

SCOPE OF AGRÉMENT

This BDA Agrément® (hereinafter 'Agrément') relates to GDeck R1 EPS Panel System (hereinafter the 'System'). The System is formed from a range of expanded polystyrene (hereinafter 'EPS') panels and load-bearing rails, for use as thermal insulation in suspended ground floors. The System is for new dwellings, and buildings other than dwellings.

DESCRIPTION

The System comprises a range of Type R1 EPS 80 infill panels and EPS 250 load-bearing rails, for use as thermal insulation in suspended ground floors (over a sub-floor void). To be used in conjunction with a structural (concrete) base slab (manufactured by others).

ILLUSTRATION



THIRD-PARTY ACCEPTANCE

See Section 3.3 (Third-Party Acceptance).

STATEMENT

It is the opinion of Kiwa Ltd. that the System is safe and fit for its intended use, provided it is specified, installed and used in accordance with this Agrément.

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SUMMARY OF AGRÉMENT

This document provides independent information to specifiers, specialists, engineers, building control personnel, contractors, installers and other construction industry professionals who are considering the safety and fitness for purpose of the System. This Agrément covers the following:

- Conditions of use;
- Production Control, Quality Management System and the Annual Verification Procedure;
- System components and ancillary items, points of attention for the Specifier and examples of details;
- Installation;
- Independently assessed System characteristics and other information;
- Compliance with national Building Regulations, other regulatory requirements and Third-Party Acceptance, as appropriate;
- Sources.

MAJOR POINTS OF ASSESSMENT

Moisture control - see Section 2.2.7 - the System can limit the risk of interstitial and surface condensation.

Strength - see Section 2.2.8 - the System will act as formwork for a cast in-situ structural (concrete) base slab that shall transmit both dead and imposed floor loads.

Fire performance - see Section 2.2.9 - the System is classified as European Classification F, in accordance with BS EN 13501-1.

Thermal performance - see Section 2.2.10 - the System can enable a floor to meet the requirements of the national Building Regulations in respect of U-value performance.

Durability - see Section 2.2.11 - the System shall have a service life durability equivalent to that of the building into which it is incorporated.

UKCA, UKNI and CE marking - see Section 2.2.12 - the Agrément holder has responsibility for conformity marking, in accordance with all relevant British and European Product Standards.

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1 GENERAL CONSIDERATIONS

1.1 CONDITIONS OF USE

1.1.1 Limitations

This Agrément has been prepared in accordance with the mandatory requirements defined in the relevant Kiwa Technical Requirement. Some information in this Agrément is provided for guidance or reference purposes only; this information falls outside the scope of the Technical Requirement.

1.1.2 Application

The assessment of the System relates to its use in accordance with this Agrément and the Agrément holder's requirements.

1.1.3 Assessment

Kiwa Ltd. has assessed the System in combination with relevant test reports, technical literature, the Agrément holder's quality plan, DoPs and site visit, as appropriate.

1.1.4 Installation supervision

The quality of installation and workmanship shall be controlled by a competent person who shall be an employee of the installation company (hereinafter 'Installer').

The System shall be installed strictly in accordance with the instructions of the Agrément holder and the requirements of this Agrément.

1.1.5 Geographical scope

The validity of this document is limited to England, Wales, Scotland and Northern Ireland, with due regard to Section 3 of this Agrément (CDM, national Building Regulations and Third-Party Acceptance).

1.1.6 Validity

The purpose of this Agrément is to provide well-founded confidence to apply the System within the scope described. The validity of this Agrément is as published on www.kiwa.co.uk/bda.

1.2 PRODUCTION CONTROL AND QUALITY MANAGEMENT SYSTEM

Kiwa Ltd. has conducted an audit of the Agrément holder and determined that they fulfil all their obligations in relation to this Agrément in respect of the System.

The initial audit demonstrated that the Agrément holder has a satisfactory Quality Management System (QMS) and is committed to continuously improving their quality plan. Document control and record-keeping procedures were deemed satisfactory. A detailed Production Quality Specification (PQS) has been compiled to ensure traceability and compliance under the terms of this Agrément.

1.3 ANNUAL VERIFICATION PROCEDURE - CONTINUOUS SURVEILLANCE

To demonstrate that the System conforms with the requirements of the technical specification described in this Agrément, an Annual Verification Procedure has been agreed with the Agrément holder in respect of continuous surveillance and assessment, and auditing of the Agrément holder's QMS.

2 TECHNICAL ASSESSMENT

This Agrément does not constitute a design guide for the System. It is intended only as an assessment of safety and fitness for purpose.

2.1 SYSTEM COMPONENTS AND ANCILLARY ITEMS

2.1.1 Components included within the scope of this Agrément

The components listed in Table 1 below are integral to the System.

Table 1 - Integral components

Component	Description	Dimensions
EPS infill panels	GT09	1,200 mm length, 325 mm thick
	GT11	1,200 mm length, 300 mm thick
	GT12	1,200 mm length, 251 mm thick
	GT15	1,200 mm length, 230 mm thick
	GT18	1,200 mm length, 181 mm thick
EPS rails	white-coloured EPS 250 load-bearing rails with density of 30.5 to 34.3 kg/m ³ and λ_D 0.032 W/mK	1,200 mm or 600 mm in length, available in thicknesses from 101 mm to 220 mm

2.1.2 Ancillary items falling outside the scope of this Agrément

The following ancillary items detailed in this Section may be used in conjunction with the System, but fall outside the scope of this Agrément:

- galvanised steel edge clips (hereinafter 'edge clips');
- concrete closure blocks, manufactured in accordance with BS EN 771-3;
- structural (concrete) base slab;
- self-bearing precast pre-stressed concrete beams (hereinafter 'pre-stressed concrete beams');
- PsiStrip™ white or silver EPS.

