

## Stofix Oy

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Agrément Certificate  
**16/5377**  
Product Sheet 1

## STOFIX CLADDING SYSTEMS

### STOFIX BRICK CLADDING SYSTEM

This Agrément Certificate Product Sheet<sup>(1)</sup> relates to the Stofix Brick Cladding System, for use as a protective/decorative cladding over solid masonry, steel and timber frame external walls in new or existing domestic and commercial buildings.

(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

**Strength and stability** — the system can adequately resist wind loads and impact damage (see section 6).

**Behaviour in relation to fire** — the system has an A2-s1, d0 reaction to fire classification in accordance with BS EN 13501-1 : 2007 (see section 7).

**Weathertightness** — the system minimises water penetration and the risk of damage to the inner wall (see section 8).

**Durability** — the system will have a service life in excess of 30 years when used in the normal climatic conditions found in the UK (see section 10).

The BBA has awarded this Certificate to the company named above for the system described herein. This system has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of First issue: 13 December 2016

Simon Wroe  
Head of Approvals — Engineering

Claire Curtis-Thomas  
Chief Executive

*The BBA is a UKAS accredited certification body — Number 113. The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at [www.bbacerts.co.uk](http://www.bbacerts.co.uk)*

*Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.*

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# Regulations

In the opinion of the BBA, the Stofix Brick Cladding System, 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)

<b>Requirement:</b> A1	<b>Loading</b>
<b>Comment:</b>	The system can sustain and transmit wind loads to the structural frame. See sections 4.3, 6.1 and 6.2 of this Certificate.
<b>Requirement:</b> B4(1)	<b>External fire spread</b>
<b>Comment:</b>	The system can satisfy or contribute to satisfying this Requirement. See sections 7.1 to 7.7 and 7.10 of this Certificate.
<b>Requirement:</b> C2(b)	<b>Resistance to moisture</b>
<b>Comment:</b>	The system will contribute to satisfying this Requirement. See sections 8.1 and 8.2 of this Certificate.
<b>Regulation:</b> 7	<b>Materials and workmanship</b>
<b>Comment:</b>	The system is acceptable. See section 10 and the <i>Installation</i> part of this Certificate



## The Building (Scotland) Regulations 2004 (as amended)

<b>Regulation:</b> 8(1)(2)	<b>Durability, workmanship and fitness of materials</b>
<b>Comment:</b>	The system can contribute to a construction satisfying this Regulation. See sections 9 and 10 and the <i>Installation</i> part of this Certificate.
<b>Regulation:</b> 9	<b>Building standards applicable to construction</b>
<b>Standard:</b> 1.1	<b>Structure</b>
<b>Comment:</b>	The system is acceptable, with reference to clause 1.1.1 <sup>(1)(2)</sup> . See sections 4.3, 6.1 and 6.2 of this Certificate.
<b>Standard:</b> 2.6	<b>Spread to neighbouring buildings</b>
<b>Comment:</b>	The system is regarded as 'non-combustible' and therefore can satisfy this Standard, with reference to clauses 2.6.4 <sup>(1)(2)</sup> , 2.6.5 <sup>(2)</sup> and 2.6.6 <sup>(2)</sup> . See section 7 of this Certificate.
<b>Standard:</b> 2.7	<b>Spread on external walls</b>
<b>Comment:</b>	The system can satisfy the requirements of this Standard, with reference to clause 2.7.1 <sup>(1)(2)</sup> and 2.7.2 <sup>(2)</sup> . See section 7 of this Certificate.
<b>Standard:</b> 3.10	<b>Precipitation</b>
<b>Comment:</b>	The system will contribute to a construction satisfying this Standard, with reference to clauses 3.10.1 <sup>(1)(2)</sup> and 3.10.6 <sup>(1)(2)</sup> . See sections 8.1 and 8.2 of this Certificate.
<b>Standard:</b> 7.1(a)(b)	<b>Statement of sustainability</b>
<b>Comment:</b>	The system 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.
<b>Regulation:</b> 12	<b>Building standards applicable to conversions</b>
<b>Comment:</b>	All comments given for the system under Regulation 9, Standards 1 to 6 also apply to this Regulation, with reference to clause 0.12.1 <sup>(1)(2)</sup> and Schedule 6 <sup>(1)(2)</sup> . (1) Technical Handbook (Domestic). (2) Technical Handbook (Non-Domestic).



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

<b>Regulation:</b> 23(a)(i)(iii)(b)	<b>Fitness of materials and workmanship</b>
<b>Comment:</b>	The system is acceptable. See section 10 and the <i>Installation</i> part of this Certificate.
<b>Regulation:</b> 28	<b>Resistance to ground moisture and weather</b>
<b>Comment:</b>	The system is not watertight but will resist the passage of rainwater to the supporting structure. See sections 8.1 and 8.2 of this Certificate.
<b>Regulation:</b> 30	<b>Stability</b>
<b>Comment:</b>	The system is acceptable as set out in sections 4.3, 6.1 and 6.2 of this Certificate.
<b>Regulation:</b> 36(a)	<b>External fire spread</b>
<b>Comment:</b>	The system is judged to satisfy the Class A2-s1,d0 requirements. See sections 7.1 to 7.7 and 7.10 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 section: 3 *Delivery and site handling* (3.5 and 3.6) of this Certificate.

## NHBC Standards 2016

NHBC accepts the use of the Stofix Brick Cladding System, provided it is installed, used and maintained in accordance with this Certificate, in relation to *NHBC Standards, Chapter 6.9 Curtain walling and cladding.*

## Technical Specification

### 1 Description

1.1 The Stofix Brick Cladding System is a prefabricated cladding system comprising the following components:

- Stofix cladding panels — comprising brick slips, factory embedded to the backing steel sheet with mortar to form a panel (see Figure 1). The dimensions of the panels vary with the brick size (see Table 1). The panels have a weight of 38 to 50 kg·m<sup>-2</sup>, depending on the brick type. Corner panels are made to the required specifications. The panel components have the following specifications:
  - brick slips — clay kiln-fired bricks slips manufactured to EN 771-1 : 2012 and with standard dimensions of 65 mm (height) x 215 mm (length) with a nominal thickness of 20 mm
  - steel sheet — the steel sheet is made from either galvanized steel with a hot-dip zinc coating (600 g·m<sup>-2</sup>) of grade DX51D or S220GD Z600 manufactured to EN 10346 : 2015 or stainless steel of grade 1.4521 in accordance with BS EN 10088-2 : 2014. The steel sheet contains holes and folds for keying into the mortar, and has a standard size of 1125 x 600 mm with a thickness of 0.7 mm
  - factory-applied mortar — cement-based, polymer-modified mortar of class M20, manufactured to BS EN 998-2 : 2010, for embedding the brick slips to the backing steel sheet during panel assembly at the factory

Figure 1 Typical Stofix Brick Cladding panel (Stofix UK WDF)

