyrene (BEPS) system which can contribute to the thermal and acoustic performance of floors in either new or existing buildings. It is designed to be installed in accordance with I.S. EN 16025-2^[2] by baseTherm® Ltd.

The product may be installed:

1. Below a concrete floor slab.
2. Below a floor screed on a concrete slab with a hardcore base.
3. Above a suspended concrete floor (e.g., block and beam) with a floor screed.

In the opinion of NSAI, the baseTherm® Insulation Mortar System as described in this Certificate, complies with the requirements of the Building Regulations 1997 and subsequent amendments.

MANUFACTURE AND MARKETING

The product is manufactured and marketed by:

baseTherm® Limited
Cappagh
Enfield
Co. Kildare
E: sales@baseTherm.com
W: www.baseTherm.com

Part D – Materials and Workmanship**D1 – Materials & Workmanship****D3 – Proper Materials**

The baseTherm® Insulated Floor System is comprised of 'proper materials' i.e., materials which are fit for their intended use and for the conditions in which they are to be used.

Buildings incorporating the baseTherm® system can be designed to meet the requirements of the following clauses of the Building Regulations 1997 and subsequent amendments:

Part D – Materials and Workmanship**D3 – Proper Materials****D1 – Materials and Workmanship****Part A – Structure****A1 – Loading****A2 – Ground Movement****Part B – Fire Safety****Part C – Site Preparation and Resistance to Moisture****C1 - Preparation of Site****C2 - Subsoil Drainage****C3 - Dangerous Substances****C4 - Resistance to Weather and Ground Moisture****Part E- Sound****E1 – Sound****Part J – Heat Producing Appliances****J3 – Protection of Building****Part L – Conservation of Fuel and Energy****L1 – Conservation of Fuel and Energy**

2.1 PRODUCT DESCRIPTION

This certificate relates to the baseTherm® Floor Insulation System, a thermally insulating, non-structural, pumpable bound expanding polystyrene (BEPS) ballasting. The system is for internal application to ground-supported and suspended floors in existing and new domestic and non-domestic building applications. The system is available in four grades, baseTherm® Low Lambda, baseTherm® 150, 200 and 250 depending on thermal performance and loading requirements.

Ancillary items that can form part of the overall construction, but which are outside the scope of this Certificate include:

- concrete base/slab;
- other suitable non-structural applied floor screeds including NSAI certified screeds;
- damp-proof courses, damp-proof membranes, vapour control layers and radon membranes – all of these must be compatible with EPS.

2.2 MANUFACTURE

baseTherm® Floor Insulation System, comprised of white, spherical expanded polystyrene beads (NSAI Certificate 04/0097, Kore EPS70, hereafter, referred to as “EPS”), manufactured in accordance with I.S. EN 13163^[3], cement (CEM I to I.S. EN 197-1^[4]) and IsoStay proprietary additive, mixed on site with water to defined and controlled proportions using purpose built BreMAT mobile production units to form a homogeneous, pumpable, fresh mortar to meet the requirements of I.S. EN 16025-1^[1] and I.S. EN 16025-2^[2].

2.2.1 Quality Control

Constituent products used in the manufacture of the ballasting mix are quality controlled as part of the Certificate holders ISO 9001^[5] Quality System. The certificate holder is also certified against ISO 14001^[6] and ISO 45001^[7].

The EPS beads, IsoStay proprietary additive, cement and water are transported to site in separate material compartments on the BreMAT mobile production unit. This unit utilizes a computer controlled automatic batching process to mix the required proportions of raw materials for the required grade of ballasting and record a batching record of same.

Samples of the mixed, bound EPS ballasting are taken and tested for both apparent density and installed density against the target requirements for the defined grade, to meet the requirements of I.S. EN 16025-1^[1] and I.S. EN 16025-2^[2].

The installed thickness is also measured with declared results recorded on the Certificate holder’s declaration sheet. See Cl. 2.4.7 of this certificate.

2.3 DELIVERY, STORAGE AND MARKING

2.3.1 Delivery

The baseTherm® Floor Insulation System is delivered to site by mobile production unit. Each delivery receives a printed docket bearing the product description, product characteristics, manufacturer’s name, NSAI Agrément identification mark and NSAI Agrément Certificate number for the system.

2.3.2 Storage

As materials are produced on site. Only the amount required for the individual project is produced, therefore no storage requirements are necessary on site.

The baseTherm® system includes a traceability capability and records the quantity of all constituents in the mix used.

2.3.3 Handling

Installation instructions and details, outlining the steps necessary to ensure correct and safe installation/application of the system, are included in the baseTherm® Technical Manual.

2.4 INSTALLATION

2.4.1 General Installation Procedures

This Certificate does not contain a complete set of installation instructions, but an overview of the procedures involved. For a full list of these instructions, refer to the Certificate holder’s manuals.

The baseTherm® Floor Insulation System is only installed by baseTherm® Ltd. strictly in accordance with I.S. EN 16025-2^[2].

