

## Ancon Building Products

President Way  
President Park  
Sheffield S4 7UR

Tel: 0114 275 5224 Fax: 0114 276 8543  
e-mail: info@ancon.co.uk  
website: www.ancon.co.uk



Agrément Certificate  
**14/5160**  
Product Sheet 3

### ANCON CAVITY WALL TIES

### ANCON TEPLO BF WALL TIES

This Agrément Certificate Product Sheet<sup>(1)</sup> relates to Ancon Teplo BF Wall Ties for use in tying masonry to masonry walls with M2 and moderately hydraulic lime mortar, and for Type 1 ties with M2 and M12 mortar in new-build or retrofit constructions with a cavity width up to 450 mm (nominal).

(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.

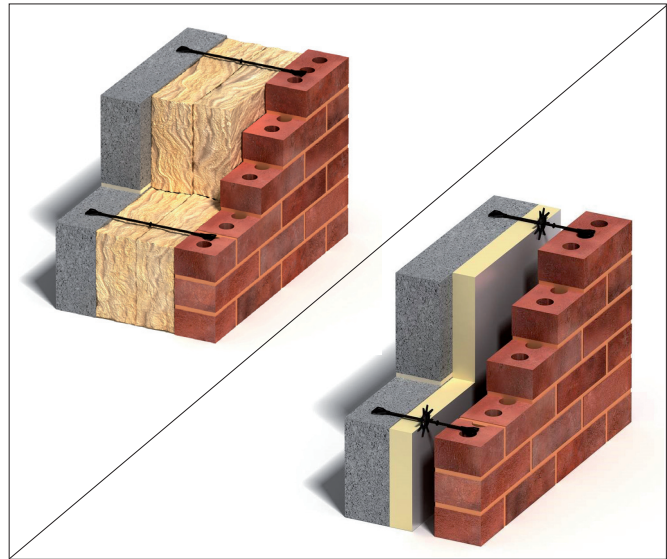
#### KEY FACTORS ASSESSED

**Structural performance** — depending on the wall tie specification, the ties can be used in buildings up to a height of 18 m and are comparable to ties of Types 1, 2, 3 and 4 as defined in PD 6697 : 2010 (see section 6).

**Behaviour in relation to fire** — the ties are suitable for use in 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 polymer end piece has a conductivity of  $0.22 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$  (see section 8).

**Durability** — the ties will 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

Date of First issue: 3 May 2016

A handwritten signature in black ink that reads 'B Chamberlain'.

Brian Chamberlain  
Head of Technical Excellence

A handwritten signature in black ink that reads 'Claire'.

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.*

British Board of Agrément  
Bucknalls Lane  
Watford  
Herts WD25 9BA

tel: 01923 665300  
fax: 01923 665301  
clientservices@bba.star.co.uk  
[www.bbacerts.co.uk](http://www.bbacerts.co.uk)

