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CI/SfB
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Agrément Certificate No 06/4333

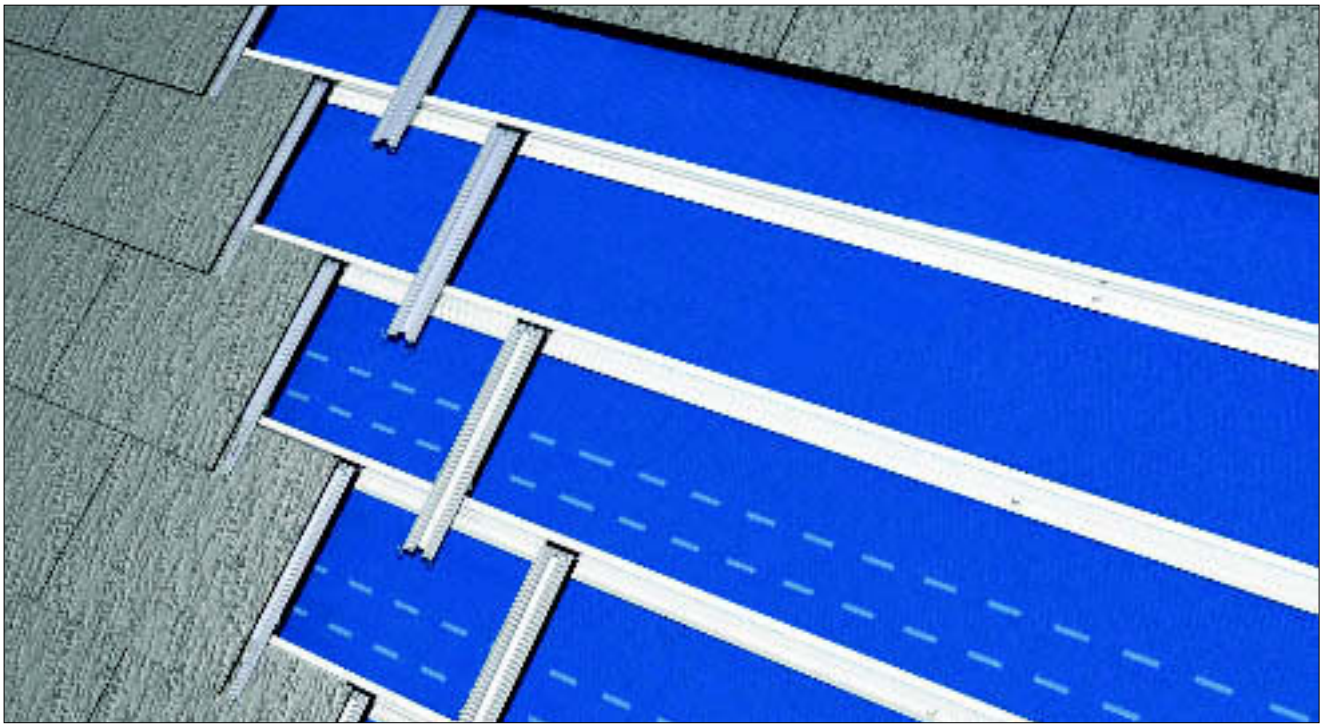
BBA BRITISH BOARD OF AGRÉMENT
TECHNICAL APPROVALS FOR CONSTRUCTION

Designated by Government to issue European Technical Approvals

NU-LOK ROOFING SYSTEM

Parement extérieur
Verkleidung Bedachung

Product



- *THIS CERTIFICATE OF CONFIRMATION RELATES TO THE NU-LOK ROOFING SYSTEM, COMPRISING CERAMIC TILES, METAL BATTENS AND LINK CHANNELS.*
- *The system is for use on conventional pitched timber roofs with a rafter pitch of 22.5° and over.*
- *It is essential that the system is installed in accordance with the conditions set out in the* Design Data *and* Installation *parts of this Certificate.*

Confirmation of Irish Agrément Certificate No 05/0212, issued by IAB.

Regulations

1 The Building Regulations 2000 (as amended) (England and Wales)

The Secretary of State has agreed with the British Board of Agrément the aspects of performance to be used by the BBA in assessing the compliance of roof finishes and wall cladding products with the Building Regulations. In the opinion of the BBA, the Nu-Lok Roofing System, if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements.