The baseTherm® Floor Insulation System shall be laid continuously poured. Vertical upstands of insulation with a minimum thermal resistance of 1.0m²K/W should be placed at the floor slab /screed perimeter to minimize thermal bridging as required to meet guidance of the Acceptable Construction Details^[8] (ACD). In addition, where thermal lightweight blocks were used (outside the scope of this certificate) they must also meet the requirements of the ACD^[8]. See figures 1 and 2. Prior to installation, the building shall be inspected by the installer, to determine whether it is suitable for application of baseTherm®.

The installation of baseTherm[®] shall be carried out in accordance with I.S. EN 16025-2^[2] and the following recommendations. The requirements of S.R.54^[9] should also be considered for all retrofit applications.

2.4.2 Site Conditions & Preparation

The ambient temperature and the temperature of the supporting substrate should have a minimum of 5 °C and a maximum of 30 °C. Weather conditions shall be monitored in preparation for the installation to ensure that it facilitates application, including that the surface temperature of the installed BEPS is maintained above 5 °C during construction and for 4 days to 5 days after laying. In addition, where required, freshly installed BEPS should be protected from rapid drying by the sun by covering with plastic sheeting. The substrate must be clean, reasonably dry, free of grease and other impurities. The supporting substrate and structure shall be sufficiently stable and comply with TGD Part A.

2.4.3 Location of Services

When pipes and conduits are laid within the thickness of the BEPS, they should be firmly anchored in position. baseTherm[®] shall be installed to a minimum thickness of 50 mm above the pipes. If wiring cables are to be located in the baseTherm[®] system, they must be placed in conduits or appropriately shielded and rated in accordance with the requirements of I.S. 10101^[31].

2.4.4 Production

baseTherm[®] BEPS mortar is manufactured on site to the required quantity by a mobile insulation factory (e.g., Bremat) using the pre-determined recipes for baseTherm[®] Low Lambda, 150, 200 and 250. The mortar must be mixed for the predetermined period of time in order to obtain a homogeneous mixture and must be pumped by means of an (on-board) rotor/stator pump.

2.4.5 Installation

baseTherm[®] can be installed directly bonded onto a suitable load bearing floor or unbonded on a separating membrane (polythene). When installing baseTherm[®] to the first and subsequent floors of a building, ensure the substrate is watertight, as water may be released from the wet mortar. In such instances the baseTherm[®] can be installed unbonded on a separating membrane (polythene), with min. 100mm overlaps and taped. Highly absorbent substrates i.e., dehydrated concrete should be pre-dampened, prior to bonded installations. Structural movement joints in the substrate should be followed through in the baseTherm[®] BEPS mortar.

2.4.6 Apparent Density of The Installed Fresh Mortar

During installation, the installer shall examine the apparent density of the fresh mortar at least every 10 m³ as per I.S. EN 16025-2^[2]. For that purpose, at least 10 L of fresh mortar shall be put into a suitable vessel in accordance with EN 12350-6^[24]. The volume of the mortar contained in the vessel shall be determined with an accuracy of ± 0,5 % and its mass with an accuracy of ± 1g.

2.4.7 Declared installed thickness of the installed bound EPS (BEPS)

Minimum required thickness' is pre-determined by datum and continuously measured by staff and laser level during installation. The declared installed thickness shall be recorded on the baseTherm[®] Site Completion Report.

2.4.8 Declared installed thermal resistance

The declared thermal resistance (R-value) is calculated in accordance with I.S. EN ISO 6946^[12] and I.S. EN ISO 13370^[13]. The value of the declared installed thermal resistance shall be rounded downwards to the nearest 0.05 m²K/W and recorded on the baseTherm[®] completion report.

2.4.9 Declared Installed Bound EPS Density

The declared installed bound EPS density shall be determined with an accuracy of 1 kg/m³ and shall be recorded on the completion report as per I.S. EN 16025-2^[2].

