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**Agrément
Certificate
No 05/4274**

Designated by Government
to issue
European Technical
Approvals

NORDMAN TILESHEETS

Système d'étanchéité pour toitures
Dachabdichtungen

Product



• THIS CERTIFICATE RELATES TO NORDMAN TILESHEETS, CONSISTING OF GALVANIZED, OR ALUMINIUM-ZINC ALLOY COATED STEEL, FINISHED WITH A PLASTISOL COATING, AND PREFORMED TO SIMULATE THE APPEARANCE OF PANTILES.

• The product is installed with a sarking felt or underlay on a timber or steel structure at a minimum pitch of 4°.

• The product is installed by competent sheet roofing contractors.

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 tiling and profiled sheets with the Building Regulations. In the opinion of the BBA, Nordman Tilesheets, if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements.

Requirement: B3(2)

Internal fire spread (structure)

Requirement: B4(2)

External fire spread

Comment:

The product meets these Requirements. See section 11 of this Certificate.

Requirement: C2(b)

Resistance to moisture

Comment:

The product meets this Requirement. See section 9 of this Certificate.

Requirement: Regulation 7

Materials and workmanship

Comment:

The product is acceptable. See section 14.1 of this Certificate.

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2 The Building (Scotland) Regulations 2004



In the opinion of the BBA, Nordman Tilesheets, 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	Durability, workmanship and fitness of materials
Regulation:	8(1)	Durability, workmanship and fitness of materials
Comment:		The product can contribute to a construction satisfying this Regulation. See section 14.1 and the <i>Installation</i> part of this Certificate.
Regulation:	9	Building standards — construction
Standard:	2.1	Compartmentation
Standard:	2.2	Separation
Standard:	2.8	Spread from neighbouring buildings
Comment:		The product can contribute to satisfying these Standards with reference to clauses 2.1.16 ⁽²⁾ , 2.2.7 ⁽²⁾ , 2.2.10 ⁽¹⁾ and 2.8.1 ⁽¹⁾⁽²⁾ , respectively. See section 11 of this Certificate.
Standard:	3.10	Precipitation
Comment:		The product can contribute to satisfying this Standard with reference to clauses 3.10.1 ⁽¹⁾⁽²⁾ and 3.10.7 ⁽¹⁾⁽²⁾ . See section 9 of this Certificate.
Regulation:	12	Building standards — conversions
Comment:		All comments given for this product 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, Nordman Tilesheets, 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 material and workmanship
Comment:		The product is acceptable. See section 14.1 of this Certificate.
Regulation:	C4	Resistance to ground moisture and weather
Comment:		The product meets the requirements of this Regulation. See section 9 of this Certificate.
Regulation:	E4	Internal fire spread — Structure
Regulation:	E5	External fire spread
Comment:		The product meets the requirements of these Regulations. See section 11 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* (5.2), 7 *Delivery and site handling* (7.1 and 7.3) and 13 *Maintenance* (13.1) and 16 *Installation, Procedure* (16.9).

Technical Specification

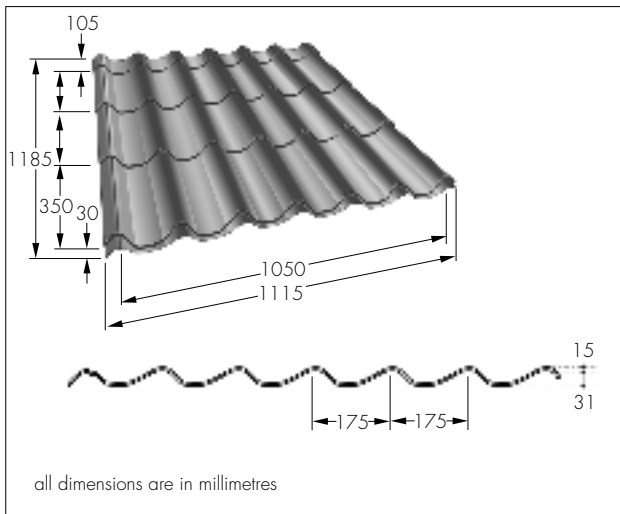
5 Description

5.1 Nordman Tilesheets are roll-formed and pressed from either galvanized steel (Z275) or aluminium-zinc alloy coated steel (AZ150) to BS EN 10327 : 2004. The steel is 0.5 mm thick and is plastisol-coated to a thickness of 200 µm. The reverse side has an acrylic or epoxy coating of thickness 7 µm to 15 µm.

