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Agrément Certificate

19/5679

Product Sheet 2

CATNIC THERMALLY BROKEN LINTELS

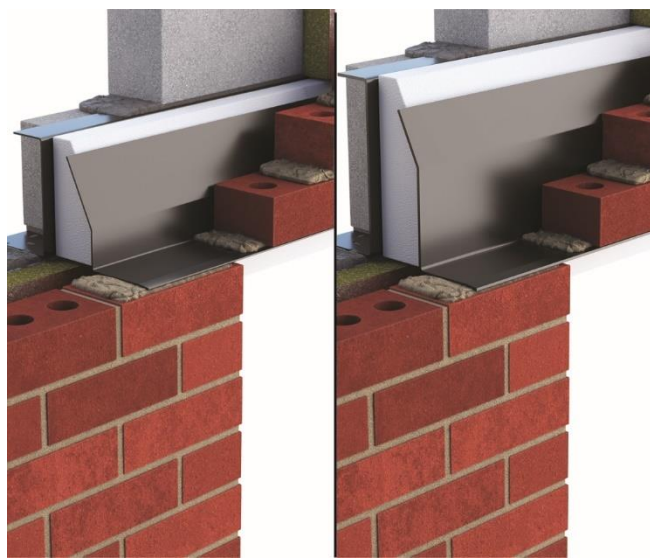
CATNIC HEAVY AND EXTRA HEAVY DUTY THERMALLY BROKEN LINTELS

This Agrément Certificate Product Sheet⁽¹⁾ relates to Catnic Heavy and Extra Heavy Duty Thermally Broken Lintels, galvanized steel with polyester finish and cavity thermal insulation insert lintels for use in external masonry cavity walls to provide support to walls, floors and roofs above window or door openings.

(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

Structural performance — the systems are suitable for use in walls with openings between 450 and 2100 mm (clear spans) for the Heavy Duty range, and between 450 and 4500 mm for the Extra Heavy Duty range (see section 6).

Behaviour in relation to fire — conventional brick/block construction incorporating the systems can have a fire resistance of up to one hour (see section 7).

Thermal performance — where the systems are used around opening head junctions, they can adequately limit heat loss (see section 8).

Condensation risk — where the systems are used around opening heads, the risk of local surface condensation will be minimal (see section 9).

Durability — provided that the systems are designed, installed and used in accordance with the Certificate, it will have a service life of at least 60 years (see section 12).



The BBA has awarded this Certificate to the company named above for the systems described herein. These systems 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: 22 July 2019

Paul Valentine
Technical Excellence Director

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
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.

Any photographs are for illustrative purposes only, do not constitute advice and should not be relied upon.

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Regulations

In the opinion of the BBA, Catnic Heavy and Extra Heavy Duty Thermally Broken Lintels, 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 systems can contribute to satisfying this Requirement as set out in sections 6.2 to 6.6 of this Certificate.
Requirement:	B3(1)	Internal fire spread (structure)
Comment:		The systems can be incorporated in a construction satisfying this Requirement. See sections 7.1 to 7.3 of this Certificate.
Requirement:	C2(c)	Resistance to moisture
Comment:		The systems incorporated in external masonry cavity walls will not adversely affect the ability of the wall to satisfy the stated requirements, provided correct construction details are adopted. See sections 9.1 and 9.3 of this Certificate.
Requirement:	L1(a)(i)	Conservation of fuel and power
Comment:		The systems incorporated in junctions can adequately limit heat loss and the risk of condensation. See sections 8.1, 9.1 and 9.3 of this Certificate.
Regulation:	7	Materials and workmanship (applicable to Wales only)
Regulation:	7(1)	Materials and workmanship (applicable to England only)
Comment:		The systems are acceptable. See section 12 and the <i>Installation</i> part of this Certificate.
Regulation:	7(2)	Materials and workmanship (applicable to England only)
Comment:		The systems are unrestricted by this Regulation. See sections 7.1 and 7.2 of this Certificate.
Regulation:	26	CO₂ emission rates for new buildings
Regulation:	26A	Fabric energy efficiency rates for new dwellings (applicable to England only)
Regulation:	26A	Primary energy consumption rates for new buildings (applicable to Wales only)
Regulation:	26B	Fabric performance values for new dwellings (applicable to Wales only)
Comment:		The systems incorporated in junctions can adequately limit heat loss and the risk of condensation. See sections 8.1, 9.1 and 9.3 of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)(2)	Durability, workmanship and fitness of materials
Comment:		The systems are acceptable. See section 12 and the <i>Installation</i> part of this Certificate.
Regulation:	9	Building standards applicable to construction
Standard:	1.1(a)(b)	Structure
Comment:		The systems are acceptable, with reference to clauses 1.1.1 ⁽¹⁾⁽²⁾ and 1.1.2 ⁽¹⁾⁽²⁾ . See sections 6.2 to 6.6 of this Certificate.
Standard:	2.3	Structural protection
Comment:		The systems can be incorporated in a construction satisfying this Standard, with reference to clauses 2.3.1 ⁽¹⁾⁽²⁾ and 2.3.3 ⁽¹⁾⁽²⁾ and appendices 2B ⁽¹⁾ and 2D ⁽²⁾ . See sections 7.1 to 7.3 of this Certificate.