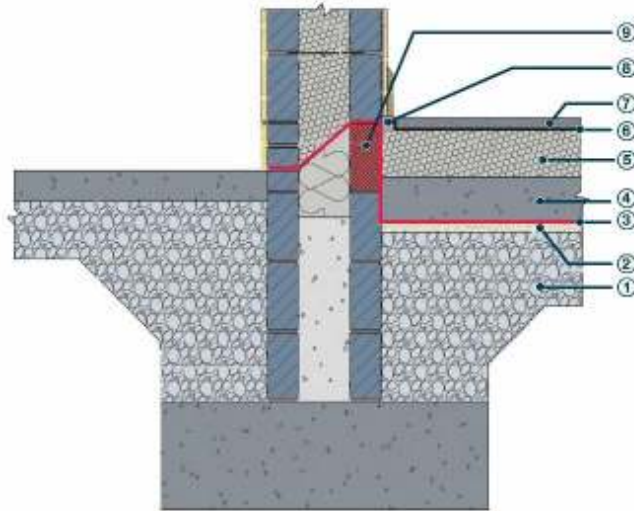
2.4.10 (Heated) Floor Screed

Depending on site conditions, after 72 hours to one week, when baseTherm[®] mortar is dry, a > 125-micron, (500 gauge) separation membrane is installed, prior to installation of underfloor heating pipes (if applicable). Edge insulation of 8mm minimum should be formed around the perimeter (walls, columns, etc.) as per BS 8204^[14]. After completion of these preparation works a self-smoothing screed to BS 8204-7^[14] or sand & cement screed to BS 8204-1^[15] can be installed. The heating pipes or cables should be fully secured to the surface of the BEPS to prevent flotation during screeding. The manufacturer of the heating system should provide their installation details, but it is essential to ensure that the heating elements cannot float.

2.4.11 Laying below the floor slab

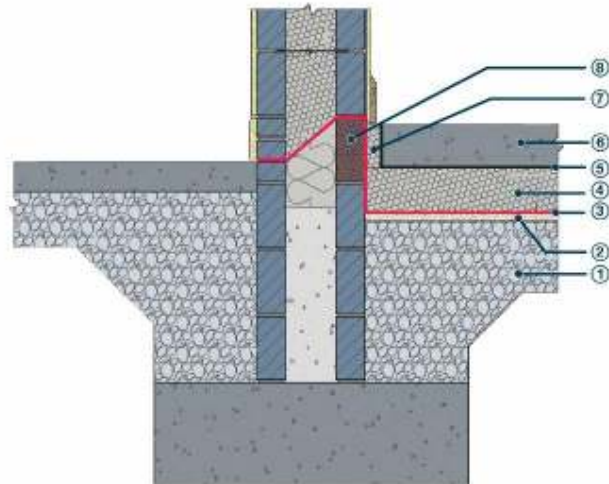
Where the baseTherm[®] Floor Insulation System is to be used below the floor slab, the hardcore should be laid in layers to meet the requirements of TGD Part C to the Irish Building Regulations. Each layer should be well-compacted with the surface blinded with quarry dust or sand to provide a suitable surface for laying a DPM (damp proof membrane).

A DPM, e.g., 1200-gauge polythene, or a radon barrier, (subject to site conditions), should be laid over the blinding with joints taped to prevent the passage of ground moisture. The DPM should be carried up the wall until it meets and seals with the DPC (damp proof course). A radon membrane, where installed, should extend to the outside of the building.



1. Compacted hardcore to engineer's specification and as per TGD Part C
2. Sand blinding
3. DPM/Radon membrane (Per TGD Part C, including outer leaf DPC 150mm min above ground level)
4. Concrete slab to engineer's specification
5. baseTherm®
6. Separation membrane
7. Floor screed to BS 8204
8. Edge insulation
9. Lightweight thermal block (where installed) to meet requirements of ACDs document

Figure 1: baseTherm® Above Slab



1. Compacted hardcore to engineer's specification and as per TGD Part C
2. Sand blinding
3. DPM/Radon membrane (Per TGD Part C, including outer leaf DPC 150mm min above ground level)
4. baseTherm®
5. Separation membrane
6. Concrete slab to engineer's specification Separation membrane
7. Edge insulation
8. Lightweight thermal block (where installed) to meet requirements of ACD document

Figure 2: baseTherm® Below Slab



Figure 3: baseTherm® pumping and levelling

3.1 GENERAL

The baseTherm® Floor Insulation System, when used in conjunction with concrete base/slabs or well compacted gravel on a DPM//radon membrane, and suitable applied floor finishes as specified in this Certificate, is effective for use as an insulated screed mortar (BEPS).

3.2 STRENGTH

The system when installed in accordance with the manufacturer's instructions and this Certificate, including a suitable floor screed to BS 8204^[15], will resist the loads likely to be met during installation and in service. See table 2. The certificate holder can offer additional guidance in this regard.

3.3 SERVICES

The installed and cured baseTherm® Floor Insulation System can accommodate underfloor heating systems. The maximum continuous working temperature of EPS is 50°C. Where underfloor heating systems are to be used, the advice of the Certificate holder should be sought.

When the source of space heating is underfloor heating, the maximum floor U-value shall be 0.15 W/m²K as per TGD Part L, and the baseTherm® Floor Insulation System will satisfy this requirement. See Table 3 - 6 of this certificate).

The baseTherm® poured Floor Insulation System fully encapsulates services where installed and leaves no uninsulated voids.

U-values may be affected by addition of any services installed prior to the application of the baseTherm® BEPS and should be considered when calculating the overall U-value of the floor.

3.4 THERMAL PERFORMANCE

The overall floor U-value will depend significantly on the deck U-value, the ratio of the exposed (and semi-exposed) floor perimeter length to floor area (P/A), the amount of underfloor ventilation and the ground thermal conductivity. Each floor U-value should be calculated in accordance with I.S. EN ISO 13370^[13]. See tables 3- 6 which offer sample U-Values for various P/A scenarios, highlighting current building regulation target values for retrofit and new build applications.