5.2 The tilesheets (see Figure 1) are available in the dimensions of:

thickness of sheet (mm)	0.5
weight of sheet (kgm ⁻²)	5
cover width of sheet (mm)	1050
minimum length of sheet (mm)	485
maximum length of sheet (m)	8
module width (mm)	175
module course height (mm)	350
side lap (mm)	70
end lap (mm)	135.

Figure 1 Tilesheet dimensions



5.3 The tilesheets are available in a range of five colours – black, brown, grey, red and green.

5.4 Accessories with the same paint and colour specification are:

- ridge tiles
- ridge plates
- eave plate
- valley
- barge plate
- monoridge
- external corner
- internal corner
- top flashing
- side flashing
- base flashing.

5.5 Other accessories include:

- large stripseal for ridges
- comb filler for eaves
- touch-up paint for use at cut edges and for surface scratches.

5.6 Fixing screws are zinc plated and passivated to a thickness of 20 µm to 25 µm. The hexagon heads are powder coated to a thickness of 35 µm to 40 µm to a colour matching the appropriate tilesheet. Each screw has an EPDM rubber washer of thickness 2.5 mm. The screw sizes used in the installation of the tilesheets are either 6.3 mm diameter by 22 mm in length or 4.8 mm diameter by 35 mm in length.

6 Manufacture

6.1 The plastisol-coated steel is decoiled, roll-formed and pressed into shape and finally cut to the required length.

6.2 The final product is examined visually for faults or discoloration and the dimensions checked.

6.3 The accessories described in section 5.4 are fabricated from flat sheet of the same material.

7 Delivery and site handling

7.1 The finished tilesheets are wrapped in polyethylene sheeting, protected at the edges and corners, covered with a protective sheet and strapped to timber pallets. The pallets are unloaded on site using fork-lift trucks.

7.2 Each pallet has a label bearing the manufacturer's name, product description, quantity of tilesheets and the BBA identification mark incorporating the number of this Certificate.

7.3 On site the pallets should be stored on a firm, dry base away from the possibility of damage, covered to prevent water ingress, and as close as possible to the building where they are to be installed. To prevent damage to the coating on installation, the sheets should be lifted from the stack rather than dragged across it.

Design Data

8 General

8.1 Nordman Tilesheets are suitable for use as a roofing system on a timber or steel structure with a minimum rafter pitch of 4°.

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

9 Weathertightness



The tilesheets, installed with a proper underlay, have satisfactory resistance to the passage of rain and snow.

10 Strength and stability

10.1 The tilesheets have adequate resistance to the effects of wind pressures likely to be met in service.

10.2 The tilesheets weigh considerably less than conventional roofing materials, hence they must be securely attached to the structure to prevent wind uplift under adverse conditions.

11 Properties in relation to fire



Tests indicate that the tilesheets, when tested to BS 476-3 : 1958 without an underlay, achieve an EXT.S.AA rating.

12 Resistance to damage

The tilesheets will not be deformed by normal maintenance traffic.

13 Maintenance

13.1 The tilesheets have a smooth surface which can be slippery when wet, therefore maintenance work should be carried out using roof ladders and crawling boards. Care is required to prevent damage to the surface, and it is recommended that soft-soled shoes are worn.

13.2 If regular access to the roof is necessary (eg for the maintenance of permanently located equipment), a catwalk should be provided.

13.3 Small damaged areas may be treated using touch-up paint supplied by the Certificate holder.

13.4 A damaged sheet can be replaced using normal installation techniques.

14 Durability



14.1 The tilesheets are available either galvanized (Z275) or aluminium-zinc alloy coated (AZ150). In normal industrial, urban and rural environments, the plastisol and metal protective coatings will give the tilesheets an ultimate life of:

- in excess of 40 years for the AZ150 version
- in excess of 25 years for the Z275 version.

