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Agrément Certificate
20/5794
Product Sheet 1

EURO QUALITY CLADDING METAL ROOFING SHEETS

NORDMAN TILESHEET

This Agrément Certificate Product Sheet(1) relates to Nordman Tilesheet, galvanized plastisol coated steel tile sheets for use on conventional steel or timber pitched roofs with a minimum rafter pitch of 8°.

(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

Weathertightness — the product, when used with a suitable roof tile underlay, has satisfactory resistance to the passage of rain and snow (see section 6).

Strength and stability — the product has adequate resistance to the effects of wind loading likely to be met in service (see section 7).

Performance in relation to fire — the use of the product is unrestricted under the national Building Regulations (see section 9).

Durability — under normal conditions, the product will have a service life in excess of 25 years (see section 11).

The BBA has awarded this Certificate to the company named above for the product described herein. This product has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of First issue: 29 October 2020

Hardy Giesler
Chief Executive Officer

Regulations

In the opinion of the BBA, Nordman Tilesheet, 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)

Requirement:	**B3(2)**	**Internal fire spread (structure)**
Requirement:	**B4(2)**	**External fire spread**
Comment:		The use of the product is unrestricted under these Requirements. See section 9 of this Certificate.
Requirement:	**C2(b)**	**Resistance to moisture**
Comment:		The product can contribute to satisfying this Requirement. See section 6 of this Certificate.
Regulation:	**7(1)**	**Materials and workmanship**
Comment:		The product is acceptable. See section 11 and the *Installation* part of this Certificate.

The Building (Scotland) Regulations 2004 (as amended)

Regulation:	**8(1)(2)**	**Durability, workmanship and fitness of materials**
Comment:		The use of the product can contribute to a construction satisfying this Regulation. See sections 10 and 11 and the *Installation* part of this Certificate.
Regulation:	**9**	**Building standards applicable to construction**
Standard:	2.1	Compartmentation
Standard:	2.2	Separation
Comment:		The product can contribute to satisfying these Standards, with reference to clauses 2.1.5(2), 2.2.7(2) and 2.2.10(1). See section 9 of this Certificate.
Standard:	2.8	Spread from neighbouring buildings
Comment:		The use of the product is unrestricted by this Standard, with reference to clause 2.8(1)(2). See section 9 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 3.10.8(1)(2). See section 6 of this Certificate.
Standard:	7.1(a)	Statement of sustainability
Comment:		The product 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.
Regulation:	**12**	**Building standards applicable to conversions**
Comment:		Comments in relation to the product under Regulation 9, Standards 1 to 6 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).

The Building Regulations (Northern Ireland) 2012 (as amended)

Regulation:	**23(a)(i)**	**Fitness of materials and workmanship**
Comment:	**(iii)(b)(i)**	The product is acceptable. See section 11 and the *Installation* part of this Certificate.

Regulation:	**28(b)**	**Resistance to moisture and weather**
Comment:		The product can contribute to satisfying the requirements of this Regulation. See section 6 of this Certificate.
Regulation:	**35(2)**	**Internal fire spread — Structure**
Regulation:	**36(b)**	**External fire spread**
Comment:		The use of the product is unrestricted under these Regulations. See section 9 of this Certificate.

Construction (Design and Management) Regulations 2015
Construction (Design and Management) Regulations (Northern Ireland) 2016

Information in this Certificate may assist the client, designer (including Principal Designer) and contractor (including Principal Contractor) to address their obligations under these Regulations.

See sections: 1 *Description* (1.2), 3 *Delivery and site handling* (3.1) and 10 *Maintenance* (10.1 and 10.2) of this Certificate.

Additional Information

NHBC Standards 2020

In the opinion of the BBA, Nordman Tilesheet, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards*, Chapter 7.2 *Pitched roofs.*

CE marking

The Certificate holder has taken the responsibility of CE marking the product, in accordance with harmonised European Standard BS EN 14782 : 2006.

Technical Specification

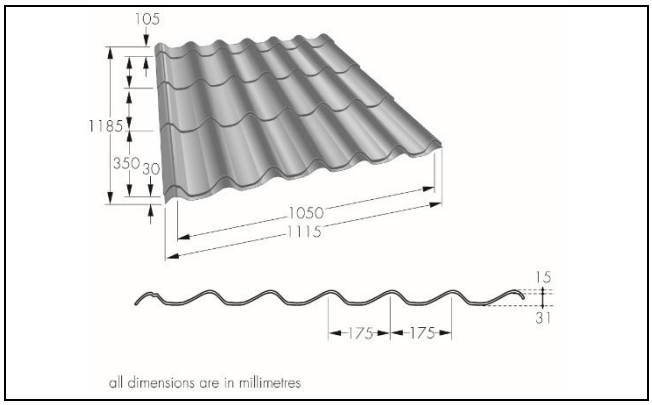
1 Description

1.1 Nordman Tilesheet are roll- formed and pressed galvanized steel (Z275) to BS EN 10346 : 2015. The steel is 0.5 mm thick and is plastisol-coated to a thickness of 200 µm. The reverse coat is acrylic or epoxy 7 µm thick.