Where the target U-values cannot be achieved using the baseTherm® Floor Insulation System, additional measures may have to be considered. Reference shall always be made to latest Building Regulation TGD Part L guidance when determining the required product thickness.

The baseTherm® Floor Insulation System can help a floor to achieve and surpass back stop elemental U-values depending on the product/thickness used.

3.5 LIMITING THERMAL BRIDGING

Care must be taken in the overall design and construction of junctions between the floor and external, internal and party walls, to limit excessive heat loss and air infiltration.

Where necessary, 'Ψ' values for junctions should be assessed by an NSAI approved thermal modeller.

3.6 SURFACE CONDENSATION

Floors will adequately limit the risk of surface condensation when the thermal transmittance (U-value) does not exceed 0.7W/m²K at any point and the junctions with walls are in accordance with the relevant requirements of BRE Information Paper IP 1/06^[18].

Junction designs are acceptable when the temperature factor, f_{Rsi} , modelled in accordance with I.S. EN ISO 10211^[19] and BR 497^[20], meets or exceeds the critical temperature factors, f_{CRsi} , detailed in Tables 1 and 2 of BRE Information Paper IP 1/06^[18] for the relevant building type.

The baseTherm® Floor Insulation System will prevent the inclusion of any gaps through the insulation at service penetrations thus minimising the risk of surface condensation at these locations.

3.7 WATER PROOFING

Floor screeds in bathrooms should be adequately waterproofed by using a continuous waterproofing membrane prior to the installation of the final floor finish. Additional guidance can be sought from the certificate holder as required.

4.1 FIRE

In the event of a fire, baseTherm® will be contained within the floor by a mineral underlay and screed overlay until the screed overlay itself is destroyed. Therefore, it is considered that the system will not contribute to the developmental stage of a fire or present a smoke or toxic hazard.

baseTherm® Low Lambda and 150 achieved an A2, and the 200 /250 achieved an A1 reaction to fire classification per I.S. EN 13501-1^[21]. See table 2.

The baseTherm® Floor Insulation System is manufactured from EPS which contains a fire retardant.

As the baseTherm® Floor Insulation System is manufactured without the use of CFCs or HCFCs, there is no release of such toxic gas on burning.

4.2 THERMAL PERFORMANCE

When tested in accordance with I.S. EN 12667^[22] the thermal conductivity λ 90/90 of the baseTherm® range of floor insulation products have been declared as:

| Table 1 Thermal Conductivity λ 90/90 per EN 12667 ^[22] - W/mK | | | |
|--|-------|-------|-------|
| Low Lambda | 150 | 200 | 250 |
| 0.041 | 0.052 | 0.059 | 0.069 |

Examples of U-value calculation results are given in **Error! Reference source not found.** of this Certificate for a range of P/A ratios.

In addition, in-situ measurements of apparent density of the installed fresh mortar, declared installed thickness of the bound EPS mortar and declared installed thermal resistance are determined and recorded in accordance with the requirements of I.S. EN 16025-2^[2].

4.3 STRENGTH

Density values for the baseTherm® range of floor insulation products, tested in accordance with the requirements of I.S. EN 16025-1^[1] are shown in table 2 of this certificate. The Compressive strength, Compressibility, Creep and Dynamic Stiffness characteristics were also tested. See table 2 for details.

4.4 RESISTANCE TO MOISTURE

Tests were performed to determine the resistance of the product range to water absorption by short term partial immersion, See table 2 for details.

When installed in accordance with this certificate, with DPC and Radon membrane (where applicable) the baseTherm® range of floor insulation products will not be exposed to ground moisture.

4.5 DURABILITY AND MAINTENANCE

The baseTherm® Floor Insulation System, has been assessed against the requirements of I.S. EN 16025-1^[1] and I.S. EN 16025-2^[2] and are judged to be stable and will remain effective as an insulation system for the life of the building, once designed, manufactured and installed in accordance with this Certificate and the manufacturer's instructions.

As the product is confined and protected under the top screed and final floor covering, it will remain durable without the necessity for maintenance.

It is important to note that alterations to the building structure, subsequent to the installation of baseTherm® must take into account the integrity of the baseTherm® Floor Insulation System. Guidance from the certificate holder should be sought in all such instances.

4.6 SOUND

As per EN 16025-1^[1], dynamic stiffness, compressibility, and installed thickness have been tested/is determined (see table 2) to allow the calculation of the Impact Noise Transmission Index.

As per TGD Part E, all building, post completion must be subjected to acoustic testing. In all cases, where applicable, the values achieved for buildings incorporating the baseTherm® Floor Insulation System on separating floors design must meet TGD Part E requirements (i.e., impact ≤ 58 db, airborne ≥ 53 db).