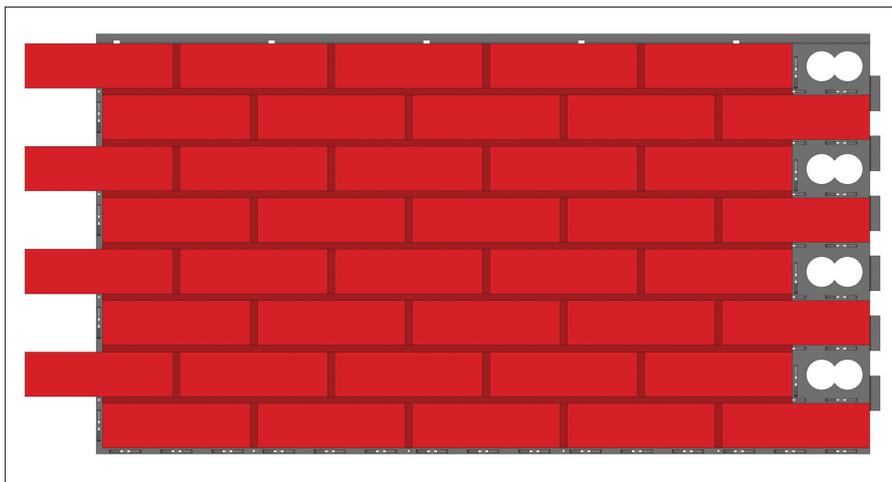


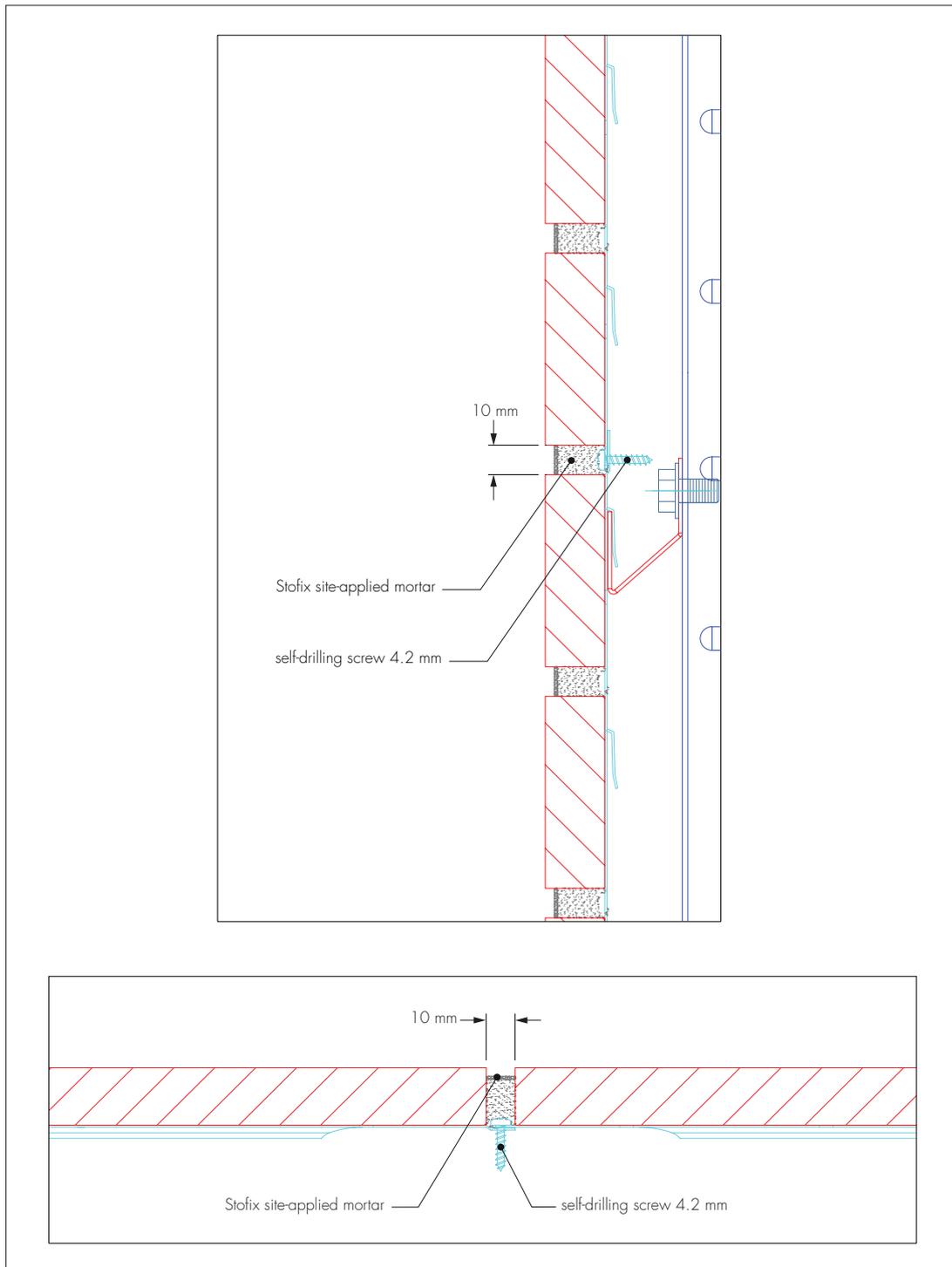
Table 1 Range of standard Stofix Brick Cladding panels<sup>(1)</sup>

Panel type	Brick code	Brick size (mm)	Maximum panel size (mm)	Brick slips (units/m <sup>2</sup> )
Stofix UK WDF	WDF	215 x 65 x 20	1125 x 600	59.3
Stofix Finnish 1/3	MTL85	285 x 85 x 20	1200 x 600	33.3
Stofix Finnish 1/2	MTL85	285 x 85 x 20	1200 x 600	33.3
Stofix Finnish Stack	MTL85	285 x 85 x 20	1200 x 600	33.3
Stofix Finnish Norm 1/2	NTL75	270 x 75 x 20	1120 x 525	40.8
Stofix German DF	DF	240 x 52 x 20	1000 x 496	64.5
Stofix German NF	NF	240 x 71 x 20	1000 x 486	49.4
Stofix LDF	LDF	290 x 52 x 20	1200 x 536	49.8
Stofix LDF Silesian	LDF	290 x 52 x 20	1200 x 536	49.8
Stofix WF	WF	210 x 50 x 20	1100 x 600	75.8
Stofix Norwegian	NOR	226 x 62 x 20	1200 x 600	55.6
Stofix Sweden	SVSE	250 x 62 x 20	1040 x 600	51.3
Stofix Denmark	DNF	228 x 54 x 20	1200 x 534	62.5
Stofix Rustic	RTL60	270 x 60 x 20	1132 x 581	48.7

(1) Additional panel types available on request.

- site-applied mortar — cement-based, polymer-modified site-applied mortar of class M10 for filling the joints of the cladding panels on site, manufactured to BS EN 998-2 : 2010
- self-drilling screws — the panels are secured together on site with zinc-plated 4.2 mm diameter self-drilling screws to DIN 7504, through the joints of the panels. The joints are then finished with the site-applied mortar (see Figure 2)

Figure 2 Standard vertical and horizontal fixed joint



- SK wall bracket and JK extension bracket — 2.0 mm thick, made from either galvanized steel with 42  $\mu\text{m}$  hot-dip zinc coating ( $600 \text{ g}\cdot\text{m}^{-2}$ ) of grade DX51D or S220GD Z600 manufactured to EN 10346 : 2015, or stainless steel of grade 1.4521 according to EN 10088-2 : 2014

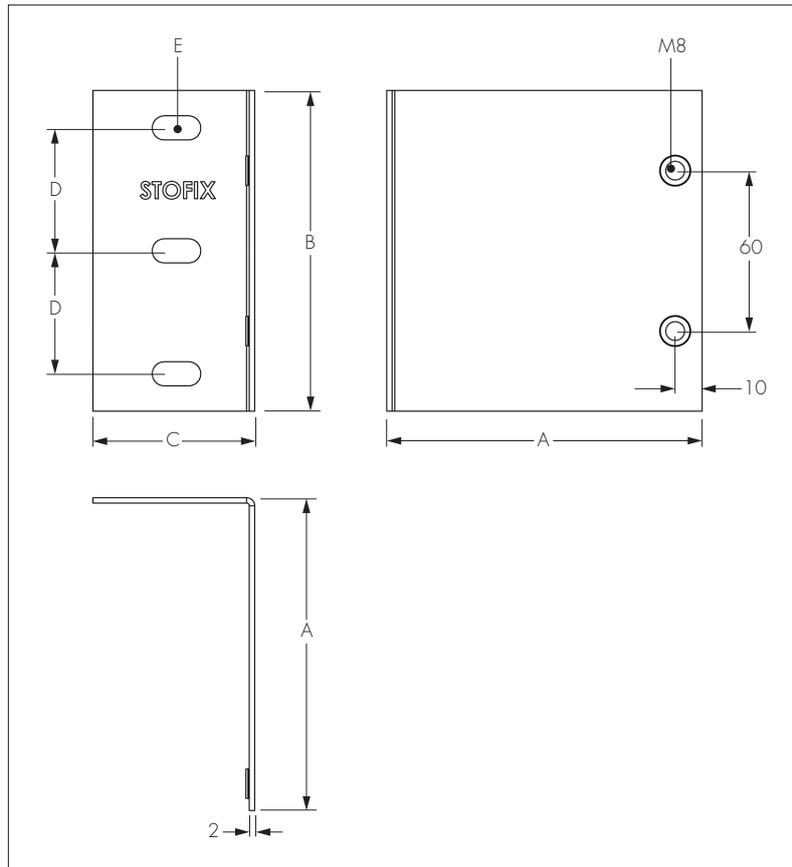
The range of the SK wall brackets is given in Table 2, with reference to Figure 3

