

CERTIFICATE NO.05/0212

Nu-Lok Roofing Systems (Ireland) Ltd
83 Rathkeele Road, Broughshane, Ballymena,
Co Antrim BT 42 4QE

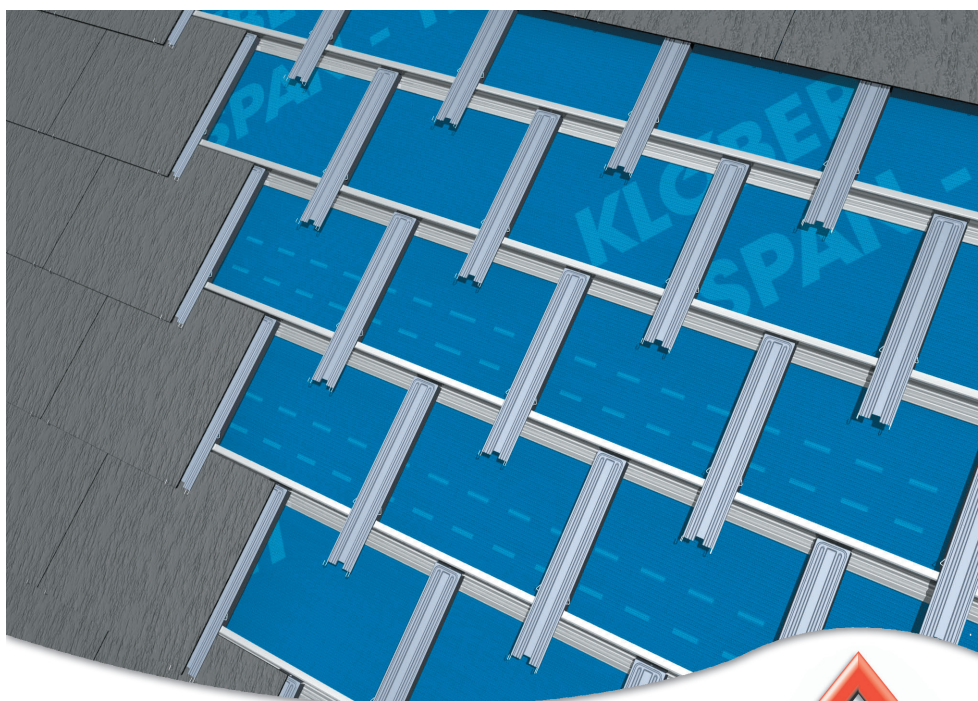
Tel: +(44) 028 2586 2717 Fax: +(44) 028 2586 2718
Email: enquiries@nulok.fsnet.co.uk
website: www.nu-lok.com

Nu-Lok™ Roofing System

The Irish **Agrément Board** is designated by Government to issue European Technical Approvals.

Irish Agrément Board Certificates establish proof that the certified products are 'proper materials' suitable for their intended use under Irish site conditions, and in accordance with the **Building Regulations 1997 to 2002**.

The Irish Agrément Board operates in association with
the **National Standards Authority of Ireland (NSAI)** as the National Member of UEAtc.



PRODUCT DESCRIPTION:

This Certificate relates to the Nu-Lok™ Roofing System.

The system is comprised of the following components:

- a) Nu-Lok™ Vitrified Ceramic Slates;
- b) Nu-Lok™ Metal Battens;
- c) Nu-Lok™ Link Channels;
- d) Nu-Lok™ Stainless Steel Wire Spring Clips;
- e) Nu-Lok™ Stainless Steel Universal Spring Clips.

The components are combined to form a single lap, broken bond, slate roofing system.

The Nu-Lok™ Metal Battens are fixed to the rafters in the conventional way, using Nu-Lok™ approved steel nails. The Nu-Lok™ Link Channels are then snap-fitted to the battens

at specified centres, to form an interlocking steel grid. Each Nu-Lok™ Vitrified Ceramic Slate is then fixed to the metal grid, using Nu-Lok™ Stainless Steel Wire Spring Clips.

The Nu-Lok™ Roofing System incorporates a headlap of 100 mm. The Nu-Lok™ Link Channel collects water from the vertical joint between the slates, and discharges it onto the slate below, thus replacing the conventional side interlock.

The Nu-Lok™ Roofing System was developed in Australia by Nu-Lok™ Roofing Systems Pty. Ltd. Nu-Lok™ Roofing Systems (Ireland) Ltd is licensed to manufacture, market and distribute the system in Ireland and the Isle of Man.

The Nu-Lok™ Roofing System is covered by
Patent No PCT/AU 01/01122.

USE:

The Nu-Lok™ Roofing System is suitable for use as a slate roofing system, designed to comply with the requirements of I.S. I.C.P. 2: 2002 *Slatting and Tiling*. The system is suitable for use in domestic, commercial and light industrial buildings, up to a maximum of four storeys high, where the roof pitch is between 22.5° and 70°, and where the building complies with the requirements of the Building Regulations 1997 – 2002.

The system is unsuitable for use in

- a) Sprocketed or bellcast roofs
- b) Roofs incorporating copper elements.

MANUFACTURE AND MARKETING:

The system is assembled and marketed by:
Nu-Lok Roofing Systems (Ireland) Ltd
83 Rathkeele Road, Broughshane, Ballymena,
Co Antrim BT 42 4QE

Tel: +(44) 028 2586 2717 Fax: +(44) 028 2586 2718

Email: enquiries@nulok.fsnet.co.uk

website: www.nu-lok.com

REVISIONS

There have been no revisions to this certificate.

Table 1: *Component Manufacture*

Component	Manufacturer
Nu Lok™ Vitrified Ceramic Slates	Marazzi Gruppo Ceramiche S.P.A., Modena, Italy
Nu Lok™ Metal Battens	Dettra Fabrications Ltd, Rowley Regis, West Midland, UK
Nu Lok™ Link Channels	Talan Products Inc., Cleveland, Ohio, USA
Nu Lok™ Stainless Steel Wire Spring Clips	Airedale Springs Ltd, Keighley, West Yorkshire, UK
Nu Lok™ Stainless Steel Universal Spring Clips	Airedale Springs Ltd, Keighley, West Yorkshire, UK

Part One / Certification

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1.1 ASSESSMENT

In the opinion of the Irish Agrément Board (IAB), the Nu-Lok™ Roofing System, when used as specified in this Irish Agrément Certificate, is satisfactory for the purpose defined above, and meets the requirements of the Building Regulations 1997 to 2002 as indicated in Section 1.2 of this Certificate.

1.2 BUILDING REGULATIONS 1997 TO 2002

REQUIREMENT:

Part A – Structure

A1 – Loading

The Nu-Lok™ Roofing System, when used as certified, meets the requirements.

Part B – Fire Safety

B4 – External Fire

The Nu-Lok™ Roofing System, when used as certified, meets the requirements.