Requirement:	B4(2)	External fire spread
Comment:		A roof incorporating the tiles has an AA classification and meets this Requirement. See sections 12.1 and 12.2 of this Certificate.
Requirement:	C2(b)	Resistance to moisture
Comment:		A roof incorporating the system meets this Requirement. See section 7.2 of this Certificate.
Requirement:	Regulation 7	Materials and workmanship
Comment:		The system is acceptable. See section 14.2 of this Certificate.

2 The Building (Scotland) Regulations 2004

In the opinion of the BBA, the Nu-Lok Roofing System, if used in accordance with the provisions of this Certificate, will satisfy or contribute to satisfying the various Regulations and related Mandatory Standards as listed below.

Regulation:	8	Fitness and durability of materials and workmanship
Regulation:	8(1)	Fitness and durability of materials and workmanship
Comment:		The system can contribute to a construction satisfying this Regulation. See section 14.2 and the *Installation* part of this Certificate.
Regulation:	9	Building standards — construction
Standard:	2.8	Spread from neighbouring buildings
Comment:		A roof incorporating the system is unrestricted under this Standard, with reference to clauses 2.8.1[(1)(2)] and 2.8.2[(1)(2)]. See sections 12.1 and 12.2 of this Certificate.
Standard:	3.10	Precipitation
Comment:		The system will contribute to a roof satisfying this Standard, with reference to clauses 3.10.1[(1)(2)] and 3.10.7[(1)(2)]. See section 7.2 of this Certificate.
Regulation:	12	Building standards — conversions
Comment:		All comments given for this system under Regulation 9, 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).

3 The Building Regulations (Northern Ireland) 2000

In the opinion of the BBA, the Nu-Lok Roofing System, if used in accordance with the provisions of this Certificate, will satisfy or contribute to satisfying the various Building Regulations as listed below.

Regulation:	B2	Fitness of materials and workmanship
Comment:		The system comprises acceptable products. See section 14.2 of this Certificate.
Regulation:	C4	Resistance to ground moisture and weather
Comment:		A roof incorporating the system can satisfy this Regulation. See section 7.2 of this Certificate.
Regulation:	E5	External fire spread
Comment:		A roof incorporating the system is unrestricted under this Regulation. See sections 12.1 and 12.2 of this Certificate.

4 Construction (Design and Management) Regulations 1994 (as amended) Construction (Design and Management) Regulations (Northern Ireland) 1995 (as amended)

Information in this Certificate may assist the client, planning supervisor, designer and contractors to address their obligations under these Regulations.

See sections:	*5 Description* (5.3), *6 Delivery and site handling* (6.1 and 6.3), and *13 Maintenance* (13.2 and 13.3) of this Certificate.

Technical Specification

5 Description

5.1 The Nu-Lok Roofing System (see Figures 1 and 2) consists of:

- Nu-Lok Vitrified Ceramic Tiles — manufactured using a mixture of naturally-occurring minerals and additives. The mix is pressed and fired resulting in vitrified ceramic tiles
- Nu-Lok Link Channels — manufactured from 0.7 mm hot-dipped, galvanized steel to BS EN 10327 : 2004 and coated on the face side with HPS200 coloured protective coating. The reverse side is coated with a stoved enamel coating. The channels lock onto the Nu-Lok Metal Battens
- Nu-Lok Metal Battens — manufactured from 1.2 mm hot-dipped, galvanized, mild steel units which firmly hold the Nu-Lok Link Channel in position produced to BS EN 10327 : 2004
- Nu-Lok Stainless Steel Wire Spring Clips — chemically-blackened, from cold drawn 316 stainless steel, produced to BS EN 10270-3 : 2001 used to restrain each tile, one at each lower corner, to the link channel
- Nu-Lok Stainless Steel Universal Spring Clips — manufactured from cold drawn 316 stainless steel used to secure tiles at hips, valleys and ridges.