Table 2 Range of SK wall brackets

Bracket type	Distance A <sup>(1)</sup> (mm)	Distance B <sup>(1)</sup> (mm)	Distance C <sup>(1)</sup> (mm)	Slot centres D (mm)	Slot size E (mm)	Weight (g)
SK50	50	80	60	26	9 x 18	123
SK65	65	80	60	26	9 x 18	145
SK80	80	80	60	26	9 x 18	162
SK95	95	80	60	26	9 x 18	179
SK115	115	120	60	46	9 x 18	412
SK165	165	120	60	46	9 x 18	412
SK225	225	150	60	61	11 x 20	644

(1) With a tolerance (mm) of +2/-0.

Figure 3 SK wall bracket profile



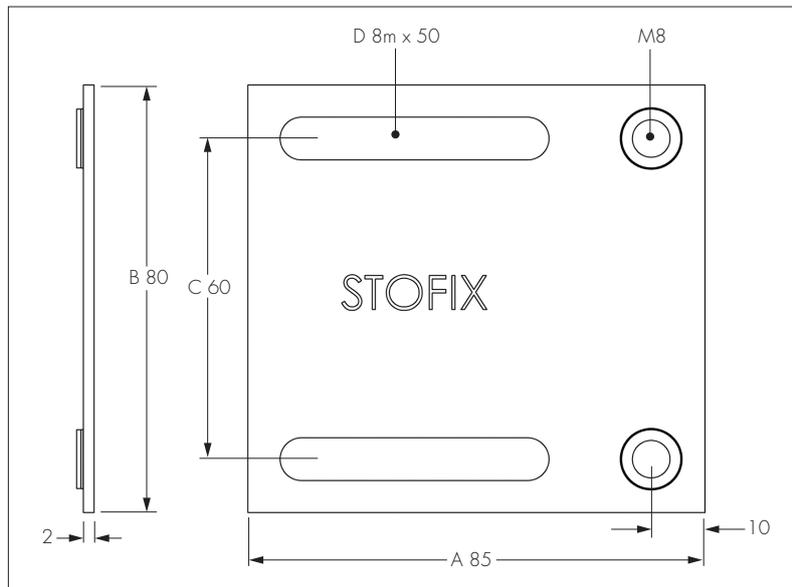
The range of JK extension brackets is given in Table 3, with reference to Figure 4

Table 3 Range of JK extension brackets

Extension bracket type	Distance A <sup>(1)</sup> (mm)	Distance B <sup>(1)</sup> (mm)	Slot centres C (mm)	Slot size D (mm)	Weight (g)
JK85	85	80	60	8 x 50	91
JK120	120	80	60	8 x 63	129

(1) With a tolerance (mm) of ±1.

Figure 4 JK extension bracket profile



- J60 vertical rail and Z vertical rails — 1.25 mm thick, made from either galvanized steel with 42 µm hot-dip zinc coating (600 g·m<sup>-2</sup>) of grade DX51D or S220GD Z600 manufactured to EN 10346 : 2015, or stainless steel of grade 1.4521 in accordance with BS EN 10088-2 : 2014. The J60 vertical rails have a weight of 0.8 kg·m<sup>-1</sup> and the range is given in Table 4, with reference to Figure 5. The Z rails have a weight of 0.5 to 0.9 kg·m<sup>-1</sup> and the range is given in Table 5, with reference to Figure 6

Table 4 Range of J60 vertical rail

Distance A (mm)	Distance B (mm)
75	75
60	60
66.67	66.67
87.5	60
90	60
100	60

Figure 5 J60 vertical rail profile

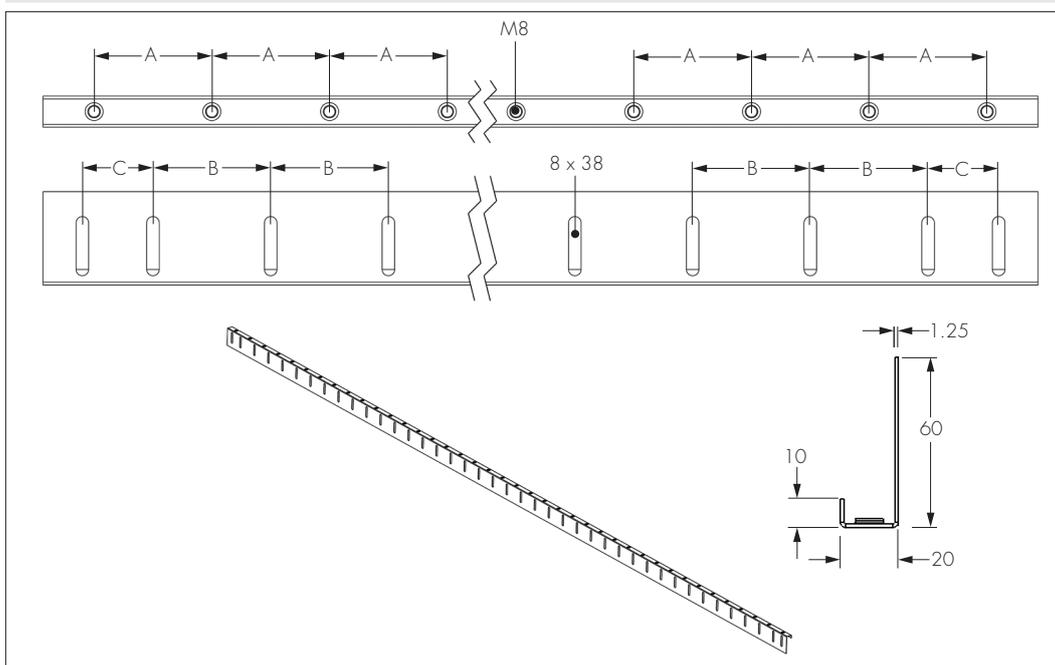
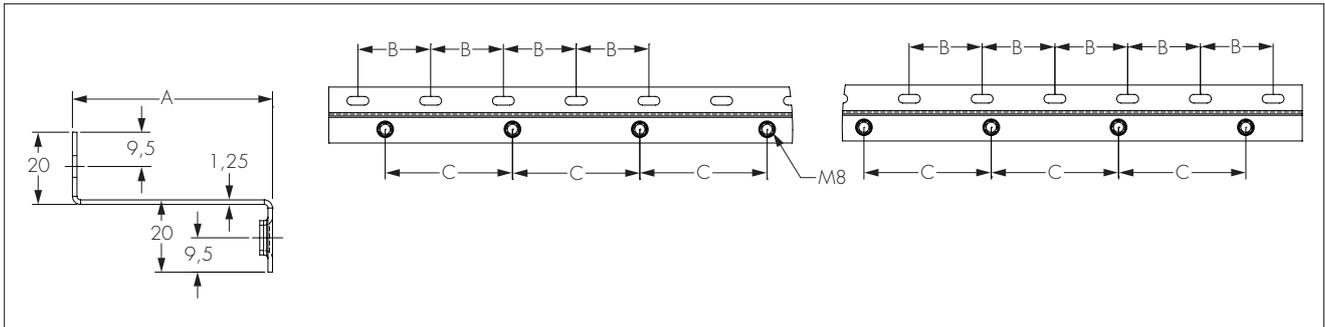


