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BAW-22-247-S-A-UK
BDA Agrément®
Integraspec ICF System
Insulated Concrete Formwork



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SCOPE OF AGRÉMENT

This Agrément relates to the Integraspec ICF System (hereinafter the 'System'), an insulated concrete formwork (hereinafter 'ICF') building system. The System is suitable for use as permanent insulated formwork for in-situ dense concrete for the formation of loadbearing and non-loadbearing internal, external and separating walls. The System is for use in new dwellings and buildings other than dwellings.

DESCRIPTION

The System comprises a range of multifaceted expanded polystyrene (hereinafter 'EPS') elements, white-grade EPS 100, including standard elements, 45° and 90° corners, exposed concrete, cavity closer, taper top, brick ledge and T-junction elements. The internal and external EPS panels of each element are connected via high-impact polystyrene (hereinafter 'HIPS') spacers, with inserts that are factory fitted into the EPS panels during the manufacturing process. The System locks together, without the need for intermediate bedding materials, to provide a formwork system into which concrete is placed.

ILLUSTRATION



THIRD-PARTY ACCEPTANCE

NHBC - for detailed information 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.

Craig Devine
Operations Manager, Building Products

Alpheo Mlotha CEng FIMMM MBA
Technical Manager, Building Products

SUMMARY OF AGRÉMENT

This document provides independent information to specifiers, building control personnel, contractors, installers and other construction industry professionals considering the safety and fitness for the intended use 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

Thermal performance - see Section 2.2.9 - the System improves the thermal performance of walls and can contribute to satisfying the requirements of the national Building Regulations.

Moisture control - see Section 2.2.10 - the System will contribute to limiting the risk of condensation and resist moisture transmitted by capillary action.

Fire performance - see Section 2.2.11 - the System is combustible and, when incorporated in a concrete wall, has fire resistance in accordance with BS EN 1992-1-2.

Strength - see Section 2.2.12 - the System has adequate strength to resist the loads encountered during installation.

Acoustic performance - see Section 2.2.13 - walls incorporating the System can provide sound resistance satisfying the national Building Regulations.

Durability - see Section 2.2.14 - the System shall have a service life durability equivalent to that of the building into which it is incorporated.

UKCA and CE marking - see Section 2.2.15 - the product manufacturers have responsibility for conformity marking, in accordance with all relevant British and European Product Standards.

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CHAPTER 1 - GENERAL CONSIDERATIONS

1.1 - CONDITIONS OF USE

1.1.1 Design considerations

See Section 2.2.

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. The NHBC Standards have also been taken into consideration.

1.1.4 Installation supervision

The quality of installation and workmanship shall be controlled by a competent person who shall be an employee of an Approved 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, Northern Ireland and Ireland, with due regard to Chapter 3 of this Agrément (CDM, national Building Regulations and Third-Party Acceptance).

1.1.6 Validity

The purpose of this BDA Agrément® is to provide for well-founded confidence to apply the System within the Scope described. The validity of this Agrément is three years after the issue date, and as published on www.kiwa.co.uk/bda.

1.2 - PRODUCTION CONTROL AND QUALITY MANAGEMENT SYSTEM

Kiwa Ltd. has determined that the Agrément holder fulfils all 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.

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

2.1 - SYSTEM COMPONENTS AND ANCILLARY ITEMS

2.1.1 Components included within the scope of this Agrément

The following components are integral to the use of the System:

Table 1 - Multifaceted EPS elements

Component [^]	Length (mm)	Height (mm)	Total thickness (mm) ^{^^}
Standard panel	1220	311	230 - 450
45° corner panel	650 - 243 ^{^^^}	311	230 - 450
90° corner panel	826 - 419 ^{^^^}	311	230 - 450
Exposed concrete panel	1220	311	-
Cavity closer	65 or 75	324	100 - 300
Taper top panel	1220	311	-
Brick ledge panel	1220	311	-
T-junction panels	Various		

[^] components formed from moulded EPS with a compressive strength of 100 kN/m² and a nominal density of 22 kg/m³, manufactured in accordance with BS EN 13163

^{^^} the total thickness of the elements depends on the concrete core thickness (see Table 2)

^{^^^} external length dimensions

The HIPS inserts are factory fitted at 203 mm centres horizontally, profiled to slide into position vertically, locking the internal and external EPS panels. The spacers are available in six sizes to create cavities for concrete cores of 100 mm, 125 mm, 150 mm, 200 mm, 250 mm and 300 mm (see Table 2).

