

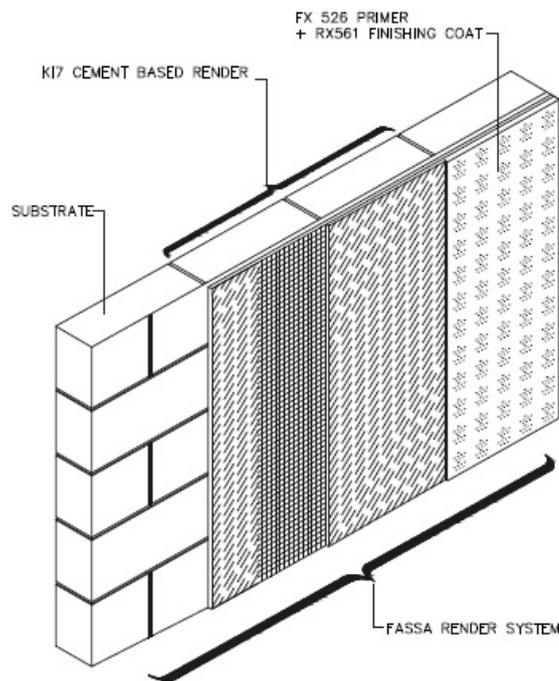
SCOPE

This Agrément relates to Fassarend KI 7 (hereinafter the 'System'), an exterior render finish for direct application to external walls of medium density blockwork (where blockwork includes clay and calcium silicate bricks, concrete blocks and natural and reconstituted stone blocks). The System can be used on new and existing residential and commercial buildings up to 18 m in height.

DESCRIPTION

The System comprises a fibre-reinforced cement render basecoat (hereinafter 'KI 7 basecoat'), a glass fibre reinforcement mesh (hereinafter 'FASSANET 160 mesh'), a primer (hereinafter 'FX 526 primer') and an acryl-siloxane finish (hereinafter 'RX 561 finish'). The RX561 finish is available in various grain sizes and colours.

SYSTEM ILLUSTRATION



THIRD-PARTY ACCEPTANCE

NHBC - For detailed information see section 3.3 (Third-Party acceptance).

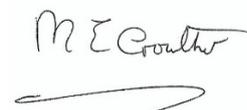
STATEMENT

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

Chris Vurley, CEng
Technical Manager, Building Products



Mark Crowther, M.A. (Oxon)
Kiwa Ltd. Technical Director



SUMMARY OF AGRÉMENT

This document provides independent information to specifiers, building control personnel, contractors, installers and other construction industry professionals considering the fitness for the intended use of the System. This Agrément covers the following:

- Conditions of use;
- Initial Factory Production Control, Quality Management System and the Annual Verification procedure;
- Points of attention for the Specifier and examples of typical details;
- Installation;
- Independently assessed System characteristics and other information;
- Compliance with national Building Regulations and Third-Party acceptance;
- Sources, including codes of practice, test and calculation reports.

MAJOR POINTS OF ASSESSMENT

Strength - the System has adequate strength to resist wind loads and impact loads normally encountered in the UK (see section 2.1.10).

Fire performance - all System components have a reaction to fire class A1 or A2-s1,d0 (see section 2.1.11). The resistance of an external wall to fire is dependent on the backing wall and interior finish which has not been assessed.

Moisture control - the System can withstand wind-driven rain (see section 2.1.9).

Durability - when installed and maintained in accordance with the Agrément holder's recommendations and this Agrément, the System will have a service life expectancy in excess of 30 years (see section 2.1.12).

CE marking - the product manufacturers have taken responsibility for CE marking of the products used in the System in accordance with all relevant harmonized European Product Standards. An asterisk (*) appearing in this Agrément indicates that data shown is given in the relevant product manufacturer's Declaration of Performance (DoP).