©2016

# Regulations

In the opinion of the BBA, Ancon Teplo BF 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>
Comment:	Where wall ties are relied upon to contribute to the strength and stability of cavity walls, the products will be satisfactory. See section 6.1 of this Certificate.
<b>Requirement:</b> B3(1)(2)	<b>Internal fire spread (structure)</b>
Comment:	When the products are used in a masonry cavity wall that contributes to the fire resistant properties of an element required to be fire resistant, their use will not adversely affect the level of fire safety of the wall. See section 7 of this Certificate.
<b>Requirement:</b> C2(b)(c)	<b>Resistance to moisture</b>
Comment:	The ties incorporate a drip feature which is effective in preventing the passage of moisture across the cavity wall. See section 10 of this Certificate.
<b>Requirement:</b> L1(a)(i)	<b>Conservation of fuel and power</b>
Comment:	When calculating the thermal transmittance of insulated masonry cavity walls incorporating the products, the thermal bridging owing to the ties must be taken into account. See section 8 of this Certificate.
<b>Regulation:</b> 7	<b>Materials and workmanship</b>
Comment:	The products are acceptable. See section 12 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>
Comment:	The products can contribute to a construction meeting this standard. See section 12 and the <i>Installation</i> part of this Certificate.
<b>Regulation:</b> 9	<b>Building standards applicable to construction</b>
Standard: 1.1(a)(b)	Structure
Comment:	Where wall ties are relied upon to contribute to the strength and stability of cavity walls, the products will be satisfactory. See section 6 of this Certificate.
Standard: 2.3	Structural protection
Standard: 2.4	Cavities
Comment:	When the products are used in a masonry cavity wall that contributes to the fire resistant properties of an element required to be fire resistant, their use will not adversely affect the level of fire safety of the wall. See section 7 of this Certificate.
Standard: 2.6	Spread to neighbouring buildings
Comment:	When used in a masonry cavity wall, the products will provide an equivalent performance to that of a typical steel tie. See section 7 of this Certificate.
Standard: 3.10	Precipitation
Comment:	The products 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.
Standard: 6.2	Building insulation envelope
Comment:	When calculating the thermal transmittance of insulated masonry cavity walls incorporating the products, the thermal bridging owing to the ties must be taken into account. See section 8 of this Certificate.
Standard: 7.1(a)(b)	Statement of sustainability
Comment:	The products can contribute to meeting the relevant requirements of Regulation 9, Standards 1 to 6 and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard.
<b>Regulation:</b> 12	<b>Building standards applicable to conversions</b>
Comment:	All comments given for the products 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>
Comment:	The products are acceptable. See section 12 and the <i>Installation</i> part of this Certificate.
<b>Regulation:</b> 28(b)	<b>Resistance to moisture and weather</b>
Comment:	When used in an external cavity wall, the products will not adversely affect the resistance of the wall to the passage of moisture. See section 10 of this Certificate.
<b>Regulation:</b> 30	<b>Stability</b>
Comment:	The products are satisfactory where relied upon to contribute to the strength and stability of cavity walls. See section 6.1 of this Certificate.

Regulation:	35	Internal fire spread – Structure
Comment:		When the products are used in a masonry cavity wall that contributes to the fire resistant properties of an element required to be fire resistant, their use will not adversely affect the level of fire safety of the wall. See section 7 of this Certificate.
Regulation:	39(a)(i)	Conservation measures
Comment:		When calculating the thermal transmittance of insulated masonry cavity walls incorporating the products, the thermal bridging owing to the products must be taken into account. See section 8 of this Certificate.

**Construction (Design and Management) Regulations 2015**

**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, Principal Designer/CDM co-ordinator, designer and contractors under these Regulations.

**Additional Information**

**NHBC Standards 2016**

NHBC accepts the use of Ancon Teplo BF Wall Ties, provided they are installed, used and maintained in accordance with this Certificate, in relation to *NHBC Standards*, Technical Requirement R3 and Chapter 6.1 *External masonry walls*.

**Technical Specification**

**1 Description**

1.1 Ancon Teplo BF Wall Ties are a range of composite wall ties comprising pultruded basalt fibres set into a resin matrix. Each tie has a moulded polymer piece at each end with a hole on either side, and incorporates an adjustable rubber o-ring fitted in the centre (see Figure 1), which acts as a drip feature to prevent water crossing the cavity, but can be adjusted.



1.2 The ties are available in the sizes given in Table 1 for use in cavity widths from 75 mm to 450 mm with a minimum design embedment depth of 62.5 mm in the masonry bed joint. The polymer end pieces enable the use of the ties with weaker mortar types. Typical examples of the ties in use are shown in Figure 2.