Table 2 - ICF build-up

Internal EPS panel thickness (mm)	Concrete core (mm)	External EPS panel thickness (mm)	Total thickness (mm)
65 or 75	100	65 or 75	230 or 250
	125		255 or 275
	150		280 or 300
	200		330 or 350
	250		380 or 400
	300		430 or 450

Ancillary items inside the scope of the assessment:

- Neopor - grey EPS panel with thermal conductivity $\lambda_D=0.031$ W/mK, fixed to the internal or external EPS panel to increase insulation performance and sound reduction;
- Integra 'H' clip - polyvinyl chloride (PVC) clip to join two or more HIPS spacers, 2440 mm by 140 mm by 200 mm.

2.1.2 Ancillary items falling outside the scope of this Agrément

Ancillary items detailed in this section may be used in conjunction with the System but fall outside the scope of this Agrément:

- concrete;
- waterproofing additive for concrete;
- damp-proof course (hereinafter 'DPC');
- steel reinforcement, in accordance with BS 4449;
- formwork support system, as recommended by the Agrément holder;
- plywood supports;
- expanding foam to fill gaps and repair the EPS elements;
- vapour barrier;
- air barrier;
- kicker plates to protect the bottom of the EPS elements in the first course;
- internal finishes drylining;
- external finishes masonry, render or cladding;
- fixings to carry vertical loads.

2.2 - POINTS OF ATTENTION TO THE SPECIFIER

2.2.1 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 installing contractor is responsible for the final as-built design.

2.2.2 Applied building physics (heat, air, moisture)

A competent specialist shall check the hygrothermal behaviour of a project-specific design incorporating the System and, if necessary, offer advice in respect of 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 consultant Specialist co-operates closely with the Agrément holder).

2.2.3 General design considerations

The project-specific design shall take into account the requirements of the national Building Regulations - see Section 3.2.

Installation of the System shall satisfy the requirements of BS 5975, BS 8000-2.1, BS 8000-2.2 and BS EN 13670.

The System may be progressively installed; part lifts are acceptable.

Concrete shall be in accordance with BS EN 1992-1-1 and NHBC Performance Standard 3.1.5.

Concrete reinforcement shall be in accordance with BS 4449.

The following are outside the scope of this Agrément:

- foundations, designed to support the completed construction and loads encountered during construction;
- waterproofing, of below-ground constructions subject to groundwater or hydrostatic pressure.

2.2.4 Project-specific design considerations

The project-specific design shall take into account the service life durability required - see Section 2.2.14.

No pre-installation survey is required.

A condensation risk analysis (hereinafter 'CRA') shall be completed at project-specific design stage - see Section 2.2.10.

The incorporation of fixings, services and other building elements shall be considered as part of the project-specific design, to minimise modifications to the System after installation. Fixings for ancillary items shall penetrate the concrete core. Other detailing can also be incorporated in the construction of the System, subject to the Agrément holder's recommendations.

When specifying fixings designed to support vertical loads on the face of walls incorporating the System, consideration shall be given to the potential deflection of the fixings between the face of the concrete core and the outer face of the EPS elements.

The incorporation of fixings will reduce the thermal performance of walls incorporating the System, in accordance with BS EN ISO 6946. Cold bridging effects shall be considered where services pass through walls incorporating the System.

On T-junctions of the walls and any EPS elements which have been cut, the System requires additional support to resist pressure during placement of the concrete, for example the use of plywood planks.