2.2 POINTS OF ATTENTION TO THE SPECIFIER

2.2.1 Design

2.2.1.1 Design responsibility

A Specifier may undertake a project-specific design, in which case it is recommended that the Specifier co-operates closely with the Agrément holder. The Specifier or Installer is responsible for the final as-built design.

2.2.1.2 Basis of design

The characteristics detailed in the section titled 'Major Points of Assessment' shall be considered during the use of the System.

2.2.1.3 General design considerations

A project-specific design is required and shall give due consideration to the combinations of the System's components with other components such as concrete beam, concrete screed and insulation strips.

The layout of the System tolerances will be outlined and agreed with the project's designer prior to manufacture.

The System shall include suitable ventilation of the subfloor void (minimum 150 mm void between underside of the floor and the ground surface). In locations where clay heave is anticipated or has been confirmed by geotechnical investigations by a competent specialist, an additional void of up to 300 mm may be required to accommodate the possible expansion of the ground below the floor.

Where a void for ventilation is provided, this shall be designed in accordance with BS 5250 and the national Building Regulations with respect to provision and positioning of vents and ducts for adequate ventilation and drainage

If present in the ground, mould or fungal growth shall be treated prior to the application of the System.

Loadbearing walls shall not be placed on the EPS components.

The floor shall not be loaded with construction materials until the structural concrete topping has reached its design strength.

The performance of a floor construction will depend on the insulation properties and type of floor covering used. Resistance to concentrated and distributed loads is a function of the structural concrete topping specification. Further guidance on the suitability of floor overlays can be found in BS EN 13810-1, DD CEN/TS 13810-2, BS 8204-1, and BS EN 312.

The overlay to the System may require a vapour control layer (VCL) or gas membrane, in accordance with BS 8102 and CP 102, and a structural concrete screed, laid in accordance with the relevant clauses of BS 8204-1, BS 8204-2 and BS 8000-9. The thickness and class of the concrete screed shall be checked by a suitably qualified structural engineer on a project-specific basis.

A continuous damp-proof course (hereinafter 'DPC') shall be laid below the external walls in accordance with BS 8215. Care shall be taken to ensure the DPC is not damaged or displaced during installation of the System.

Electrical cables that are likely to come into contact with the EPS components shall be protected by a suitable conduit or PVC-U trunking. Consider de-rating electrical cables where the System restricts the air cooling of cables.

2.2.1.4 Project-specific design considerations

The project-specific design shall:

- be determined by the Specifier;
- consider intended working life and nominal cover to normal reinforcement;
- take into account the requirements of the relevant national Building Regulations - see Section 3.2;
- take into account the service life durability required - see Section 2.2.11.

A pre-installation survey is required to allow determination of the project-specific design - see Section 2.4.1.

2.2.2 Applied building physics (heat, air, moisture)

A Specialist shall check the hygrothermal behaviour of a project-specific design incorporating the System and, if necessary, offer advice on improvements to achieve the final specification. The Specialist can be either a qualified employee of the Agrément holder or a suitably qualified consultant (in which case it is recommended that the Specialist co-operates closely with the Agrément holder).

2.2.3 Permitted applications

Only applications designed according to the specifications given in this Agrément are permitted. In each case, the Specifier and Installer shall co-operate closely with the Agrément holder.

2.2.4 Installer competence level

The System shall be installed strictly in accordance with the instructions of the Agrément holder and the requirements of this Agrément.

Installation can be undertaken by competent persons experienced in this type of work.

2.2.5 Delivery, storage and site handling

The System components are delivered in suitable packaging bearing relevant identification information (such as the System name, production identification date or batch number, the Agrément holder's name, etc.) and, where applicable, the BDA Agrément® logo incorporating the number of this Agrément.

Prior to installation, the System components shall be stored in accordance with the Agrément holder's requirements. Good housekeeping protocols shall be followed to avoid damage. When required, particular care shall be taken to:

- avoid exposure to direct sunlight for extended periods of time;
- avoid exposure to high or low temperatures for extended periods of time;
- store System components in a well-ventilated covered area to protect them from rain, frost and humidity;
- store System components away from possible ignition sources.

The System components shall be stored in clean, dry conditions, stacked on a flat base, off the ground in order to avoid contamination. Care shall be taken to avoid contact with organic solvents. Damaged or wet System components shall not be used. System components shall be protected from contaminants after installation.

2.2.6 Maintenance and repair

Once installed, the System components are within the floor structure, and therefore the System does not require regular maintenance. For advice in respect of repair, consult the Agrément holder.

For specific calculation for robust details of wall and floor, the Agrément holder can provide a technical consulting service for calculations and installation advice.

Performance factors in relation to the Major Points of Assessment

2.2.7 Moisture control

Condensation risk

External walls and ground floors incorporating the System will adequately limit the risk of interstitial condensation when designed in accordance with BS 5250. A condensation risk analysis shall be completed by the Specifier at design stage.

To minimise the risk of interstitial condensation:

- there shall be an underfloor void of at least 150 mm which incorporates ventilation openings in opposing external walls to facilitate cross ventilation. Ventilation openings shall be a minimum of 1,500 mm² for every metre run of wall, or 500 mm² for at least every square metre of floor area, depending which ratio results in the largest opening area;
- wall insulation shall extend to at least 150 mm below the top of the EPS infill panels.

To minimise the risk of condensation, any gaps around service penetrations shall be filled (e.g. with expanding foam) or sealed.

2.2.8 Strength

The System requires a structural (concrete) base slab. A non-structural topping or screed can be applied to the structural (concrete) base slab to form grounds for the final flooring or to serve as flooring (wearing screed). Note: a screed is different from a base slab with regard to the load-bearing capacity; a screed primarily has to resist compression not bending and puncture.