Table 5 Range of Z vertical rail

Rail type	Distance A (mm)	Distance B (mm)	Distance C (mm)
Z20/2795/67	20	67	67
Z20/2995/75	20	50	75
Z20/2790/87.5	20	50	87.5
Z20/2785/90	20	50	90
Z20/2795/100	20	50	100
Z20/2795/75	55	50	75
Z55/2790/87.5	55	50	100
Z55/2795/100	55	50 </td <td>100</td>	100

Figure 6 Z vertical rail profile

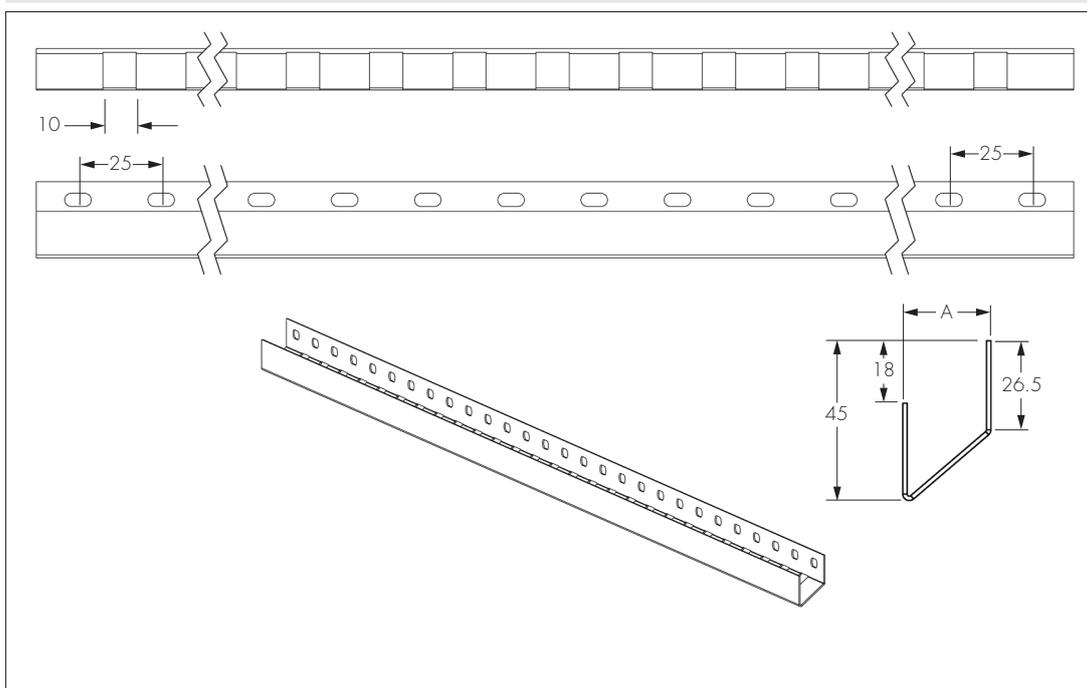


- AK horizontal rail 1.25 mm thick, made from either galvanized steel with 42  $\mu\text{m}$  hot-dip zinc coating ( $600 \text{ g}\cdot\text{m}^{-2}$ ) of grade DX51D S220GD Z600 manufactured to EN 10346 : 2015, or stainless steel of grade 1.4521 according to BS EN 10088-2 : 2014. The range of AK horizontal rail is given in Table 6, with reference to Figure 7

Table 6 Range of AK horizontal rail

Rail type	Distance A (mm)	Weight ( $\text{kg}\cdot\text{m}^{-1}$ )
AK15	15	0.67
AK25	25	0.67

Figure 7 AK horizontal rail profile



- M8 hexagon bolts and nuts — used to attach the horizontal rail to the vertical rail and the vertical rail to the bracket/extension bracket. The bolts have a diameter of 8 mm and length of 12 mm and are zinc plated to ISO 7380. The nuts are zinc plated to DIN 985.

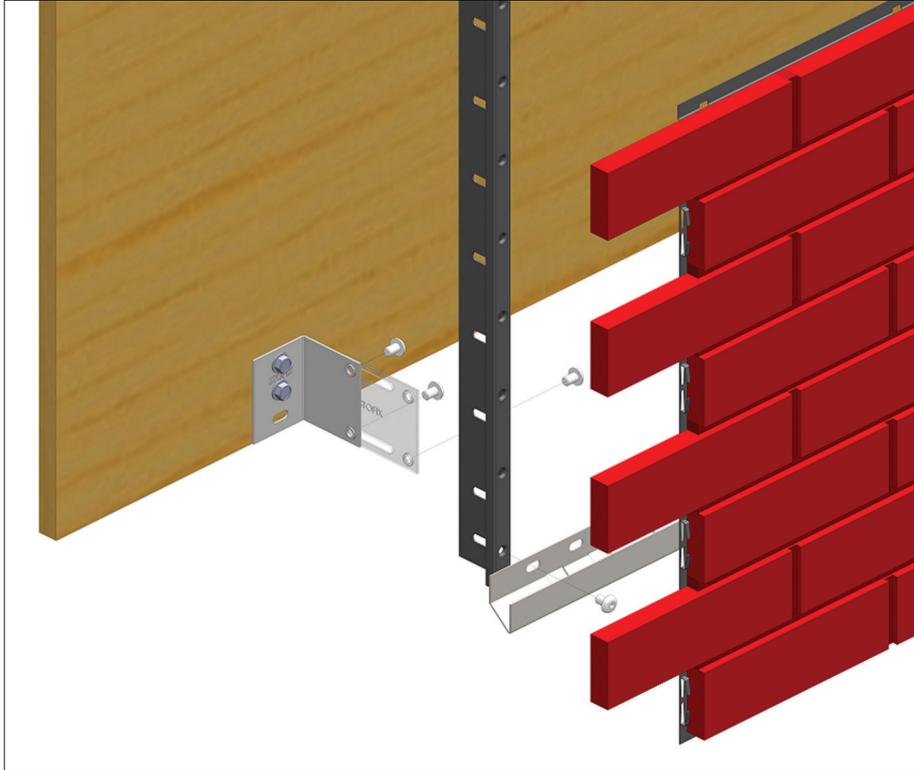
1.2 Ancillary items for use with the system, but outside the scope of this Certificate, are:

- closed cell polyethylene backer rod — for use in the expansion joints as shown in Figure 11
- mastic adhesive — based on hybrid polymers, for sealing expansion joints (see Figure 11).