Care shall be taken to prevent damage or weakening of the EPS elements, as this may result in a loss of integrity or overall stability of the System prior to the placement of concrete.

To verify that concrete is adequately compacted, which is of utmost importance in areas such as around openings, carefully remove a section of an EPS element to create an inspection aperture. When inspection is complete, the EPS shall be repaired.

2.2.5 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.

2.2.6 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 must be by employees trained and approved by the Agrément holder.

2.2.7 Delivery, storage and site handling

The System is delivered to site in suitable packaging, bearing the System name, the Agrément holder's name and the BDA Agrément® logo incorporating the number of this Agrément.

Prior to installation, store the System components in accordance with the Agrément holder's requirements. 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;
- avoid exposure to contaminants, particularly volatile organic components (VOCs), hydrocarbons etc.

2.2.8 Maintenance and repair

Once installed, the System does not require regular maintenance. For advice in respect of repair, consult the Agrément holder.

Performance factors in relation to the Major Points of Assessment

2.2.9 Thermal performance

The System can contribute to meeting all required levels and provisions regarding thermal transmittance (hereinafter 'U-value') and thermal resistance, in accordance with the national Building Regulations.

The designed U-value of walls incorporating the System is dependent upon the EPS elements, concrete specification, and internal and external finishes.

The thermal resistance and U-value of building elements incorporating the System shall be calculated according to BS EN ISO 6946 and BRE Report 443, using the thermal resistance (RSI) value as detailed in Section 2.5.2.

Care shall be taken in the overall design and construction of junctions with other elements and openings, to minimise cold bridging and heat loss by air infiltration. Due consideration shall be given to the Government Accredited Construction Details.

2.2.10 Moisture control

Condensation risk

To assist in minimising the risk of surface and interstitial condensation, a CRA shall be completed at project-specific design stage.

Concrete walls incorporating the System can adequately limit the risk of surface and interstitial condensation when designed in accordance with BS 5250 and BRE Report 262.

Damp-proofing and waterproofing

The EPS elements will not transmit moisture by capillarity action.

Walls incorporating the System shall be designed to include damp-proofing features extending to at least 150 mm above ground level. These can be either a continuous DPC or a layer of concrete mixed with waterproofing additive, placed within the System. A damp-proof membrane (DPM) shall be incorporated within the floor.

2.2.11 Fire performance

Neither the EPS components nor the HIPS components of the System are classified as non-combustible.

In England, Wales and Northern Ireland, the System shall not be used on buildings with a storey 18 m or more above ground level. Boundary restrictions will depend on the external surface materials of the external wall facing the boundary. Refer to the national Building Regulations for types of buildings and any exclusions that may apply.

In Scotland, the System shall not be used on buildings with a storey 11 m or more above ground level or less than 1 m from the boundary. In such cases, the System may be excluded from the unprotected area calculation, regardless of openings. Refer to the national Building Regulations for types of building and any exclusions that may apply. For dwellings, the boundary restrictions will be dependent on the reaction to fire classification of the external finish.

For detailed conditions of use regarding requirements for fire resistance of concrete, cavity closers and barriers, fire stopping of service penetrations and combustibility limitations for other materials and components used in the overall wall construction, designers shall refer to the relevant national Building Regulations.

Fire resistance values for reinforced concrete walls incorporating the System, designed in accordance with BS EN 1992-1-1:

- vary according to the thickness of a wall;
- are given in Table 5.4 of BS EN 1992-1-2, subject to cover and design load considerations.

The minimum thickness requirements of plain concrete walls incorporating the System, when acting as a fire wall, are given in clause 5.4.2 of BS EN 1992-1-2.

Any additional protection provided by internal and external finishes are outside the scope of this Agrément.

The System shall be separated or shielded from any heat-emitting devices, flue pipes or chimneys, and any potential source of ignition by non-combustible insulation, in accordance with the provisions of the national Building Regulations.