4.7 TESTS AND ASSESSMENTS WERE CARRIED OUT IN ACCORDANCE WITH I.S. EN 16025-1^[1] TO DETERMINE THE FOLLOWING (See table 2 for details):

- Density (Apparent and Bound)
- Thermal conductivity
- Reaction to Fire
- Compressive strength
- Compressibility
- Creep
- Dynamic stiffness
- Water vapour diffusion resistance retransmission
- Water absorption
- Efficiency of the installation/application process
- Determination of product designation code

4.8 OTHER INVESTIGATIONS

- (i) The manufacturing process was examined, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.
- (ii) Site visits were conducted to assess the practicability of installation and the history of performance in use of the product.
- (iii) The certificate holder's installation control documentation was assessed, as well as the technical support to, and control of, installers of the system.
- (iv) All relevant installation control requirements of I.S. EN 16025-2^[2] were reviewed and considered satisfactory.

Table 2
baseTherm® Characteristics to I.S. EN 16025-1^[1]

| Essential Characteristics | Performance | | | | Test Standard |
|--|--|--|---|---|------------------------------------|
| | Low Lambda | 150 | 200 | 250 | |
| Designation Code | BEPS-EN 16025-1-PS6-D0-N-FMD178-DMD85-MU20-CS(10)100-CC(2/2/10)6.5-SD127-CP2 | BEPS-EN 16025-1-PS6-D0-N-FMD246-MU20-CS(10)150-CC(3/3/10)6.5-SD226-CP2 | BEPS-EN 16025-1-PS6-D0-N-FMD297-MU20-CS(10)400-CC1.5/1.5/10)6.5-SD253-CP2 | BEPS-EN 16025-1-PS6-D0-N-FMD353-MU20-CS(10)600-CC1.5/1.5/10)6.6-SD475-CP2 | EN 16025-1 ^[1] Cl. 6 |
| Particle size group of EPS | ≤ 6mm | ≤ 6mm | ≤ 6mm | ≤ 6mm | EN 993-1 ^[23] |
| Apparent density of fresh mortar ± 10% | ± 178 kg/m ³ | ± 246 kg/m ³ | ± 297 kg/m ³ | ± 353 kg/m ³ | EN 12350-6 ^[24] |
| Thermal Conductivity λ 90/90 | 0.041 W/mK | 0.052 W/mK | 0.059 W/mK | 0.069 W/mK | EN 12667 ^[22] |
| Bound EPS Density ± 10% | ± 85 kg/m ³ | ± 150 kg/m ³ | ± 200 kg/m ³ | ± 250 kg/m ³ | EN 1602 ^[11] |
| Reaction to Fire | Class A2 | Class A2 | Class A1 | Class A1 | EN 13501-1 ^[21] |
| Compressive Strength σ ₁₀ | CS (10)100 | CS (10)150 | CS (10)400 | CS (10)600 | EN 826 ^[25] |
| Compressibility | ≤ 2mm | ≤ 2mm | ≤ 2mm | ≤ 2mm | EN 12431 ^[26] |
| Creep | CC(2/2/10)3.5 CC(2/2/10)6.5 CC(3/3/10)10 | CC(3/3/10)3.5 CC(3/3/10)6.5 CC(2/2/10)10 | CC(2/2/10)3.5 CC(1.5/1.5/10)6.5 CC(2/2/10)10 | CC(2/2/10)3.5 CC(1.5/1.5/10)6.5 CC(2/2/10)10 | EN 1606 ^[27] |
| Water Vapour Diffusion Resistance | 5 to 20 | 5 to 20 | 5 to 20 | 5 to 20 | EN 12086 ^[28] |
| Water absorption by short term partial immersion | ≤ 2.6 kg/m ² | ≤ 2.0 kg/m ² | ≤ 1.6 kg/m ² | ≤ 0.8 kg/m ² | EN 1609 ^[29] |
| Dynamic Stiffness | 127 MN/m ³ | 226 MN/m ³ | 253 MN/m ³ | 475 MN/m ³ | EN 29052-1 ^[30] |

Table 3: Ground Floor Construction Typical U-values (W/m²K)
New/Existing Buildings Part L 2019
BaseTherm Low Lambda | λ 90/90 = 0.041 W/mK | λ Ground 2.0 (soil) / Wall thickness 350mm