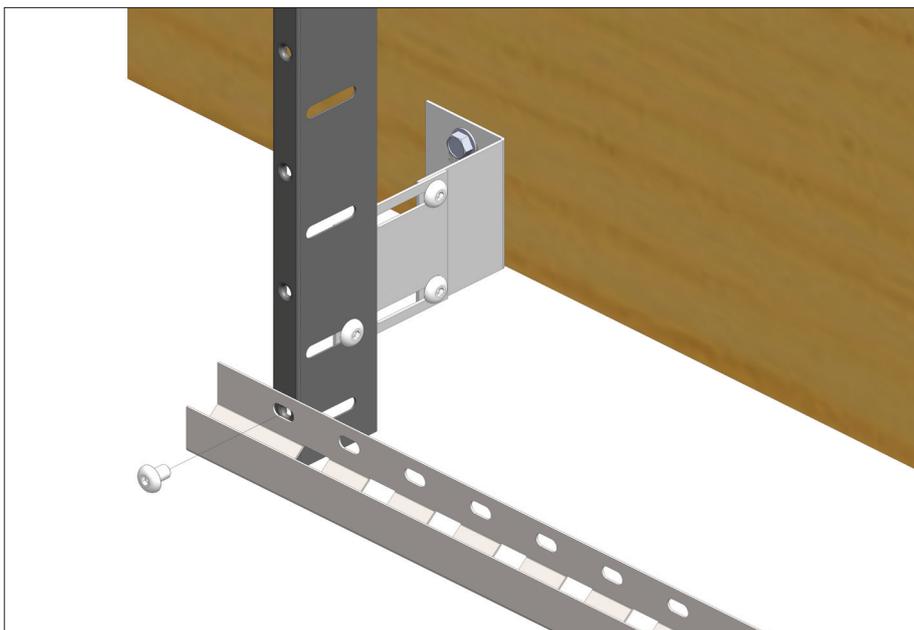
1.3 The Stofix Brick Cladding System can be installed in two configurations:

- standard build-up — comprising (from outer surface to inner): cladding panels, AK horizontal rails, J60 vertical rails, JK extension brackets (if required for wider cavity to accommodate additional insulation thickness), SK wall brackets and M8 hexagon bolts and nuts (see Figures 8 and 9)

*Figure 8 Standard build-up of the Stofix Brick Cladding System*

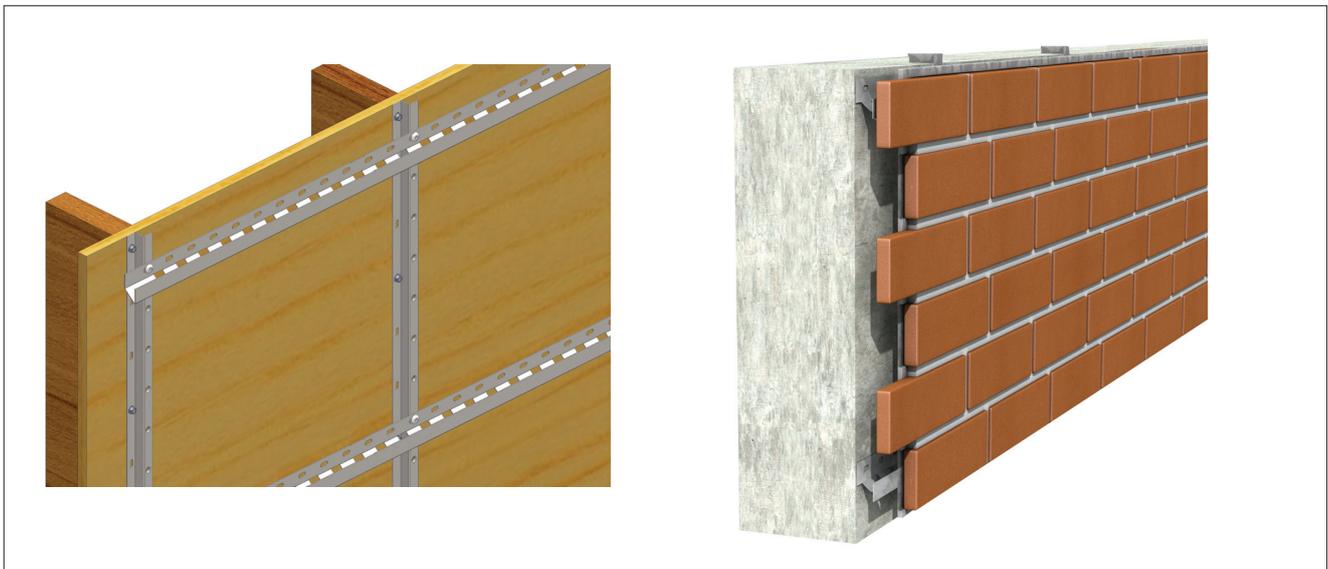


*Figure 9 SK wall bracket fixed to the load bearing wall and JK extension bracket and vertical rail*



- Z-rail build-up — suitable for use with thin insulation (up to 40 mm) or no insulation. The vertical Z-rails are mechanically fixed directly to the load-bearing wall. The AK horizontal rails are then secured to the Z-rails with M8 hexagon bolts and nuts (see Figure 10).

Figure 10 Z-rail build-up



## 2 Manufacture

2.1 Natural clay, kiln-fired brick slips are factory-embedded onto a fabricated steel backing sheet using a factory-applied mortar. Once dried, the panels are delivered to site and the joints of the panels are filled with site-applied mortar on site.

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.

## 3 Delivery and site handling

3.1 The panels are delivered on pallets, on foam strips with cardboard and polystyrene inserts. Pallets are strapped and covered with plastic.

3.2 The pallets must be stored on a flat surface, clear of the ground, out of direct sunlight and in dry conditions. Adequate distance must be left between the pallets and the constructed or renovated wall, to minimise movement during installation.

3.3 Panels should be carried in a vertical position and handled with care to avoid damage.

3.4 Packs of rails should be stacked horizontally on sufficient bearers to prevent distortion. Care is required when handling long lengths of rail, particularly at heights.

3.5 Care should be exercised when handling rails to avoid injury from sharp edges. Protective clothing should be worn and all Health and Safety rules must be observed.

3.6 The mortar is packed in paper and plastic sacks of 25 kg each, and must be stored in dry conditions, protected from frost and excessive heat. The mortar must be used within the date indicated on the packaging or the supplier's guidelines.

# Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the Stofix Brick Cladding System.

## Design Considerations

### 4 General

4.1 The Stofix Brick Cladding System, when installed in accordance with this Certificate, is satisfactory for use as protective and decorative cladding on external walls of domestic and commercial buildings of masonry, steel and timber frame construction above the damp-proof course (dpc) level.

4.2 It is important for designers, planners, contractors and/or installers to ensure that the installation of the system is in accordance with the Certificate holder's instructions and the information given in this Certificate. All design aspects should be checked by a suitably-qualified and experienced individual in accordance with the requirements of the relevant Building Regulations and Standards.



4.3 The wall to which the cladding system is to be fixed must be structurally sound and constructed in accordance with the requirements of the relevant national Building Regulations and Standards:

- timber-frame walls must be designed and constructed in accordance with BS EN 1995-1-1 : 2004, and preservative-treated in accordance with BS EN 351-1 : 2007
- steel-frame substrate must be structurally sound, and designed and constructed in accordance with BS EN 1993-1-1 : 2005 and BS EN 1993-1-3 : 2006
- masonry walls must be designed and constructed in accordance with the relevant recommendations of BS EN 1996-1-1 : 2005, BS EN 1996-1-2 : 2005, BS EN 1996-2 : 2006, BS EN 1996-3 : 2006, and BS 8000-3 : 2001.

4.4 Ventilation and drainage must be provided behind the cladding. The clear cavity between the back of the tile and substrate wall (or insulation if installed within the cavity) must be at least 38 mm wide, to ensure that a minimum ventilation area of 1000 mm<sup>2</sup> per metre run of cladding is achieved. All ventilation openings around the periphery of the system should be suitably protected with mesh to prevent the ingress of birds, vermin and insects.