2.2.12 Strength

Concrete walls incorporating the System shall be designed in accordance with the relevant recommendations and limit principles defined in BS EN 1990, to loadings defined in:

- BS EN 1991-1-1;
- BS EN 1991-1-2;
- BS EN 1991-1-3;
- BS EN 1991-1-4;
- BS EN 1991-1-5;
- BS EN 1991-1-6;
- BS EN 1991-1-7;
- BS EN 1992-1-1;
- BS EN 1992-1-2.

A suitably qualified structural engineer shall ensure that the foundations can adequately support the intended loads.

The System shall be progressively installed in a series of storey-height continuous lifts, or part lifts where necessary. Due care and attention shall be given to ensuring alignment of the System during concrete placement. The Agrément holder's recommended formwork support system shall be used to provide stability and facilitate alignment throughout installation.

Concrete shall achieve flow class F3, in accordance with BS EN 206, to ensure free flow through complex details. Recommended slump is between 152 mm and 203 mm, in accordance with Agrément holder recommendations.

In accordance with BS EN 1992-1-1, the System shall be used in conjunction with concrete compressive strength class:

- C25/30 for plain concrete;
- C35/45 for reinforced concrete.

Concrete shall be fully compacted in accordance with BS EN 1992-1-1. Consult the Agrément holder for further information regarding compaction by vibration.

Coverage of steel reinforcements shall be suitable for the environmental exposure condition for the concrete.

Where the project-specific design includes an outer leaf of brickwork or stonework, this shall be secured with wall ties into the concrete core formed within the System.

To ensure the stability of the System during and after placement of concrete, the System shall be supported by the Agrément holder's recommended formwork support system.

2.2.13 Acoustic performance

The core of separating concrete walls incorporating the System will achieve a required minimum mass per unit area of 300 kg/m² when the core density is greater than 2200 kg/m³ with a thickness of 150 mm, together with a single layer of plasterboard on each side. When used in conjunction with suitable framing, lining and flanking details, this specification satisfies the requirements of a Type 3 wall, as defined in national Building Regulations.

Concrete walls incorporating the System shall have a minimum mass per unit area of 120 kg/m² (excluding finishes) when specified as:

- internal walls;
- walls flanking separating walls;
- rooms for residential purposes.

Concrete walls incorporating the System:

- can provide sound resistance satisfying the national Building Regulations;
- will not exhibit reduced acoustic performance.

Pre-completion testing shall be undertaken on separating concrete walls incorporating the System, in accordance with the documents supporting the national Building Regulations.

2.2.14 Durability

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 should be at least 60 years.

2.2.15 UKCA and CE marking

There is no relevant product standard for the System.