Figure 1 Nu-Lok Tile Clip, Link Channel and Channel Clip Component

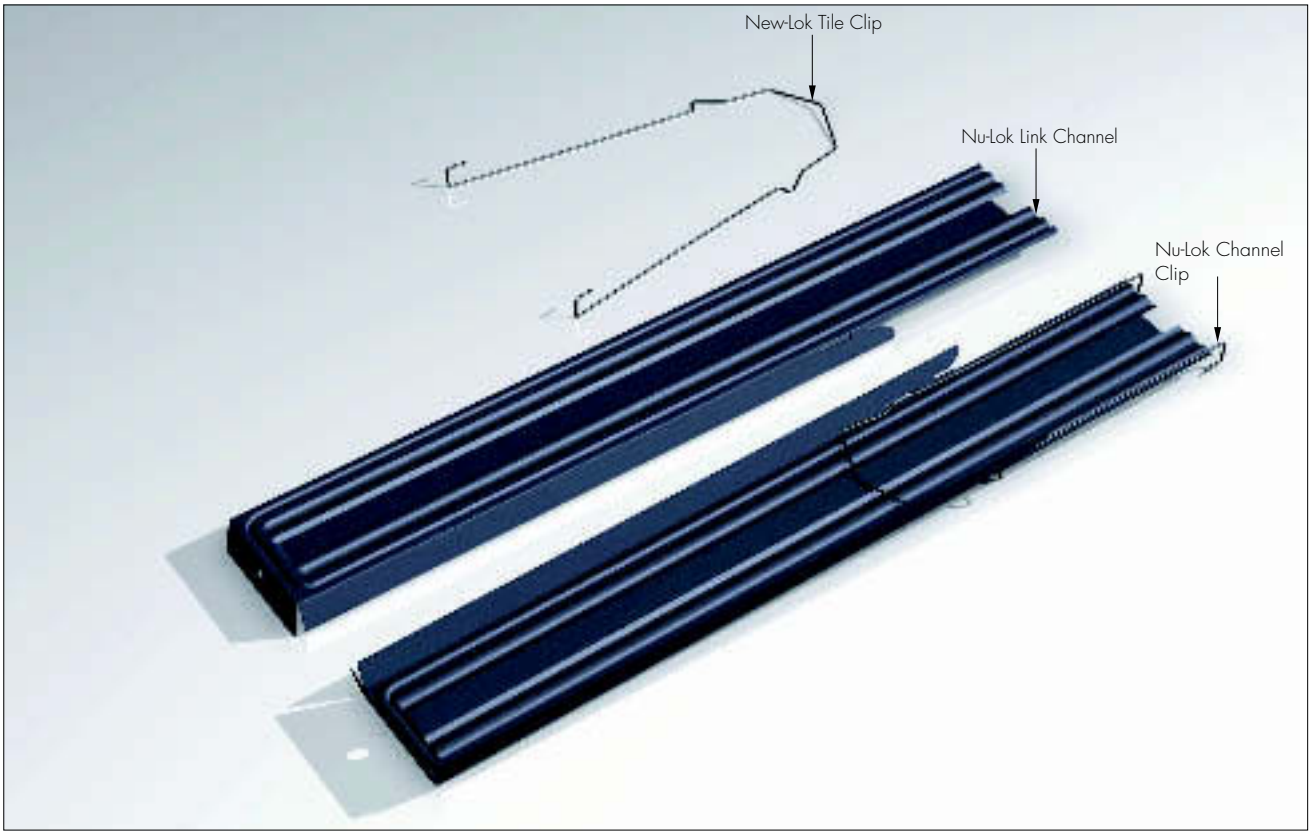


Figure 2 Nu-Lok Metal Batten and Ceramic Tiles


Nu-Lok Metal Batten


Nu-Lok Ceramic Tiles

5.2 The manufacturers maintain a quality control system for the components.

5.3 The system component have the nominal characteristics given in Table 1.

Table 1 Characteristics (units)

	Components		
	Tile	Metal batten	Link channel
Dimension (mm)	400 x 400	48.1 x 24.3 x 5400	395
Thickness (mm)	8.5	1.2	0.85
Weight (kg)	3	22[1]	12.6[1]
Installed weight (kgm^{-2})	25	–	–
Colour	grey[2]	–	–

(1) Weight per box

(2) Other colours available to order.