| BaseTherm Thickness | Perimeter/Area (m ²) | | | | | |
|---------------------|----------------------------------|------|------|------|------|------|
| | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 |
| 100mm | 0.20 | 0.23 | 0.25 | 0.27 | 0.28 | 0.29 |
| 110mm | 0.19 | 0.22 | 0.24 | 0.25 | 0.26 | 0.27 |
| 120mm | 0.18 | 0.21 | 0.22 | 0.24 | 0.25 | 0.25 |
| 130mm | 0.17 | 0.20 | 0.21 | 0.22 | 0.23 | 0.24 |
| 140mm | 0.16 | 0.19 | 0.20 | 0.21 | 0.22 | 0.22 |
| 150mm | 0.16 | 0.18 | 0.19 | 0.20 | 0.21 | 0.21 |
| 160mm | 0.15 | 0.17 | 0.18 | 0.19 | 0.20 | 0.20 |
| 170mm | 0.15 | 0.17 | 0.18 | 0.18 | 0.19 | 0.19 |
| 180mm | 0.14 | 0.16 | 0.17 | 0.18 | 0.18 | 0.18 |
| 190mm | 0.14 | 0.15 | 0.16 | 0.17 | 0.17 | 0.17 |
| 200mm | 0.13 | 0.15 | 0.16 | 0.16 | 0.17 | 0.16 |
| 210mm | 0.13 | 0.14 | 0.15 | 0.16 | 0.16 | 0.16 |
| 220mm | 0.12 | 0.14 | 0.15 | 0.15 | 0.15 | 0.16 |
| 230mm | 0.12 | 0.13 | 0.14 | 0.14 | 0.15 | 0.15 |
| 240mm | 0.12 | 0.13 | 0.14 | 0.14 | 0.14 | 0.15 |
| 250mm | 0.11 | 0.12 | 0.13 | 0.14 | 0.14 | 0.14 |

- Those values shown in blue text fall below the required target values for new build (are relevant for retrofit applications only).

Table 4: Ground Floor Construction Typical U-values (W/m²K)
New Buildings Part L 2019
BaseTherm 150 | λ 90/90 = 0.052 W/mK / λ Ground 2.0 (soil) / Wall thickness 350mm

| BaseTherm Thickness | Perimeter/Area (m ²) | | | | | |
|---------------------|----------------------------------|------|------|------|------|------|
| | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 |
| 100mm | 0.22 | 0.26 | 0.29 | 0.31 | 0.33 | 0.34 |
| 110mm | 0.21 | 0.25 | 0.27 | 0.29 | 0.31 | 0.32 |
| 120mm | 0.20 | 0.24 | 0.26 | 0.28 | 0.29 | 0.30 |
| 130mm | 0.19 | 0.23 | 0.25 | 0.26 | 0.27 | 0.28 |
| 140mm | 0.19 | 0.22 | 0.24 | 0.25 | 0.26 | 0.27 |
| 150mm | 0.18 | 0.21 | 0.23 | 0.24 | 0.25 | 0.25 |
| 160mm | 0.17 | 0.20 | 0.22 | 0.23 | 0.24 | 0.24 |
| 170mm | 0.17 | 0.19 | 0.21 | 0.22 | 0.23 | 0.23 |
| 180mm | 0.16 | 0.19 | 0.20 | 0.21 | 0.22 | 0.22 |
| 190mm | 0.16 | 0.18 | 0.19 | 0.20 | 0.21 | 0.21 |
| 200mm | 0.15 | 0.17 | 0.19 | 0.19 | 0.20 | 0.20 |
| 210mm | 0.15 | 0.17 | 0.18 | 0.19 | 0.19 | 0.20 |
| 220mm | 0.14 | 0.16 | 0.17 | 0.18 | 0.19 | 0.19 |
| 230mm | 0.14 | 0.16 | 0.17 | 0.17 | 0.18 | 0.18 |
| 240mm | 0.14 | 0.15 | 0.16 | 0.17 | 0.17 | 0.18 |
| 250mm | 0.13 | 0.15 | 0.16 | 0.16 | 0.17 | 0.17 |

- Those values shown in blue text fall below the required target values for new build (are relevant for retrofit applications only).

Table 5: Ground Floor Construction Typical U-values (W/m²K)
New Buildings Part L 2019
BaseTherm 200 | λ 90/90 = 0.059 W/mK | λ Ground 2.0 (soil) / Wall thickness 350mm

| BaseTherm Thickness | Perimeter/Area (m ²) | | | | | |
|---------------------|----------------------------------|------|------|------|------|------|
| | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 |
| 100mm | 0.23 | 0.28 | 0.31 | 0.33 | 0.35 | 0.37 |
| 110mm | 0.22 | 0.27 | 0.29 | 0.32 | 0.33 | 0.34 |
| 120mm | 0.21 | 0.25 | 0.28 | 0.30 | 0.31 | 0.33 |
| 130mm | 0.21 | 0.24 | 0.27 | 0.29 | 0.30 | 0.31 |
| 140mm | 0.20 | 0.23 | 0.26 | 0.27 | 0.28 | 0.29 |
| 150mm | 0.19 | 0.22 | 0.25 | 0.26 | 0.27 | 0.28 |
| 160mm | 0.19 | 0.22 | 0.24 | 0.25 | 0.26 | 0.27 |
| 170mm | 0.18 | 0.21 | 0.23 | 0.24 | 0.25 | 0.26 |
| 180mm | 0.17 | 0.20 | 0.22 | 0.23 | 0.24 | 0.24 |
| 190mm | 0.17 | 0.19 | 0.21 | 0.22 | 0.23 | 0.23 |
| 200mm | 0.17 | 0.19 | 0.20 | 0.21 | 0.22 | 0.23 |
| 210mm | 0.16 | 0.18 | 0.20 | 0.21 | 0.21 | 0.22 |
| 220mm | 0.16 | 0.18 | 0.19 | 0.20 | 0.21 | 0.21 |
| 230mm | 0.15 | 0.17 | 0.18 | 0.19 | 0.20 | 0.20 |
| 240mm | 0.15 | 0.17 | 0.18 | 0.19 | 0.19 | 0.20 |
| 250mm | 0.14 | 0.16 | 0.17 | 0.18 | 0.19 | 0.19 |

- Those values shown in blue text fall below the required target values for new build (are relevant for retrofit applications only).