Diagram 1 - Standard element



Diagram 2 - 45° corner element

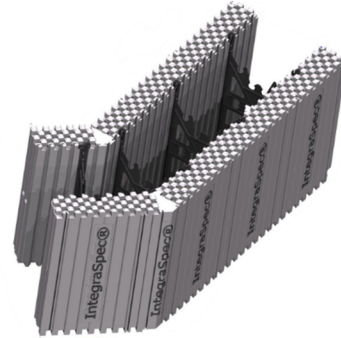


Diagram 3 - 90° corner element



Diagram 4 - Cavity closer element



Diagram 5 - Taper top element



Diagram 6 - Brick ledge element

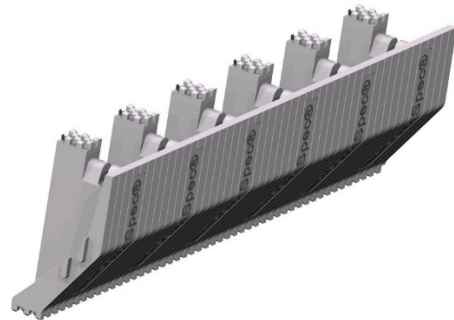


Diagram 7 - Exposed concrete face element

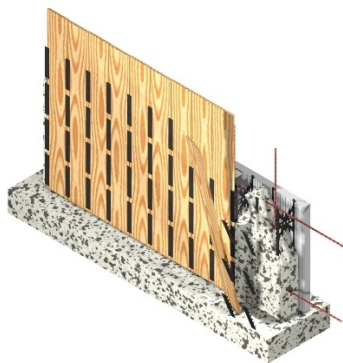


Diagram 8 - T-junction element

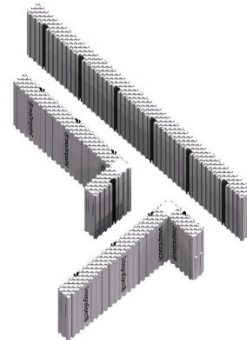


Diagram 8 - Spacer



Diagram 9 - Insert



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

2.4.1 Installer competence level

See section 2.2.6.

2.4.2 Delivery, storage and site handling

See section 2.2.7.

2.4.3 Project-specific installation considerations

No pre-installation survey is required for the installation of the System.

2.4.4 Preparation

The following considerations apply before starting the work:

- allowance shall be made for waste when calculating quantities for installation of the System;
- EPS elements may be cut using a hand saw or hot wire cutter;
- concrete shall be supplied from companies accredited by the Quality Scheme for Ready Mixed Concrete (QSRMC), BSI or equivalent schemes;
- the temperature of concrete being placed shall be in accordance with the manufacturer's recommendations;
- structural features such as roofs and floors shall be supported by mechanical fixings and bracketry cast into the concrete core during concrete placement, or drilled into the concrete core after curing;
- for sealing gaps and around ducts, expanding foam shall be applied between the EPS elements to prevent concrete leaking and to mitigate any cold bridging effects;
- the thickness of the EPS elements shall not be reduced (e.g. chased for services) before the concrete has been placed, as it will substantially weaken the strength of the System;
- additional props or bracing may be required when the height of concrete to be placed exceeds 1 m (or as recommended by the Agrément holder) or when installing on exposed sites or in strong winds;
- the concrete specification shall be verified as correct and well mixed before placement; deliveries shall be checked for concrete slump in accordance with BS EN 206.

The following works shall be undertaken before the installation of the System:

- foundations on which the System is to be installed shall be clean and level;
- in water and muddy conditions, it is recommended that granular material is placed around the affected area;
- once footings are stripped, the working area shall be free of mud and water;
- chalk wall lines (both inside and outside recommended) are drawn on footings and slabs prior to placing construction materials inside the workplace area;
- where foundations are required to be stepped, step heights shall be in multiples corresponding to the height of the EPS elements;
- where the specified elevation height is not a multiple of the standard System component height, the System can be adjusted by cutting or trimming the:
 - bottom course of the System components;
 - top off the highest course of the System components.

2.4.5 Outline installation procedure

The detailed installation sequence can be found in full in the Agrément holder's Installation Manual.

The key sequence for installation is:

- assemble the System:
 - position the EPS corners and standard elements following the chalk lines, starting in one corner, proceeding to centre of wall line or structural opening;
 - set the next EPS corner opposite the first corner, and place standard form elements to meet the previous elements;
 - for each successive course, reverse the corner units (short and long legs) so that the EPS elements will be stacked in a running, staggered pattern;
 - once the position of the first two courses has been set, fasten kicker plates to the footing or slab;
 - continue laying each course up to the level of the first layer of concrete to be placed, incorporating steel reinforcement as required;
 - install any necessary ducts, and seal gaps between the ducts and EPS elements using expanding foam;
 - join internal wall elements to the external wall elements using T-junction panels;
 - install the Agrément holder's recommended formwork support system as work progresses;
 - protect the top edges of the EPS elements to prevent concrete contamination and physical damage during placement of the concrete;
- perform the alignment:
 - ensure that the bottom course is straight with respect to the original chalk lines;
 - plumb and square all corners, T-junctions, and end walls by installing a mason's line suspended off the top of the wall;
 - adjust wall to mason line once all corners have been plumbed;
- placement of concrete:
 - pour the concrete, carefully vibrating accordingly, while observing the wall for any bulges; start with the concrete under window openings and then progressively around the wall;
 - when manually placing concrete, it is recommended that the EPS elements are installed and filled in stages to maintain close control over the filling and compaction process;
 - place concrete into lintels as a single operation without joints;
 - arrange horizontal cold joints at the height of the floor where possible; install vertical starter bars if required by the Structural Engineer. Remove any laitance and loose concrete and sufficiently pre-wet cold joints before pouring additional concrete;
 - ensure concrete flows smoothly and fills the System progressively and completely;
 - ensure concrete around steel reinforcement does not displace the reinforcement;
 - after placement of concrete, check the wall line and level; if any movement has occurred, apply even and regular pressure to the face of the wall to correct it and then apply temporary bracing support;
 - clean any spillage off the exposed faces of the EPS elements while the concrete is still wet.