Standard:	3.15	Condensation
Comment:		The systems will not adversely affect the ability of the wall to satisfy this Standard with reference to clauses 3.15.1 ⁽¹⁾⁽²⁾ , 3.15.4 ⁽¹⁾⁽²⁾ and 3.15.5 ⁽¹⁾⁽²⁾ . See sections 9.1 and 9.3 of this Certificate.
Standard:	6.1	Carbon dioxide emissions
Standard:	6.2	Building insulation envelope
Comment:		The systems incorporated in heads of openings in external walls can limit heat loss and the risk of condensation, with reference to clauses 6.1.2 ⁽¹⁾ , 6.1.6 ⁽¹⁾ , 6.2.3 ⁽¹⁾ , 6.2.4 ⁽¹⁾ , 6.2.5 ⁽²⁾ , 6.2.6 ⁽²⁾ , 6.2.10 ⁽¹⁾ and 6.2.11 ⁽¹⁾⁽²⁾ of these Standards. See sections 8.1, 9.1 and 9.3 of this Certificate.
Standard:	7.1(a)(b)	Statement of sustainability
Comment:		The systems can contribute to satisfying the relevant requirements of Regulation 9, Standards 1 to 6, and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard. See section 8.1 of this Certificate.
Regulation:	12	Building standards applicable to conversions
Comment:		All comments given for systems 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:	(ii)(iii)(b)	The systems are acceptable. See section 12 and the <i>Installation</i> part of this Certificate.
Regulation:	28	Resistance to moisture and weather
Comment:		The systems can be incorporated in a construction satisfying this Regulation. See section 9.3 of this Certificate.
Regulation:	29	Condensation
Comment:		The systems can contribute to satisfying this Regulation. See section 9.3 of this Certificate.
Regulation:	30	Stability
Comment:		The systems are acceptable as set out in sections 6.2 to 6.6 of this Certificate.
Regulation:	35(1)	Internal fire spread — structure
Comment:		The systems can be incorporated in a construction satisfying this Regulation. See sections 7.1 to 7.3 of this Certificate.
Regulation:	39(a)(i)	Conservation measures
Regulation:	40(2)	Target carbon dioxide emissions rate
Comment:		The systems incorporated in heads of openings in external masonry cavity walls can limit heat loss and the risk of condensation. See sections 8.1 and 9.3 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* (3.4) and the *Installation* (14.2) part of this Certificate.

Additional Information

NHBC Standards 2019

In the opinion of the BBA, Catnic Heavy and Extra Heavy Duty Thermally Broken Lintels if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards, Part 6 Superstructure (excluding roofs), Chapter 6.1 External masonry walls.*

CE marking

The Certificate holder has taken the responsibility of CE marking the product in accordance with harmonised European Standard BS EN 845-2 : 2013. An asterisk (*) appearing in this Certificate indicates that data shown are given in the manufacturer's Declaration of Performance.

Technical Specification

1 Description

1.1 Catnic Heavy and Extra Heavy Duty Thermally Broken Lintels are manufactured from four components:

- Inner and outer profiles of hot-dipped, galvanized steel to BS EN 10346 : 2015, grade DX51D and Z275 (minimum yield stress is $250 \text{ N}\cdot\text{mm}^{-2}$)
- $275 \text{ g}\cdot\text{m}^{-2}$ Zinc coating finished with a black polyester powder coating $35 \pm 5 \mu\text{m}$ thick- NN104E – Interpon 610
- thermal insulation⁽¹⁾ inserts made from rigid, expanded polystyrene (EPS) boards in accordance with BS EN 13163 : 2012 to defined density grade (EPS200) and thermal conductivity value ($\lambda_{90/90} = 0.034 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$)
- bonding material – solvent-free single-component moisture-curing polyurethane (1K MCPU) adhesive for internal and external applications – Apollo (A9331)

(1) Insulation used (EPS 200) is covered by BBA Certificate 89/2196 (PS1)

1.2 The Heavy Duty (TH) lintels are manufactured in a range of lengths from 750 to 2400 mm (full length), in 150 mm increments. The Extra Heavy Duty (TX) lintels are manufactured in a range of lengths from 750 to 4800 mm, in 150 mm increments (for up to 3000 mm lengths) and 300 mm increments (for 3000 to 4800 mm lengths). They are used in cavity widths from 90 to 165 mm and 100 to 115 mm inner leaves. The lintel profiles available for each span are shown in Figure 1.