Part C – Site Preparation and Resistance to Moisture

C4 – Resistance to Weather and Ground Moisture

The Nu-Lok™ Roofing System, when used as certified, meets the requirements.

Part D – Materials and Workmanship

D1 – The Nu-Lok™ Roofing System, as certified in this Irish Agrément Certificate, meets the requirements for workmanship.

D3 – The Nu-Lok™ Roofing System, as certified in this Irish Agrément Certificate, is comprised of proper materials, which are fit for their intended use, as indicated in Part 4 of this Certificate.

Part F – Ventilation

F2 Condensation in roofs

Roofs incorporating the Nu-Lok™ Roofing System, when used as certified in this Irish Agrément Certificate, can be designed to meet the requirements.

Part H Drainage and Waste Water

H1 Drainage Systems

Roofs incorporating the Nu-Lok™ Roofing System, when used as certified in this Irish Agrément Certificate, can be designed to meet the requirements.

Part K Stairways, Ladders, Ramps and Guards

K2 Protection from falling

Roofs incorporating the Nu-Lok™ Roofing System, when used as certified in this Irish Agrément Certificate, can be designed to meet the requirements.

Part L – Conservation of Fuel and Energy

L1 – Conservation of fuel and energy

Roofs incorporating the Nu-Lok™ Roofing System, when used as certified in this Irish Agrément Certificate, can be designed to meet the requirements.

Part J – Heat producing Appliances

J3 – Protection of building

Roofs incorporating the Nu-Lok™ Roofing System, when used as certified in this Irish Agrément Certificate, can be designed to meet the requirements.

Part Two / Technical Specification and Control Data

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2.1 PRODUCT DESCRIPTION

2.1.1 Components

The Nu-Lok™ Roofing System is comprised of the components specified in Table 2 and shown in Fig 1.
 The components are assembled as shown in Fig 2.

Table 2: *Component Specifications*

Nu-Lok™ Vitrified Ceramic Slates

Specification	I.S. EN 1304: 1998 <i>Clay Roofing Tiles for discontinuous laying – Product definitions and specification</i> and Class B1 to I.S. EN 87: 1991 <i>Ceramic floor and wall tiles – Definitions, classification, characteristics and marking</i>
Dimensions	400 mm long x 400 mm wide x 8.5mm thick
Water absorption	<0.05 % I.S. EN 99: 1992 <i>Ceramic tiles – Determination of water absorption</i>
Bending strength	> 45n/mm ² I.S. EN 100: 1992 <i>Ceramic tiles – Determination of modulus of rupture</i>
Weight/slate	3 Kg
Weight/m²	25 Kg/m ²
Colour	Grey (other colours can be provided on request)

Nu-Lok™ Metal Batten

Specification	Hot dipped galvanised mild steel; DX51D+ Z275 to I.S. EN 10327:2004: <i>Continuously hot-dip coated strip and sheet of low carbon steels for cold forming. Technical delivery conditions</i>
Thickness	1.2 mm
Width	48.1 mm
Depth	24.3 mm
Length	5400 mm

Nu-Lok™ Link Channel

Specification	AZ55 Galvalume™ steel to AS™ A792/A792M – 03 <i>Standard Specification for steel sheet, 55% aluminium-zinc alloy – coated by the hot dip process, with 0.01 mm to 0.02 mm thick black automotive e-coating, post applied after cutting and pressing.</i>
Length	395 mm
Thickness	0.8 mm

Nu-Lok™ Stainless Steel Wire Spring Clip

Specification	1.6 mm diameter, cold drawn, chemically blackened, 316S42 stainless steel to I.S. EN 10270-3:2001 <i>Steel wire for mechanical springs. Part 3 Stainless spring steel wire</i>
Tensile strength	1460 n/mm ² to 1700 n/mm ²

Nu-Lok™ Stainless Steel Universal Spring Clip

Specification	2.03 mm thick, cold drawn, 316S42 stainless steel to I.S. EN 10270-3:2001 <i>Steel wire for mechanical springs. Part 3 Stainless spring steel wire</i>
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Figure 1: Nu-Lok™ Components