14.2 The performance of the coating will depend upon the colour chosen, its environment and location. It will retain good appearance for at least 15 years in non-corrosive environments, and at least 10 years in coastal or severe industrial environments. Colour changes will in general be slight.

14.3 Maintenance painting should be considered at these intervals. The Certificate holder can recommend a suitable overcoating system.

15 General

15.1 The standard of installation should comply with the requirements of BS 8000-6 : 1990.

15.2 The roof construction must be adequate to resist the loadings detailed in BS 6399-1 : 1996 and BS 6399-2 : 1997. The maximum permitted rafter or roof truss spacing depends on the batten size used, as detailed in Table 1. The roof construction should be in accordance with the requirements of BS 5534 : 2003.

Table 1 Permitted rafter spacing

Minimum batten size (mm)	Maximum rafter spacing (mm)
50 x 38	900
50 x 50	1200

15.3 The standard number of fixings for the tilesheets, including additional fixings, such as at gable ends, end overlaps, is six per square metre.

15.4 The roof space and batten space must be adequately ventilated in accordance with BS 5250 : 2002.

15.5 The underlay must be to BS 747 : 2000 Type 1F or 5U, or covered by an Agrément Certificate and installed in accordance with that Certificate.

15.6 Where the rafters/trusses are spaced at greater than 600 mm centres, polypropylene or nylon tape is nailed across the rafters to support the underlay.

15.7 Rafters should be securely tied to the building structure with, for example, galvanized steel straps complying with BS 5628-3 : 2001.

16 Procedure

16.1 Battens are laid over the underlay and fixed securely to the rafters. The fascia board is fixed at a height of 15 mm above the line of the top of the battens (see Figure 2).

16.2 Installation of the tilesheets can commence from the left or right hand side of the roof verge. The tilesheets are fixed to the battens using self-drilling, self-tapping painted screws (4.8 mm by 35 mm) fixed through the valley of the profiles, and, in the case of side overlaps, slightly to the right of the valley of the profile (see Figure 3).

16.3 When fitting from the right hand side the next tilesheet is laid over the fixed sheet. When laying from the left-hand side the edge of the fixed sheet must be lifted and the next tilesheet slid under to allow overlapping. Correct positioning of tilesheets is at right angles to the eaves, the gable end should not be used for positioning as this can introduce errors.

Figure 2 Batten spacing (all dimensions in mm)

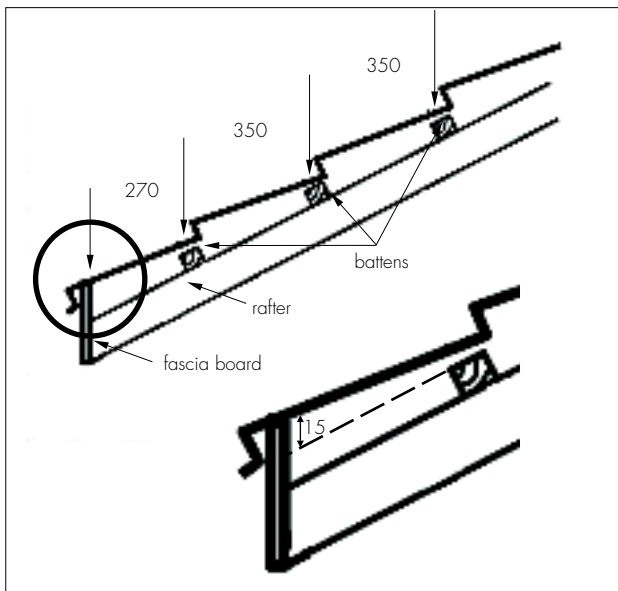
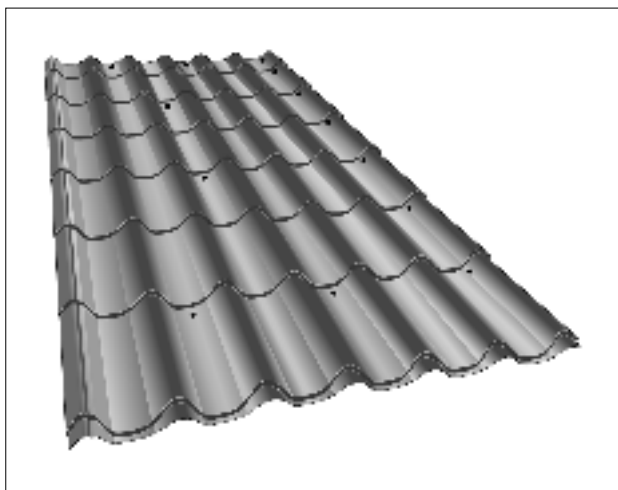