5.4 Ancillary items available, for use with the system are Senco Weatherex 5 mm long by 2.8 mm diameter ring-shank nails used to fix the Nu-Lok Metal Battens to timber rafters.

6 Delivery and site handling

6.1 The system components are delivered to site with sufficient parts for the designated area of roofing in palletised shrink-wrapped bundles containing boxes of seven tiles weighing 21 kg. The metal battens are delivered to site in bundles of nine and the link channels and stainless steel clips are packaged in boxes of 84.

6.2 The components should be stored on a dry, level base in dry conditions under cover and away from the possibility of damage.

6.3 All components are labelled with the manufacturer's name and address, product details, batch number, size, quantity and weight and the BBA identification mark incorporating the number of this Certificate.

Design Data

7 General

7.1 The Nu-Lok Roofing System is satisfactory for use on conventional, pitched, timber roofs with a rafter pitch of 22.5° and over. It is essential that such roofs and walls are designed and constructed to incorporate the normal precautions to prevent moisture penetration and the formation of condensation (eg by adequate ventilation).

7.2 Roofs incorporating the system and subject to the national Building Regulations should be designed and constructed in accordance with the relevant recommendations of BS 5534 : 2003 and BS 8000-6 : 1990. In particular, the designer should follow the recommendations of Clauses 5.1, 5.2, 5.5 and 5.8 of BS 5534 : 2003 on rain and snow resistance, roof pitch, head-laps and side-laps, structural stability and control of condensation, respectively; and select a construction appropriate to its location paying due attention to design detailing, workmanship and materials to be used.

7.3 Other roofs incorporating the system and not subject to any of the national Building Regulations should be constructed in accordance with BS 5534 : 2003 and BS 8000-6 : 1990.

7.4 The system is unsuitable for use on sprocketed or bellcast roofs or roofs incorporating copper elements.

8 Strength

8.1 The system has adequate resistance to damage during site handling and installation using conventional roofing methods.

8.2 When tested in accordance with BS EN 538 : 1994, the Nu-Lok Vitrified Ceramic Tiles have a mean flexural strength of 2.3 kN, and comply with the requirements of BS EN 1304 : 1998, Section 5.4.2.

8.3 The system has adequate resistance to the uniformly distributed loads (wind, snow) likely to be encountered. Where high local snow loads may occur, the advice given in BRE Digest 332 *Loads on roofs from snow drifting against vertical obstructions and in valleys* should be followed.

8.4 When fixed in accordance with the manufacturer's instructions, the tiles are resistant to the effects of wind uplift likely to be encountered in the United Kingdom. Where conditions of exposure may be severe, consideration should be given to the recommendations outlined in BS 5534 : 2003.

9 Weathertightness

9.1 Wind-driven rain penetration tests indicate that the system has adequate resistance to the ingress of wind-driven rain when installed on a roof with a rafter pitch of 22.5°.

9.2 When used at pitches of 22.5° or greater in conjunction with a suitable underlay the system will provide a roof with satisfactory resistance to the passage of rain or snow.

9.3 The tiles, when tested in accordance with EN 539-1 : 2005, comply with the requirements for impermeability in accordance with BS EN 1304 : 1998.

10 Ventilation

Ventilation should be provided in accordance with the requirements of BS 5250 : 2002.

11 Corrosion

To prevent electro-chemical corrosion, direct contact with copper or its alloys should be avoided and copper roofs must not drain onto the installation.

12 Performance in relation to fire

12.1 When tested in accordance with BS 476-3 : 1958, the tiles achieved an EXT.S.AA designation.

12.2 The tiles are non-combustible and as such have a Class 0 surface. A roof incorporating the system is designated AA and is consequently unrestricted by the relevant requirements of the national Building Regulations:

England and Wales

Regulation B4(2)

Scotland

Mandatory Standard 2.8, clauses 2.8.1[1][2] and 2.8.2[1][2]

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).

Northern Ireland

Regulation E5.

13 Maintenance

13.1 Damaged tiles can be replaced by following the manufacturer's instructions and the relevant sections of BS 5534 : 2003 and BS 8000-6 : 1990.