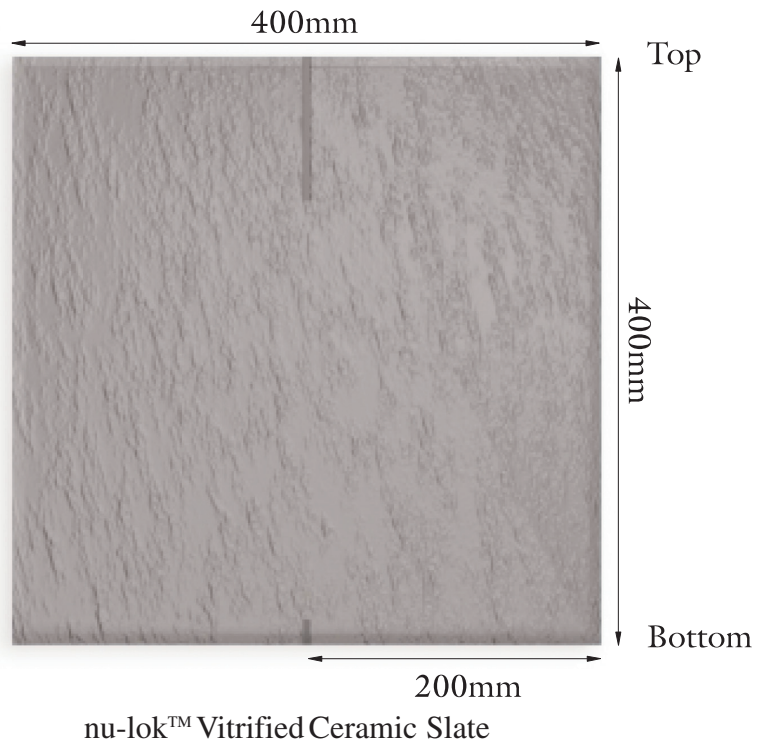


Figure 1a

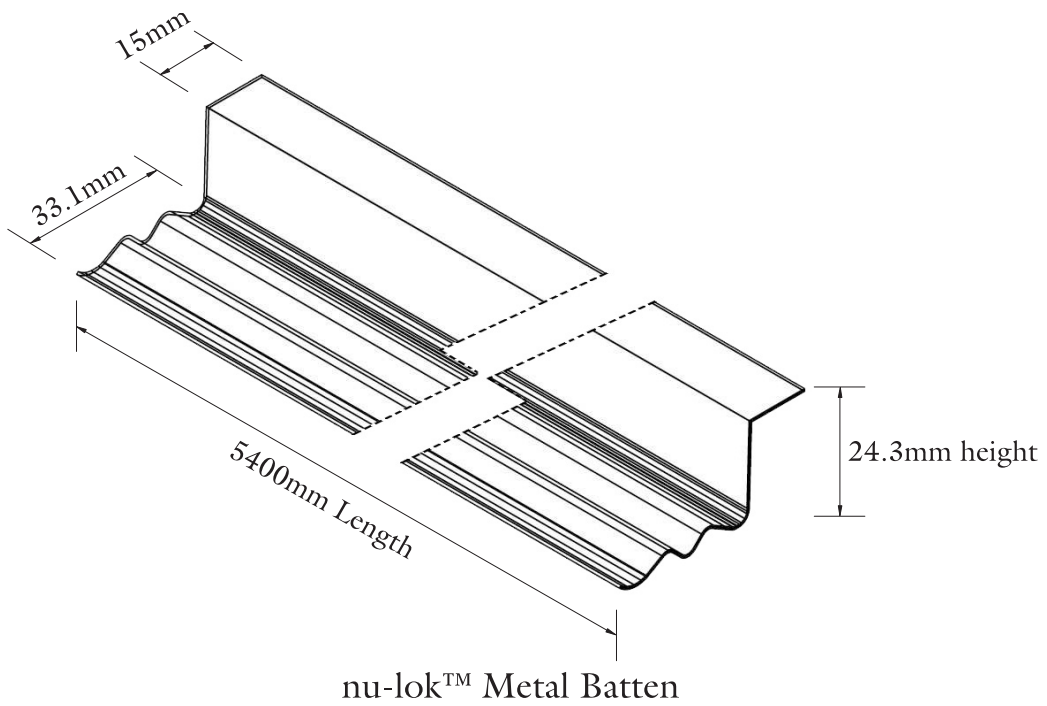


Figure 1b

Figure 1: Nu-Lok™ Components (ctd)

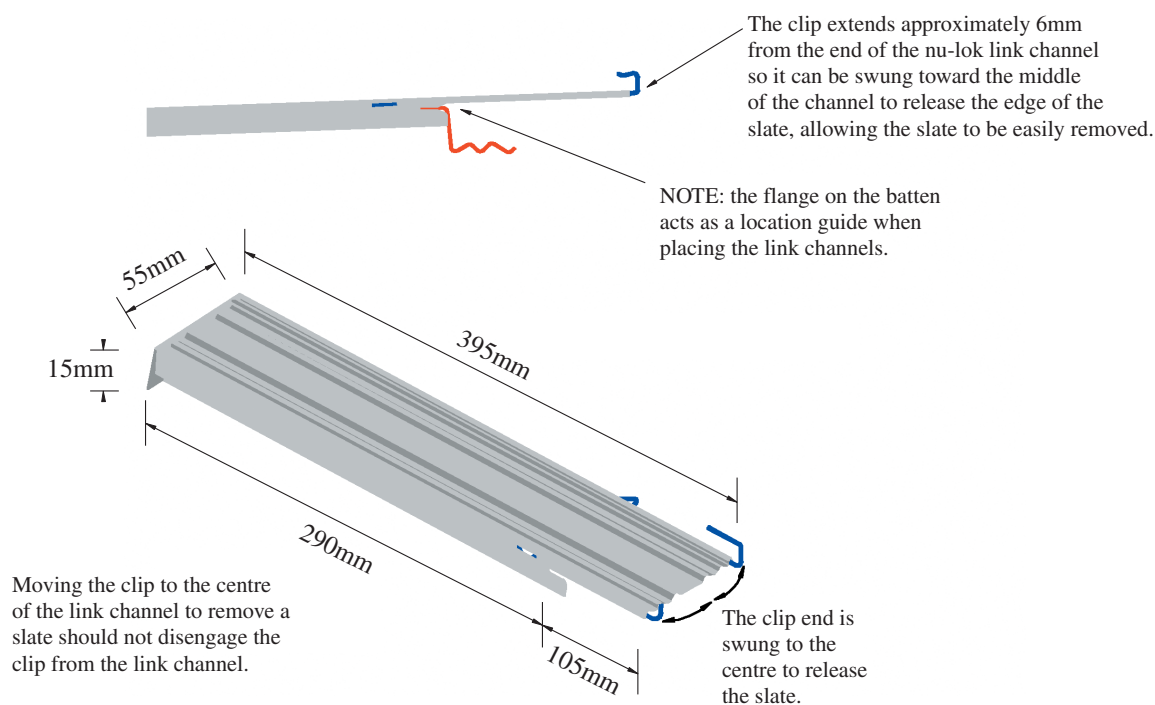


Figure 1c

nu-lok™ Link Channel

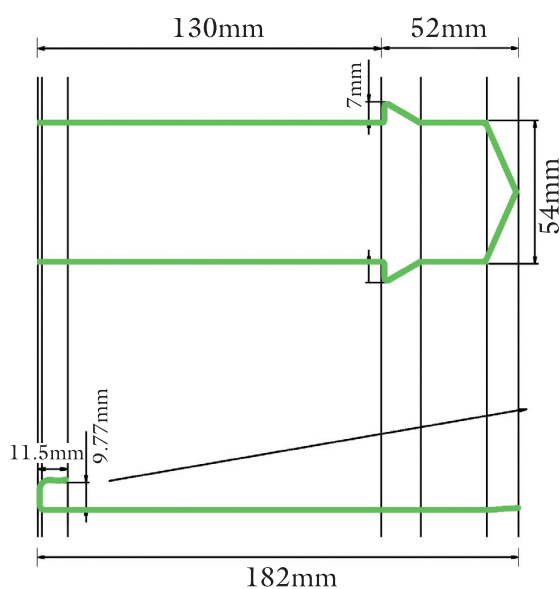
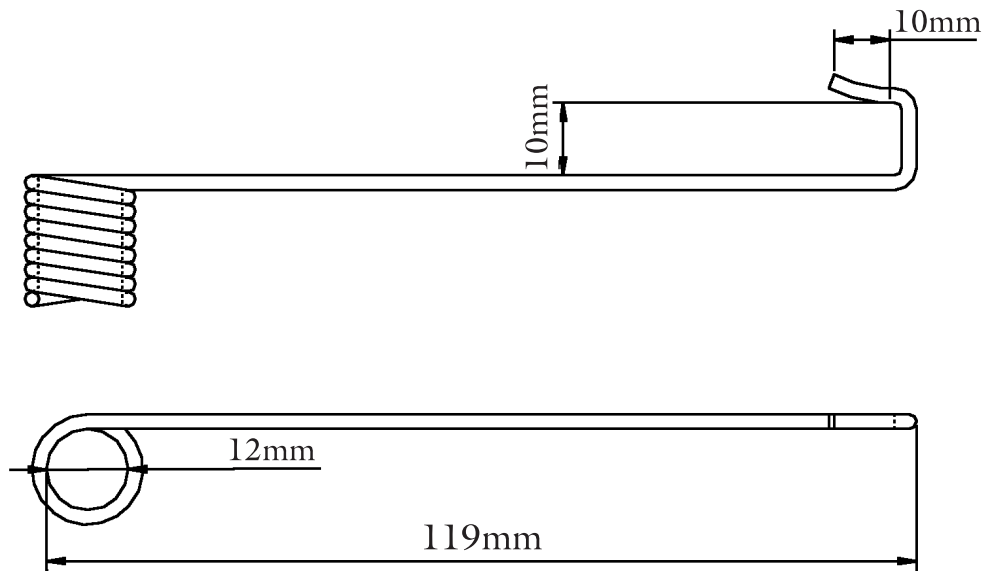


Figure 1d

nu-lok™ Stainless Steel Wire Clip

Figure 1: Nu-Lok™ Components (ctd)



nu-lok™ Universal Spring Clip

Figure 1e

2.1.2 Manufacture and quality control

The manufacturing method and quality control details are given in Table 3.