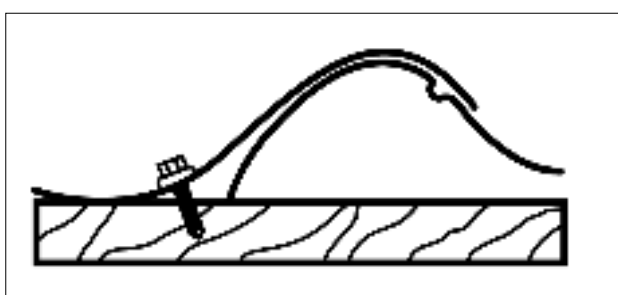
Figure 3 Typical pattern of fixing



16.4 Tilesheets should be fully fitted from ridge to eaves at one side before progressing along the roof. For roofs requiring more than one tilesheet from ridge to eaves, a number of bottom sheets are fitted before any top sheets are fitted.

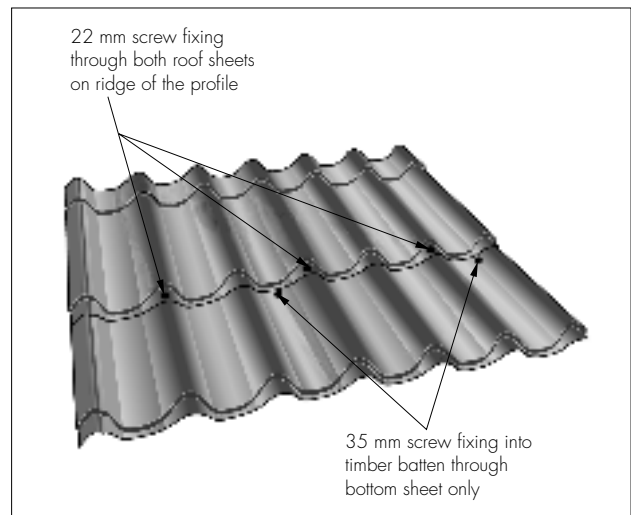
16.5 Side overlaps are secured at every step profile by use of a screw fixed at an angle into the batten (see Figure 4). The correct positioning and tensioning of the screw will close up the side overlap. Care should be taken not to overtighten the screw as this may have the effect of opening up the overlap.

Figure 4 Fixing of side overlaps



16.6 At end overlaps a 22 mm screw is used to stitch both tilesheets together at the top of the profile and a 35 mm screw is used to fix the bottom sheet to the batten. Screwing through both sheets into the batten is incorrect and should be avoided (see Figure 5).

Figure 5 Fixing of end overlaps



16.7 Roofing accessories such as hip and ridge tiles, cappings, barges and flashings are secured to the tilesheets using 6.3 mm by 22 mm stitching screws fixed through the top of the profile.

16.8 The tilesheets should extend over the eaves by 30 mm.

16.9 Where required the tilesheets and accessories should be carefully cut using non-abrasive tools, formed and installed to provide a watertight finish. Care should be taken to remove swarf and steel cuttings, and cut edges should be protected using touch-up paints.

16.10 Profiled filler blocks and comb fillers are used along the eaves, ridges, hips and valleys.

Technical Investigations

17 Tests

17.1 Tests were carried out on Nordman Tilesheets in accordance with MOAT No 34 : 1986 to determine:

- abrasion resistance
- impact resistance
- scratch resistance
- effect of artificial weathering
- effect of salt spray
- effect of bending
- resistance to sulphur dioxide.