13.2 Care is required when carrying out maintenance work on any roof in tiling, and the recommendations contained in BS 5534 : 2003, Clause 6.13 *Installation, repairs and maintenance*,

and BS 8000-6 : 1990, Section 5, Clause 5.2, should be followed.

13.3 Precautions should be taken to prevent danger to the public from falling broken or displaced tiles.

14 Durability

14.1 The tiles when tested in accordance with EN 539-2 : 1998, Method D, meet the requirements of BS EN 1304 : 1998 for freeze-thaw cycling.

14.2 Evidence from accelerated tests indicates that there will be no significant change in the physical properties of the material due to ageing. The system will have a life equivalent to known good quality clay tiles, when used in normal exposure conditions in the United Kingdom (ie in excess of 35 years).

Installation

15 Procedure

15.1 The Nu-Lok Roofing System should be installed on pitched roofs strictly in accordance with the Certificate holder's instructions, BS 5534 : 2003 and BS 8000-6 : 1990 (see Figure 3).

15.2 Nu-Lok Metal Battens are fastened to the rafters (maximum span 600 mm) at 307 (± 7 mm) gauge, using 51 mm long by 2.8 mm diameter Weatherex nails.

15.3 The Nu-Lok Link Channels and Nu-Lok Stainless Steel Wire Spring Clips are assembled at ground level.

15.4 A tilting fillet is installed behind the fascia board line. The top of the tilting fillet should be flush with the rear top edge of the fascia.

15.5 The underlay should be fixed in accordance with the manufacturer's instructions ensuring that it overhangs the fascia sufficiently to allow rainwater to drain into the gutter.

15.6 Starting at eaves level, a row of Nu-Lok Link Channels are slotted into position at 400 mm centres across the roof. The channels are fixed by clipping them into the Nu-Lok Metal Battens, above and below. The channels are locked into position between the metal battens. The lower section of each link channel extends over the head of the tile below, retaining it in position.

15.7 As installation progresses, the two stainless steel wire clips protruding from the link channels are used to retain and secure the tail of the next row of tiles.

15.8 Ridge, verge, hip, valley details should be completed using Nu-Lok Stainless Steel Universal Clips in accordance with the Certificate holder's instructions.

15.9 The verge should be completed using conventional cement mortar or approved proprietary systems fixed in accordance with the manufacturer's instructions.

15.10 Where flashing is required, the cover flashing method should be used. Use of soakers is not permitted without metal separation.

15.11 Where the system is to be used on an existing roof structure, the recommendations contained in BS 5534 : 2003 and BS 8000-6 : 1990, should be followed.

16 Health and safety

16.1 If it is necessary to cut tiles using a dust-generating technique and on such a scale as to generate excessive concentrations of dust, the measures identified in Health and Safety Executive Hygiene Guidance Note EH44/1997 *Dust : General principles of protection*, should be followed.