2.4.6 Finishing

The following finishing is required on completion of the installation:

- once placing of the concrete has been completed, cover any exposed concrete to prevent it drying too quickly;
- prior to backfilling, the concrete shall be at its cured compressive strength and the top of wall shall be laterally supported with prop bracing or by installing the sub floor (in accordance to building code requirements);
- prior to the application of internal and external finishes (such as render or cladding), care shall be taken to protect concrete walls incorporating the System from damage. Finishes fall outside the scope of this Agrément;
- for heavy items (not standard building material finishes such as siding, drywall, etc), ensure that fixings for ancillary items penetrate the concrete core.

2.5 - INDEPENDENTLY ASSESSED SYSTEM CHARACTERISTICS

2.5.1 Efficiency of filling concrete

Test	Standard	Result
Efficiency of filling concrete	EAD 340309-00-0305	Satisfactory

2.5.2 Thermal performance

Test	Standard	Result
Thermal resistance (RSI)	ASTM C518	0.74 m ² K/W

2.5.3 Moisture control

Test	Standard	Result
Water vapour resistance (μ) of EPS element	BS EN 12524	60

CHAPTER 3 - CDM, NATIONAL BUILDING REGULATIONS AND THIRD-PARTY ACCEPTANCE

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 Chapter 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 compliance of any project-specific design with the national Building Regulations.

3.2.1 - ENGLAND THE BUILDING REGULATIONS 2010 AND SUBSEQUENT AMENDMENTS

- B3(4) Internal fire spread (structure) - walls formed from the System can contribute to inhibiting the unseen spread of fire and smoke within concealed spaces
- C2(c) Resistance to moisture - walls formed from the System can adequately limit the risk of surface condensation and contribute to minimising the risk of interstitial condensation
- E1 Protection against sound from other parts of the building and adjoining buildings - walls formed from the System can provide reasonable resistance to sound
- E2(a) Protection against sound within a dwelling-house etc. - walls formed from the System can provide reasonable resistance to sound
- L1A(a)(i) Conservation of fuel and power in new dwellings - the System can contribute to limiting heat gains and losses through walls
- L2A(a)(i) Conservation of fuel and power in new buildings other than dwellings - the System can contribute to limiting heat gains and losses through walls
- Regulation 7(1) Materials and workmanship - the System is manufactured from suitably safe and durable materials for their 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

- B3(4) Internal fire spread (structure) - walls formed from the System can contribute to inhibiting the unseen spread of fire and smoke within concealed spaces
- C2(c) Resistance to moisture - walls formed from the System can adequately limit the risk of surface condensation and contribute to minimising the risk of interstitial condensation
- E1 Protection against sound from other parts of the building and adjoining buildings - walls formed from the System can provide reasonable resistance to sound
- E2(a) Protection against sound within a dwelling-house etc. - walls formed from the System can provide reasonable resistance to sound
- L1A(a)(i) Conservation of fuel and power in new dwellings - the System can contribute to limiting heat gains and losses through walls
- L2A(a)(i) Conservation of fuel and power in new buildings other than dwellings - the System can contribute to limiting heat gains and losses through walls
- Regulation 7(1) Materials and workmanship - the System is manufactured from suitably safe and durable materials for their 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 consumption 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