Guidance regarding the method of construction of a floor, including recommendations for the concrete strength of slabs, can be provided by the Agrément holder and is given in BS 8204-1; for characteristic floor loads see Table 4.

The design of a structural (concrete) base slab and specification of concrete shall be done by a specialist; specification of screed shall be by a designer while screed material proportions should be established by the contractor or supplier of the screed, in close co-operation with the designer.

Welded steel mesh, ribbed steel bars and/or steel or macro-polymer fibres can be used as reinforcement to cope with tensile stresses and shear stresses. TR34 provides guidance relating to a structural (concrete) base slab with fibres.

The calculation of the ultimate moment capacity (M_u) of a base slab varies for fibre-only, fibre plus bar reinforcement where $A_s < 0.15\%$ and fibre plus bar reinforcement where $A_s \geq 0.15\%$.

The EPS infill panels and EPS load-bearing rails provide a permanent formwork for a structural (concrete) base slab; only the rails distribute loads to the self-bearing beams when the structural (concrete) base slab or screed has hardened.

The EPS infill panels are designed to have a 20 mm bearing on prestressed concrete beams; an allowance of 5 mm is made for manufacturing tolerances in the beams and misalignment during installation; always maintain a minimum bearing of 15 mm.

To reduce the risk of accidental penetration of the EPS infill panels during construction when steel mesh or bars are used as reinforcement, place reinforcement spacers (four per m^2 and with dimensions not less than 50 mm by 50 mm) over the EPS infill panels and load-bearing rails.

General guidance and recommendations relating to the exchange of information and site work are given in BS 8204-1 while basic workmanship is addressed in code of practice BS 8000-2.2; additional requirements for execution can be found in BS EN 13670 (a standard intended to be a link between design and execution, and to give guidance on documentation); employ qualified persons (e.g. a structural engineer) for design and specifications.

Examples of typical pre-stressed concrete beams are given in Diagram 4. Concrete beams shall be self-bearing and be UKCA/CE marked.

Table 2 - concrete specifications for single-family, self-contained dwelling with the characteristic imposed loads given in Table 4

Grade ^a	Maximum aggregate size (mm)	Type	Reinforcement type and specification
C25/30	20	Standard	Conventional reinforcement: - one-layer A142 steel mesh to BS 4483 with characteristic yield strength of (f_{yk}) 500 N/mm²; nominal cover to reinforcement shall be 35 mm. Macro-fibre (Class II) reinforcement: - Durus S400 (4.0 kg/m³), Novomesh B&BA (macro, 3.33 kg/m³), Durus Easy Finish (2.50 kg/m³). Steel fibre reinforcement: - Adfil SF86 (7.55 kg/m³), SikaFiber® - 1050 B&BA HF (11.50 kg/m³).

^a minimum concrete cover shall be 50 mm above services

Table 3 - concrete specifications for commercial buildings with the characteristic imposed loads given in Table 4

Grade ^a	Maximum aggregate size (mm)	Type	Reinforcement type and specification
C25/30	10	Self-levelling, self-compacting	Steel mesh
C28/35	20	Conventional	Steel mesh

^a minimum concrete cover shall be 50 mm above services

Table 4 - imposed loads for dwelling units, communal areas and commercial buildings

Description	Characteristic value of loads for...		
	Single-family dwellings	Communal areas in blocks of flats	Commercial buildings
Uniformly distributed load, q_k (kN/m ²)	1.5	3.0	2.0 to 7.5
Concentrated load, Q_k (kN)	2.0	4.5	1.5 to 7.0
Allowance for moveable partitions (kN/m ²) when self-weight ≤ 3.0 kN/m	0.5 to 1.2	N/A	0.5 to 1.2

Remarks:

- specific values for dwelling units and communal areas are given in the Tables NA.2, NA.3 and NA.6 in the UK National Annex to BS EN 1991-1-1;
- specific values for commercial buildings are given in Tables NA.2 and NA.3 in the UK National Annex to BS EN 1991-1-1 and/or PD 6688-1-1;
- do not combine distributed loads with point loads or with line loads (self-weight of partition walls);
- commercial buildings do not include areas for storage and industrial activities.

2.2.9 Fire performance

The System is classified as European Classification F, in accordance with BS EN 13501-1.

2.2.10 Thermal performance

For the purpose of U-value calculations, and to determine if the requirements of national Building (or other statutory) Regulations are met, the thermal resistance of pitched roof incorporating the System shall be calculated in accordance with BS EN ISO 10211 (taking into consideration BS EN ISO 6946, BS EN ISO 10456 and BRE Report 443), using the System's declared thermal conductivity (λ_D) detailed in Section 2.5.4.

The Agrément holder can provide a service for 2D and 3D calculations for numerically modelled EPS panel and beam configurations, complying to BS EN ISO 13370, BS EN ISO 10211 and BRE Report 497.

The U-values of the building fabric elements shall not exceed the maximum values as given in the national Building Regulations and are to be calculated according to methods and conventions as given in those documents.

Thermal bridging at junctions and around openings

The Agrément holder provides a design service to enhance the benefit of the System in terms of improved ψ -values; including external walls, party walls, thresholds and temperature factors. Modelling undertaken according to BRE Report 497 and the guidance in the documents supporting the national Building Regulations. Consult the Agrément holder for further details.

Guidance on linear thermal transmittance, heat flows and surface temperature factors can be found in the documents supporting the national Building Regulations and in BS EN ISO 10211, BRE Information Paper 1/06, BRE Report 262 and BRE Report 497. If required, further information can be provided by the Agrément holder.

The ψ -values depend on several parameters such as System variants (Diagram 1); beam dimensions (Diagram 4), EPS infill panel and beam configurations, external wall configurations and foundation configurations.