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- 1.1 - Conditions of use
- 1.2 - Production Control and Quality Management System
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Chapter 2 - Technical assessment

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- 3.1 - The Construction (Design and Management) Regulations 2015 and The Construction (Design and Management) Regulations (Northern Ireland) 2016
- 3.2 - National Building Regulations
- 3.3 - Third-Party acceptance

Chapter 4 - Sources

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CHAPTER 1 - GENERAL CONSIDERATIONS

1.1 - CONDITIONS OF USE

1.1.1 Design considerations

See section 2.1.

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 available test reports, technical literature, the Agrément holder's quality plan, DoPs and site visits as appropriate. The NHBC Standards have also been taken into consideration.

1.1.4 Installation

The quality of installation and workmanship must be controlled by a competent person who must be an employee of the installation company.

The System must be strictly installed 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 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 FPC is in conformity with the requirements of the technical specification described in this Agrément, the continuous surveillance, assessment and approval of the FPC will be done at a frequency of not less than once per year by Kiwa Ltd.

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

2.1 - POINTS OF ATTENTION TO THE SPECIFIER

2.1.1 Design responsibility

A Specifier may undertake a project specific design in which case it is recommended that the Specifier cooperates closely with the Agrément holder; the Specifier is responsible for the final project specific design.

The Agrément holder reviews all submitted project specific designs and offers advice and guidance to ensure a compliant final project specific design; the Agrément holder is responsible for the project specific design.

2.1.2 Applied building physics (heat, air, moisture)

The physical behaviour of the building incorporating the System shall be verified as suitable by a competent Specialist, who can be either a qualified employee of the Agrément holder or a qualified consultant. The Specialist will check the physical behaviour of the building design and if necessary, can offer advice in respect of improvements to achieve the final specification. It is recommended that the Specialist cooperates closely with the Agrément holder.

2.1.3 General design considerations

Designs and specifications shall be produced in a clearly understandable format to comply with clause 6.11.2 of the NHBC Standards. This relates to areas to be rendered and details of interfaces and abutments, such as joints, junctions and service penetrations.

Protect the substrate from adverse weather conditions at the earliest opportunity during and following construction. Assess the likely weather conditions prior to and after rendering. Assess the substrate, e.g. suction and surface preparation, and apply a preparation coat where necessary.

The System must not cross between different substrate elements. At junctions between different substrate elements the render must be broken and mastic sealant applied.

2.1.4 Project specific design considerations

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

2.1.5 Permitted applications

Only constructions designed according to the specifications as given in this Agrément are allowed under this Agrément; in each case the Specifier will have to cooperate closely with the Agrément holder.

It is not permitted to apply the System to render boards.

2.1.6 Installer competence level

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

Installation shall be by contractors with employees trained and approved by the Agrément holder.

2.1.7 Delivery, storage and site handling

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

Store the System in accordance with the Agrément holder's requirements. Particular care must be taken to:

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

Disposal of containers with residues of RX 561 finish must be in accordance with local requirements; residue must not be disposed of via surface water or drains.

2.1.8 Maintenance and repair

Once installed, the System requires routine maintenance. For advice in respect of maintenance and repair, consult the Agrément holder.

Performance factors in relation to the Major Points of Assessment

2.1.9 Moisture Control

The System is suitable for use in all areas of exposure to wind-driven rain given the test result with a water head of 100 mm.

If horizontal cavity barriers are required, other than directly under the roof eaves, they should be individually protected by a damp-proof course (DPC) arranged to shed moisture away from the sheathing boards of the inner leaf, if present.

When using a PVC expansion bead to cover movement joints the gap between the masonry units is to be sealed by a compressible backing rod with closed cells and use an elastic, weather resistant sealant to finish the exterior surface.

2.1.10 Strength

Wind actions should be calculated in accordance with BS EN 1991-1-4. Due consideration should be given to higher pressure coefficients applicable to corners of a building.

The bond strength of the System as tested, after ageing by heat-rain and freeze on a wall of masonry units, exceeds the wind loads by far. See section 2.4.1.3 of this Agrément for more information.