Table 3: Components – Manufacture and quality control details

Nu-Lok™ Vitrified Ceramic Slates			
Method	Quality Control Checks	Certification Scope ISO 9001: 2000	Certification Body
Homogenous compound of dense rock, clay, selected minerals and strong glazes is atomized, before being injected into a pressurised mould to form a 'biscuit' or 'raw' slate. This slate is then fed through a series of quality control checks before being fired at 1200°C, to form a Nu-Lok™ Ceramic slate	Dimensional checks, modulus of rupture, bending strength, water absorption, resistance to deep abrasion, surface hardness, resistance to frost, thermal shock, chemical attack, stains, acids and bases, colour resistance to light exposure, determination of linear thermal expansion coefficient.	Product design and development, production, sale and assistance of spray-dried powder mix ceramic tiles in Firestream technology and in porcelain gres as well as systems for outdoor wall coverings and raised floors by <i>Certificate No 195/3</i>	Certificazione Italiana de Sistemi Qualità Aziendali (CISQ)
Nu-Lok™ Metal Battens			
Battens are cold pressed on a continuous rolling press system, from strips of 1.2 mm gauge hot dipped galvanised (G275) steel guillotine, cut from flat sheets to I.S. EN 10327: 2004 <i>Continuously hot-dip coated strip and sheet of low carbon steels for cold forming-Technical delivery conditions</i>	Visual and gauge checks	In-house quality system to ISO 9001: 2000	
Nu-Lok™ Link Channels			
The channels are cut and pressed from Galvalume™ steel sheet, prior to application of a paint coating.	Dimensional checks, visual inspection	Stamping and metal forming services <i>Registration No 9807007.</i>	Moody International Certification
Nu Lok™ Stainless Steel Wire Spring Clips and Universal Spring Clips			
Manufactured on a spring press from continuous feed coil stainless steel cold drawn spring wire	Visual and gauge checks	Manufacture of springs, wire forms, light pressings, assemblies and associated products <i>Certificate No LRQ 0850194</i>	Lloyds

2.1.3 Ancillary Items

Senco Weatherex 51 x 2.8 mm diameter ring shank nails are used to fix Nu-Lok™ Metal Battens to timber rafters.

2.3 DELIVERY, STORAGE AND MARKING

The Nu-Lok™ Roofing System is delivered to site with sufficient components for the designated area of roofing.

Nu-Lok™ Ceramic Slates are delivered to site in palletised shrink-wrapped bundles containing boxes of 7 slates. The metal battens are delivered to site in bundles of 20 (nominal 22 m² roof area). The Link Channels and stainless steel clips are packaged in boxes of 100 (nominal 12 m² roof area).

All components should be stored above ground on a flat surface, in accordance with the Certificate Holder's instructions. They should be protected from exposure to the elements, mechanical damage and long-term submersion in water, until ready for use. Cardboard boxes and shrink-wrapping are not considered adequate protection from the weather.

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

2.4 INSTALLATION

2.4.1 General

The Nu-Lok™ Roofing System should be laid and fixed in accordance with I.S. I.C.P.2, BS 8000-6: 1990 *Code of Practice for Workmanship on Building Sites – Slating and Tiling of Roofs & Cladding* and the Certificate Holder's instructions.

2.4.2 Roofing Contractors

The Nu-Lok™ Roofing System shall be installed by Nu-Lok Roofing Systems (Ireland) Ltd approved installers, in accordance with the 'Nu-Lok™ Roofing Systems Design and Installation Guide', Nu-Lok Roofing Systems (Ireland) Ltd, November 2004.

Approved installers are trained, supervised and monitored by Nu-Lok Roofing Systems (Ireland) Ltd.

2.4.3 Roof structure

Before work commences, the roof structure should be checked in accordance with BS 8000-6, to confirm compliance with the design specification recommendations given in I.S.193: 1986 *Timber trussed rafters for roofs* and I.S. 444: 1988 *The structural use of timber in buildings* and with the requirements of the Nu-Lok™ Roofing System. Particular attention should be paid to prevention of bi-metallic corrosion. See Cl 3.3 of this Certificate and Cl 5.11.3 of I.S. I.C.P. 2.

2.4.4 Underlay Membrane or Felt

The underlay or felt should meet the requirements of the Building Regulations 1997 – 2002. Nu-Lok Roofing Systems (Ireland) Ltd recommends the use of a Type 5U underlay to I.S. 36 *Bitumen roofing felts*, or a breather membrane, which is IAB certified.

2.4.5 Installation summary

- a) Full details, including details for verges, hips, open valleys and ridges abutments, are given in the 'Nu-Lok™ Roofing Systems Design and Installation Guide', Nu-Lok Roofing Systems (Ireland) Ltd, November 2004. Typical installation details are given in Figures 3 to 6.
- b) The underlay is fixed in accordance with I.S. I.C.P. 2, BS 8000-6 and the manufacturer's recommendations. It should overhang the fascia sufficiently to ensure that rainwater drains down into the gutter.
- c) Nu-Lok™ metal battens are fastened to the rafters (maximum span 600 mm), at 307 (± 7 mm) gauge, using 51 x 2.8 mm diameter Weatherex nails. The sequence is indicated in Figure 2.
Note: Other direct fixings have not been tested for use in conjunction with the system and are not recommended by Nu-Lok™ Roofing Systems (Ireland) Ltd.
- d) The Nu-Lok™ Link Channel and Stainless Steel Wire Clips are assembled at ground level.
- e) 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. A conventional kicker is not required at eaves course level. The height of the fascia is critical to a successful installation. Reference should be made to the 'Nu-Lok™ Roofing Systems Design and Installation Guide'.
- f) 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 now locked into position between the metal battens. The lower section of each link channel extends over the head of the slate below, retaining it in position.
- g) 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 offset Nu-Lok™ Ceramic Slates (see Figure 2). Nu-Lok™ Stainless Steel Universal clips are used to secure slates at hips, valleys and ridges.
- h) Installation proceeds across the roof to the verge or valley. Due to the unique fixing system only one row of channels should be installed before inserting slates. The verge should be closed in accordance with I.S. I.C.P. 2, using conventional cement mortar or approved proprietary systems, fixed in accordance with the manufacturer's instructions.