16.2 Any tiled roof should be treated as fragile and the recommendations in sections 13.2 and 13.3 should be followed.

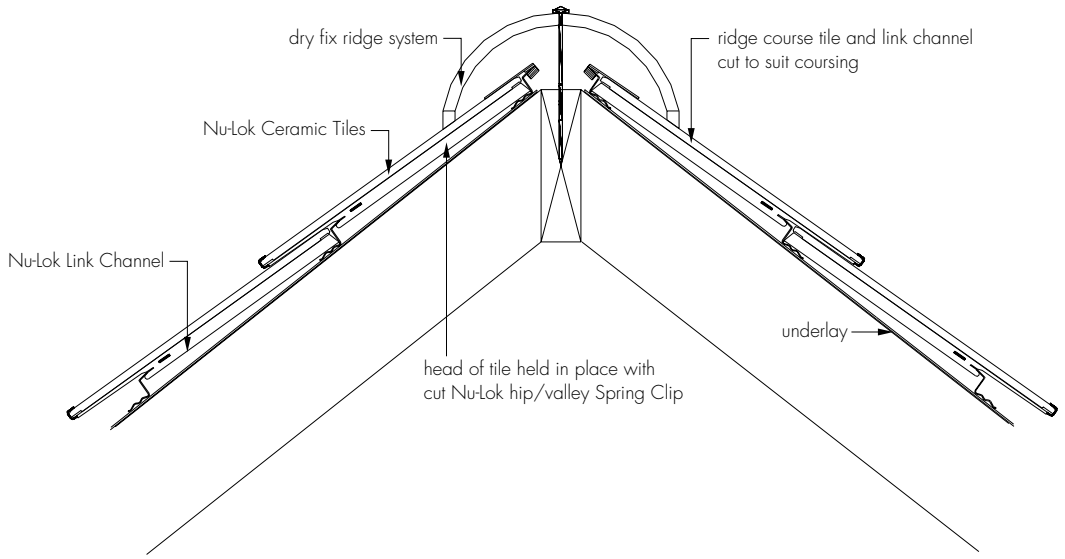
17 Cutting

17.1 If it is necessary to cut tiles, a heavy duty scribe and break floor tile cutter or a wet saw with a fast cut or porcelain blade should be used. When using wet saws, the cut tiles should be rinsed thoroughly to remove all traces of cutting slurry.

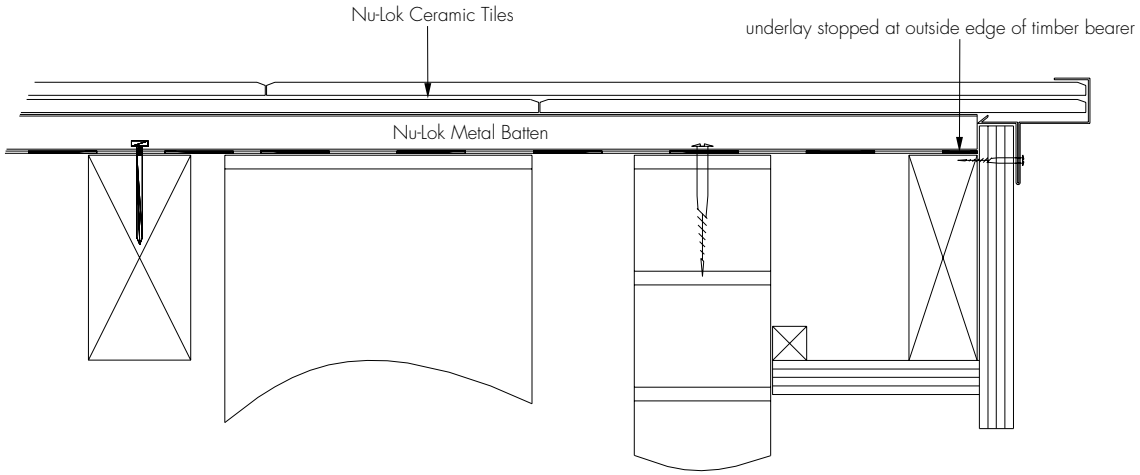
17.2 When cutting tiles using a machine that may generate excessive concentrations of dust, the recommended actions contained in section 16.1 should be followed.