1.2 The sheets (see Figure 1) have the nominal dimensions of:

thickness (mm)	0.50
length of sheet (min) (mm)	485
length of sheet (max) (m)	8
width of cover (mm)	1050
module width (mm)	175
module course height (mm)	350
side lap (mm)	70
end lap (mm)	135
weight of sheet ($kg \cdot m^{-2}$)	5.

Figure 1 Nordman Tilesheets — nominal dimensions



1.3 The tiles are available in the following colours: black, brown, grey, red and green.

1.4 Fixing screws are zinc plated and passivated to a thickness of 20 to 25 µm. The hexagon heads are powder coated to a thickness of 35 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 4.8 mm diameter by 22 mm in length or 4.8 mm diameter by 35 mm in length.

1.5 Accessories available with the same paint and colour specifications and included in this assessment are:

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

1.6 Ancillary items for use with the tiles, but outside the scope of this Certificate, are:

- touch-up kit for re-coating damaged areas
- roof ventilation products
- gas vent ridge terminals.

2 Manufacture

2.1 The tilesheets are manufactured from plastisol-coated steel which is decoiled, roll formed and pressed into the finished profile and cut to the required length. The accessories are fabricated from flat sheet material of the same material.

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.

2.3 The management systems of Euro Quality Cladding Ltd have been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015 by NQA Certification Ltd (Certificate No 69247).

3 Delivery and site handling

3.1 The product is delivered to site stacked on pallets, covered with plastic sheeting material, protected at the edges and corners and secured with steel strapping. The pallets are labelled with the name and address of the Certificate holder, contents of the pallet and storage/handling instructions. The maximum weight of a pallet is 1000 kg.

3.2 On site, the pallets are unloaded using fork-lift trucks and 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.

3.3 To prevent damage to the coating on installation, the sheets should be lifted from the stack rather than dragged across it.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Nordman Tilesheet.

Design Considerations

4 Use

4.1 Nordman Tilesheet is satisfactory for use, in conjunction with a suitable roof tile underlay, as a weatherproof and decorative roof covering on conventional timber or steel structures with a minimum rafter pitch of 8°.

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

5 Practicability of installation

The sheets should only be installed by roofers/tilers trained and approved by the Certificate holder.

6 Weathertightness

The product, with a suitable underlay, has satisfactory resistance to the passage of rain and snow.

7 Strength and stability

7.1 When tested for dynamic wind load in accordance with ETAG 006 : 2000, a built-up system including the following, achieved a design wind load resistance of 1.3 kPa(1):

- Nordman Tilesheets, mechanical fixings (nails) and 38 by 50 mm Sweden whitewood (WPCA) timbers of grade C24 in accordance with EN 14081-1 : 2016
- Six screws per sheet spaced equidistantly fixed through the sheets to the timbers.

(1) Obtained applying a safety factor of 1.5 to the test value.

7.2 The product weighs considerably less than conventional roofing materials, and must be securely attached to the structure to prevent wind uplift under adverse conditions.

8 Resistance to damage

8.1 The sheets will not be deformed by normal maintenance traffic.

8.2 The sheets may be deformed by impact. Damaged product can be replaced but care should be taken to prevent damage to adjacent tiles.

9 Performance in relation to fire

The product is classified as $B_{ROOF}(t4)$ in accordance with BS EN 13501-5 : 2016 and is therefore unrestricted by the requirements of the national Building Regulations.

10 Maintenance

10.1 The tilesheets have a smooth surface which is slippery when wet, therefore for maintenance work, roof ladders or crawling boards should be used, but care is still required to prevent damage. It is recommended that soft-soled shoes are worn to prevent damage to the surface.

10.2 If regular access to the roof is necessary, e.g. for the maintenance of permanently located equipment, a catwalk should be provided.

10.3 Small areas where the coating has been damaged should be recoated using the touch-up paint supplied by the Certificate holder.

11 Durability

11.1 The plastisol coating will protect the steel substrate against corrosion and will give the product a service life in excess of 25 years.

11.2 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.

11.3 Maintenance painting should be considered at the intervals stated in section 11.2. The Certificate holder can recommend a suitable overcoating system.