Table 6: Ground Floor Construction Typical U-values (W/m²K)
New Buildings Part L 2019
BaseTherm 250 | λ 90/90 = 0.069 W/mK | λ Ground 2.0 (soil) / Wall thickness 350mm

| BaseTherm Thickness | Perimeter/Area (m ²) | | | | | |
|---------------------|----------------------------------|------|------|------|------|------|
| | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 |
| 100mm | 0.24 | 0.30 | 0.34 | 0.36 | 0.39 | 0.40 |
| 110mm | 0.23 | 0.29 | 0.32 | 0.35 | 0.36 | 0.38 |
| 120mm | 0.23 | 0.27 | 0.31 | 0.33 | 0.35 | 0.36 |
| 130mm | 0.22 | 0.26 | 0.29 | 0.31 | 0.33 | 0.34 |
| 140mm | 0.21 | 0.25 | 0.28 | 0.30 | 0.31 | 0.33 |
| 150mm | 0.21 | 0.24 | 0.27 | 0.29 | 0.30 | 0.31 |
| 160mm | 0.20 | 0.24 | 0.26 | 0.28 | 0.29 | 0.30 |
| 170mm | 0.19 | 0.23 | 0.25 | 0.27 | 0.28 | 0.29 |
| 180mm | 0.19 | 0.22 | 0.24 | 0.26 | 0.27 | 0.27 |
| 190mm | 0.18 | 0.21 | 0.23 | 0.25 | 0.26 | 0.26 |
| 200mm | 0.18 | 0.21 | 0.23 | 0.24 | 0.25 | 0.25 |
| 210mm | 0.18 | 0.20 | 0.22 | 0.23 | 0.24 | 0.25 |
| 220mm | 0.17 | 0.20 | 0.21 | 0.22 | 0.23 | 0.24 |
| 230mm | 0.17 | 0.19 | 0.21 | 0.22 | 0.22 | 0.23 |
| 240mm | 0.16 | 0.19 | 0.20 | 0.21 | 0.22 | 0.22 |
| 250mm | 0.16 | 0.18 | 0.19 | 0.20 | 0.21 | 0.21 |

- Those values shown in blue text fall below the required target values for new build (are relevant for retrofit applications only).

5.1 National Standards Authority of Ireland ("NSAI") following consultation with NSAI Agrément has assessed the performance and method of installation of the product/process and the quality of the materials used in its manufacture and certifies the product/process to be fit for the use for which it is certified provided that it is manufactured, installed, used and maintained in accordance with the descriptions and specifications set out in this Certificate and in accordance with the manufacturer's instructions and usual trade practice. This Certificate shall remain valid for five years from date of latest revision so long as:

- (a) the specification of the product is unchanged.
- (b) the Building Regulations 1997 and subsequent revisions and any other regulation or standard applicable to the product/process, its use or installation remains unchanged.
- (c) the product continues to be assessed for the quality of its manufacture and marking by NSAI.
- (d) no new information becomes available which in the opinion of the NSAI, would preclude the granting of the Certificate.
- (e) the product or process continues to be manufactured, installed, used, and maintained in accordance with the description, specifications and safety recommendations set out in this certificate.
- (f) the registration and/or surveillance fees due to NSAI are paid.

5.2 The NSAI Agrément mark and certification number may only be used on or in relation to product/processes in respect of which a valid Certificate exists. If the Certificate becomes invalid the Certificate holder must not use the NSAI Agrément mark and certification number and must remove them from the products already marked.

5.3 In granting Certification, the NSAI makes no representation as to;

- (a) the absence or presence of patent rights subsisting in the product/process; or
- (b) the legal right of the Certificate holder to market, install or maintain the product/process; or
- (c) whether individual products have been manufactured or installed by the Certificate holder in accordance with the descriptions and specifications set out in this Certificate.

5.4 This Certificate does not comprise installation instructions and does not replace the manufacturer's directions or any professional or trade advice relating to use and installation which may be appropriate.

5.5 Any recommendations contained in this Certificate relating to the safe use of the certified product/process are preconditions to the validity of the Certificate. However, the NSAI does not certify that the manufacture or installation of the certified product or process in accordance with the descriptions and specifications set out in this Certificate will satisfy the requirements of the Safety, Health and Welfare at Work Act 2005, or of any other current or future common law duty of care owed by the manufacturer or by the Certificate holder.

