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Agrément Certificate
21/5968
Product Sheet 1

NON-COMBUSTABLE CAVITY TRAY SYSTEM

KEYFIX NON COMBUSTABLE CAVITY TRAYS

This Agrément Certificate Product Sheet(1) relates to Keyfix Non Combustible Cavity Trays, a range of trays for use in the external walls of masonry or steel-frame constructions, with a brick outer leaf.

(1) Hereinafter referred to as 'Certificate'.

CERTIFICATION INCLUDES:

- factors relating to compliance with Building Regulations where applicable
- factors relating to additional non-regulatory information where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.

KEY FACTORS ASSESSED

Behaviour in relation to fire — The trays have a reaction to fire classification of A1 without the need for testing, as defined by Commission Decision 96/603/EC and their use is unrestricted by the documents supporting the national Building Regulations (see section 6).

Behaviour under load — the products will not adversely affect the ability of the wall to sustain and transmit compressive loads (see section 7).

Resistance to passage of water — the products will provide an effective barrier against liquid water above the ground damp proof course (dpc) level (see section 8).

Use with cavity wall insulation — the products are compatible with A1 fire-rated materials currently used as cavity wall insulation. The trays do not form a continuous barrier, therefore blown insulation may penetrate from above or below the trays (see section 9)

Durability — under normal service conditions, the products will remain effective for the lifetime of the building in which they are installed (see section 11)

The BBA has awarded this Certificate to the company named above for the products described herein. These products have been assessed by the BBA as being fit for their intended use provided they are installed, used and maintained as set out in this Certificate.

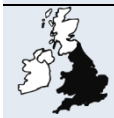
On behalf of the British Board of Agrément

Date of First issue: 4 November 2021

Hardy Giesler
Chief Executive Officer

Regulations

In the opinion of the BBA, Keyfix Non Combustible Cavity Trays, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements of the following Building Regulations (the presence of a UK map indicates that the subject is related to the Building Regulations in the region or regions of the UK depicted):



The Building Regulations 2010 (England and Wales) (as amended)

Requirement:	**A1**	**Loading**
Comment:		The products can contribute to satisfying this Requirement when properly installed. The presence of a dpc, however, can reduce the shear and tensile strength of a wall at that location. See section 7 of this Certificate.
Requirement:	**B4(1)**	**External Fire Spread**
Comment:		The products are unrestricted under this Requirement. See section 6 of this Certificate.
Requirement:	**C2(b)**	**Resistance to moisture**
Comment:		The products can contribute to satisfying this Requirement. See section 8 of this Certificate.
Regulation:	**7(1)**	**Materials and workmanship**
		The products are acceptable. See section 11 and the *Installation* part of this Certificate.
Regulation:	**7(2)**	**Materials and workmanship.**
Comment:		The products are unrestricted by this Regulation. See section 6 of this Certificate.

The Building (Scotland) Regulations 2004 (as amended)

Regulation:	**8(1)**	**Durability, workmanship and fitness of materials**
Comment:		The use of the products can contribute to a construction satisfying this Regulation. See section 11 and the *Installation* part of this Certificate.
Regulation:	**9**	**Building standards applicable to construction**
Standard:	1.1(a)(b)	Structure
Comment:		The products can contribute to a construction satisfying this Standard with reference to clause 1.1.1[(1)(2)]. The presence of a dpc, however, can reduce the shear and tensile strength of a wall at that location. See section 7 of this Certificate.
Standard:	2.6	Spread on external walls
Comment:		The products are unrestricted under this Standard with reference to clauses 2.6.5[(1)] and 2.6.6[(2)]. See section 6 of this Certificate.
Standard:	3.1	Precipitation
Comment:		The products can contribute to a construction satisfying this Standard, with reference to clauses 3.10.1 and 3.10.4. See section 8 of this Certificate.
Standard:	7.1(a)	Statement of sustainability
Comment:		The products can contribute to meeting 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.
Regulation:	**12**	**Building standards applicable to conversions**
Comment:		Comments in relation to the products under Regulation 9, Standards 1 to 6 also apply to this Regulation, with reference to clause 0.12.1[(1)(2)] and Schedule 6[(1)(2)].