12 Reuse and recyclability

The product contains steel, which can be recycled.

Installation

13 General

13.1 The standard of installation of Nordman Tilesheet should comply with the requirements of BS 8000-0 : 2014 and BS 8000-6 : 2013.

13.2 The roof construction must be adequate to resist the loadings detailed in BS EN 1991-1-1 : 2002 and BS EN 1991-1-4 : 2005, and their UK National Annexes. The roof construction should be in accordance with the relevant requirements of BS 5534 : 2014.

13.3 The minimum batten sizes permitted depend on the rafter spacing, as detailed in Table 1.

Table 1 Batten sizes and rafter or roof truss centres (mm)

Minimum batten size	Rafter spacing
50 x 40	900
50 x 50	1200

13.4 The standard number of fixings for the tilesheets, including additional fixings such as at gable ends and end overlaps, is ten per square metre. In some areas, the number of fixings may be increased. The Certificate holder's advice should be sought for specific projects.

13.5 The roof space and batten space must be adequately ventilated in accordance with BS 5250 : 2011.

13.6 The underlay must be to BS 8747 : 2007, Annex B, Type 1F or 5U, or covered by a BBA Certificate and installed in accordance with that Certificate.

13.7 Rafters must be securely tied to the building structure, for example, with galvanized steel straps complying with BS EN 1996-1-1 : 2005, BS EN 1996-2 : 2006 or PD 6697 : 2010.

13.8 Where the rafters/trusses are spaced at 900 or 1200 mm centres, polypropylene or nylon tape is nailed across the rafters to support the underlay, unless an approved self-supporting underlay is used.

14 Procedure

14.1 Battens are secured over the underlay and roof trusses. The fixings used to secure the battens to the rafters must be adequate to resist the predicted wind loads. The fascia board is fixed at a height of 15 mm above the line of the top of the battens (see Figure 2 for eaves details).

14.2 Installation of the tilesheets can commence from either 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 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).

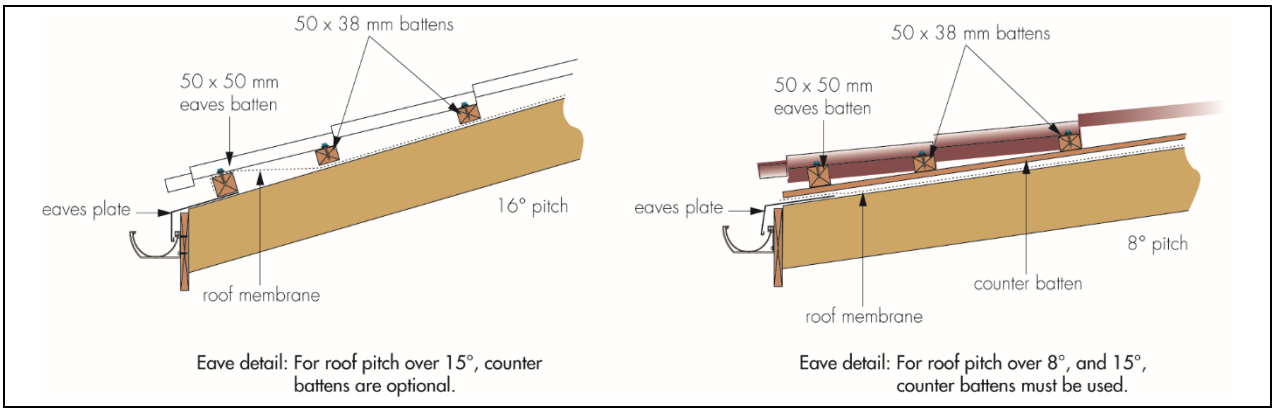
14.3 When fitting from the right- hand side, the next tilesheet is laid over the fixed sheet. When laying from the left-hand side the edge of the fixed sheet must be lifted and the next tilesheet slid under to allow overlapping. Correct positioning of the tilesheets is at right angles to the eaves; the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

14.4 Tilesheets must 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 installed.

14.5 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 an effect of opening up the overlap.

14.6 At end overlaps a 4.8 by 22 mm screw (average 3 per m^2 for sheeting) is used to stitch both tilesheets together at the top of the profile and a 35 mm screw 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 2 Eave details (all dimensions in mm)



Eave detail: For roof pitch over 15°, counter battens are optional.

Eave detail: For roof pitch over 8°, and 15°, counter battens must be used.