- i) The process continues row by row up to ridge level and out to valley or verge. All completion operations are as for conventional roofing. The system can be used in conjunction with conventional ancillary roofing products.
- j) Where flashing is required eg at chimneys, steps etc, the cover flashing method shall be used. Use of soakers is not permitted without metal separation, in accordance with CI 3.3 and Table 4 of this Certificate.
- k) Nu-Lok™ Roofing Systems (Ireland) Ltd recommends that each course of slates is fully fixed, as work progresses, particularly on pitches greater than 30°. See CI 5.11.4 of I.S. I.C.P. 2.

2.4.6 Roof windows

Roof windows should be installed in accordance with the manufacturer's and the Certificate holder's instructions. The roof construction, in the vicinity of the window opening, must be adequate. Suitable fixings points must be provided, to support the ends of the Nu-Lok™ metal battens, where they run into the window opening.

2.4.7 Slate vents and soil and vent pipes

The Nu-Lok™ Roofing System can accommodate the incorporation of slate vents and soil and vent pipes, in accordance with the manufacturer's and the Certificate Holder's instructions.

2.4.8 Cutting of components

2.4.8.1 Nu-Lok™ Ceramic Slates should be cut using

- a) a heavy duty, scribe and break floor slate cutter (bed length 560 mm minimum), or

- b) a wet saw (motor rating greater than 1.5hp), fitted with a Fast Cut, or Porcelain blade. (This is recommended for Close Mitre Hips as a very clean mitred cut can be achieved.) **When using wet saws it is vital that the cut slates are rinsed thoroughly to remove all traces of cutting slurry. Failure to do so may result in residual cutting slurry drying on the Ceramic Slates after installation. Removal may be problematic.**

Petrol or electric cut off saws (angle grinders) should not be used.

2.4.8.2 Nu-Lok™ metal battens can be cut with an angle grinder, hand held metal shears or hack saw. Cutting with an angle grinder should not be carried out on the roof, as damage to the underlay could occur.

2.4.9 Weather conditions

Excessive rain can wet the cardboard packaging on slates, causing them to break and allowing the slates to slide down the roof. It is recommended that if rain is forecast, care should be taken not to load more slates on the roof, than can be laid in one day.

2.4.10 Repair or replacement

Damaged or broken slates should be removed and replaced with a new slate in accordance with the Certificate Holder's instructions.

2.4.11 Health & Safety

Attention is drawn to all relevant safety regulations and the Certificate Holder's safety instructions.

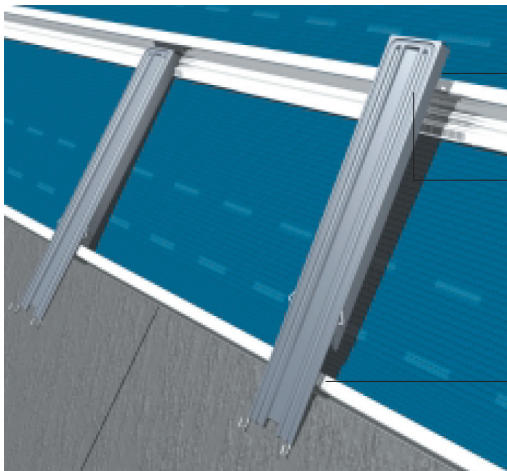
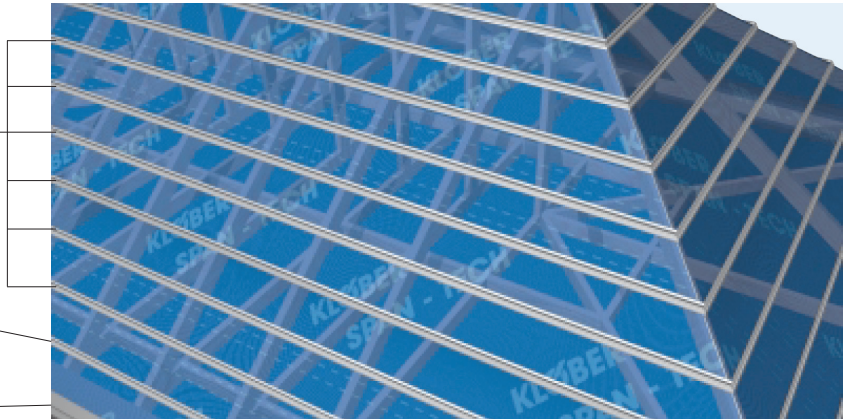
Figure 2: Installation

Nu-lok metal battens fixed in position using Senco Weatherex 51mm x 28mm ring shank nails

Battens set at even gauge (307mm ± 7mm)

1st batten set 314mm from back of fascia to front of batten

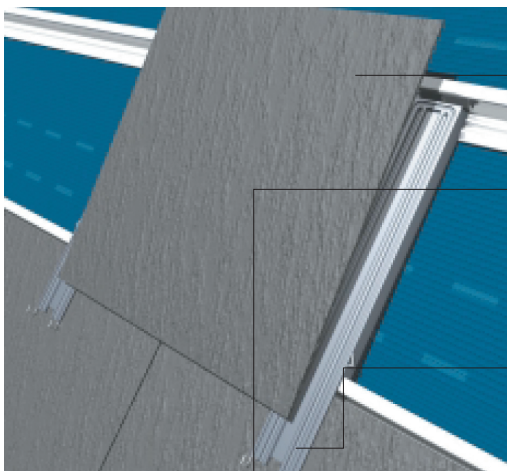
Eave batten set behind fascia



End tab of Nu-lok link channel can be adjusted to ensure a secure fit of the link channel into the batten