(1) Technical Handbook (Domestic).
(2) Technical Handbook (Non-Domestic).

The Building Regulations (Northern Ireland) 2012 (as amended)

Regulation:	**23(a)(i)**	**Fitness of materials and workmanship**
Comment:	**(iii)(b)(i)**	The products are acceptable. See section 11 and the *Installation* part of this Certificate.
Regulation:	**28(b)**	**Resistance to moisture**
Comment:		The products can contribute to satisfying this Regulation. See section 8 of this Certificate.
Regulation:	**30**	**Stability**
Comment:		The products can contribute to satisfying this Regulation. The presence of a dpc, however, can reduce the shear and tensile strength of a wall at that location. See section 7 of this Certificate.
Regulation:	**36(a)**	**Fire Safety**
Comment:		The products are unrestricted under this Requirement. See section 6 of this Certificate.

Construction (Design and Management) Regulations 2015
Construction (Design and Management) Regulations (Northern Ireland) 2016

Information in this Certificate may assist the client, designer (including Principal Designer) and contractor (including Principal Contractor) to address their obligations under these Regulations.

See sections: 3 *Delivery and site handling* (3.2) of this Certificate.

Additional Information

NHBC Standards 2021

In the opinion of the BBA, Keyfix Non Combustible Cavity Trays, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards*, Chapter 6.1 *External masonry walls* and Chapter 6.10 *Light steel framed walls and floors.*

Technical Specification

1 Description

1.1 Keyfix Non Combustible Cavity Trays are formed from 0.5 mm or 0.9 mm thick stainless steel grade 304 (or 316 for use where enhanced corrosion resistance is required) to BS EN 10028-7 : 2016. As well as the use of weeps, the system relies on trays or joining pieces with three profiled ribs to enable drainage of excess water through channels to the outside of the external brickwork. No joint sealants are used during the installation of the system.

1.2 The standard product range is shown in Table 1

Table 1 Standard product range

Product Code	Keyfix Cavity Tray	Length of tray
JP	Jointing Piece	230 mm
1BT	1 Brick Tray	222 mm
1.5BT	1.5 Brick Tray	333 mm
2BT	2 Brick Tray	447 mm
2.5BT	2.5 Brick Tray	559 mm
3BT	3 Brick Tray	672 mm
3.5BT	3.5 Brick Tray	784 mm
4BT	4 Brick Tray	897 mm
4.5BT	4.5 Brick Tray	1009 mm
5BT	5 Brick Tray	1122 mm
5.5BT	5.5 Brick Tray	1234 mm
6BT	6 Brick Tray	1347 mm
6.5BT	6.5 Brick Tray	1459 mm
7BT	7 Brick Tray	1572 mm
7.5BT	7.5 Brick Tray	1685 mm
8BT	8 Brick Tray	1797 mm
8.5BT	8.5 Brick Tray	1910 mm
9BT	9 Brick Tray	2022 mm
9.5BT	9.5 Brick Tray	2135 mm
10BT	10 Brick Tray	2247 mm
10.5BT	10.5 Brick Tray	2360 mm
11BT	11 Brick Tray	2472 mm
Product Code	**Keyfix Cavity Tray Corner**	
SL205 x 550RR	Standard External Reveal Corner	205 mm x 550 mm
RL550 x 205SR	Standard External Reveal Corner	550 mm x 205 mm
RL550 x 550RR	Standard External Corner	550 mm x 550 mm
RL450i x i450RR	Standard Internal Corner	450 mm x 450 mm

The Standard Type 1 trays are supplied in a variety of styles, as follows:

- with stop-ends at both ends of the tray (see Figure 1)
- with a stop-end at one end of the tray and three profiled drainage ribs at the other end (RH and LH versions available). (see Figure 2).

Joining pieces with three profiled drainage ribs on each end are used to link together two trays with stopends (see Figure 3).

The factory-welded corner units are supplied with three profiled drainage ribs at both ends (see Figure 4).

The factory-welded Corner Pier Unit are supplied in a variety of sizes not exceeding 3000 mm length (see Figure 5).

1.3 Ancillary items used with the cavity trays include:

- upper and lower clips to secure the joints between trays.
- stainless steel weeps.