17.2 An assessment was made of independent tests carried out relating to:

- fire roof exposure rating to BS 476-3 : 1958
- wind-driven rain resistance at a roof pitch of 4°.

18 Investigations

18.1 The manufacturing process was examined, and details were obtained of the quality controls conducted on the raw materials and finished products, the raw material specifications and the method of manufacture.

18.2 Visits were made to established sites to assess the performance in service.

18.3 An assessment was made of:

- life of the fixings
- compatibility of materials in contact
- strength of the system including resistance to loading.

Bibliography

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

BS 747 : 2000 *Reinforced bitumen sheets for roofing — Specification*

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 5628-3 : 2001 *Code of practice for use of masonry — Materials and components, design and workmanship*

BS 6399-1 : 1996 *Loading for buildings — Code of practice for dead and imposed loads*

BS 6399-2 : 1997 *Loading for buildings — Code of practice for wind loads*

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

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

MOAT No 34 : 1986 *Precoated metal sheet roofing and cladding*

Conditions of Certification

19 Conditions

19.1 This Certificate:

- (a) relates only to the product that is named, described, installed, used and maintained as set out in this Certificate;
- (b) is granted only to the company, firm or person identified on the front cover — no other company, firm or person may hold or claim any entitlement to this Certificate;
- (c) is valid only within the UK;
- (d) has to be read, considered and used as a whole document — it may be misleading and will be incomplete to be selective;
- (e) is copyright of the BBA;
- (f) 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 and the manufacture and/or fabrication including all related and relevant processes thereof:

- (a) are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA;

(b) continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine; and

(c) are reviewed by the BBA as and when it considers appropriate.

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

- (a) the presence or absence of any patent, intellectual property or similar rights subsisting in the product or any other product;
- (b) the right of the Certificate holder to market, supply, install or maintain the product; and
- (c) the actual works in which the product is installed, used and maintained, including the nature, design, methods and workmanship of such works.

19.5 Any recommendations relating to the use or installation of this product which are contained or referred to in this Certificate are the minimum standards required to be met when the product is used. They do 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 recommendations 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 installation and use of this product.



In the opinion of the British Board of Agrément, Nordman Tilesheets are fit for their intended use provided they are installed, used and maintained as set out in this Certificate. Certificate No 05/4274 is accordingly awarded to Nordman Profile Ltd.

On behalf of the British Board of Agrément

A handwritten signature in black ink, appearing to read 'G. A. Cooper', is written over a light grey background.

Date of issue: 17th October 2005

Chief Executive

Electronic Copy

British Board of Agrément

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



**NORDMAN TILESHEETS
(BBA CERTIFICATE No 05/4274)
IRISH BUILDING REGULATIONS STATEMENT**



- THIS STATEMENT RELATES TO NORDMAN TILESHEETS AND SETS OUT THE OPINION OF THE BBA ON THE POSITION OF THE PRODUCT UNDER THE BUILDING REGULATIONS IN THE REPUBLIC OF IRELAND.
- It must be read in conjunction with BBA Certificate No 05/4274.
- It will remain valid provided BBA Certificate No 05/4274 is valid.

The Building Regulations 1997–2002 (Ireland)

In the opinion of the BBA, Nordman Tilesheets, if used in accordance with the provisions of Certificate No 05/4274, will satisfy or contribute to satisfying the relevant requirements.

Requirement:	B3(2)	Internal fire spread (structure)
Comment:		The product meets this Requirement. See section 11 of BBA Certificate No 05/4274.
Requirement:	B4	External fire spread
Comment:		The product meets this Requirement. See section 11 of BBA Certificate No 05/4274.
Requirement:	C4	Resistance to weather and ground moisture
Comment:		The product meets this Requirement. See section 9 of BBA Certificate No 05/4274.
Requirement:	D1	Materials and workmanship
Comment:		The product is a proper material. See section 14.1 of BBA Certificate No 05/4274.

On behalf of the British Board of Agrément

Date of issue: 3rd November 2005

A handwritten signature in black ink, appearing to read 'G. A. Cooper'.

Chief Executive