

## Ancon Building Products

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Agrément Certificate  
**14/5160**  
Product Sheet 2

### ANCON CAVITY WALL TIES

### ANCON TEPLO-L-TIE WALL TIES

This Agrément Certificate Product Sheet<sup>(1)</sup> relates to Ancon Teplo-L-Tie Wall Ties, composite wall ties comprising pultruded basalt fibres held in a resin matrix, which incorporate an L-shaped stainless steel piece at one end. The ties are for use in tying a masonry outer leaf to timber, in-situ masonry, concrete or steel in cavity walls of up to 300 mm (nominal) in new-build or retrofit constructions.

(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.

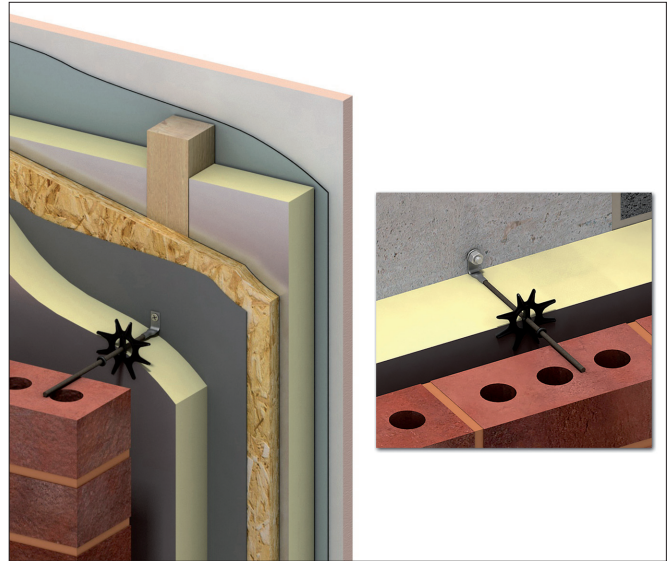
#### KEY FACTORS ASSESSED

**Structural performance** — the wall ties can be used in multi-storey buildings and are comparable to ties of types 2, 3 and 4 as defined in PD 6697 : 2010 and ties of types 6 as defined in BS 5268-6 : 1996 (see section 6).

**Behaviour in relation to fire** — the ties are suitable for buildings requiring 60-minute fire resistance (see section 7).

**Thermal performance** — the ties have a thermal conductivity in the longitudinal direction of  $0.71 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$  and the stainless steel end has a conductivity of  $17.000 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$  (see section 8).

**Durability** — the ties should have a service life of not less than 60 years (see section 12).



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

A handwritten signature in black ink, appearing to read 'Simon Wroe'.

Simon Wroe  
Head of Approvals — Engineering

A handwritten signature in black ink, appearing to read 'Claire Curtis-Thomas'.

Claire Curtis-Thomas  
Chief Executive

Date of First issue: 25 March 2015

*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, Ancon Teplo-L-Tie Wall Ties, 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>	Where wall ties are relied upon to contribute to the strength and stability of cavity walls, they will be satisfactory. See section 6.1 of this Certificate.
<b>Requirement:</b> B3(1)(2)	<b>Internal fire spread (structure)</b>
<b>Comment:</b>	When used in a masonry or masonry/timber cavity wall that contributes to the fire resistant properties of an element required to be fire resistant, the use of the wall ties will not adversely affect the level of fire safety of the wall. See sections 7.1 and 7.2 of this Certificate.
<b>Requirement:</b> C2(b)(c)	<b>Resistance to moisture</b>
<b>Comment:</b>	When used in an external cavity wall, the wall ties will not adversely affect the resistance of the wall to the passage of moisture. See section 10 of this Certificate.
<b>Requirement:</b> L1(a)(i)	<b>Conservation of fuel and power</b>
<b>Comment:</b>	When calculating the thermal transmittance of insulated masonry cavity walls incorporating the ties, the thermal bridging due to the ties must be taken into account. See section 8 of this Certificate.
<b>Regulation:</b> 7	<b>Materials and workmanship</b>
<b>Comment:</b>	The products are acceptable. See sections 12.1 and 12.2 and the <i>Installation</i> part of this Certificate