Table 5 - default ψ -values (W/mK) according to Table K1 in SAP 2012

Junction	ψ -value
External wall (with ground floor, ref. E5)	0.32
Party wall (with ground floor, ref. P1)	0.16

2.2.11 Durability

The service life durability of the System shall have a service life durability equivalent to that of the building into which it is incorporated. The expected lifespan of the building itself shall be at least 60 years.

Once installed, the System is not susceptible to damage from environmental conditions normally encountered in the UK.

EPS components may deteriorate when subjected to volatile organic compounds (VOCs) or other gases, and where such conditions apply, an assessment shall be made by a suitably qualified person to determine the compatibility of the EPS with any potential emissions.

The suitability of reinforced or pre-stressed concrete with regard to durability depends on many aspects (e.g. compressive strength class and maximum w/c-ratio) and the working life; for concrete with a maximum aggregate size of 20 mm, durability recommendations are given in Tables A.4 and A.5 in standard BS 8500-1.

2.2.12 UKCA, UKNI and CE marking

The British and European standard for the System is BS EN 15037-4.

2.3 EXAMPLES OF TYPICAL DETAILS

Diagram 1 - Range of GDeck R1 EPS panels

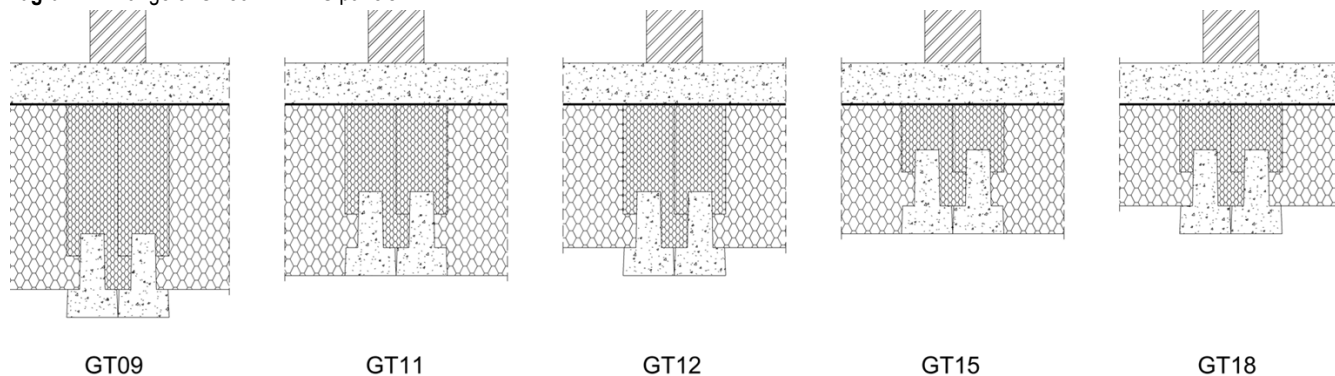


Diagram 2 - Full-size (left) and half-size (right) EPS infill panels (Figures separated by commas indicate available size variations)

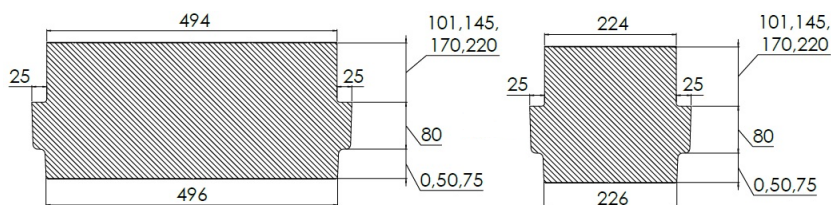


Diagram 3 - EPS load-bearing rails for 150 mm and 175 mm deep beams

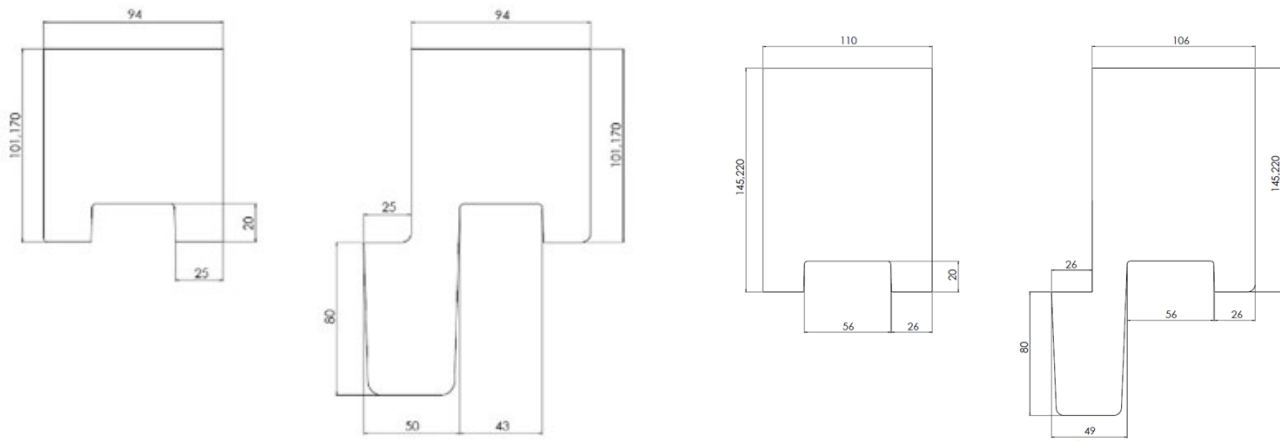


Diagram 4 - Typical prestressed concrete beams (where H_w = width of the beam header, all dimensions in mm)