17.3 Nu-Lok Metal Battens can be cut with an angle grinder, hand-held metal shears or hacksaw.

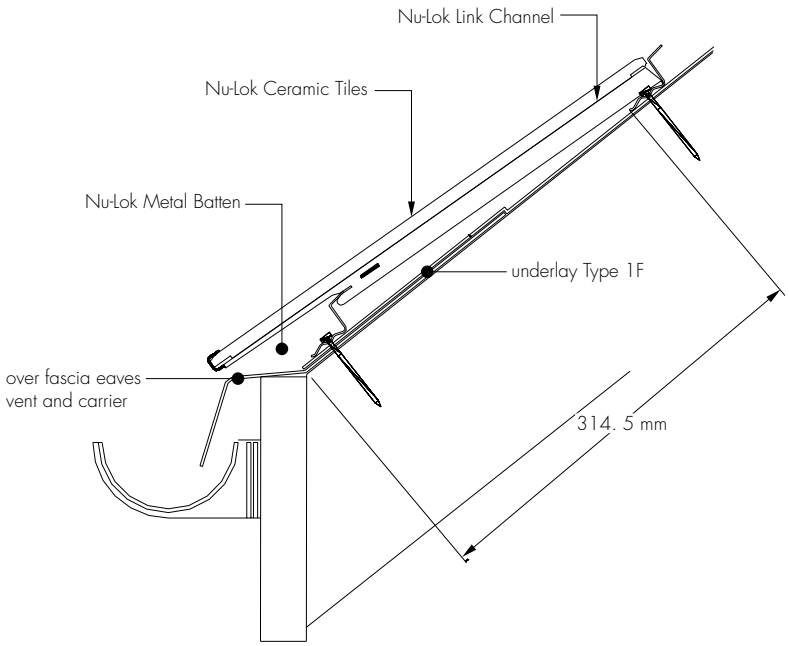
Figure 3 Installation details



ridge detail



verge detail



eaves detail

Technical Investigations

The following is a summary of the technical investigations carried out on the Nu-Lok Roofing System.

18 Investigations

18.1 Data from independent laboratories in relation to the following was examined:

- geometrical characteristics
- flexible strength
- water absorption
- resistance to sulphuric acid, chemical and salt resistance
- impermeability
- resistance to wind-driven rain penetration
- freeze/thaw resistance
- resistance to algal growth
- compatibility of materials
- durability of fixing system.

18.2 Fire test data in relation to BS 476-3 : 1958 was also examined and found to be satisfactory.

18.3 The manufacturing process was examined, including the methods adopted for quality control.

Bibliography

BS 476-3 : 1958 *Fire tests on building materials and structures — External fire exposure roof test*

BS 5250 : 2002 *Code of practice for control of condensation in buildings*

BS 5534 : 2003 *Code of practice for slating and tiling (including shingles)*

BS 8000-6 : 1990 *Workmanship on building sites — Code of practice for slating and tiling of roofs and claddings*

BS EN 538 : 1994 *Clay roofing tiles for discontinuous laying — Flexural strength test*

BS EN 1304 : 1998 *Clay roofing tiles for discontinuous laying — Products definitions and specifications*

BS EN 10270-3 : 2001 *Steel wire for mechanical springs — Stainless spring steel wire*

BS EN 10327 : 2004 *Continuously hot-dip coated strip and sheet of low carbon steels for cold forming — Technical delivery conditions*

EN 539-1 : 2005 *Clay roofing tiles for discontinuous laying — Determination of physical characteristics — Impermeability test*

EN 539-2 : 1998 *Clay roofing tiles for discontinuous laying — Determination of physical characteristics — Test for frost resistance*

Conditions of Certification

19 Conditions

19.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is granted only to the company, firm or person named on the front page — no other company, firm or person may hold or claim any entitlement to this Certificate
- 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.

19.2 References in this Certificate to any Act of Parliament, Regulation made thereunder, Directive or Regulation of the European Union, Statutory Instrument, Code of Practice, British Standard, manufacturers' instructions or similar publication, are references to such publication in the form in which it was current at the date of this Certificate.

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

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- remain covered by a valid Irish Agrément; and
- are reviewed by the BBA as and when it considers appropriate.

19.4 In granting this Certificate, the BBA is not responsible for:

- 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
- individual installations of the product or system, including the nature, design, methods and workmanship of or related to the installation
- the actual works in which the product/system is installed, used and maintained, including the nature, design, methods and workmanship of such works.

19.5 Any information relating to the manufacture, supply, installation, use and maintenance 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 and maintained. It does not purport in any way to restate the requirements of the Health & Safety at Work etc Act 1974, or of any other statutory, common law or other duty which may exist at the date of this Certificate or in the future; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any present or future statutory, common law or other duty of care. In granting this Certificate, the BBA does not accept responsibility to any person or body for any loss or damage, including personal injury, arising as a direct or indirect result of the manufacture, supply, installation, use and maintenance of this product/system.

BBA BRITISH BOARD OF AGRÉMENT
TECHNICAL APPROVALS FOR CONSTRUCTION

In the opinion of the British Board of Agrément, the Nu-Lok Roofing System is fit for its intended use provided it is installed, used and maintained as set out in this Certificate. Certificate No 06/4333 is accordingly awarded to Nu-Lok Roofing Systems (UK) Ltd.

On behalf of the British Board of Agrément

Date of issue: 14th August 2006

Chief Executive

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For information about the Agrément Certificate, including validity and scope, tel: Hotline 01923 665400, or check the BBA website.