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

<b>Regulation:</b> 8(1)	<b>Durability, workmanship and fitness of materials</b>
<b>Comment:</b>	The products are acceptable. See sections 12.1 and 12.2 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(a)(b)	<b>Structure</b>
<b>Comment:</b>	Where wall ties are relied upon to contribute to the strength and stability of cavity walls, they will be satisfactory. See section 6.1 of this Certificate.
<b>Standard:</b> 2.3	<b>Structural protection</b>
<b>Standard:</b> 2.4	<b>Cavities</b>
<b>Comment:</b>	When used in a masonry or masonry/timber cavity wall that contributes to the fire resistant properties of an element required to be fire resistant, the use of the wall ties will not adversely affect the level of fire safety of the wall. See sections 7.1 and 7.2 of this Certificate.
<b>Standard:</b> 2.6	<b>Spread to neighbouring buildings</b>
<b>Comment:</b>	When used in a masonry or masonry/timber cavity wall, the wall ties will provide an equivalent performance to that of a typical steel tie. See sections 7.1 and 7.2 of this Certificate.
<b>Standard:</b> 3.10	<b>Precipitation</b>
<b>Comment:</b>	The wall ties will not adversely affect the resistance of the wall to the passage of moisture, with reference to clauses 3.10.1 <sup>(1)(2)</sup> , 3.10.2 <sup>(1)(2)</sup> , and 3.10.3 <sup>(1)(2)</sup> . See section 10 of this Certificate.
<b>Standard:</b> 6.2	<b>Building insulation envelope</b>
<b>Comment:</b>	When calculating the thermal transmittance of insulated masonry cavity walls incorporating the ties, the thermal bridging due to the ties must be taken into account. See section 8 of this Certificate.
<b>Standard:</b> 7.1(a)(b)	<b>Statement of sustainability</b>
<b>Comment:</b>	The ties 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.
<b>Regulation:</b> 12	<b>Building standards applicable to conversions</b>
<b>Comment:</b>	All comments given for this product 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

<b>Regulation:</b> 23(a)(i)(iii)(b)	<b>Fitness of materials and workmanship</b>
<b>Comment:</b>	The products are acceptable. See sections 12.1 and 12.2 and the <i>Installation</i> part of this Certificate.
<b>Regulation:</b> 28(b)	<b>Resistance to moisture and weather</b>
<b>Comment:</b>	When used in an external cavity wall, the wall ties will not adversely affect the resistance of the wall to the passage of moisture. See section 10 of this Certificate.

Regulation:	30	<b>Stability</b>
Comment:		The wall ties are satisfactory where relied upon to contribute to the strength and stability of cavity walls. See section 6.1 of this Certificate.
Regulation:	35	<b>Internal fire spread – Structure</b>
Comment:		When used in a masonry or masonry/timber cavity wall that contributes to the fire resistant properties of an element required to be fire resistant, the use of the wall ties will not adversely affect the level of fire safety of the wall. See sections 7.1 and 7.2 of this Certificate.
Regulation:	39(a)(i)	<b>Conservation measures</b>
Comment:		When calculating the thermal transmittance of insulated masonry cavity walls incorporating the ties, the thermal bridging due to the ties must be taken into account. See section 8 of this Certificate.

## Construction (Design and Management) Regulations 2007

## Construction (Design and Management) Regulations (Northern Ireland) 2007

In the opinion of the BBA, there is no information in this Certificate which relates to the obligations of the client, CDM co-ordinator, designer and contractors under these Regulations.

## Additional Information

### NHBC Standards 2014

NHBC accepts the use of Ancon Teplo-L-Tie Wall Ties, provided they are installed, used and maintained in accordance with this Certificate, in relation to *NHBC Standards*, Chapter 6.1 *External masonry walls*.

## Technical Specification

### 1 Description

Ancon Teplo-L-Tie Wall Ties are composite wall ties comprising basalt fibres set into a resin matrix. Crimped to the tie at one end is an L-shaped stainless steel piece with a 7 mm fixing hole. The ties have a sand finish to help ensure a good bond in the mortar joint and each incorporates a rubber o-ring which acts as a drip feature. This is fitted to the centre of the tie to prevent water crossing the cavity (see Figure 1), but can be adjusted on site to suit the conditions required. The ties are available in the sizes given in Table 1 for use in cavity widths from 100 mm to 300 mm with a minimum design embedment depth of 62.5 mm in the masonry bed joint.