Push top end of the Nu-lok link channel into Nu-Lok batten

Insert top flange of the batten into slot on the Nu-Lok link channel



The Nu-Lok ceramic slate is carefully lowered into place

Nu-Lok ceramic slate is positioned into the hook on the Nu-Lok spring clip

The head of the slate is secured by the over-lapped link channel

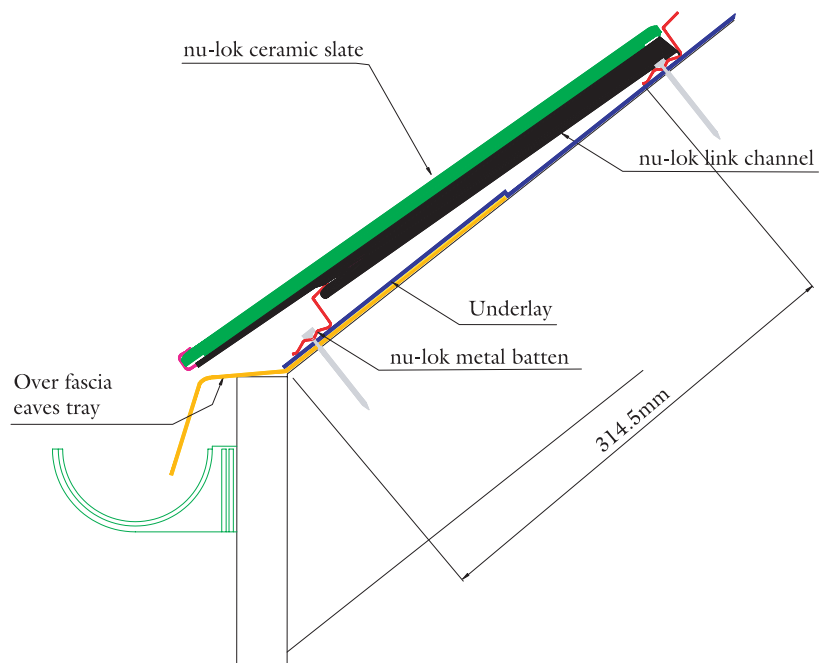


Figure 3: Standard Eaves Detail

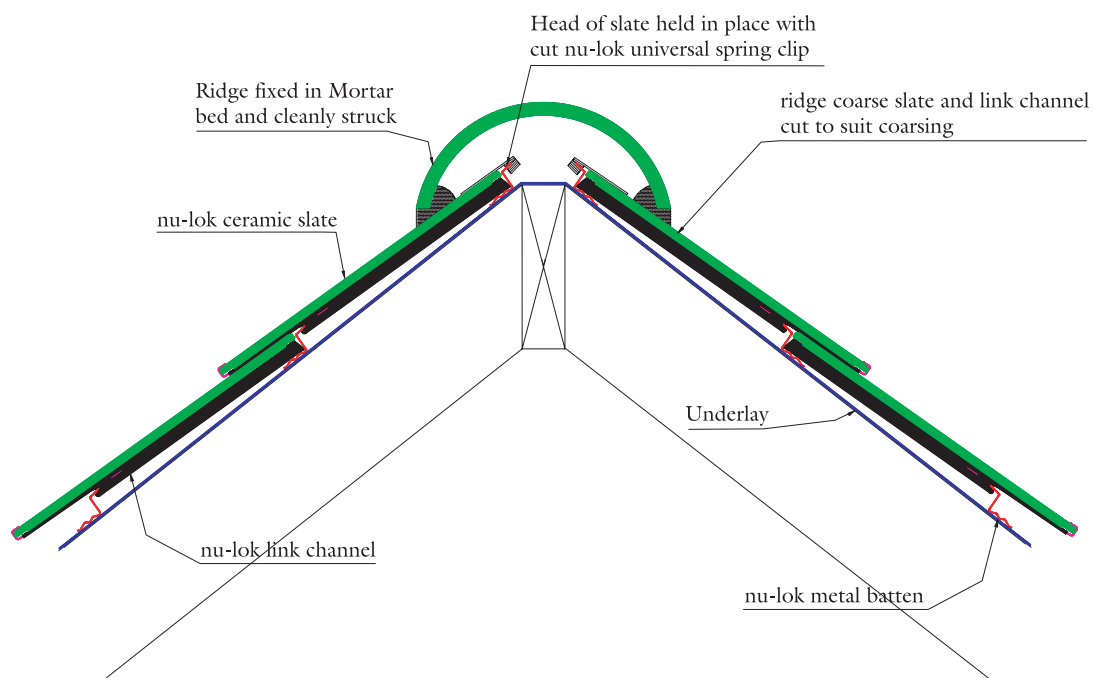


Figure 4: Bedded Ridge Detail

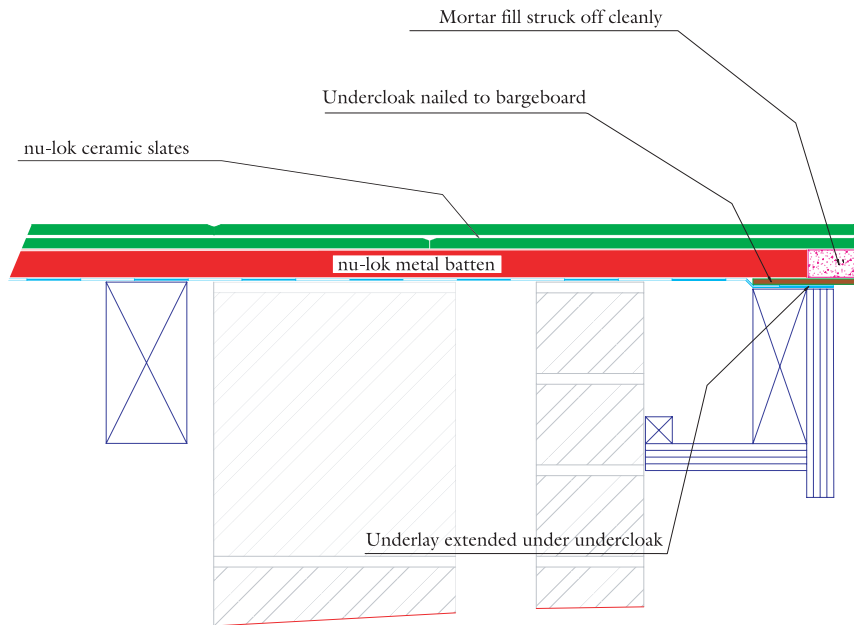


Figure 5: Bedded Verge Detail

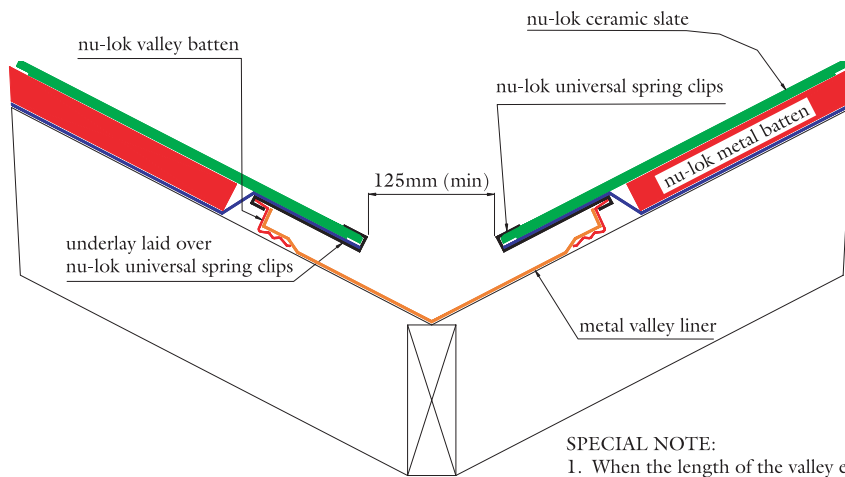


Figure 6: Open Valley Detail

3.1 DESIGN PROPERTIES

The Nu-Lok™ Roofing System is suitable for use as a broken bond slate roofing system, in conventional pitched roofs, where the pitch is between 22.5° and 70° and where roof access is limited to maintenance and repair. The system can be used in buildings up to and including four storeys high.