The System must not be subjected to vertical loads other than self-weight; the backing wall of masonry units must support all vertical loads.

The System can withstand a hard body impact with regard to safety and serviceability. See section 2.4.1.4 of this Agrément.

2.1.11 Fire Performance

The System components have a reaction to fire class of A1 (KI 7 basecoat) and A2-s1,d0 (RX 561 finish).

The reaction to fire class is relevant for the provisions relating to external fire spread. Those requirements depend on the distance to the relevant boundary, the use of a building and the height of a building.

The fire performance of a wall will not solely depend on the System; use of intumescent sealant, cavity barriers (in case of a cavity wall) and fire-stopping may be required to limit the spread of fire and smoke.

The resistance to fire class is relevant for the provisions relating to internal fire spread (structure). The fire performance of a wall with the System has not been assessed in that respect. Those requirements depend on a wall being load-bearing or not, the distance to the relevant boundary, the use of a building and the height of a top floor above ground.

2.1.12 Durability

The System comprises durable materials and is considered to be adequately resistant to deterioration and wear in normal service conditions, provided it is installed in accordance with the requirements of this Agrément. There is no mould risk to any component in the System.

The durability and service life of the System will depend upon the immediate environmental conditions, location, height and intended use of the building. Providing regular inspection and maintenance is carried out and any defects are promptly repaired in accordance with the Agrément holder’s maintenance and repair instructions, the System will have a service life expectancy in excess of 30 years.

2.2 - EXAMPLES OF DETAILS

Examples of details (e.g. wall-window interface, penetrations and roof and wall junctions) can be given by the Agrément holder. Note: diagrams are not exhaustive and in practice every project requires bespoke details and solutions.

Diagram 1 - typical wall-window interface for a cill

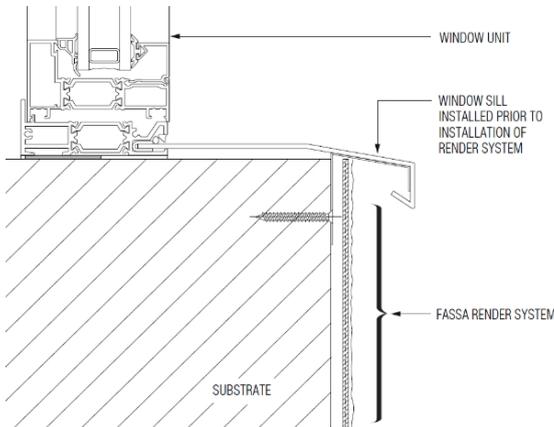
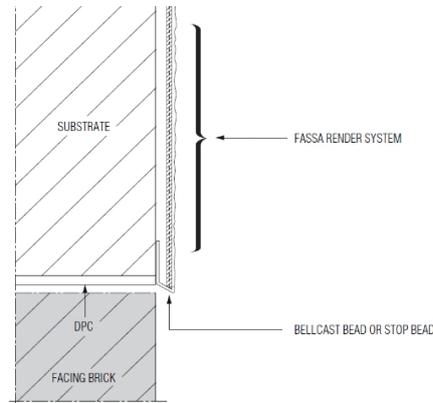


Diagram 2 - typical base detail



Note: the stop bead at the base of a wall shall be cut when a (vertical) movement joint is present.

Diagram 3a - cross-section of a typical (vertical) movement joint in render - variant 1

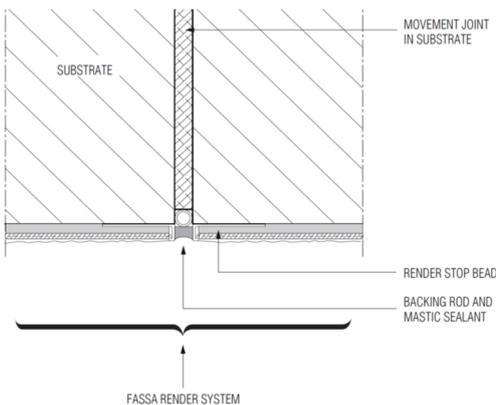


Diagram 3b - cross-section of a typical (vertical) movement joint in render - variant 2