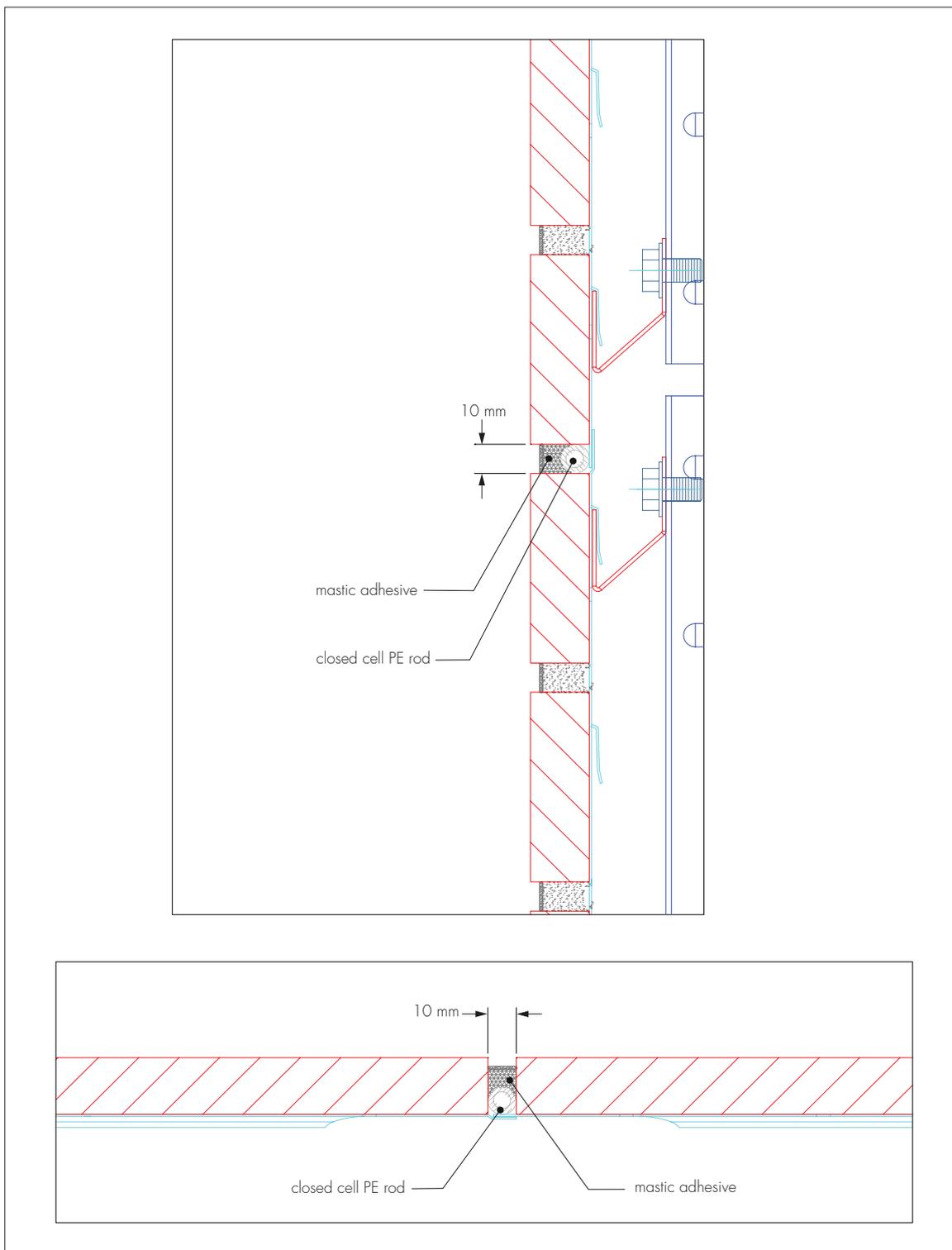
4.5 The substrate to which the cladding is fixed should be watertight.

4.6 Vertical and horizontal expansion joints should be provided at 7.5 m intervals when the height/length of the wall exceeds 12 m (see Figure 11).

4.7 External plumbing should be removed before installation and alterations made to underground drainage, where appropriate, to accommodate repositioning on the finished face of the system.

4.8 It is essential that the system is installed and maintained in accordance with the conditions set out in this Certificate.

Figure 11 Standard vertical and horizontal expansion joint



## 5 Practicability of installation

The system is designed to be installed only by specialised contractors who have been trained and registered by the Certificate holder.

## 6 Strength and stability

6.1 Design wind actions must be calculated in accordance with BS EN 1991-1-4 : 2005 and its UK National Annex. Due consideration should be given to higher pressure coefficients applicable to corners of the building, as recommended in this Standard.

6.2 The supporting substrate wall must have sufficient strength to resist the general actions imposed directly by the cladding system and wind actions normally experienced in the UK, as well as any racking loads, on its own. No contribution from the cladding system may be assumed in this regard.

6.3 The structural adequacy of the fixings used to attach the system to the substrate wall, including their pull-out strength, will depend on the type and condition of the individual substrate wall and must therefore be designed and selected on a project specific basis. The maximum spacing between these fixings should not exceed 720 mm vertically and 600 mm horizontally.

6.4 An assessment of the structural performance for a particular building must be carried out by a qualified structural engineer to confirm that:

- the supporting substrate wall is capable of withstanding the loads applied to it from the cladding system and resisting the temporary additional loads that may be applied as a result of installing the system, and have an acceptable resistance to the pull-out of fixings
- the proposed system and associated fixing layout provide adequate resistance to wind loads
- an appropriate number of site-specific pull-out tests is conducted on the substrate to determine the minimum pull-out resistance to failure of the fixings. The characteristic pull-out resistance should be determined in accordance with the guidance given in ETAG 014 : 2011, Annex D, using 60% of the mean value of the five smallest measured values at the ultimate load
- design of the sub-frame is in accordance with the relevant Codes and Standards, and is such as to limit mid-span deflections to L/200 and cantilever deflections to L/150.

6.5 The following tests have been carried out for the dynamic wind load resistance of the systems:

- a system with 600 x 1200 mm panels fixed to a steel framed structure, consisting of wall brackets (SK 225) with extension brackets (JK 120) spaced at 600 mm centres horizontally and 720 mm centres vertically, J60 vertical rails, AK15 horizontal rails, achieved an ultimate wind pressure of 2.75 kN·m<sup>-2</sup> with a characteristic wind load resistance of 1.83 kN·m<sup>-2</sup>. The Z-rail build-up system has been assessed as capable of achieving the same performance with respect to wind loading
- a system with 600 x 1200 mm panels fixed to a steel frame structure, consisting of wall brackets (SK165) with extension brackets (JK 120) spaced at 600 mm centres horizontally and 540 mm centres vertically, J60 vertical rail and AK25 horizontal rails spaced at 300 mm centres vertically, achieved an ultimate wind pressure of 3.6 kN·m<sup>-2</sup> with a characteristic wind load resistance of 2.4 kN·m<sup>-2</sup>.

For the design value, a wind load factor of 1.5 should be applied to the characteristic wind load resistance in accordance with BS EN 1990 : 2002.

### Impact resistance

6.6 When tested for hard body and soft body impacts, the system comprising Stofix panels of approximately 2400 x 1800 mm, AK horizontal rails and J60 vertical rails, JK extension brackets and SK wall brackets at 720 mm centres vertically and 600 mm centres horizontally, achieved adequate resistance. The system is, therefore, suitable for use in all categories as defined in ETAG 034-1 : 2012 (see Table 7). The Z-rail build-up system has been assessed as capable of achieving the same performance with respect to impact resistance.

*Table 7 Definition of use categories*

Use category	Description
I	A zone readily accessible at ground level to the public and vulnerable to hard body impacts but not subjected to abnormally rough use.
II	A zone liable to impacts from thrown or kicked objects, but in public locations where the height of the kit will limit the size of the impact; or at lower levels where access to the building is primarily to those with some incentive to exercise care.
III	A zone not likely to be damaged by normal impacts caused by people or by thrown or kicked objects.
IV	A zone out of reach from ground level

## 7 Behaviour in relation to fire

 7.1 The reaction to fire classification for the Stofix Brick Cladding System, in accordance with BS EN 13501-1 : 2007, is A2-s1,d0.

7.2 The system is not the subject of any height restriction or boundary when used on a substrate and with components that meet the non-combustibility requirement of materials in the relevant national Building Regulations. When the system is used in conjunction with combustible materials, the whole wall construction should meet the requirements of BRE Report BR 135 : 2013 *Fire performance of external thermal insulation for walls of multi-storey buildings* (refer to Clause 7.4).