Figure 1 Standard Tray with stop-ends at both ends

Figure 2 Standard Tray with a stop-end at one end and profiled drainage ribs at the other (also shows the bottom clip before and after fixing).

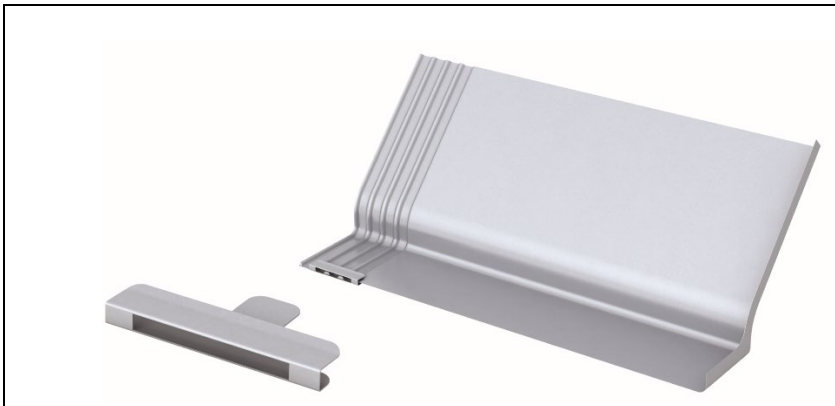


Figure 3 joining piece

Figure 4 External corner unit with fitted bottom clips

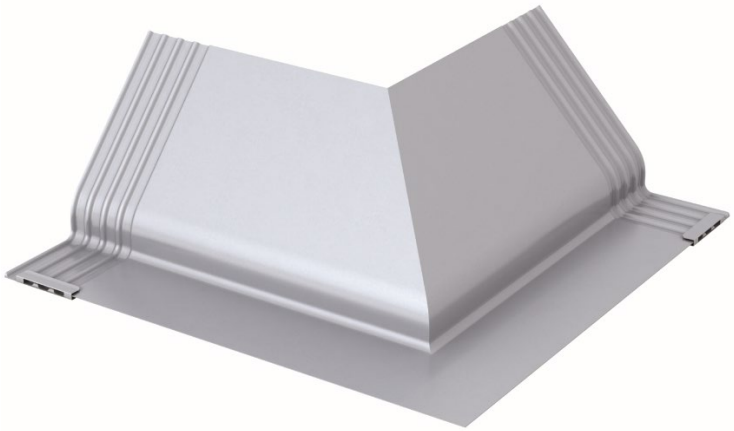
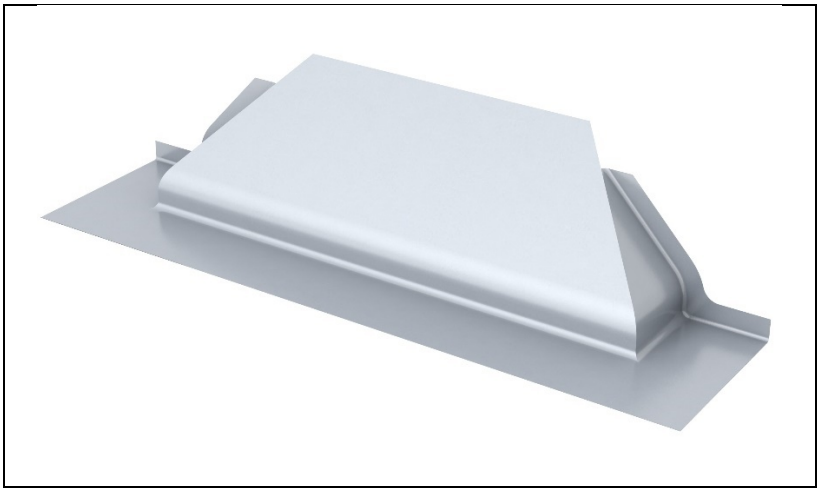


Figure 5 Internal corner unit with fitted bottom clips

Figure 6 Corner Pier Unit



2 Manufacture

2.1 The products are factory-formed from stainless steel grades 304 or 316. Corner units and special shapes are made to order and welded in the factory to ensure they are watertight.

2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:

- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

2.3 The management system of Keystone Group has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015 by the BBA (Certificate No. 18/Q059).