Figure 1 Typical cross section of TH 90-150 mm thermally broken lintels

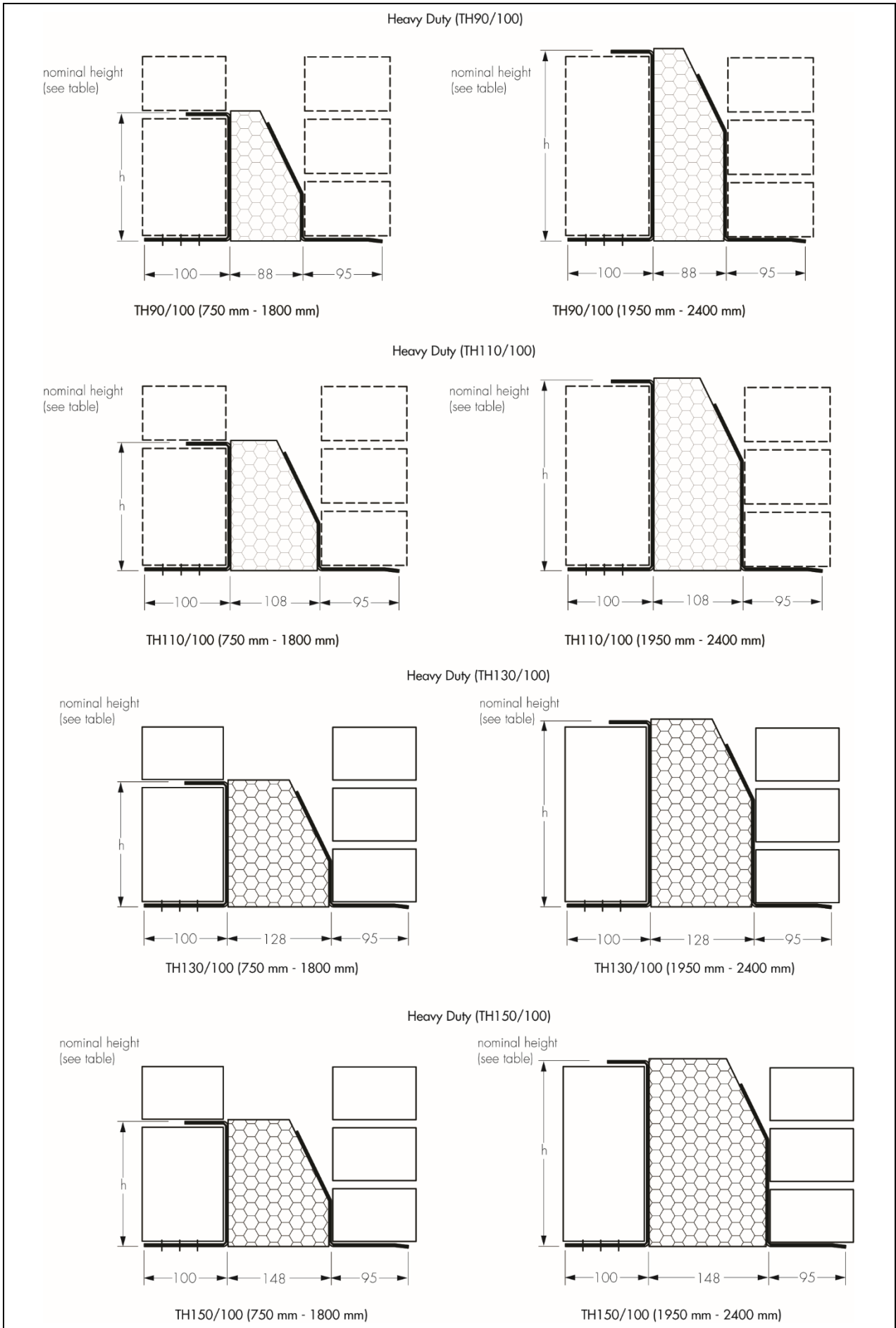
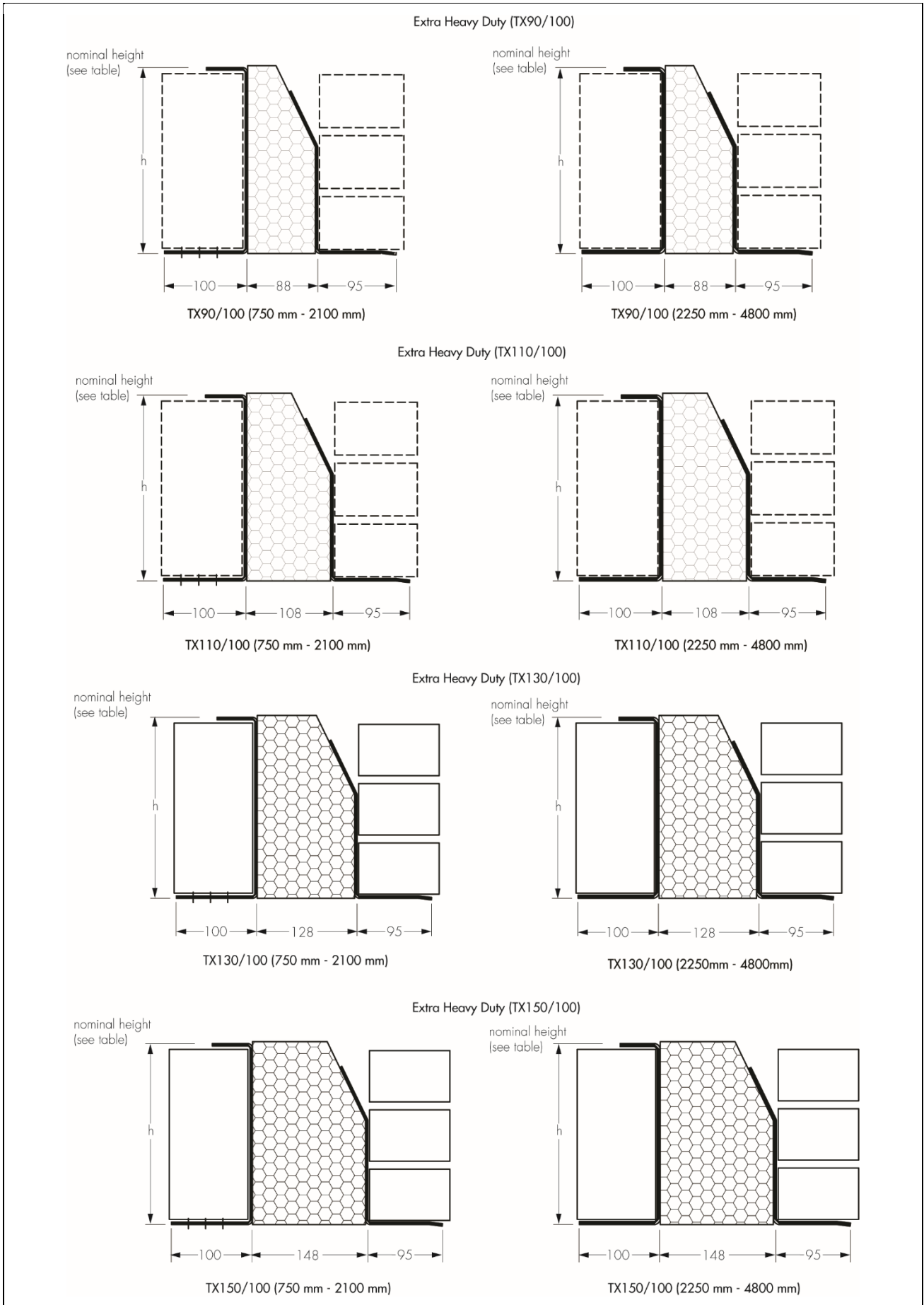