The Nu-Lok™ Roofing System has adequate strength and stiffness to resist the wind loadings on all roofs designed within the scope of I.S. I.C.P. 2.

The Nu-Lok™ Roofing System has a self-weight of 0.27 kN/m². The permitted span of the Nu-Lok™ Metal Battens is 600 mm.

The Nu-Lok™ Roofing System is suitable for use in all areas where the driving rain indices are within the design scope of I.S. I.C.P. 2 and where the underlay meets the requirements of Cl 2.4.4 and Cl 2.4.5b) of this Certificate.

The Nu-Lok™ Roofing System is unsuitable for use in

- a) Sprocketed or bellcast roofs
- b) Roofs incorporating copper elements.

3.2 SUPPORTING STRUCTURE

The roof structure must be designed, by suitably qualified persons, in accordance with the Building Regulations 1997 – 2002, taking into account the design properties of, and the recommended construction details for, the Nu-Lok™ Roofing System.

Timber roofs should be designed in accordance with I.S. 444: 1988 The structural use of timber in buildings. Steel roofs should be designed in accordance with BS 5950 *Structural use of steelwork in building. Code of practice for design*.

Maximum permitted rafter spacing in timber roofs: 600 mm.

Permitted pitch range: 22.5° to 70°.

Note: Particular attention should be paid to design of hips and valleys, to ensure that the minimum pitch is achieved at all times.

For all exposure zones and wind speeds within the design scope of I.C.P. 2 the Nu-Lok™ Metal Battens should be fixed at each rafter, with a 51 mm x 28 mm Senco Weatherex nail.

Roof drainage to be designed in accordance with I.S. EN 12056-3:2000 *Gravity drainage systems inside buildings. Roof drainage, layout and calculation*. The roof must be designed so that downpipes do not discharge concentrated water flows directly onto the Nu-Lok™ Roofing System. Care should be taken to ensure that discharge from gutters, downpipes etc does not give rise to bi-metallic corrosion (see Cl 3.3 of this Certificate).

Where the Nu-Lok™ Roofing System is to be used as a replacement roofing on an existing roof, the existing roof structure must meet the requirements for a new roof structure.

3.3 BI-METALLIC CORROSION

Consideration shall be given to prevention of bi-metallic corrosion. The construction details proposed by Nu-Lok™ Roofing System (Ireland) Ltd are designed to limit contact of dissimilar metals. Galvalume™ sheet steel should not be used with lead (see Table 4 Note 1), copper, graphite/amorphous carbon, green or wet lumber, or treated wood. Copper and copper containing brasses, lead (for flashing or as a contaminant in other materials) and graphite (from pencils used to mark components) should not be used in the construction.

3.4 Ventilation

Ventilation to be provided in accordance with the requirements of the Building Regulations Technical Guidance Document Part F (TGD F) and BS 5250: 2002 *Code of practice for the control of condensation in buildings*.

3.5 Weathertightness

The Nu-Lok™ Roofing System incorporates a nominal head lap of 100 mm. The Nu-Lok™ Ceramic Slate incorporates a nib along its lower edge, to improve resistance to wind driven rain.

The use of a high performance approved underlay, is recommended (see Cl 2.4.4)

3.6 Ancillary Items

The system can be used in conjunction with conventional ancillary roofing products.

3.7 Construction Details

Any relevant requirements specified in Part 2 or 4 of this Certificate, or in the Certificate Holder's 'Nu-Lok™ Roofing Systems Design and Installation Guide', should be incorporated at the design stage.

Table 4: Corrosion resistance of components

Construction and Flashing Material						
	Aluminum	Copper ⁽²⁾	Galvanised Steel (Nu-Lok™ battens)	Lead	Stainless Steel (Nu-Lok™ s/s spring clips and Universal clips)	Galvalume (Nu-Lok™ link channels)
Aluminum						
Copper ⁽²⁾						
Galvanised Steel (Nu-Lok™ battens)						
Lead						
Stainless Steel (Nu-Lok™ s/s spring clips and Universal clips)						
Galvalume (Nu-Lok™ link channels)						

Key

- No reaction will occur; no metal separation required
- Reaction is insignificant; no metal separation required
- Reaction may occur; metal separation required if this combination of metals is to be used
- Reaction will occur; do not use this combination of metals

Notes

- 1 Where flashing is required eg at chimneys, steps etc, the cover flashing method shall be used. Use of soakers is not permitted without metal separation in accordance with Table 4. Lead must be separated from direct contact with link channels by the use of a protective tape. Nu-Lok™ Roofing System (Ireland) Ltd recommends Flashbond for this purpose
- 2 Copper flashings are not suitable for use with the Nu-Lok Roofing system.

Part Four / Technical investigations

4

4.1 STRENGTH

The Nu-Lok™ Roofing System and its components, when installed in accordance with the Certificate Holder's instructions, and this Certificate, will resist the loads likely to be met during installation and in service.

The Nu-Lok™ Roofing System fixing specifications (batten to rafter, link channel to batten and slate to link channel) are adequate to resist wind uplift on all roofs designed within the scope of I.S. I.C.P. 2.

The Nu-Lok™ Ceramic Slate when tested in accordance with I.S. EN 538: 1995 *Clay roofing tiles for discontinuous laying – flexural strength test* met the requirements of I.S. EN 1304 1998 *Clay roofing tiles for discontinuous laying – Product definitions and specifications*.

4.2 BEHAVIOUR IN FIRE

4.2.1 Internal Fire Spread (Structure)

All components of the Nu-Lok™ Roofing System are non-combustible as defined in Building Regulations Technical Guidance Document Part B (TGD B) Table A8 Note b.

The requirements in relation to party walls, as defined in Building Regulations TGD B, apply ie: the junction between the party wall and roof construction should be fire stopped in accordance with Table A1 and Cl 3.2.5.10 of TGD B.

4.2.2 External Fire Spread

The Nu-Lok™ Roofing System, when tested in accordance with BS 476: Part 3: 1958 *Fire tests on building materials and structures: Part 3: External fire exposure roof tests*, is designated Class EXT.S.AA.

4.2.3 Toxicity in fire

The toxicity of components released in fire conditions is considered insignificant.

4.3 WEATHERTIGHTNESS

4.3.1 Nu-Lok™ Ceramic Slate

The slates when tested in accordance with I.S. EN 539-1: 1995 *Clay roofing tiles for discontinuous laying – Determination of physical characteristics – Part 1: Impermeability test* met the requirements of I.S. EN 1304 1998.