7.3 For houses in Scotland and for all buildings in England, Wales and Northern Ireland, the system is suitable for use on, or at any distance from, the boundary.

7.4 There is no restriction on height or boundary for the system when it is included in the following wall specification, which, when tested, met the performance criteria in Annex B of BRE Report BR 135 : 2013 (the components of the substrate construction are outside the scope of this Certificate):

- 100 mm lightweight SFS steel framing system
- 12 mm cement particle sheathing board
- breather membrane
- maximum of 120 mm thick Kooltherm K15 Insulation
- horizontal firebreaks — AIM intumescent cavity barrier 133 mm x 75 mm
- vertical firebreaks — mineral wool firebreaks 170 mm x 75 mm
- vertical and horizontal galvanized steel rails and wall brackets
- 38 mm ventilation cavity between the insulation and the cladding panel.

7.5 For resistance to fire, the performance of a wall incorporating the system can only be determined by tests from a suitably-accredited laboratory, and is not covered by this Certificate.

#### On steel-frame and masonry substrates



7.6 The system is suitable for use on, or at any distance from, the boundary, and there is no height restriction provided it is constructed as detailed in section 7.4 or it meets the requirements in section 7.2 of this Certificate.

#### On timber-frame substrates



7.7 The system is restricted for use in buildings up to 18 metres in height.



7.8 For flats and maisonettes and non-domestic buildings in Scotland, the system is suitable only for use more than one metre from the boundary.

7.9 The system used on a timber-frame substrate is not classified as 'non-combustible' and, therefore, calculations for unprotected areas may apply, dependent on the fire-resistance characteristics of the wall.

#### For all substrates



7.10 To limit the risk of fire spread between the floors in buildings subject to the national Building Regulations, fire barriers must be incorporated in the cavity behind the product as required under these Regulations, but should not block essential ventilation pathways. Guidance on fire barriers can be found in BRE Report BR 135 : 2013.

## 8 Weathertightness



8.1 The system is not airtight or watertight. Any water passing through the panel and collecting in the cavity owing to rain or condensation will be removed by drainage and ventilation. The substrate wall onto which the system is installed must be watertight and meet the requirements of the relevant Standards and Building Regulations for airtightness.

8.2 The minimum cavity width between the back face of the panels and the substrate wall (or insulation if installed within the cavity) should be 38 mm.

8.3 Designers and installers should take particular care in detailing around openings, penetrations and movement joints to minimise the risk of rain ingress. Only details approved by the Certificate holder should be used.

## 9 Maintenance and repair



9.1 A maintenance schedule for the installed system must include regular visual inspections:

- of the brick slips for signs of disbandment. Dislodged slips should be re-fixed using brick slip adhesive
- of the sealant around openings and service entry points
- of architectural details designed to shed water to confirm that they are performing properly
- to ensure that water is not leaking from external downpipes or gutters (such leakage could penetrate the cladding panel).

9.2 Maintenance should include the replacement and resealing of joints, for example between the cladding panels and window and door frame. Materials with signs of corrosion must be replaced.

9.3 Damaged areas must be repaired using the appropriate components and procedures detailed in the Certificate holder's installation instructions. Damaged brick slips are removed and replaced with new ones, using the brick slip adhesive as supplied by the Certificate holder.

9.4 Corroded materials must be replaced.

## 10 Durability



10.1 The durability and service life of the system will depend upon the building location and height, the intended use of the building and the immediate environmental conditions.

10.2 Provided regular maintenance is carried out, as described in this Certificate and in accordance with the Certificate holder's instructions, the system will have a service life in excess of 30 years when used in the normal climatic conditions found in the UK.

10.3 The components of the system made of hot-dip galvanized steel with 42  $\mu\text{m}$  zinc coating ( $600 \text{ g}\cdot\text{m}^{-2}$ ) of grade DX51D or S220GD Z600 manufactured to EN 10346 : 2015 will remain effective with an ultimate life in excess of 50 years in rural and suburban conditions and 30 years in unpolluted temperate marine conditions, provided no cut edges are left exposed or are in contact with other metals.

10.4 The components of the system made of ferritic stainless steel of grade 1.4521, when they are not in contact with other metals, can remain effective with an ultimate life in excess of 60 years under normal conditions in the UK.

10.5 Maintenance repainting should be conducted before the steel materials have become exposed, within the periods stated above.

## 11 Reuse and recyclability

The Stofix Cladding System consists of brick, mortar and steel materials which can be recycled.

## Installation

### 12 General

12.1 A diagram defining the types and sizes of different elements is produced by the Certificate holder for each project. As corner panels are manufactured to size, the construction method of external corners and window frames (straight bricks/corner bricks) must be defined at an early stage.

12.2 The cladding panels hang freely on the horizontal mounting rails with a minimum of one rail per panel. The backing steel sheets are fixed together at overlaps with self-drilling screws.

12.3 In shock-sensitive areas, such as near external doors and windows, it is recommended to use horizontal rails with 300 mm spacing.

12.4 Installation of flashings and replacement of accessories such as lamps, sensors or wiring must be carried out with care. For detailed instructions, the Certificate holder must be consulted.

12.5 It is recommended that a minimum distance of 250 mm is allowed between the lower end of the cladding and the ground, to avoid blockage of the cavity by leaves and debris.

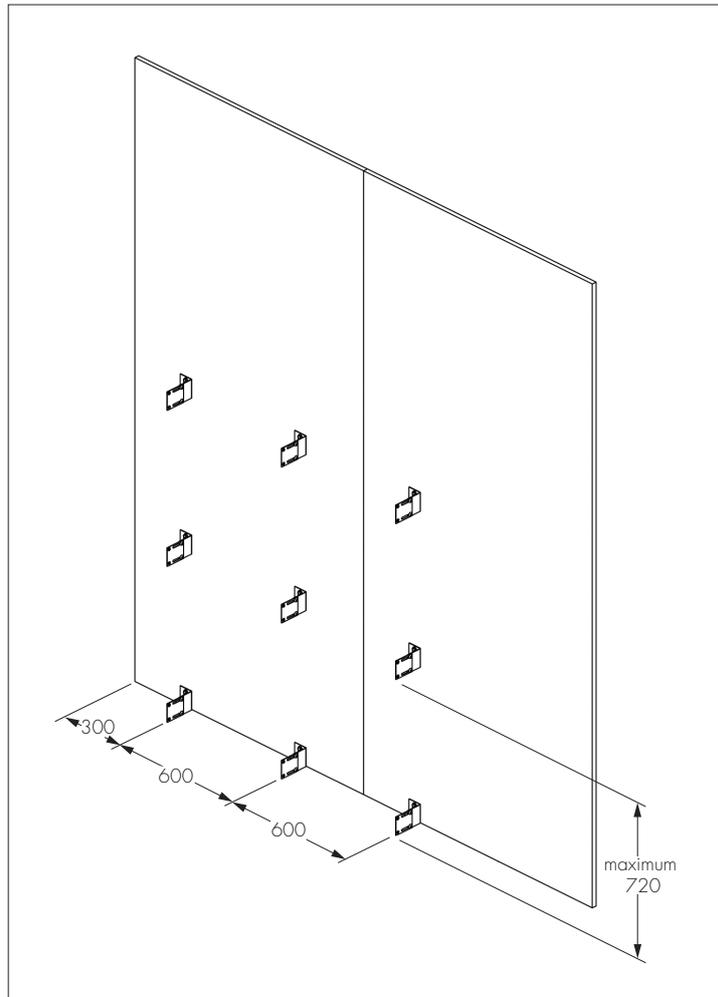
12.6 The fixings of rainwater goods, satellite dishes, clothes lines, hanging baskets and similar items is outside the scope of this Certificate.