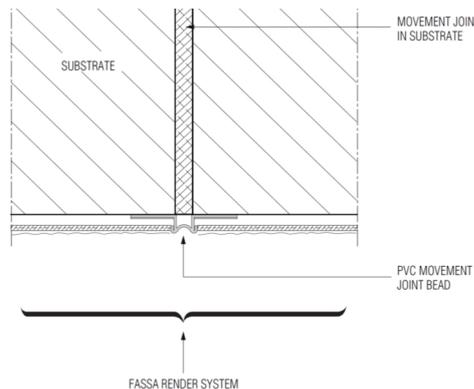


Diagram 4 - typical roof-wall junction

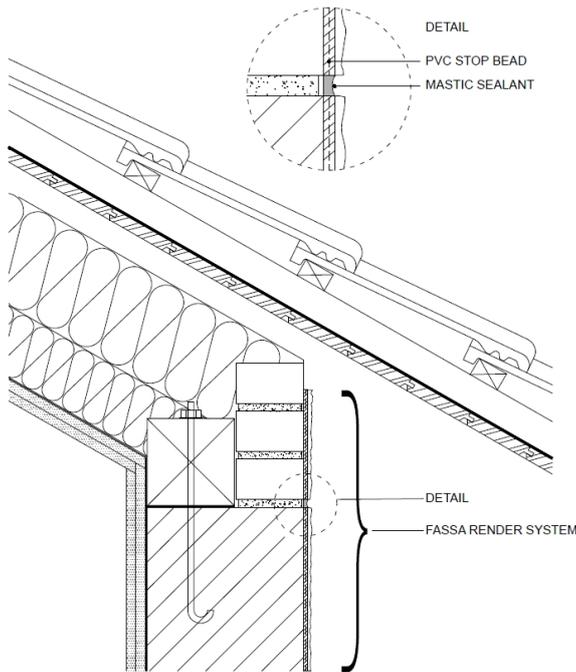
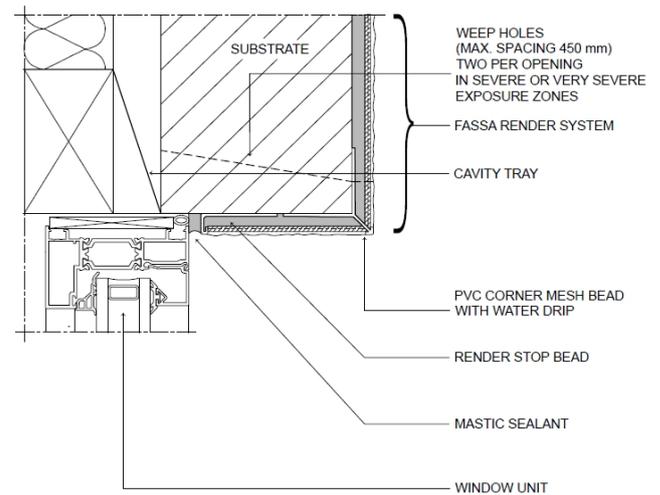


Diagram 5 - typical render head



2.3 - INSTALLATION

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

2.3.1 Installer competence level

See section 2.1.6.

2.3.2 Delivery, storage and site handling

See section 2.1.7.

2.3.3 Project specific installation considerations

For project specific installation considerations, please refer to the project specific design.

2.3.4 Preparation

The following considerations apply prior to the commencement of work:

- the wall must be free from dust, dirt, saline deposits etc; remove any traces of oil, grease, wax, etc. Check if the joints between the bricks are effectively pointed, any holes or cracks in the wall must be sealed beforehand.