4.3.2 Water management

The slates in the Nu-Lok™ Roofing System are discontinuous, as with conventional slate roofing. The Nu-Lok™ Link Channel is designed to collect any water that enters the joint between the slates, and to discharge this water onto the slate below. This system is considered to be at least as efficient as the water management system with single lap interlocking concrete tiles.

4.3.3 Resistance to wind driven rain

The Nu-Lok™ Roofing System, when tested in accordance with the Florida Building Test Protocol TAS 100-95 *Test Procedure for wind and wind driven rain resistance of discontinuous roof systems*, was deemed to pass.

The Nu-Lok™ Ceramic Slate incorporates a nib along its lower edge to improve the resistance to wind driven rain.

The provision of a high quality underlay (see Cl 2.4.4) is critical to achieving the required performance levels.

4.4 WEATHERING

4.4.1 Frost resistance

The slates when tested in accordance with I.S. EN 539-2: 1998 *Clay roofing tiles for discontinuous laying – determination of physical characteristics – test for frost resistance Method D* met the requirements of I.S. EN 1304 for freeze thaw cycling.

4.4.2 Algal Growth

An assessment of the materials used concluded that the slates would have a high resistance to algal growth.

4.4.3 Colour stability

Whilst the scope of the assessment did not include colour stability, the Nu-Lok™ Ceramic Slate would be expected to have a high level of colour stability. Nu-Lok™ Roofing Systems (Ireland) Ltd guarantee colour of slate for 50 years.

4.5 DURABILITY

The Nu-Lok™ Roofing System, when installed in accordance with the Certificate Holder's instructions and the requirements of this Certificate, is considered to have a design life of 50/60 years. This assumes that the requirements, in relation to avoidance of bi-metallic corrosion (Cl 3.3), are strictly adhered to, over the design life.

Nu-Lok™ Roofing Systems (Ireland) Ltd guarantees the performance of the Nu-Lok™ Roofing System for 50 years.

4.6 CONDENSATION

The Building Regulations apply. See Cl 1.2 and Cl 3.4 of this Certificate and Cl 5.12 of I.S. I.C.P. 2.

4.7 HEAT PRODUCING APPLIANCES

The Building Regulations apply. See Cl 1.2 of this Certificate and Cl 5.13 of I.S. I.C.P. 2.

4.8 THERMAL INSULATION

The Nu-Lok™ Roofing System has minimal thermal insulation properties. The roof design shall comply with Building Regulations 2002 Part L.

4.9 MAINTENANCE

The Nu-Lok™ Roofing System is considered to be a low maintenance system. Regular cleaning of the gutters and valleys is required to remove leaves, lichens etc.

Where slates are damaged, these should be replaced as soon as possible and the channels and battens inspected when this is being done.

4.10 TESTS AND ASSESSMENTS WERE CARRIED OUT TO DETERMINE THE FOLLOWING:

In addition to the testing and assessments referred to above, the following tests/assessments were also carried out:

Nu-Lok™ Ceramic Slates

I.S. EN 538 1995 *Clay roofing tiles for discontinuous laying – Flexural strength test*

I.S. EN 539/1 1995 *Clay roofing tiles for discontinuous laying – Determination of physical characteristics – Part 1: Impermeability Test*

I.S. EN 539/2 1998 *Clay roofing tiles for discontinuous laying – Determination of physical characteristics – Test for Frost Resistance*

I.S. EN 1024 1997 *Clay roofing tiles for discontinuous laying – Determination of geometric characteristics*

I.S. EN 1304 1998 *Clay roofing tiles for discontinuous laying – Products Definitions & Specifications*

Nu-Lok™ Link Channel System

Measurement of E coating thickness

Salt spray test

4.11 OTHER INVESTIGATIONS

- (i) The manufacturing process was examined including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.
- (ii) Construction details were examined for compliance with good building practice
- (iii) Site visits were conducted to assess the practicability of installation and the history of performance in use of the product.

Part Five / Conditions of Certification

5

- 5.1** National Standards Authority of Ireland ("NSAI") following consultation with the Irish Agrément Board ("IAB") has assessed the performance and method of installation of the product/process and the quality of the materials used in its manufacture and certifies the product/process to be fit for the use for which it is certified provided that it is manufactured, installed, used and maintained in accordance with the descriptions and specifications set out in this Certificate and in accordance with the manufacturer's instructions and usual trade practice. This Certificate shall remain valid for five years so long as:
- (a) the specification of the product is unchanged.
 - (b) the Building Regulations 1997 to 2002 and any other regulation or standard applicable to the product/process, its use or installation remains unchanged.
 - (c) the product continues to be assessed for the quality of its manufacture and marking by NSAI.
 - (d) no new information becomes available which in the opinion of the NSAI, would preclude the granting of the Certificate.
 - (e) the product or process continues to be manufactured, installed, used and maintained in accordance with the description, specifications and safety recommendations set out in this certificate.
 - (f) the registration and/or surveillance fees due to IAB are paid.
- 5.2** The IAB mark and certification number may only be used on or in relation to product/processes in respect of which a valid Certificate exists. If the Certificate becomes invalid the Certificate holder must not use the IAB mark and certification number and must remove them from the products already marked.
- 5.3** In granting Certification, the NSAI makes no representation as to;
- (a) the absence or presence of patent rights subsisting in the product/process; or
 - (b) the legal right of the Certificate holder to market, install or maintain the product/process; or
 - (c) whether individual products have been manufactured or installed by the Certificate holder in accordance with the descriptions and specifications set out in this Certificate.
- 5.4** This Certificate does not comprise installation instructions and does not replace the manufacturer's directions or any professional or trade advice relating to use and installation which may be appropriate.
- 5.5** Any recommendations contained in this Certificate relating to the safe use of the certified product/process are preconditions to the validity of the Certificate. However the NSAI does not certify that the manufacture or installation of the certified product or process in accordance with the descriptions and specifications set out in this Certificate will satisfy the requirements of the Safety, Health and Welfare at Work Act, 1989, or of any other current or future common law duty of care owed by the manufacturer or by the Certificate holder.
- 5.6** The NSAI is not responsible to any person or body for loss or damage including personal injury arising as a direct or indirect result of the use of this product or process.
- 5.7** Where reference is made in this Certificate to any Act of the Oireachtas, Regulation made thereunder, Statutory Instrument, Code of Practice, National Standards, Manufacturer's instructions, or similar publication, it shall be construed as reference to such publication in the form in which it is in force at the date of this Certification.

The Irish Agrément Board

This Certificate No. **05/0212** is accordingly granted by the NSAI to **Nu-Lok Roofing Systems (Ireland) Ltd.** on behalf of The Irish Agrément Board.

Date of Issue: **February 2005**

Signed



Chief Executive, NSAI

Readers may check that the status of this Certificate has not changed by contacting the Irish Agrément Board, NSAI, Glasnevin, Dublin 9, Ireland. Telephone: (01) 807 3800. Fax: (01) 807 3842. www.nsai.ie