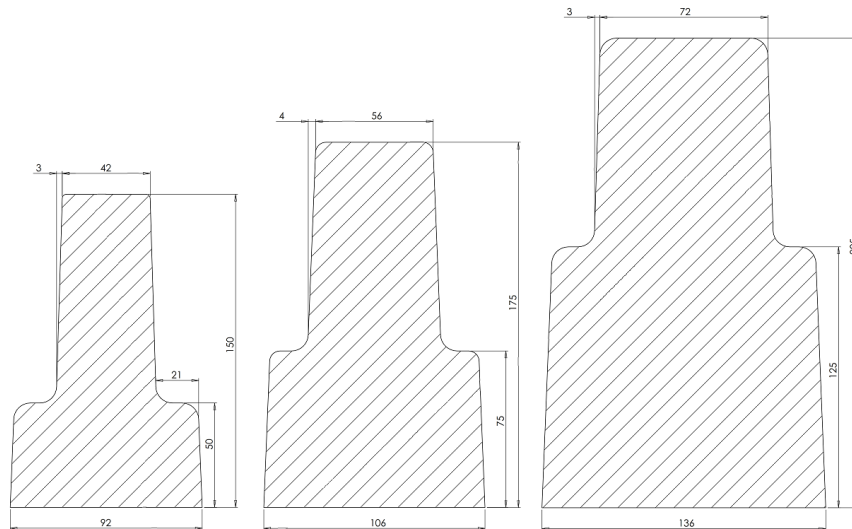


Diagram 5 - System variant GT12 (depth 250 mm) floor/wall junction

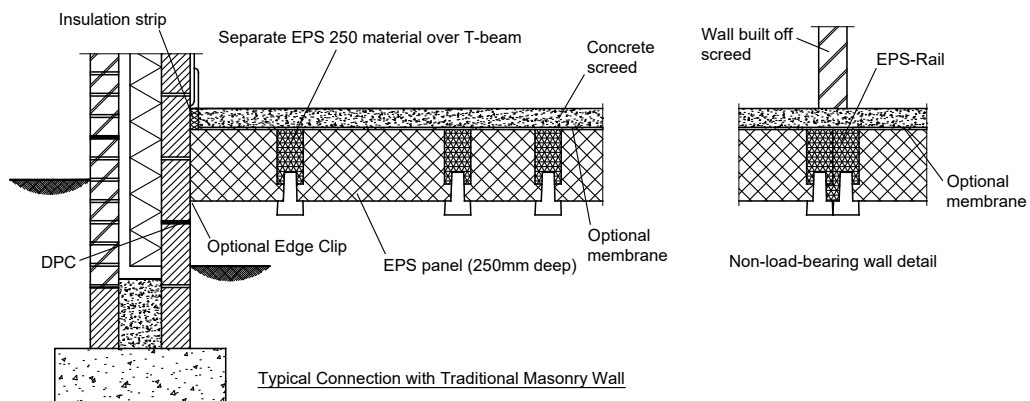


Diagram 6 - System variant GT15 (depth 230 mm) floor/wall junction

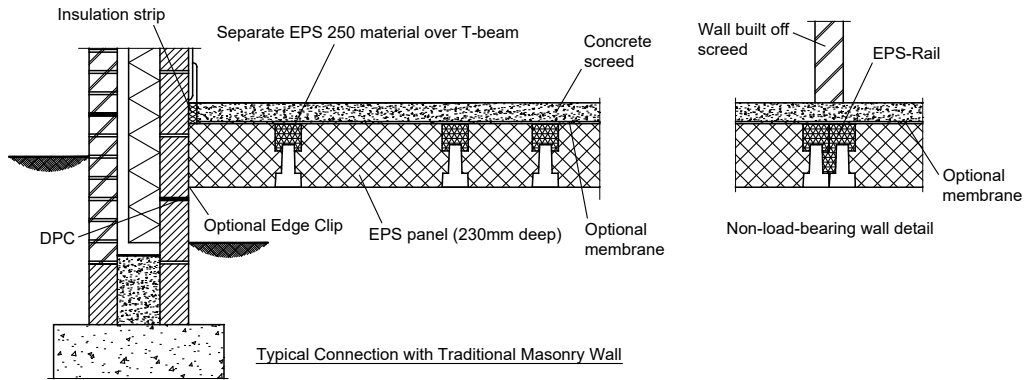


Diagram 7 - System variant GT18 (depth 180 mm) floor/wall junction

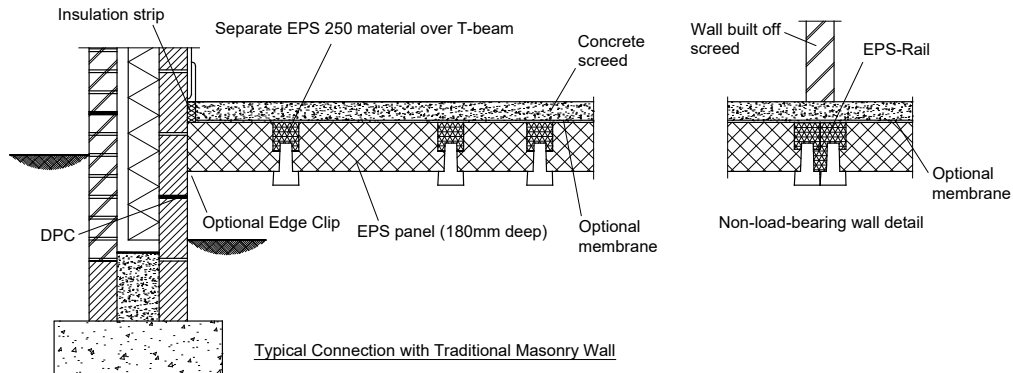
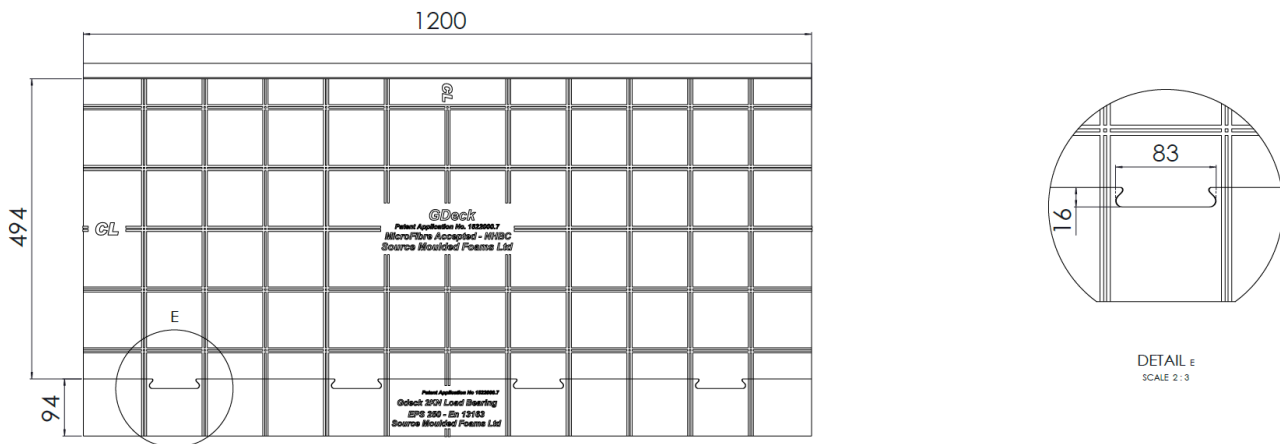