3.2.3 - SCOTLAND THE BUILDING (SCOTLAND) REGULATIONS 2004 AND SUBSEQUENT AMENDMENTS

3.2.3.1 Regulation 8 (1) 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, provided it is installed in accordance with the requirements of this Agrément

3.2.3.2 Regulation 9 Building Standards - construction

- 2.1 Compartmentation - walls formed from the System can contribute to inhibiting fire and smoke from spreading beyond the compartment of origin
- 2.2 Separation - walls formed from the System can contribute to inhibiting fire and smoke from spreading beyond the area of occupation where a fire originates
- 2.4 Cavities - walls formed from the System can contribute to inhibiting the unseen spread of fire and smoke within concealed spaces
- 3.15 Condensation - the System will contribute to limiting the risk of surface and interstitial condensation
- 5.1 Noise separation - walls formed from the System can provide reasonable resistance to sound
- 5.2 Noise reduction between rooms - walls formed from the System can provide reasonable resistance to sound
- 6.1(b) Carbon dioxide emissions - the System will contribute to reducing carbon dioxide emissions of a building
- 6.2 Building insulation envelope - the System will contribute to the insulation envelope to resist thermal transfer

- 7.1(a)(b) Statement of sustainability - the System can contribute to satisfying the relevant Requirements of Regulation 9, Standards 1 to 6, and will therefore contribute to a construction meeting a bronze level of sustainability as defined in this Standard. In addition, the Product 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 6 of the 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(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
- 29 Condensation - walls formed from the System can adequately limit the risk of surface condensation and contribute to minimising the risk of interstitial condensation
- 35(4) Internal fire spread (structure) - walls formed from the System can contribute to inhibiting the unseen spread of fire and smoke within concealed spaces
- 39(a)(i) Conservation measures - the System can contribute to limiting heat gains and losses through walls
- 40(2) Target carbon dioxide emission rate - the System will contribute to reducing carbon dioxide emissions of a building
- 49 Resistance to the passage of sound - walls formed from the System can contribute to satisfying this Regulation
- 50(a) Protection against sound within a dwelling or room for residential purposes - walls formed from the System can contribute to satisfying this Regulation

3.2.5 - IRELAND BUILDING REGULATIONS 1997 AND SUBSEQUENT AMENDMENTS

In order to demonstrate compliance with Irish Building Regulations, this BDA Agrément® certifies that the Product complies with the requirements of a recognised document and indicates it is suitable for its intended purpose and use.

- B3(3) Internal fire spread (structure) - walls formed from the System can contribute to inhibiting the unseen spread of fire and smoke within concealed spaces
- C4 Resistance to weather and ground moisture - wall formed from the System can be constructed to prevent the passage of moisture
- D1/D3 Materials and workmanship - the System is manufactured from suitably safe, durable materials for the application and can be installed to give a satisfactory performance
- E1 Sound - walls formed from the System can provide reasonable resistance to sound
- L1 Conservation of fuel and energy - the System will contribute to a building not exceeding its target CO₂ emission rate

3.3 - THIRD-PARTY ACCEPTANCE

NHBC - In the opinion of Kiwa Ltd., the System, if installed, used and maintained in accordance with this Agrément, can satisfy or contribute to satisfying the relevant requirements in relation to NHBC Standards, Chapter 3.1 Concrete and its reinforcement.