#### Standard Stofix build-up

12.7 J60 vertical rails are secured to SK wall brackets or JK extension brackets (if required) using M8 hexagon bolts and nuts (see Figures 12, 13 and 14). AK horizontal rails are then secured to the vertical rails with M8 hexagon bolts and nuts.

12.8 Spacing between the centres of SK wall brackets in a typical installation using Stofix UK WDF panels is 675 mm vertically (not exceeding 720 mm in any case) and 600 mm horizontally, as shown in Figure 12.

Figure 12 Spacings between SK wall brackets



### Z-rail build-up

12.9 The vertical Z-rails are mechanically fixed directly to the load-bearing wall, with maximum centre spacings of 600 mm horizontally and 400 mm vertically.

## 13 Procedure

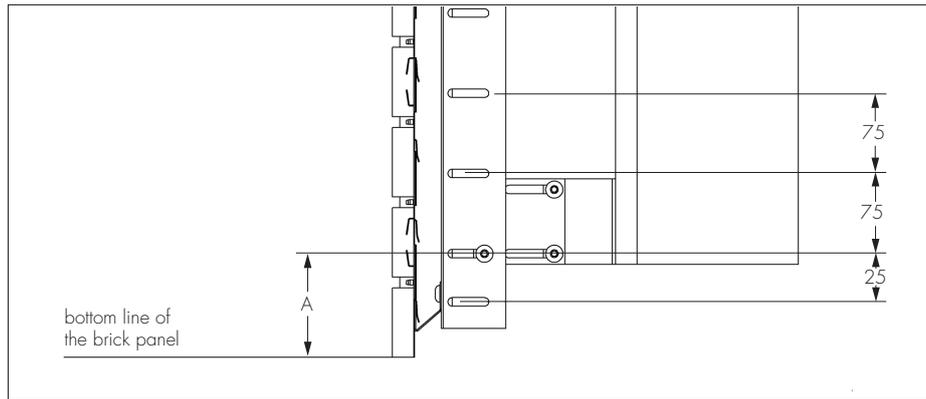
13.1 All panels are supplied to the required specifications for each building design, and therefore cutting of panels on site should be minimal. When required, the panels are cut with a diamond wheel. Any cut edges of the galvanized steel should be covered with a zinc coating. Near windows and doors, the vertical or horizontal dimension of a brick panel is trimmed as necessary.

13.2 The brick panel installation procedure must begin from left to right and from bottom to top.

13.3 When installing the wall brackets, a laser measuring device or a plumb-line should be used to ensure that the brackets follow a straight line.

13.4 The distance between the lower edge of the first SK wall bracket and the desired bottom line of the cladding panel (distance A in Figure 13) depends on the brick size and panel type. The advice of the Certificate holder must be sought for detailed drawings of the specific building design.

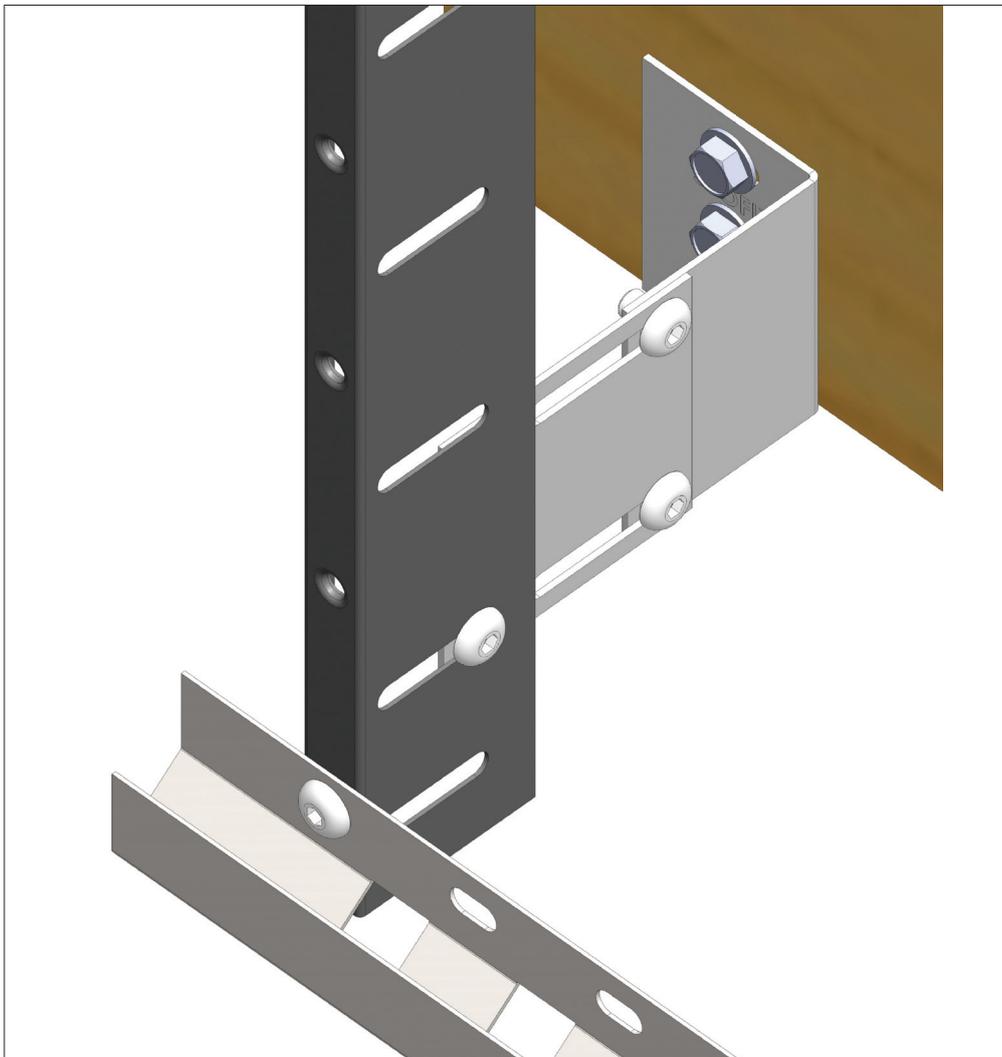
Figure 13 Installation of SK wall bracket



13.5 The vertical rails are attached to the brackets or extension brackets with M8 hexagon bolts and nuts. The lowest horizontal rail is attached to the first hole from the bottom of the vertical rail, as shown in Figure 14.

13.6 The lowest course of panels must be hung to two horizontal rails per panel. The subsequent courses must be hung to a minimum of one rail per panel, with maximum vertical spacing of 600 mm.

Figure 14 Connection of AK horizontal rail to J60 vertical rail



13.7 Above windows and doors and over horizontal expansion joints, the cladding panels must be supported at both top and lower ends. The horizontal rails must be fixed on the bottom attachment flange of the cladding panel.

## 14 Tests and investigations

14.1 Tests were conducted and the results assessed to determine:

- wind resistance
- impact resistance
- resistance to horizontal point loads
- resistance to vertical load
- reaction to fire
- hygrothermal behaviour
- freeze/thaw resistance.

14.2 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.

## Bibliography

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BS EN 998-2 : 2010 *Specification for mortar for masonry — Masonry mortar*

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EN 771-1 : 2012 *Specification for masonry units — Clay masonry units*

EN 10346 : 2015 *Continuously hot-dip coated steel flat products for cold forming — Technical delivery conditions*

ETAG 014 : 2011 *Plastic anchors for fixing of external thermal insulation composite systems with rendering*

ETAG 034 : 2012 *Guideline for European Technical Approval of kits for external wall claddings*

ETAG 034-1 : 2012 *Guideline for European Technical Approval of kits for external wall claddings — Ventilated cladding kits comprising cladding components and associated fixings*

## 15 Conditions

15.1 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.

15.2 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.

15.3 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.

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

15.5 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.

15.6 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.