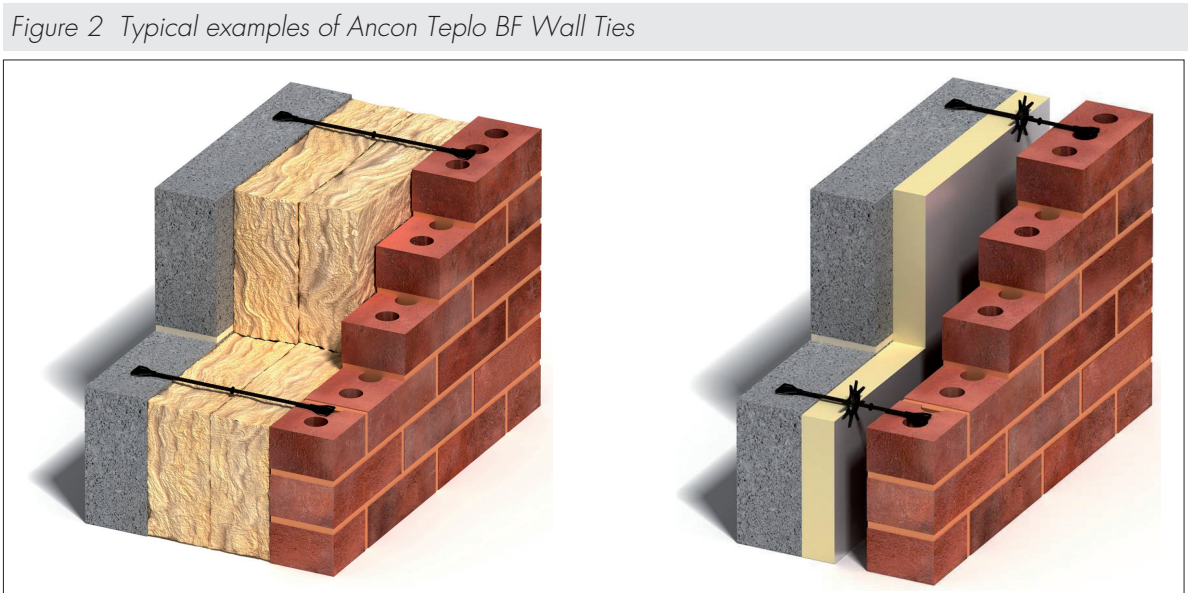


Table 1 Wall tie classification and dimensions

Name	Wall tie type <sup>(1)</sup>	Diameter (mm)	Length (mm)	Cavity (mm)	Maximum building height* (m)
TEPLO4 BF 200	4	4	200	75	10
TEPLO4 BF 225	4	4	225	100	10
TEPLO4 BF 250	4	4	250	125	10
TEPLO2 BF 200	2	5	200	75	15
TEPLO2 BF 225	2	5	225	100	15
TEPLO2 BF 250	2	5	250	125	15
TEPLO2 BF 275	2	6	275	150	15
TEPLO2 BF 300	2	6	300	175	15
TEPLO2 BF 325	2	6	325	200	15
TEPLO2 BF 350	2	7	350	225	15
TEPLO2 BF 375	2	7	375	250	15
TEPLO2 BF 400	2	7	400	275	15
TEPLO2 BF 425	2	7	425	300	15
TEPLO3 BF 450	3	7	450	325	15
TEPLO3 BF 475	3	7	475	350	15
TEPLO3 BF 500	3	7	500	375	15
TEPLO3 BF 525	3	7	525	400	15
TEPLO4 BF 550	4	7	550	425	15
TEPLO4 BF 575	4	7	575	450	15
TEPLO1 BF 200	1	7	200	75	18
TEPLO1 BF 225	1	7	225	100	18
TEPLO1 BF 250	1	7	250	125	18
TEPLO1 BF 275	1	7	275	150	18

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

1.3 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. 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 pultrusion process which combines longitudinal fibre with a resin binder. The profile is cut to size and the polymer pieces are moulded at each end.

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 includes the installation instructions and carries a label bearing the Certificate holder's name, product details, batch number, box weight and the BBA logo.

## Assessment and Technical Investigations

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

## 4 General

4.1 Ancon Teplo BF Wall Ties are satisfactory for use to tie leaves of masonry walls together in new-build or retrofit constructions with a cavity width up to 450 mm (nominal). Type 1, 2, 3 and 4 wall ties can be used in typical M2 mortar and moderately-hydraulic lime mortar; Type 1 ties can also be used in M12 mortar.

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 and their UK National Annexes and PD 6697 : 2010.

4.3 The masonry wall mortar joint thickness must be a minimum of 10 mm and in accordance with BS EN 845-1 : 2013.

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 and their UK National Annexes and PD 6697 : 2010.
- the national Building Regulations:

**England and Wales** — Approved Document A1/2, Section 0.1c

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

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).