5.6 The NSAI is not responsible to any person or body for loss or damage including personal injury arising as a direct or indirect result of the use of this product or process.

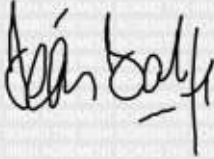
5.7 Where reference is made in this Certificate to any Act of the Oireachtas, Regulation made thereunder, Statutory Instrument, Code of Practice, National Standards, manufacturer's instructions, or similar publication, it shall be construed as reference to such publication in the form in which it is in force at the date of this Certification.

NSAI Agrément

This Certificate No. **22/0430** is accordingly granted by the NSAI to **Smet Building Products Limited** on behalf of NSAI Agrément.

Date of Issue: **26th May 2022**

Signed



Seán Balfe
Director of NSAI Agrément

Readers may check that the status of this Certificate has not changed by contacting NSAI Agrément, NSAI, 1 Swift Square, Northwood, Santry, Dublin 9, Ireland. Telephone: (01) 807 3800. Fax: (01) 807 3842. www.nsai.ie

Bibliography

- [1] I.S. EN 16025-1: 2013: *Thermal and/or sound insulating products in building construction - Bound EPS ballastings Part 1: Requirements for factory premixed EPS dry plaster.*
- [2] I.S. EN 16025-2: 2013: *Thermal and/or sound insulating products in building construction - Bound EPS ballastings Part 2: Processing of the factory premixed EPS dry plaster.*
- [3] I.S. EN 13163:2012+A1:2016; *Thermal insulation products for buildings – Factory made expanded polystyrene (EPS) products – Specification.*
- [4] I.S. EN 197-1:2011 *Cement – Part 1: Composition, specifications and conformity criteria for common cements.*
- [5] ISO 9001: 2015: *Quality management systems - Requirements.*
- [6] ISO 14001: 2015: *Environmental management systems - Requirements with guidance for use.*
- [7] ISO 45001: 2018: *Occupational health and safety – Requirements with guidance for use.*
- [8] *Acceptable Construction Details (ACD) to TGD Part L: 2021 Edition. Published by DoHLGH*
- [9] S.R.54: 2019: *Code of practice for the energy efficient retrofit of homes.*
- [10] I.S. EN 1991-1-1: 2002: *Eurocode 1: Actions on structures - part 1-1: general actions - densities, self-weight, imposed loads for buildings (including Irish national annex 2013).*
- [11] I.S. EN 1602:2013: *Thermal insulation products for building applications – Determination of the apparent density.*
- [12] I.S. EN ISO 6946:2017: *Building components and building elements - Thermal resistance and thermal transmittance - Calculation method.*
- [13] I.S. EN ISO 13370:2017: *Thermal performance of buildings – Heat transfer via the ground – Calculation methods.*
- [14] BS 8204-7: 2003: *Screeds,bases and in-situ floorings – Pumpable self-smoothing screeds - Code of Practice.*
- [15] BS 8204-1: 2003+A1:2009: *Screeds, bases and insitu flooring – Concrete bases and cementitious levelling screeds to receive floorings - Code of Practice.*
- [16] BS 8102:2022: *Protection of below ground structures against water ingress. Code of practice.*
- [17] CP 102:1973: *Code of practice for the protection of buildings against water from the ground (as read with AMD 1511, AMD 2196 and AMD 2470.*
- [18] BRE IP 1/06: *Assessing the effects of thermal bridging at junctions and around openings.*
- [19] I.S. EN ISO 10211:2017: *Thermal bridges in building construction – Heat flows and surface temperatures – Detailed calculations.*
- [20] BRE Report BR 497: *Conventions for calculation linear thermal transmittance and temperature factors.*
- [21] I.S. EN 13501-1:2018: *Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests.*
- [22] I.S. EN12667: *Thermal performance of building materials and products — Determination of thermal resistance by means of guarded hot plate and heat flow meter methods - Products of high and medium thermal resistance.*
- [23] I.S. EN 993-1: *Tests for geometrical properties of aggregates — Part 1: Determination of particle size distribution — Sieving method.*
- [24] I.S. EN 12350-6: *Testing fresh concrete — Part 6: Density.*
- [25] I.S. EN 826: *Thermal insulating products for building applications — Determination of compression behaviour.*
- [26] I.S. EN 12431: *Thermal insulating products for building applications — Determination of thickness for floating floor insulating products.*
- [27] I.S. EN 1606: *Thermal insulating products for building applications — Determination of compressive creep.*
- [28] I.S. EN 12086: *Thermal insulating products for building applications — Determination of water vapour transmission properties.*

- [29] I.S. EN 1609: *Thermal insulating products for building applications — Determination of short term water absorption by partial immersion.*
- [30] I.S. EN 29052-1: *Acoustics — Determination of dynamic stiffness — Part 1: Materials used under floating floors in dwellings.*
- [31] I.S. 10101: 2020: *National Rules for Electrical Installations.*