Diagram 8 - White top rail - silver panel interlocking detail



2.4 INSTALLATION

The System shall be installed strictly in accordance with the instructions (hereinafter 'Installation Manual') of the Agrément holder, the requirements of this Agrément and the requirements of BS 8000-0.

2.4.1 Project-specific installation considerations

The project-specific design shall be determined from a pre-installation survey.

2.4.2 Preparation

The following considerations apply before starting the work:

- the EPS infill panels and EPS load-bearing rails provide a platform for foot traffic and are formwork for the structural (concrete) base slab. However, the System is not intended as a working platform - unless provision is made to spread the working load e.g. boarding the floor. Localised provision e.g. one pallet of materials up to 1,200 kg, can be achieved with two loaded parallel scaffolding boards perpendicular to rails. The minimum specification for the working platform is two GT infill panels (as per Table 1) combined with three EPS rails (as evidenced in a test with a thickness of 150 mm);
- the ground beneath the floor does not need to be raised to the external ground level if there is a good natural drainage or if site drains prevent water standing under the floor;
- under the ground floor a layer of oversite concrete or other surface seal is not required, however the ground shall be free of vegetation and topsoil. Any material used to level the ground shall be hard and dry;
- typically, a minimum void of 150 mm (300 mm in high heave soils) shall be maintained between the underside of the polystyrene and the ground surface, this shall be confirmed with local authority building control;

- along the strip/wall supporting the floor beams a continuous DPC shall be installed, at the level or below the bearing of the beams, in accordance with BS 8215 or code of practice PD 6697.

The following works shall be undertaken before installing the System:

- ensure a ventilated airspace is provided beneath the infill panels of at least 150 mm; ventilators in the perimeter wall shall allow air to pass beneath the EPS infill panels;
- a DPC shall be placed over all bearings prior to placing the beams for the ground floor; all bearings shall be level and true, ensure a bearing of 90 mm is maintained;
- inverted 'T' pre-stressed concrete beams shall be placed in accordance with the relevant design drawings and guidelines supplied by the beam designer.

2.4.3 Outline installation procedure

Detailed installation procedures can be found in the Agrément holder's Installation Manual.

The outline procedure is as follows:

Installation of the pre-stressed concrete beams

- use concrete closure blocks or EPS infill panels as an aid to determine the spacing or centre distances between the pre-stressed concrete beams;
- inner leaf blockwork shall be brought up to finished floor level where running parallel to the pre-stressed concrete beams; if not, use edge clips to support infill panels;
- to ease installation, the position of pre-stressed concrete beams can be adjusted to accurately fit male or female EPS infill panels after cutting.

Installation of the EPS infill panels

- to aid cutting, the EPS infill panels have imprinted guidelines; EPS infill panels will fill the space between the beams to the shoulder/ledge or the bottom of a beam (depends on the system variant that is being installed);
- ensure the EPS infill panels achieve a full 20 mm bearing on the beam; accommodate openings for service pipes;
- first row: if necessary, a cut row is formed along the perimeter, parallel with the beams, by cutting an EPS infill panel lengthwise; the male part is tightly placed between the beam and wall (if the inner leaf is built to the finished floor level) or is supported at the underside by edge clips; keep the female part for use in the last row;
- intermediate rows: place the EPS load-bearing rail over the top of a beam and check if the minimum length of a rail is not less than 300 mm; use multi-rails in case of multiple/grouped beams;
- at the end of a row, cut the EPS infill panels to fit and use the 'offcut' as a starter block for the next row; a panel cut to a length of 300 mm or less shall be placed at the edge of the floor, being cautious to avoid damage by foot traffic;
- last row: use the female part (the remaining part of the panel used for the first row); cut to width if necessary and place between the beam and wall with a tight fit or use edge clips.

Remark: the EPS infill panels and EPS load-bearing rails provide a platform for foot traffic and are formwork for the structural (concrete) base slab. However, the System is not intended as a working platform. The floor shall be boarded if a working platform is required.

2.4.4 Finishing

The following finishing is required on completion of the installation:

- concrete closure blocks are provided where the beams take bearing on the inside skin of a cavity wall;
- profiled EPS end blocks can be supplied by the Agrément holder, or alternatively they can be cut on site from a full or half panel; EPS end blocks shall not be more than 300 mm wide at the top;
- a gas barrier membrane can be installed where required and laid over the floor in accordance with the Agrément holder's requirements;
- after fitting service pipes through openings in the EPS infill panels, seal gaps around the pipes with foam insulation;
- in applications where underfloor heating is used with the System, this shall be clipped to a clamp track (stapling should be avoided as this may penetrate the membrane), and the tails brought up to the manifold.