2.3.5 Outline of installation procedure

The key points to note for installation of the System are described in detail in the Installation Manual:

- to maintain the plumb of the wall, corner guards or uprights should be placed at the corners and vertical guides should be placed on the walls;
- use an intumescent sealant where required according to the project specific design;
- allow the KI 7 basecoat to cure/harden for 2 - 3 weeks before application of the FX 526 primer;
- movement joints in the System using the PVC expansion bead require the joint gap between masonry units to be sealed by a compressible filler / backing rod with closed cells and use an elastic, weather resistant sealant to finish the exterior surface;
- consider sealing the joint between render and a cill with a silicon-based sealant if (cast) stone cills have no stooling or if no cill pans (with end dams / upstands) are used.

2.3.6 Finishing

The following finish is required upon completion of the base coat:

- apply the FX 526 primer to a dry and clean substrate; allow to dry for 16 - 24 hours prior to application of the RX 561 finish;
- apply the FX 526 primer and RX 561 finish when air temperatures are between 5 °C and 30 °C and when the relative humidity is lower than 75 %;
- do not apply the FX 526 primer and RX 561 finish on façades in full sunlight or strong winds;
- dispose of containers with residues of RX 561 finish in accordance with national regulations, residue shall NOT be disposed of via surface water or drains.

2.4 - INDEPENDENTLY ASSESSED SYSTEM CHARACTERISTICS

2.4.1 Characteristics of System components

2.4.1.1 Moisture control - watertightness of KI 7 base coat

Watertightness of the System was determined with a water head of 100 mm for 24 hours.

Table 1 - Watertightness of KI 7 base coat

Base coat - substrate	Watertightness
KI 7 (12 mm) - masonry unit	Watertight (test report 0327-C-17-6)

2.4.1.2 Moisture control - vapour transmission of the System

Table 2 - Characteristics of render coat KI 7

Property	Value	Unit
Dry bulk density (ρ_s) of base coat	1590	kg·m ⁻³
KI 7 base coat (without FX 526 primer + RX 561 finish):		
- Thickness (d) of base coat only	13.17	mm
- Water vapour resistance factor (μ) of base coat, wet cup	12.81	(-)
- Water vapour resistivity of base coat, wet cup, calculated	64.05	MN·s/g·m
- Diffusion-equivalent air layer thickness (S_d) of base coat	0.17	M
- Water absorption coefficient (C_m)	0.22	kg/(m ² ·min ^{0.5})
System (KI 7 base coat + FX 526 primer + RX 561 finish):		
- Thickness (d) of base coat with finish (top coat)	16.09	mm
- Water vapour resistance factor (μ) of System, wet cup	35.33	(-)
- Water vapour resistivity of System, wet cup	176.65	MN·s/g·m
- Diffusion-equivalent air layer thickness (S_d) of base coat with finish (top coat), wet cup	0.57	m
- Watertightness with a water head of 100 mm for 24 hours	pass	(-)

2.4.1.3 Strength - bond strength KI 7

Table 3 - Bond strength of render KI 7 on masonry units

Render - substrate	Initial strength (kPa)	After ageing (kPa)
KI 7 - masonry unit	412 (241 - 618)*	448 (279 - 562)*

* delamination in the render, not the substrate.

Note: mean values for bond strength (rounded down) after 5 measurements. Between brackets the range of measurements.

Note: ageing was done by 80 cycles of heat-rain and two periods of freezing during 64 hours to -20 °C (after cycles 40 and 80).

Note: the substrate (for the System) was made of aggregate concrete masonry units.

2.4.1.4 Strength - impact resistance KI 7

Table 4 - Hard body impact for render KI 7 on masonry units

Render - substrate	Safety in use (10 Nm)	Serviceability (6 Nm)
KI 7 - masonry unit	No collapse, penetration and/or projection	No penetration and/or degradation*

* no cracks, depressions or protuberances are visible to the naked eye.

Note: safety in use: one impact of 10 Nm (impact energy), serviceability: three impacts of 6 Nm each. Tests according to EOTA Technical Report TR 001:2003.