Figure 3 Typical pattern of fixing

Figure 4 Fixing of side overlaps

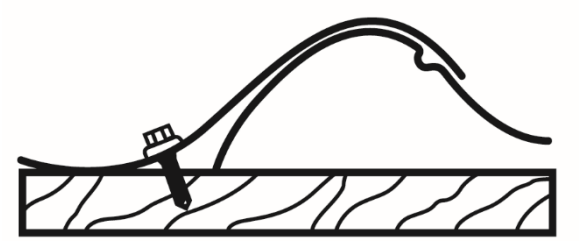
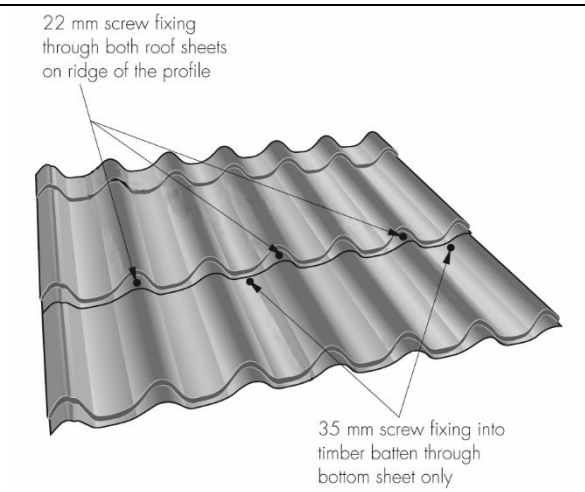


Figure 5 Fixing of end overlaps



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

14.8 The tilesheets should extend over the eaves by a minimum of 30 mm.

14.9 Where required the tilesheets and accessories should be carefully cut using appropriate tools such as snips, nibblers, jigsaw or circular saw with correct blades, then formed and installed to provide a watertight finish. Care should be taken to remove steel cuttings and swarf, and cut edges should be protected using touch-up paints. The Certificate holder can advise on suitable materials for this purpose.

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

15 Repair

When repairs are required, the Certificate holder's instructions must be followed.

Technical Investigations

16 Tests

Tests were carried out and the results assessed to determine:

- abrasion resistance
- impact resistance
- scratch resistance
- effect of salt spray
- effect of bending
- resistance to sulfur dioxide
- resistance to artificial weathering
- resistance to wind uplift
- wind-driven rain resistance at a roof pitch of 8°.

17 Investigations

17.1 An assessment was made in relation to:

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

17.2 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 + A1 : 2016 *Code of practice for control of condensation in buildings*

BS 5534 : 2014 + A2 : 2018 *Slating and tiling for pitched roofs and vertical cladding — Code of practice*

BS 8000-0 : 2014 *Workmanship on construction sites- Introduction and general principles*
BS 8000-6 : 2013 *Workmanship on building sites — Code of practice for slating and tiling of roofs and walls*

BS 8747 : 2007 *Reinforced bitumen membranes (RBMs) for roofing — Guide to selection and specification*

BS EN 13501-5 : 2016 *fire classification of construction products and building elements Part 5: Classification using data from external fire roof exposure tests*

BS EN 1991-1-1 : 2002 *Eurocode 1 — Actions on structures — General actions — Densities, self-weight, imposed loads for buildings*
NA to BS EN 1991-1-1 : 2002 UK National Annex to *Eurocode 1 — Actions on structures — General actions — Densities, self-weight, imposed loads on buildings*
BS EN 1991-1-4 : 2005 + A1 : 2010 *Eurocode 1 — Actions on structures — General actions — Wind actions*
NA to BS EN 1991-1-4 : 2005 + A1 : 2010 UK National Annex to *Eurocode 1 — Actions on structures — General actions — Wind actions*

BS EN 1996-1-1 : 2005 + A1 : 2012 *Eurocode 6 — Design of masonry structures — General rules for reinforced and unreinforced masonry structures*
BS EN 1996-2 : 2006 *Eurocode 6 — Design of masonry structures — Design considerations, selection of materials and execution of masonry*

BS EN 14782 : 2006 *Self-supporting metal sheet for roofing, external cladding and internal lining — Product specification and requirements*

BS EN 10346 : 2015 *Continuously hot-dip coated steel flat products — Technical delivery conditions*

BS EN ISO 9001 : 2015 *Quality management systems — Requirements*

EN 14081-1 : 2016 + A1 : 2019 *Timber structures — Strength graded structural timber with rectangular cross section. General requirements*

ETAG 006 : 2000 *Systems of Mechanically Fastened Flexible Roof Waterproofing Membranes*

PD 6697 : 2010 *Recommendations for the design of masonry structures to BS EN 1991-1-1 and BS EN 1996-2*

18 Conditions

18.1 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.

18.2 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.

18.3 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.

18.4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

18.5 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.

18.6 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.