Concrete work

- to avoid damage to the System, the structural (concrete) base slab shall be laid as soon as possible after the panels have been installed;
- PsiStrip™ is placed along the perimeter edge of the structural (concrete) base slab to reduce thermal bridging at the perimeter wall;
- concrete should not be poured on the panels and rails from heights greater than 500 mm and in concrete heaps over 300 mm high;
- the fibre content of delivered concrete shall be tested in accordance with BS EN 14488-7; for steel fibres use samples of fresh or hardened concrete; for polymer macro-fibres only use samples of fresh concrete.

2.5 INDEPENDENTLY ASSESSED SYSTEM CHARACTERISTICS

2.5.1 Moisture control

Test	Standard	Result	
		EPS 250 White	EPS 80 Grey
Water vapour diffusion resistance factor, μ	BS EN 13163	40 - 100	20 - 40

2.5.2 Strength

Test	Standard	Result	
		EPS 250 White	EPS 80 Grey
Maximum characteristic concentrated load P_{Rk}	BS EN 15037-4	R2	R1
Compressive stress at 10% deformation	BS EN 206	250 kPa	80 kPa

2.5.3 Fire performance

Test	Standard	Result	
		EPS 250 White	EPS 80 Grey
Reaction to fire classification	BS EN 13501-1	F	

2.5.4 Thermal performance

Test	Standard	Result	
		EPS 250 White	EPS 80 Grey
Declared thermal conductivity (λ_D)	BS EN 12667	0.032 W/mK	0.030 W/mK

3.1 THE CONSTRUCTION (DESIGN AND MANAGEMENT) REGULATIONS 2015 AND THE CONSTRUCTION (DESIGN AND MANAGEMENT) REGULATIONS (NORTHERN IRELAND) 2016

Information in this Agrément may assist the client, principal designer/CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

3.2 THE NATIONAL BUILDING REGULATIONS

In the opinion of Kiwa Ltd., the System, if installed and used in accordance with Section 2 of this Agrément, can satisfy or contribute to satisfying the relevant requirements of the following national Building Regulations.

This Agrément shall not be construed to confer the compliance of any project-specific design with the national Building Regulations.

3.2.1 England**The Building Regulations 2010 and subsequent amendments**

- A1 Loading - the System requires a structural (concrete) base slab to sustain and transmit dead and imposed floor loads to the ground
- C2(a)(c) Resistance to moisture - to limit the risk of (a) ground moisture and (c) surface and interstitial condensation, use an adequately ventilated void or use an appropriate damp proof membrane
- L1(a)(i) Conservation of fuel and power - the System will contribute to satisfying this Requirement
- Regulation 7 Materials and workmanship - the System is manufactured from suitably safe and durable materials for its application and can be installed to give a satisfactory performance
- Regulation 26 CO₂ emission rates for new buildings - the System will contribute to satisfying this Regulation
- Regulation 26A Fabric energy efficiency rates for new dwellings - the System will contribute to satisfying this Regulation
- Regulation 26C Target primary energy rates for new buildings - the System will contribute to satisfying this Regulation

3.2.2 Wales**The Building Regulations 2010 and subsequent amendments**

- A1 Loading - the System requires a structural (concrete) base slab to sustain and transmit dead and imposed floor loads to the ground
- C2(a)(c) Resistance to moisture - to limit the risk of (a) ground moisture and (c) surface and interstitial condensation, use an adequately ventilated void or use an appropriate damp proof membrane
- L1(a)(i) Conservation of fuel and power - the System will contribute to satisfying this Requirement
- Regulation 7 Materials and workmanship - the System is manufactured from suitably safe and durable materials for its application and can be installed to give a satisfactory performance
- Regulation 26 CO₂ emission rates for new buildings - the System will contribute to satisfying this Regulation
- Regulation 26A Primary energy rates for new buildings - the System will contribute to satisfying this Regulation
- Regulation 26B Fabric performance values for new dwellings - the System will contribute to satisfying this Regulation
- Regulation 26C Energy efficiency rating - the System will contribute to satisfying this Regulation

3.2.3 Scotland**The Building (Scotland) Regulations 2004 and subsequent amendments****3.2.3.1 Regulation 8(1)(2) Durability, workmanship and fitness of materials**

- The System is manufactured from acceptable materials and is adequately resistant to deterioration and wear under normal service conditions

3.2.3.2 Regulation 9 Building Standards - Construction

- 1.1(a)(b) Structure - the System requires a structural (concrete) base slab to sustain and transmit dead and imposed floor loads to the ground
- 3.4 Moisture from the ground - to limit the risk of ground moisture, use an adequately ventilated void or use an appropriate damp proof membrane
- 3.15 Condensation - to limit the risk of surface and interstitial condensation, apply permanent ventilation of the under floor space by means of ventilators in external walls on opposite sides of the building (open area in each wall is 1500 mm² for every metre run of wall, or 500 mm² for at least every square metre of floor area); the ventilated space must be 150 mm between solum and the underside of the floor
- 6.2 Building insulation envelope - the System will contribute to satisfying this Regulation
- 7.1(a)(b) Statement of sustainability - the EPS infill panels can contribute to satisfying the relevant Requirements of Regulation 9, Standards 1 to 6, and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard; in addition, the panels can contribute to a construction meeting a higher level of sustainability as defined in this Standard