Figure 1 Ancon Teplo-L-Tie



Table 1 Wall tie classification and dimensions

Product name	Tie diameter (mm)	Length (mm)	Cavity (mm)	Tie type <sup>(2)(3)(4)</sup> as per BS 5268	Tie type <sup>(1)(4)</sup> As per PD 6697
TEPLO-L-5-165	5	165	100	6	3
TEPLO-L-5-190	5	190	125	6	3
TEPLO-L-5-215	5	215	150	6	3
TEPLO-L-5-240	5	240	175	6	4
TEPLO-L-5-265	5	265	200	6	4
TEPLO-L-7-165	7	165	100	6	2
TEPLO-L-7-190	7	190	125	6	2
TEPLO-L-7-215	7	215	150	6	2
TEPLO-L-7-240	7	240	175	6	2
TEPLO-L-7-265	7	265	200	6	2
TEPLO-L-7-290	7	290	225	6	2
TEPLO-L-7-315	7	315	250	6	2
TEPLO-L-7-340	7	340	275	6	2
TEPLO-L-7-365	7	365	300	6	2

(1) Type classification as defined in PD 6697 : 2010.

(2) Type classification as defined in BS 5268-6 : 1996.

(3) All results were obtained using a 5 mm by 30 mm countersunk wood screw.

(4) It is possible to increase the number of ties used per m<sup>2</sup> to achieve a stronger tie type in accordance with PD 6697 : 2010 and BS 5268-6 : 1996. For example, a Type 3 tie may be able to give a performance in accordance with a Type 2 tie by using a greater number of ties per m<sup>2</sup>. This approach is outside the scope of this Certificate. For more information the Certificate holder's advice should be sought.

## 2 Manufacture

2.1 The products are formed by a continuous moulding process which combines longitudinal fibre with a binder. Once cut to size, a stainless steel tube is placed over one end of the tie. This is then crimped and bent as a 90° angle.

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

The ties are delivered to site packed in cardboard boxes. Each box bears the product identification.

# Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Ancon Teplo-L-Tie Wall Ties.

## Design Considerations

### 4 General

4.1 Ancon Teplo-L-Tie Wall Ties are suitable to tie a masonry outer leaf to timber, in-situ masonry, concrete or steel walls with cavity widths of between 100 mm and 300 mm (see Table 1).

4.2 The products must be used in accordance with the requirements of BS EN 1996-1-1 : 2005, BS EN 1996-1-2 : 2005, BS EN 1996-2 : 2006, BS EN 1996-3 : 2006, PD 6697 : 2010 and BS 5268-6 : 1996.

4.3 The masonry wall mortar joint thickness must be a minimum of 10 mm and in accordance with BS EN 845-1 : 2013. If the ties are to be used in mortar joints with a thickness greater than 10 mm, guidance should be sought from the Certificate holder.

4.4 Masonry walls incorporating the ties must be constructed in accordance with one or more of the following technical specifications:

- BS EN 1996-1-1 : 2005, BS EN 1996-1-2 : 2005, BS EN 1996-2 : 2006, BS EN 1996-3 : 2006, PD 6697 : 2010 and BS 5268-6 : 1996
- the national Building Regulations.

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

**Scotland** — Mandatory Standard 1.1 *Structure*<sup>(1)(2)</sup>

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).

**Northern Ireland** — Technical Booklet D *Structure*.


4.5 Ties should be evenly distributed over the wall area, except around openings, and should preferably be staggered.

4.6 At the vertical edges of an opening, unreturned or unbonded edges, and vertical expansion joints, additional ties should be used at a rate of one per 300 mm height, located not more than 225 mm from the edge.

## 5 Practicability of installation

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

## 6 Structural performance


 6.1 Tests were carried out generally in accordance with the principles of BS EN 846-6 : 2013. The applications for which the ties are suitable are given in Table 2 of this Certificate.

*Table 2 Suitable applications as per PD 6697 : 2010 and BS 5268-6 : 1996*

Tie type	Masonry type
<b>As per PD 6697 : 2010</b>	
2	General purpose
3	Basic
4	Light duty
<b>As Per BS 5268-6 : 1996</b>	
6	Timber frame: high movement


6.2 In tension the ties fail by straightening or pulling out from the masonry; in compression by buckling.

## 7 Behaviour in relation to fire

 7.1 The effectiveness of the installed ties in fire is assessed as being equivalent to that of typical steel ties. Guidance on the fire resistance of cavity walls is given in BS EN 1996-1-1 : 2005, BS EN 1996-1-2 : 2005, BS EN 1996-2 : 2006, BS EN 1996-3 : 2006 and PD 6697 : 2010.

7.2 Based upon an evaluation of test data generally to BS EN 846-6 : 2013 and fire test data, the ties are suitable for use in buildings requiring a fire resistance period of 60 minutes.