Figure 2 Typical cross section of TX 90-150 mm thermally broken lintels



1.3 Other items or components⁽¹⁾ which may be used with the product, but which are outside the scope of this Certificate, are:

- brick or block masonry units, to BS EN 771-1 to 6
- bricklaying mortar, to BS EN 998-2 : 2016
- gypsum plasterboard to BS EN 520 : 2004.

(1) Details on the above products' specifications can be obtained from the Certificate holder.

2 Manufacture

2.1 The galvanised steel coil is slit to the correct width required and re-coiled. The galvanised steel is de-coiled, punched, cut to length and folded to the correct profile. Perforations in the lintel's back steel are pressed to provide a key for the mortar bed. Then, the lintel's front and rear steel pieces are coated with polyester powder. Finally, the EPS insert (polystyrene block), which is a bought-in item, is adhered to the front and rear steel profiles and thermally cured to complete the production process.

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 the manufacturer has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015 by BSI (Certificate FM14913).

3 Delivery and site handling

3.1 The lintels are delivered in bundles or separately, depending on their size and shape, and strapped together with protective wooden supports between each layer. Each product carries a bar coded label with the manufacturer's name and logo; lintel type, length and weight; date of manufacture; and manufacturer's website details.

3.2 Reasonable care must be taken during unloading, stacking and storage to avoid damage to the lintels. Lintels which have suffered deformation or damage to the protective galvanized coating must not be used. Minor damage to the galvanized steel profile can be repaired by using the same anti-corrosive paint used for treating cut edges, or zinc-rich paint.

3.3 The lintels must be stored off the ground in such a manner as to avoid the risk of either mechanical damage or contamination by corrosive substances.

3.4 The lintels may be handled by site personnel or mechanical lifting devices – care must be taken to ensure any forks, slings or chains do not damage the protective coating.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Catnic Heavy and Extra Duty Thermally Broken Lintels.