3.2.3.3 Regulation 12 Building Standards - Conversions

- All comments given under Regulation 9 also apply to this Regulation, with reference to Schedule of Building (Scotland) Regulations 2004 and subsequent amendments and clause 0.12 of the Technical Handbook (Domestic) and clause 0.12 of the Technical Handbook (Non-Domestic)

3.2.4 Northern Ireland**The Building Regulations (Northern Ireland) 2012 and subsequent amendments**

- 23(1)(a)(i)(iii)(b) Fitness of materials and workmanship - the System is manufactured from materials which are considered to be suitably safe and acceptable for use as thermal insulation
- 28(a) Resistance to moisture and weather - the System can be constructed so as to prevent any harmful effect on the building or the health of the occupants caused by the passage of moisture to any part of the building from the ground
- 29 Condensation - the EPS infill panels and load-bearing rails will contribute to limiting the risk of surface and interstitial condensation
- 30 Stability - the System requires a structural (concrete) base slab to sustain and transmit dead and imposed floor loads to the ground
- 39(a)(i) Conservation measures - the System will contribute to satisfying this Regulation
- 40(2) Target carbon dioxide emission rate - the System will contribute to satisfying this Regulation

In the opinion of Kiwa Ltd. if installed, used, and maintained in accordance with this Agrément, this System can satisfy the appropriate structural, moisture, thermal and durability requirements of a Structural Warranty provider. Please contact the relevant Structural Warranty provider to ascertain their project-specific design requirements and to confirm their acceptance on a case-by-case basis.

4 SOURCES

- BS EN ISO 6946:2017 Building components and building elements. Thermal resistance and thermal transmittance. Calculation method
- BS EN ISO 9001:2015+A1:2024 Quality management systems. Requirements
- BS EN ISO 10211:2017 Thermal bridges in building constructions. Calculation of heat flows and surface temperatures
- BS EN ISO 13370:2017 Thermal performance of buildings. Heat transfer via the ground. Calculation methods
- BS EN ISO 10456:2007 Building materials and products. Hygrothermal properties. Tabulated design values and procedures for determining declared and design thermal values
- BS EN 206:2013+A2:2021 Concrete. Specification, performance, production and conformity
- BS EN 312:2010 Particleboards. Specifications
- BS EN 771-3:2011+A1:2015 Specification for masonry units - Aggregate concrete masonry units (Dense and lightweight aggregates)
- BS EN 1991-1-1:2002 Eurocode 1. Actions on structures - General actions - Densities, self-weight, imposed loads for buildings
- NA to BS EN 1991-1-1:2002 UK National Annex to Eurocode 1. Actions on structures - General actions. Densities, self-weight, imposed loads for buildings
- BS EN 12667:2001 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
- BS EN 13163:2012+A1:2016 Thermal insulation products for buildings. Factory made expanded polystyrene (EPS) products. Specification
- BS EN 13501-1:2018 Fire classification of construction products and building elements. Classification using data from reaction to fire tests
- BS EN 13810-1:2002 Wood-based panels. Floating floors - Performance specifications and requirements
- BS EN 14488-7:2006 Testing sprayed concrete - Fibre content of fibre reinforced concrete
- BS EN 15037-4:2010+A1:2013 Precast concrete products. Beam-and-block floor systems. Expanded polystyrene blocks
- BS 5250:2021 Management of moisture in buildings. Code of practice
- BS 8000-0:2014+A1:2024 Workmanship on construction sites. Introduction and general principles
- BS 8000-2.2:1990 Workmanship on building sites. Code of practice for concrete work - Sitework with in situ and precast concrete
- BS 8000-9:2003 Workmanship on building sites - Cementitious levelling screeds and wearing screeds. Code of practice
- BS 8102:2022 Protection of below ground structures against water ingress. Code of practice
- BS 8204-1:2003+A1:2009 Screeds, bases and in situ floorings - Concrete bases and cementitious levelling screeds to receive floorings. Code of practice
- BS 8204-2:2003+A2:2011 Screeds, bases and in situ floorings - Concrete wearing surfaces. Code of practice
- BS 8215:1991 Code of practice for design and installation of damp-proof courses in masonry construction
- BS 8500-1:2023 Concrete. Complementary British Standard to BS EN 206 - Method of specifying and guidance for the specifier
- BRE Information Paper 1/06:2006 Assessing the effects of thermal bridging at junctions and around openings
- BRE Report 262:2002 Thermal insulation: avoiding risks
- BRE Report 443:2019 Conventions for U-value calculations
- BRE Report 497:2016 Conventions for calculating linear thermal transmittance and temperature factors
- CP 102:1973 Code of practice for protection of buildings against water from the ground
- DD CEN/TS 13810-2:2003 Wood-based panels. Floating floors - Test methods
- PD 6688-1-1:2011 Recommendations for the design of structures to BS EN 1991-1-1
- PD 6697:2019 Recommendations for the design of masonry structures to BS EN 1996-1-1 and BS EN 1996-2
- SAP 2012 Conventions, version 9.92, October 2013

Remark - Apart from these sources, technical information and confidential reports have been assessed; any relevant documents are in the possession of Kiwa Ltd. and are kept in the Technical Assessment File of this Agrément. The Installation Manual for the System may be subject to change; contact the Agrément holder for the clarification of revisions.

5 AMENDMENT HISTORY

Revision	Amendment description	Author	Approver	Date
-	First issue (as BAF 17-059/01/A)	N Hendriks	C van der Meijden	April 2018
A	Reissued as BAF-17-059-S-A-UK	C Devine	C Vurley	December 2020
B	Updated	C Devine	C Vurley	February 2021
C	Reissue upon successful 3 Year Renewal	C Devine	C Vurley	May 2021
D	Migration into current UK template; reissue upon successful 3 Year Renewal; additional components	M Javed	C Devine	May 2025
E	Amendment to minimum concrete cover and rewording of working platform specifications	M Javed	C Devine	September 2025

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