**Northern Ireland** — Technical Booklet D.

4.5 Ties must be evenly distributed over the wall area at not less than 2.5 ties per m<sup>2</sup>, except around openings, and should preferably be staggered, at 900 mm horizontal and 450 mm vertical centres.

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 products are designed to be installed by a competent general builder, or a contractor, experienced with this type of product.

## 6 Structural performance



6.1 Characterisation tests were carried out on the products generally in accordance with BS EN 846-6 : 2012. The applications in which the products are suitable for use are given in Table 2.

*Table 2 Suitable applications as per PD 6697 : 2010*

Tie type	Masonry type
1	heavy duty
2	general purpose
3	basic
4	light duty

6.2 The products were also tested in moderately-hydraulic lime mortar, and were found to achieve the same tie type as when tested in M2 mortar.

6.3 In tension the products fail by straightening or pull-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 1996-1-2: 2005 and its UK National Annex, and PD 6697 : 2010.

7.2 Based upon an evaluation of test data generally to BS EN 846-5 : 2012 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 cavity 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 *Conventions for U-value calculations* using a thermal conductivity of 0.71 W·m<sup>-1</sup>·K<sup>-1</sup> for the basalt fibre rod and 0.22 W·m<sup>-1</sup>·K<sup>-1</sup> for the polymer end. Ancon Teplo ties have a low thermal conductivity in comparison with both galvanized and stainless steel ties.

## 9 Condensation risk

Walls must be designed to limit the risk of interstitial and surface condensation. Guidance is available in BS 5250 : 2011 and BRE Report 262 : 2002 *Thermal insulation : avoiding risks*.

## 10 Weathertightness



The ties incorporate an o-ring which is effective as a water shedding feature to prevent the transfer of water across the ties to the inner leaf. The drip must be located so that it is in the centre of the wall cavity or the residual cavity between the insulation and the external leaf of the wall.

## 11 Maintenance

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

## 12 Durability



The products will not be adversely affected by mortar (including those incorporating conventional mortar admixtures) or cavity insulation materials and will have a service life of not less than 60 years.

# Installation

## 13 General

Ancon Teplo BF 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 their UK National Annexes, PD 6697 : 2010, and the Certificate holder's instructions.

## 14 Procedure

14.1 Ideally, the outer leaf brickwork should be kept one course 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 blockwork as construction proceeds.

14.2 The wall ties are sandwiched between brickwork and blockwork within the horizontal bed joint of the mortar. The ties are pressed down and buried within the mortar joint to ensure complete cover. The embedment length of the ties must be 62.5 mm, taking care that the drip is at or close to the centre of the cavity or residual cavity.

14.3 The ties are placed horizontally or with a slight fall towards the outer leaf, and at right angles to the walls. Care should be taken to ensure that the mortar joints are correctly aligned, to ensure that the ties adequately fit into each leaf with a slight fall towards the outer leaf.

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

## 15 Tests

Tests were conducted and the results assessed to determine:

- tensile performance in M2, M12 and lime mortar
- compressive performance in M2, M12 and lime mortar
- performance in shear
- tensile strength
- durability
- fire resistance.

## 16 Investigations

16.1 Test reports generally in accordance with BS EN 846-5 : 2012 were reviewed in connection with the structural performance of the wall ties.

16.2 Existing information was assessed relating to the products' durability and their compatibility with materials in contact.

16.3 Data were assessed relating to the effects of the products on the weathertightness of cavity walls.

16.4 An assessment was made of the products' performance in fire.

16.5 A thermal assessment was conducted to determine the performance of the products in relation to ageing and conductivity.

16.6 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 EN 845-1 : 2013 *Specification for ancillary components for masonry — Ties, tension straps, hangers and brackets*
- BS EN 846-5 : 2012 *Methods of test for ancillary components for masonry — Determination of tensile and compressive load capacity and load displacement characteristics of wall ties (couplet test)*
- BS EN 846-6 : 2012 *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*
- NA to BS EN 1996-1-1 : 2005 + A1 : 2012 *UK National Annex to 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*
- NA to BS EN 1996-1-2 : 2005 *UK National Annex to 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*
- NA to BS EN 1996-2 : 2006 *UK National Annex to 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*
- 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 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*

## 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.