Design Considerations

4 Use

4.1 Catnic Heavy and Extra Heavy Duty Thermally Broken Lintels are satisfactory for use in external masonry cavity walls of brickwork or blockwork to support wall, floor or roof loads, above door or window openings.

4.2 It is important for designers, planners, contractors and/or installers to ensure that the installation of the lintels is in accordance with the Certificate holder's instructions and the information given in this Certificate.

4.3 A cavity tray over the lintel must be provided and installed in accordance with BS 8215 : 1991 and *NHBC Standards*, Chapter 6.1, *External Masonry Walls*. The installation must incorporate appropriate weepholes and stop-ends to direct moisture out of the cavity.

4.4 All lintels should have a damp proof course (dpc) built into the inner leaf; in regions where exposure to driving rain is 'very severe', the upstand part of the damp-proof protection should be returned into the inner leaf of masonry.

5 Practicability of installation

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

6 Structural performance

6.1 The lintels have adequate strength and stiffness to sustain the safe working loads given in Tables 1 and 2, when uniformly distributed, subject to the following conditions:

- the defined cavity width and size of standard masonry units is not exceeded, and a minimum of 150 mm bearing is provided at each end
- no more than half of the total load on the lintel is supported at the outer leaf position
- the specified loads given relate to simply supported lintels, laterally and torsionally unrestrained. Therefore, there are no requirements for composite action with, or restraint by, adjacent elements of construction
- where part of the loading is applied as concentrated loads, each concentrated load is supported over a length of lintel not less than 200 mm. In such cases, the total applied loading must not produce bending moments, shear forces, reactions or bearing stresses greater than those produced by the total uniformly distributed loads specified in Tables 1 and 2
- the applied loads are assumed to act centrally on the lintel steel profile. Design of the wall and opening details, together with appropriate workmanship on site, must ensure that eccentric loading on the galvanized steel profile is avoided.



6.2 The loads shown in Tables 1 and 2 have been derived from tests according to BS EN 846-9 : 2016, supported by calculations, and relate to a maximum allowable deflection of span/325.

Table 1 Load-span data for Catnic Heavy Duty Lintels

Lintel reference	Steel sheet thickness (mm)	Weight (Kg/m)	Standard length (mm)	Clear span (mm)	Nominal height (h) channel to inner leaf (mm)	SWL for load distribution 1:1 – 19:1 (kN)
TH90/100	3.1	13.3	750-1800	450-1500	154	32
	3.1	16.71	1950-2100	1650-1800	229	48
	3.1	16.7	2250-2400	1950-2100	229	45
TH110/100	3.1	13.4	750-1800	450-1500	154	32
	3.1	16.85	1950-2100	1650-1800	229	48
	3.1	16.85	2250-2400	1950-2100	229	45
TH130/100	3.1	13.49	750-1800	450-1500	154	32
	3.1	16.99	1950-2100	1650-1800	229	48
	3.1	16.99	2250-2400	1950-2100	229	45
TH150/100	3.1	13.58	750-1800	450-1500	154	32
	3.1	17.13	1950-2100	1650-1800	229	48
	3.1	17.13	2250-2400	1950-2100	229	45

Table 2 Load-span data for Catnic Extra Heavy Duty Lintels

Lintel reference	Steel sheet thickness (mm)	Weight (Kg/m)	Standard length (mm)	Clear span (mm)	Nominal height (h) channel to inner leaf (mm)	SWL for load distribution 1:1 – 19:1 (kN)
TX90/100	3.1	16.71	750-2100	450-1800	229	60
	4.0	21.58	2250-2700	1950-2400	229	60
	4.0	21.58	2850-3000	2550-2700	229	55
	4.0	21.58	3300-3600	3000-3300	229	50
	4.0	21.58	3900-4800	3600-4500	229	32
TX110/100	3.1	16.85	750-2100	450-1800	229	60
	4.0	21.72	2250-2700	1950-2400	229	60
	4.0	21.72	2850-3000	2550-2700	229	55
	4.0	21.72	3300-3600	3000-3300	229	50
	4.0	21.72	3900-4800	3600-4500	229	32
TX130/100	3.1	16.99	750-2100	450-1800	229	60
	4.0	21.86	2250-2700	1950-2400	229	60
	4.0	21.86	2850-3000	2550-2700	229	55
	4.0	21.86	3300-3600	3000-3300	229	50
	4.0	21.86	3900-4800	3600-4500	229	32
TX150/100	3.1	17.13	750-2100	450-1800	229	60
	4.0	22.0	2250-2700	1950-2400	229	60
	4.0	22.0	2850-3000	2550-2700	229	55
	4.0	22.0	3300-3600	3000-3300	229	50
	4.0	22.0	3900-4800	3600-4500	229	32

6.3 The load ratio between the inner and outer flanges should be a minimum of 1:1 and not exceed 19:1.

6.4 In addition to the requirements specifically referred to in this Certificate, structures of brickwork or blockwork in which the lintel is incorporated must be designed and constructed in accordance with BS EN 1996-1-1 : 2005 and BS EN 1996-1-2 : 2005 or BS EN 1996-3 : 2006 and their UK National Annexes, PD 6697 : 2010 and the following technical specifications of the national Building Regulations as appropriate:

England and Wales — Approved Document A1/2, Part C, Section 1

Scotland — Section 1, Small Building Guide

Northern Ireland — Technical Booklet D *Structure*, Section 3.