CHAPTER 4 - SOURCES

- BS EN ISO 6946:2017 Building components and building elements. Thermal resistance and thermal transmittance. Calculation methods
- BS EN 206:2013+A2:2021 Concrete. Specification, performance, production and conformity
- BS EN 1990:2002+A1:2005 Eurocode. Basis of structural design
- NA to BS EN 1990:2002+A1:2005 UK National Annex for Eurocode. Basis of structural design
- 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 1991-1-2:2002 Eurocode 1. Actions on structures. General actions. Actions on structures exposed to fire
- NA to BS EN 1991-1-2:2002 UK National Annex to Eurocode 1. Actions on structures. General actions. Actions on structures exposed to fire
- BS EN 1991-1-3:2003+A1:2015 Eurocode 1. Actions on structures. General actions. Snow loads
- NA+A2:2018 to BS EN 1991-1-3:2003+A1:2015 UK National Annex to Eurocode 1: Actions on structures. General actions. Snow loads
- BS EN 1991-1-4:2005+A1:2010 Eurocode 1. Actions on structures. General actions. Wind actions
- NA to BS EN 1991-1-4:2005+A1:2010 UK National Annex to Eurocode 1. Actions on structures. General actions. Wind actions
- BS EN 1991-1-5:2003 Eurocode 1. Actions on structures. General actions. Thermal actions
- NA to BS EN 1991-1-5:2003 UK National Annex to Eurocode 1. Actions on structures. General actions. Thermal actions
- BS EN 1991-1-6:2005 Eurocode 1. Actions on structures. General actions. Actions during execution
- NA to BS EN 1991-1-6:2005 UK National Annex to Eurocode 1. Actions on structures. General actions. Actions during execution
- BS EN 1991-1-7:2006+A1:2014 Eurocode 1. Actions on structures. General actions. Accidental actions
- NA+A1:2014 to BS EN 1991-1-7:2006+A1:2014 National Annex to Eurocode 1. Actions on structures - Accidental actions
- BS EN 1992-1-1:2004+A1:2014 Eurocode 2. Design of concrete structures. General rules and rules for buildings
- NA+A2:2014 to BS EN 1992-1-1:2004+A1:2014 UK National Annex to Eurocode 2. Design of concrete structures. General rules and rules for buildings
- BS EN 1992-1-2:2004+A1:2019 Eurocode 2. Design of concrete structures. General rules. Structural fire design
- NA to BS EN 1992-1-2:2004 UK National Annex to Eurocode 2. Design of concrete structures. General rules. Structural fire design
- BS EN 12524:2000 Building materials and products. Hygrothermal properties. Tabulated design values
- BS EN 13163:2012+A2:2016 Thermal insulation products for buildings. Factory made expanded polystyrene (EPS) products. Specification
- BS EN 13670:2009 Execution of concrete structures
- BS 4449:2005+A3:2016 Steel for the reinforcement of concrete. Weldable reinforcing steel. Bar, coil and decoiled product. Specification
- BS 5250:2021 Management of moisture in buildings. Code of practice
- BS 5975:2019 Code of practice for temporary works procedures and the permissible stress design of falsework
- BS 8000-2.1:1990 Workmanship on building sites. Code of practice for concrete work. Mixing and transporting concrete
- BS 8000-2.2:1990 Workmanship on building sites. Code of practice for concrete work. Sitework with in situ and precast concrete
- ASTM C518-17 Standard test method for steady-state thermal transmission properties by means of the heat flow meter apparatus
- BRE Report 262:2002 Thermal insulation: avoiding risks
- BRE Report 443:2019 Conventions for U-value calculations
- EAD 340309-00-0305:2019 Non load-bearing permanent shuttering kits/systems based on hollow blocks or panels of insulating materials and sometimes concrete
- NHBC Standards 2022

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

CHAPTER 5 - AMENDMENT HISTORY

Revision	Amendment description	Author	Approver	Date
-	First issue	A Chapman	C Devine	July 2022
A	Updated contact details	A Chapman	C Devine	July 2022
B	Issue with NHBC acceptance	A Chapman	C Devine	September 2022

CHAPTER 6 - CONDITIONS OF USE

This Agrément may only be reproduced and distributed in its entirety.

Where a National Annex exists in respect of a BS EN (or other) standard, its use is deemed mandatory wherever the original standard is referenced.

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