3 Delivery and site handling

3.1 The products and ancillary items are delivered to site packed in boxes, shrink-wrapped on pallets using plastic film. Address labels and delivery notes are attached along with customer drawings and installation instructions.

3.2 To prevent damage or surface contamination, the pallets should be unloaded by forklift truck and the products should be stored in a secure place in the original packaging until required for use.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Keyfix Non Combustible Cavity Trays.

Design Considerations

4 General

4.1 Keyfix Non Combustible Cavity Trays and the associated ancillary items, when specified and installed in accordance with this Certificate and generally with the specifications in PD 6697 : 2019, BS EN 1996-1-2 : 2005, BS EN 1996-2 : 2006, BS EN 1996-3 : 2006 and BS 8215 : 1991, are satisfactory for use in external cavity walls with a brick outer leaf and either a steel framing system (SFS) or a concrete/blockwork inner leaf.

4.2 The external leaf of the cavity walls should be built from standard brickwork and a minimum thickness of 102.5 mm and maximum thickness of 215 mm.

4.3 The trays have a pattern of indentations in the steel where the bricks are placed. These indentations will act as a 'key' to the mortar and improve the bond of the mortar to the steel.

5 Practicability of installation

The products are designed to be installed by a competent general builder or bricklayer experienced with these types of products.

6 Behaviour in relation to fire

The trays have a reaction to fire classification of A1 without the need for testing, as defined by Commission Decision 96/603/EC and their use is unrestricted by the documents supporting the national Building Regulations.

7 Behaviour under load

The products will not adversely affect the ability of a wall to sustain and transmit compressive loads. However, the presence of a dpc can reduce the shear and tensile (and therefore bending) strengths of a wall. Test walls(1) incorporating the products and tested to BS EN 1052-4 : 2000 gave a Characteristic Shear Strength of 0.10 Nmm^{-2}, and when tested to DD86-1 : 1983 gave a Characteristic Internal Angle of Friction 21.57°. The effect of wind and other horizontal or upward forces should be considered at the design stage.

(1) The test walls in these tests used Sunset Red bricks with a compressive strength of 49 Nmm^{-2} and a 1:1:6 mortar with compressive strengths of 4.05 Nmm^{-2} (Shear test) and 4.15 Nmm^{-2} (Flexural test).

8 Resistance to Passage of Water

The Keyfix Non Combustible Cavity Trays and associated ancillaries (such as corner units and stopends), when sealed together, provide a continuous barrier against liquid water. Water is typically drained through weepholes or evaporates from the outer skin.

9 Use with cavity wall insulation

Stainless Steel has no effect on, and is unaffected by, materials currently used as A1 fire-rated cavity wall insulants. However, where the trays are not bonded to the inner leaf, they do not form a continuous mechanical barrier, and blown or injected insulation may penetrate from the cavity above to below the trays. This possibility must be considered when an in-situ applied cavity insulation is used.

10 Maintenance

As the products are confined within the wall and wall cavity, and have suitable durability (see section 11), maintenance is not required. However, any damage occurring before enclosure must be repaired (see section 15).

11 Durability

Under normal service conditions, the trays will remain effective for the life of the building in which they are installed.

12 Reuse and recyclability

The products comprise steel, which can be recycled.

Installation

13 General

13.1 Keyfix Non Combustible Cavity Trays must be installed in accordance with this Certificate, the Certificate holder's instructions, and generally in accordance with PD 6697 : 2019, BS EN 1996-1-1 : 2005, BS EN 1996-2 : 2005, BS EN 1996-3 : 2006 and BS 8215 : 1991.

13.2 The products may be installed at a minimum temperature of 5°C in any weather that permits bricklaying. All relevant surfaces must be clean and dry prior to installing the cavity tray units.

13.3 The drainage ribs, which are present at each joint in the assembled cavity trays, should be free of all obstructions (eg mortar droppings accumulated during the laying of the trays in the mortar bed) to enable them to fulfil their function of conveying any excess water present in the try to the outer edge of the brickwork.

14 Procedure

14.1 Each Keyfix component has a unique reference number, which can be cross-referenced to the setting out documents supplied for each job.