6.5 The load-span data shown in Tables 1 and 2 is valid only for the maximum Safe Working Loads and the lintel lengths given. For other loading conditions, or spans outside this range, the Certificate holder should be consulted for advice.

6.6 To avoid excessive eccentricities of loading, the lintel must only be used with standard masonry units 90 to 115 mm wide.

6.7 Guidance for the assessment of loads on lintels in masonry is given in BS EN 845-2 : 2013 and PD 6697 : 2010. It is the responsibility of the appropriately qualified design engineer to ensure that the applied loads do not exceed the safe working loads given in Tables 1 and 2.

7 Behaviour in relation to fire



7.1 Galvanized steel profiles are non-combustible and classified as Class A1 in accordance with national Building Regulations.

7.2 The systems contain EPS and adhesive, which are not classified as non-combustible or of limited combustibility.

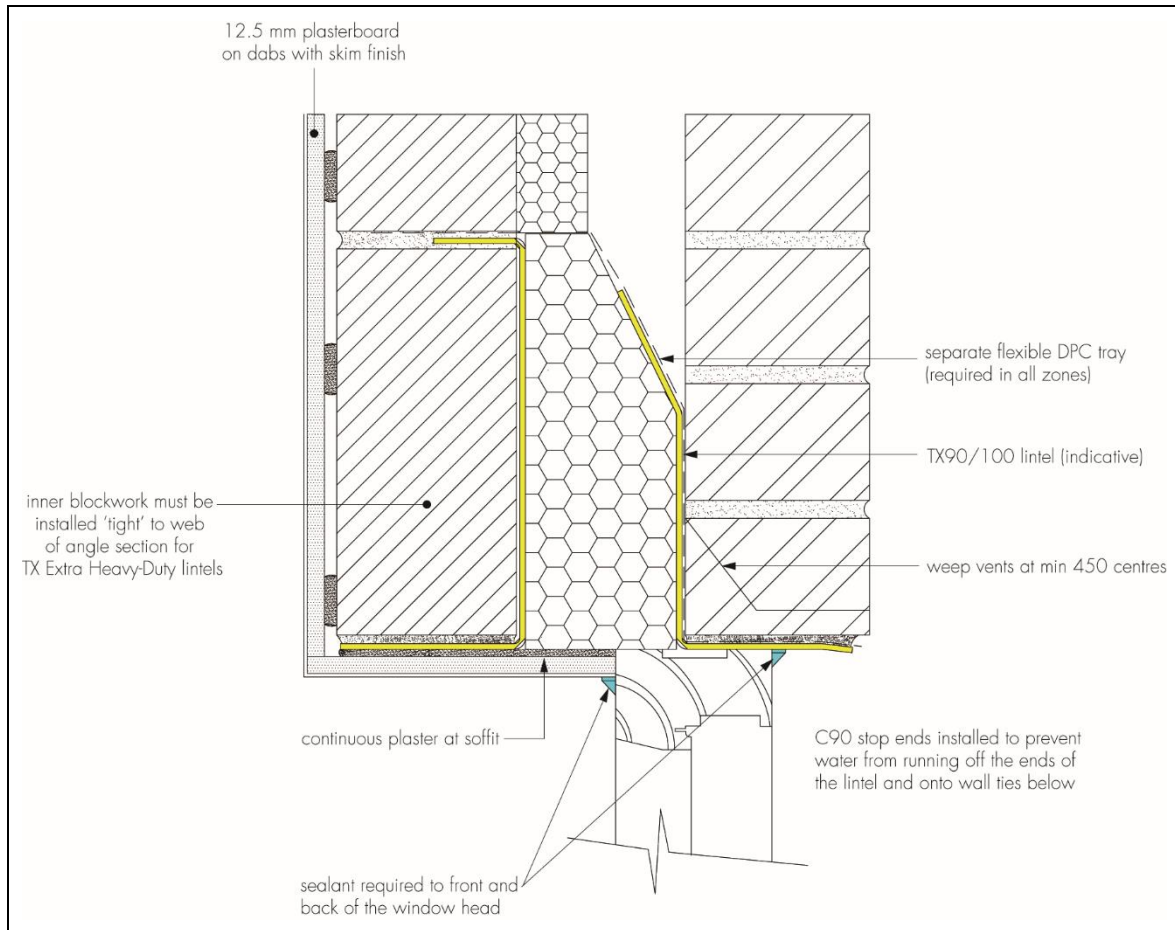
7.3 When used in conventional brick/block construction and with protection provided by gypsum boards and plaster, the construction may be regarded as having a fire resistance in relation to the national Building Regulations

of 'one hour'⁽¹⁾ (in England, Wales and Northern Ireland) and of 'medium'⁽¹⁾ duration (in Scotland). Construction should be in accordance with the requirements of BS EN 1996-1-2 : 2005.