Note: the substrate (for the System) was made of aggregate concrete masonry units.

2.4.1.5 Fire performance

Table 5 - Characteristics of render coat KI 7

Property	Value	Unit
Reaction to fire, class	A1	(-)

2.5 - ANCILLIARY ITEMS

Note: ancillary items detailed in this section are to be used in conjunction with the System.

Reinforcement mesh - FASSANET 160

Table 6 - Characteristics tested on glass fibre reinforcement mesh

Property	Value	Unit
Length x width (nominal values)	50 x 1	m
Thickness (mean value)	0.44	mm
Mesh size (longitudinal / transverse direction)	5.0 / 4.5	mm
Apparent density (mean value)	159	g·m ⁻²
Tensile strength (in N/50 mm) and elongation (%) - longitudinal direction (mean values)	986 & 63	N & %
Tensile strength (in N/50 mm) and elongation (%) - transverse direction (mean values)	1055 & 42	N & %

Primer - FX 526 primer

Table 7 - Product Data Sheet information regarding technical data and consumption

Property	Value	Unit
Water vapour transmission rate (V)	V ≈ 45	g/(m ² ·d)
Water vapour resistance factor (μ)	μ ≈ 1250	(-)
Diffusion equivalent layer thickness S_d (= μ ·d)	S_d ≈ 0.5	m

Property	Value	Unit
Liquid water permeability (water absorption)	$w \leq 0.1 \pm 0.02$	$\text{kg}/(\text{m}^2 \cdot \text{h}^{0.5})$
Reaction to fire, class	NPD	(-)
Coverage	0.2 - 0.25	$\text{kg} \cdot \text{m}^{-2}$
Test reports confirm the coverage	0.220 / 0.235 / 0.315	$\text{kg} \cdot \text{m}^{-2}$

Finish - RX 561 finish

Table 8 - Technical Data Sheet information regarding application, technical data and consumption

Property	Value	Unit
Water vapour permeability	category V ₂ (medium)	(-)
Water vapour transmission rate (V)	$15 < V \leq 150$	$\text{g}/(\text{m}^2 \cdot \text{d})$
Diffusion equivalent layer thickness S _d (= $\mu \cdot d$)	$0.14 < S_d \leq 1.4$	m
Water absorption: category W ₃ (low)	$w \leq 0.1$	$\text{kg}/(\text{m}^2 \cdot \text{h}^{0.5})$
Reaction to fire, class	A2-s1,d0	(-)
Coverage (depends on grading)	2.0 - 4.6	$\text{kg} \cdot \text{m}^{-2}$

Bead profiles

A wide variety of bead profiles (e.g. corner, stop and APU) can be used in conjunction with the System, as defined in the project specific design.

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 coordinator, designer and contractors to address their obligations under these Regulations.

3.2 - 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.

3.2.1 - ENGLAND THE BUILDING REGULATIONS 2010 AND SUBSEQUENT AMENDMENTS

- A1(2) Loading - imposed and wind loads - the System can withstand wind design pressures up to 2,600 Pa and an impact load of 10 Nm by a hard body;
- B3(1)(4) Internal fire spread (structure) - the fire resistance of an external wall has to be verified by a Specialist for each project in advance; any unseen spread of fire and smoke shall be limited by cavity barriers, compartmentation and fire stopping to be determined by a Specialist;
- B4(1) External fire spread - the risk shall be assessed by a Specialist, additional testing may be required;
- C2(a)(b) Resistance to moisture - the System can withstand precipitation if a finishing coat is applied; interstitial condensation shall be assessed by a Specialist;
- Regulation 7 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.