## 8 Thermal performance

 The U value of a completed wall will depend on the selected insulation thickness, the insulating value of the substrate masonry and its internal finish. Calculations of thermal transmittance (U value), including corrections for wall ties if required, should be carried out in accordance with BS EN ISO 6946 : 2007 and BRE Report 443 : 2006 using a thermal conductivity of 0.71 W·m<sup>-1</sup>·K<sup>-1</sup> for the basalt fibre rod and 17.00 W·m<sup>-1</sup>·K<sup>-1</sup> for the stainless steel end.

## 9 Condensation risk

Walls should be designed to limit the risk of interstitial and surface condensation. Guidance may be obtained from BS 5250 : 2011 and BRE Report 262 : 2002.

## 10 Weathertightness

 The water shedding details of the ties are effective in preventing the transfer of water across the ties to the inner leaf. The drip should be located so that it is in the centre of the wall cavity or residual cavity between the insulation and the external leaf of the wall.

## 11 Maintenance

As the ties are contained within the walls, maintenance is not required.

## 12 Durability



12.1 The profiles and fixings will not be adversely affected by mortar (including those incorporating conventional mortar admixtures) or cavity insulation materials.

12.2 The ties will not be impaired by contact with conventional cavity insulation materials or mortar admixtures and should have a service life of not less than 60 years.

## Installation

### 13 General

Ancon Teplo-L-Tie Wall Ties should be installed in accordance with the requirements of BS EN 1996-1-1 : 2005, BS EN 1996-1-2 : 2005, BS EN 1996-2 : 2006, BS EN 1996-3 : 2006, and PD 6697 : 2010 and the Certificate holder's instructions.

### 14 Procedure

14.1 Ideally, the outer leaf brickwork should be kept clear during installation of the ties. The first run of ties is to be laid as near as possible to, though not directly on, the damp-proof course, and built into the brickwork and attached to concrete or timber sheathing/studs as construction proceeds.

14.2 To stop the ingress of water, ties should be installed with a slight fall to the outer leaf and always bedded on, and then surrounded by, fresh mortar in the masonry leaf.

14.3 All fixings used must be able to produce the required pull-out strength required to meet the required tie type.

14.4 For installation into all substrates, the tie must be secured through the hole of the L-shaped piece into the inner leaf. The outer masonry leaf is then built up to the protruding end of the tie to ensure the tie is bedded on and surrounded by fresh mortar. The tie should be embedded 65 mm in the mortar bed joint.

14.5 Installed ties should be clear of mortar droppings to allow the drip to function to prevent water from crossing to the inner leaf of masonry.

14.6 Where used in partially-filled cavity applications:

- insulation should be cut/notched as necessary to fit closely around the ties (and abut the adjacent board, slab or batt)
- insulation retaining clips must be pushed up against the insulation to hold it securely in place against the inner leaf.

## Technical Investigations

### 15 Tests

Tests were carried out to establish:

- tensile performance of the wall tie to mortar bond
- compressive performance of the wall tie to mortar bond
- performance in shear
- tensile strength
- durability.

### 16 Investigations

16.1 Test reports generally in accordance with BS EN 846-6 : 2013 were reviewed in connection with the structural performance of the wall ties.

16.2 Existing information relating to the suitability of the corrosion protection and compatibility of materials in contact was examined.

16.3 Data relating to the effects of the product on the weathertightness of cavity walls were examined.

16.4 An assessment was made of the behaviour of the product in fire.

16.5 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 5250 : 2011 *Code of practice for control of condensation in buildings*

BS 5268-6 : 1996 *Structural use of timber — Part 6: Code of practice for timber frame walls*

BS EN 845-1 : 2003 *Specification for ancillary components for masonry — Ties, tension straps, hangers and brackets*

BS EN 846-6 : 2013 *Methods of test for ancillary components for masonry — Determination of tensile and compressive load capacity and load displacement characteristics of wall ties (single end test)*

BS EN 1996-1-1 : 2005 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 Eurocode 6 — 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 calculation methods for unreinforced masonry structures  
BS EN ISO 6946 : 2007 Building components and building elements — Thermal resistance and thermal transmittance — Calculation method  
BS EN ISO 9001 : 2008 Quality management systems — Requirements  
PD 6697 : 2010 Recommendations for the design of masonry structures to BS EN 1996-1-1 and BS EN 1996-2  
BRE Report 262 : 2002 Thermal insulation : avoiding risks  
BRE Report 443 : 2006 Conventions for U-value calculations

## Conditions of Certification

### 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.