(1) Tested in fire conditions based on the method set out in BS EN 1363-1 : 2012, with the lintel protected by 12.5 mm plasterboard and skim coat (data available from Certificate holder, EXOVA WF test report 397374, 14 March 2018).

7.4 Where any other form of wall construction (other than shown in Figure 3) incorporating the lintels is subject to fire-resistance requirements, an appropriate assessment or test must be carried out by a United Kingdom Accreditation Service (UKAS) accredited laboratory (accredited for the test concerned).

Figure 3 Wall construction incorporating Catnic Thermally Broken Lintels as tested for resistance to fire



8 Thermal performance



8.1 Typical example details containing the system at its longest span, based on the construction details shown in Figure 3, were analysed numerically to determine their likely thermal performance, as shown in Table 3 below.

Table 3 Junction values

Lintel product	Example Ψ -value ⁽¹⁾	Approved Ψ -value ⁽⁴⁾	Default Ψ -value ⁽⁵⁾
	$W \cdot m^{-1} \cdot K^{-1}$		
TX90/100 ⁽²⁾	0.052	0.30	1.0
TX150/100 ⁽³⁾	0.066	0.30	1.0

- (1) Assumes 50 mm window frame which overlaps the cavity by 30 mm. Wall construction: 102.5 mm brickwork ($\lambda = 0.77 W \cdot m^{-1} \cdot K^{-1}$), 50 mm vented cavity (see notes 2 and 3, below), PIR (see notes 2 and 3, below) insulation ($\lambda = 0.023 W \cdot m^{-1} \cdot K^{-1}$), 100 mm blockwork ($\lambda = 0.162 W \cdot m^{-1} \cdot K^{-1}$), 12.5 mm plasterboard ($\lambda = 0.25 W \cdot m^{-1} \cdot K^{-1}$). on dabs cavity ($\lambda = 0.088 W \cdot m^{-1} \cdot K^{-1}$).
- (2) 90 mm cavity width, comprising 50 mm vented cavity adjacent to low emissivity ($\epsilon = 0.05$) foil ($R = 0.664 m^2 \cdot K \cdot W^{-1}$), 40 mm PIR insulation.
- (3) 165 mm cavity width, comprising 50 mm vented cavity ($R = 0.183 m^2 \cdot K \cdot W^{-1}$), 115 mm PIR insulation.
- (4) Approved value may be claimed when the gauge of the steel lintel is less than or equal to 3.2 mm and there is a 30 mm overlap of the window frame over the cavity.
- (5) Where a junction detail has not been calculated in accordance with BS EN ISO 10211: 2017 and BR 497 : 2016 (second edition) and the construction deviates from those described above, these default values should be used.

8.2 For other junction details/constructions, not described in Table 3, the linear thermal transmittance and temperature factor should be calculated in accordance with BS EN ISO 10211 : 2017, following the guidance in BRE Report BR 497 : 2007 Conventions for Calculating Linear Thermal Transmittance and Temperature Factors. The Certificate holder can provide a detailed Ψ value calculation if required.

9 Condensation risk



9.1 Constructions described in section 8.1 will achieve a surface temperature factor, f_{Rsi} , in excess of 0.75 with any typical finish and 30 mm window/door frame setback over the cavity and should adequately limit the risk of surface condensation in dwellings, as defined in BRE Information Paper IP1/06. The surface condensation risk of other constructions should be established by numerical modelling in accordance with BRE Information Paper IP 1/06.

9.2 Further guidance on limiting the risk of surface condensation can be found in:

England and Wales — Limiting thermal bridging and air leakage: Robust construction details for dwellings and similar buildings TSO 2002 or Accredited Construction Details (version 1.0)

Scotland — Accredited Construction Details (Scotland)

Northern Ireland — Accredited Construction Details (version 1.0).



9.3 Under normal domestic conditions, the level of interstitial condensation associated with the product will be low and the risk of any resultant damage minimal.

10 Corrosion protection

The polyester-coated galvanised steel profiles of the lintels have adequate protection against corrosion, providing:

- the polyester coating protection remains undamaged or minor blemishes are repaired
- mortar complies with the requirements of BS EN 845-2 : 2013.