14.2 Starting at a corner, a half-bed of mortar is placed on the brick course and the first itemised corner unit is placed on this bed, aligned with the outer edge of the brickwork, and pushed down to ensure good contact.

14.3 Trays can be bedded into the mortar course and fitted ongoing from the corner unit. Depending on the design of each tray, the joins between trays can be made in different ways:

- To join two trays which each have a stopend, a joining piece must be used to connect the trays together. A lower joining clip is used to secure the overlapping tray to the joining piece and an upper joining clip is used to secure the trays together at the top. This process is repeated for the second tray
- If one tray has a stopend and the next tray has profiled drainage channels, then a joining piece is not required and the tray with the stopend overlaps the one with the drainage channels by a minimum of half a brick overlap
- All joins between trays must be secured by the use of lower and upper clips.

14.4 Cavity trays are installed sequentially from the installed corner unit. Each unit is aligned with the outer edge of the brickwork. At the joins between trays care must be taken to ensure that the drainage channels do not become contaminated with mortar droppings, which would impede the drainage of excess water to the external brickwork via the channels.

14.5 Providing that all drainage channels are covered by consecutive trays, the trays can be adjusted horizontally in order to achieve brick bond matching. The integral Stop Ends also provide joint width adjustability of ±3 mm between 7-13 mm if required.

14.6 After installation of the trays on a bed of mortar has been completed, the next course of bricks can be laid and the weeps installed. Stainless Steel Weeps should be installed at a minimum distance of 450 mm along the brick course with a minimum of two installed at every corner unit. Mortar droppings should be cleared from the rear of the tray and from the weeps. It is good practice to use a wooden lath behind brickwork to catch mortar droppings, which can be periodically cleaned, raised and repositioned on top of ties as work progresses.

14.7 Care should be taken when laying the first brick course on the cavity trays, ensuring that the exit holes from the drainage channels do not become obstructed by mortar, as this will result in a reduction in the drainage efficiency of the channels.

14.8 Once the first brick course above the cavity trays has been laid, a strip of membrane should be installed over the space between the tray and the internal skin to provide protection to the install during construction and provide drainage of any condensation present within the cavity.

15 Repair

Damaged cavity trays should be replaced prior to the installation of brick courses above the tray.

Technical Investigations

16 Tests

Tests were carried out and the results assessed to determine:

- Characteristic shear strength to BS EN 1052-4 : 2000
- Characteristic flexural bond strength to DD86-1 :1983
- Leakage test carried out on a sample installation.

17 Investigations

17.1 The manufacturing process was evaluated, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.

17.2 A visit was carried out to a site-in-progress to assess the practicability of installation.

Bibliography

PD 6697 : 2019 *Recommendations for the design of masonry structures to BS EN 1996-1-1 and BS EN 1996-2*

BS EN 1052-4 : 2000 *Methods of test for masonry – Determination of shear strength including damp proof course*

BS EN 1996-1-1 : 2005 + A1 : 2012 *Eurocode 6 – Design of masonry structures – General rules for reinforced and unreinforced masonry structures*

BS EN 1996-1-2 : 2005 *Eurocode 6 – Design of masonry structures – General rules – Structural fire design*

BS EN 1996-2 : 2006 *Design of masonry structures – Design considerations, selection of materials and execution of masonry*

BS EN 1996-3 : 2006 *Eurocode 6 – Design of masonry structures – Simplified circulation methods for unreinforced masonry structures*

BS EN 10028-7 : 2016 *flat products made of steel for pressure purposes – stainless steel*

BS 8215 : 1991 *Code of practice for design and installation of damp-proof courses in masonry construction*

BS EN ISO 9001 : 2015 *Quality management systems – Requirements*

DD86-1 : 1983 *Damp-proof courses – Methods of test for flexural bond strength and short term shear strength*

18 Conditions

18.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page – no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- is valid only within the UK
- has to be read, considered and used as a whole document – it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English Law.

18.2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

18.3 This Certificate will remain valid for an unlimited period provided that the product/system and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
- are reviewed by the BBA as and when it considers appropriate.

18.4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

18.5 In issuing this Certificate the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- actual installations of the product/system, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product/system is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product/system, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to CE marking.

18.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product/system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.

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