3.2.2 - WALES THE BUILDING REGULATIONS 2010 AND SUBSEQUENT AMENDMENTS

- A1(2) Loading - imposed and wind loads - the System can withstand wind design pressures up to 2,600 Pa and an impact load of 10 Nm by a hard body;
- B3(1)(4) Internal fire spread (structure) - the fire resistance of an external wall has to be verified by a Specialist for each project in advance; any unseen spread of fire and smoke shall be limited by cavity barriers, compartmentation and fire stopping to be determined by a Specialist;
- B4(1) External fire spread - the risk shall be assessed by a Specialist, additional testing may be required;
- C2(a)(b) Resistance to moisture - the System can withstand precipitation if a finishing coat is applied; interstitial condensation shall be assessed by a Specialist;
- Regulation 7 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.

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

- 3.1 Regulations 8 (1)(2): Fitness and Durability of materials and workmanship
- the System is manufactured from acceptable materials which are considered to be adequately resistant to deterioration and wear under normal service conditions, provided they are installed in accordance with the requirements of this Agrément;
 - maintenance or repair work will not be necessary unless (a part of) the external wall is damaged or is affected by structural modifications.
- 3.2 Regulation 9: Building Standards - Construction
- 1.1 (a) Structure - the System can withstand wind design pressures up to 2,600 Pa and an impact load of 10 Nm by a hard body;
 - 2.4 Cavities - any unseen spread of fire and smoke shall be limited by cavity barriers, compartmentation and fire stopping to be determined by a Specialist;
 - 2.7 Fire spread on external walls - the risk shall be assessed by a Specialist, additional testing may be required;
 - 3.10 Precipitation - the System can withstand precipitation if a finishing coat is applied;
 - 3.15 Condensation - interstitial condensation shall be assessed by a Specialist.
- 3.3 Regulation 12: Building Standards - Conversions
- All comments given for the System under Regulation 9 also apply to this Regulation, with reference to clause 0.12 and Schedule 6 of this Standard.

3.2.4 - NORTHERN IRELAND THE BUILDING REGULATIONS (NORTHERN IRELAND) 2012 AND SUBSEQUENT AMENDMENTS

- 23(a)(ii)(iii) Fitness of materials and workmanship - the System is manufactured from materials which are considered to be suitably safe;
- 28(b) 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 (b) the weather;
- 29 Condensation - interstitial condensation shall be assessed by a Specialist;
- 30(a)(b) Stability - the System can transmit wind loads to the ground safely given an adequate wooden subframe and backing are constructed;
- 35(1)(4) Internal fire spread (Structure) - the fire resistance of an external wall (1) has to be verified by a Specialist for each project in advance; any unseen spread of fire and smoke (4) shall be limited by cavity barriers, compartmentation and fire stopping to be determined by a Specialist;
- 36(a) External fire spread - adequate resistance to the spread of fire over an external wall depends on the combination with other materials, the use, position and height of the building; The risk shall be assessed by a Specialist, additional testing may be required.

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, Chapters 6.1 and 6.11.

CHAPTER 4 - SOURCES

- BS EN ISO 7783:2011. Paints and varnishes. Determination of water-vapour transmission properties. Cup method.
- BS EN 1015-12:2016. Methods of test for mortar for masonry. Part 12: Determination of adhesive strength of hardened rendering and plastering mortars on substrates.
- BS EN 1062-3:2008. Paints and varnishes. Coating materials and coating systems for exterior masonry and concrete. Determination of liquid water permeability.
- 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 15824:2017. Specifications for external renders and internal plasters based on organic binders.
- BS 5250:2011+A1:2016. Code of practice for control of condensation in buildings.
- BR 443 - Conventions for U-value calculations (2006 Edition).
- BR 497 - Conventions for Calculating Linear thermal transmittance and Temperature Factors (BR 497).
- NHBC Standards 2019.

Remark: apart from these sources confidential reports may also have been assessed; any relevant reports are in the possession of Kiwa Ltd. and kept in the Technical Assessment File of this Agrément; the Installation Guides are current at the time of publication and may be subject to change, the Agrément holder should be contacted for clarification of revision.

CHAPTER 5 - AMENDMENT HISTORY

Revision	Amendment Description	Amended By	Approved By	Date
-	First Issue	C Vurley	C Forshaw	March 2020