11 Maintenance

Maintenance is not required, but the exposed toe of the lintel may be re-painted to improve appearance, using finishes that are compatible with a polyester coating.

12 Durability



Providing the lintels are designed and installed in accordance with this Certificate, they will have a service life of at least 60 years, subject to the following conditions:

- the lintels are installed and used in accordance with the temperature and humidity conditions described in section 9 of this Certificate
- the galvanized steel profile of the lintel is protected as described in section 10.

13 Reuse and recyclability

The product contains steel and EPS, which can be recycled.

Installation

14 General

14.1 Typical installation details of the lintels are shown in Figure 3.

14.2 Except for the longer span lintels, the lintels can generally be lifted and handled by a single operative. Protective gloves should be worn when handling the product.

14.3 Lintels must be installed with at least 150 mm end bearing, and must be fully bedded on bricklaying mortar.

14.4 The inner and outer leaves of bricks or blocks supported by the lintels must be raised together to avoid excessive eccentricity of loading.

14.5 Weepholes should be provided in the outer leaf above the lintel, to drain moisture from the cavity. A minimum of two weepholes should be provided per lintel. For fair-faced masonry, weepholes should be provided at centres not greater than 450 mm.

14.6 Stop ends (outside the scope of this Certificate) should be provided to cavity trays and lintels.

14.7 Mortar joints in exposed masonry should be weatherstruck in severe or very severe exposure zones.

14.8 Precautions must be taken to prevent mortar dropping through the cavity onto the lintel and obstructing the weepholes.

Technical Investigations

15 Tests

Tests were carried out on the systems, and the results assessed to determine:

- the flexural and shear strength of the lintel in accordance with BS EN 846-9 : 2016
- load-deflection characteristic to BS EN 845-2 : 2013
- fire resistance (ad-hoc) test under loading utilising the heating conditions to BS EN 1363-1 : 2012.

16 Investigations

16.1 An examination was made of data relating to:

- the thermal performance and declared $\lambda_{90/90}$ value
- minimum temperature factors and Ψ values for typical constructions incorporating the systems in accordance with BRE Information Paper IP 1/06
- practicability of installation
- durability
- fire performance

16.2 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

- BS 8215 : 1991 *Design and installation of damp-proof courses in masonry construction*
- BS EN 520 : 2004 + A1 : 2016 *Gypsum plasterboards – Definitions, requirements and test methods*
- BS EN 771-1 to 6 *Specifications for masonry units (Volumes 1 to 6)*
- BS EN 845-2 : 2013 + A1 : 2016 *Specification for ancillary components for masonry – Lintels*
- BS EN 846-9 : 2016 *Methods of test for ancillary components for masonry – Part 9: Determination of flexural resistance and shear resistance of lintels*
- BS EN 998-2 : 2016 *Specification for mortar for masonry – Part 2: Masonry mortar*
- BS EN 1363-1 : 2012 *Fire resistance tests – General requirements*
- BS EN 1996-1-1 : 2005 + A1 : 2012 *Eurocode 6 – Design on masonry structures – General rules for reinforced and unreinforced masonry*
- NA to BS EN 1996-1-1 : 2005 + A1 : 2012 *UK National Annex to Eurocode 6 – Design on masonry structures – General rules for reinforced and unreinforced masonry*
- BS EN 1996-1-2 : 2005 *Eurocode 6 – Design on masonry structures – General rules – Structural fire design*
- NA to BS EN 1996-1-2 : 2005 *UK National Annex to Eurocode 6 – Design on masonry structures – General rules – Structural fire design*
- BS EN 1996-3 : 2006 *Eurocode 6 – Design of masonry structures – Simplified calculation methods for unreinforced masonry structures*
- NA + A1 : 2014 to BS EN 1996-3 : 2006 *UK National Annex to Eurocode 6 – Design of masonry structures – Simplified calculation methods for unreinforced masonry structures*
- BS EN 10346 : 2015 *Continuously hot-dip coated steel flat products for cold forming – Technical delivery conditions*
- BS EN 13163 : 2012 + A2 : 2016 *Thermal insulation products for buildings – Factory made expanded polystyrene (EPS) products – Specification*
- BS EN ISO 9001 : 2015 *Quality management systems – Requirements*
- BS EN ISO 10211 : 2013 *Thermal bridges in building construction – Heat flows and surface temperature – Detailed calculations*
- BRE Information Paper IP 1/06 *Assessing the effects of thermal bridging at junctions and around openings*
- BR 497 : 2007 *Conventions for Calculating Linear Thermal Transmittance and Temperature Factors*
- PD 6697 : 2010 *Recommendations for the design of masonry structures to BS EN 1996-1-1 and BS EN 1996-2*
- TSO 2002 : *Limiting thermal bridging and air leakage : Robust construction details for dwellings and similar buildings*

17 Conditions

17.1 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.

17.2 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.

17.3 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.

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

17.5 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.

17.6 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.