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BBA BRITISH BOARD OF AGRÉMENT
ASSESSMENT OF PRODUCTS FOR CONSTRUCTION

Designated by Government to issue European Technical Approvals

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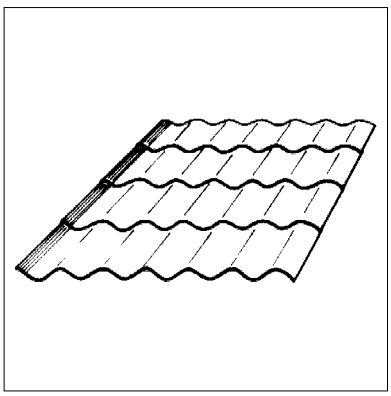
Agrément Certificate No 89/2272
*Third issue**

BRITMET TILEFORM

Système d'étanchéité pour toitures
Dachabdichtungen

Product

- *THIS CERTIFICATE RELATES TO BRITMET TILEFORM, PREFORMED COATED GALVANIZED STEEL ROOFING SHEETS AND ACCESSORIES. THE WEATHER FACE IS COATED WITH A PIGMENTED MINERAL FILLED ACRYLIC COATING.*
- *The system is installed with a sarking felt or underlay on a timber or steel structure at a minimum pitch of 5°.*
- *Britmet Tileform is available in the Pantile 2000 profile at thicknesses of 0.9 mm and 0.7 mm, and in the Boldroll profile at thicknesses of 0.9 mm and 0.6 mm. Both profiles can be supplied in six colours.*
- *The system is installed by competent sheet roofing contractors.*



Regulations

1 The Building Regulations 1991 (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, Britmet Tileform roofing sheets, if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements.

Requirement:	B3(4)	Internal fire spread (structure)
Comment:		The roof space should be sub-divided in accordance with this Requirement.
Requirement:	B4(2)	External fire spread
Comment:		The system meets this Requirement. See section 11 of this Certificate.
Requirement:	C4	Resistance to weather and ground moisture
Comment:		The system meets this Requirement. See section 9 of this Certificate.
Requirement:	Regulation 7	Materials and workmanship
Comment:		Britmet Tileform roofing sheets are acceptable. See section 14 of this Certificate.

2 The Building Standards (Scotland) Regulations 1990 (as amended)

In the opinion of the BBA, Britmet Tileform roofing sheets, if used in accordance with the provisions of this Certificate, will satisfy or contribute to satisfying the various Regulations and Technical Standards as listed below.

Regulation:	10	Fitness of materials
Standard:	B2	Selection and use of materials and components
Comment:		Britmet Tileform roofing sheets are acceptable. See section 14 of this Certificate.
Regulation:	12	Structural fire precautions
Standard:	D3.5	Junctions between separating or compartment walls and roofs
Comment:		The product can satisfy this Standard. See section 11 of this Certificate.
Standard:	D4.1	Concealed spaces (cavities)
Comment:		The roof space should be sub-divided in accordance with this Standard.
Standard:	D6.7	Roofs and rooflights
Comment:		The product is unrestricted by this Standard. See section 11 of this Certificate.
Regulation:	17	Preparation of sites and resistance to moisture
Standard:	G3.1	Resistance to precipitation
Comment:		The product satisfies this Standard. See section 9 of this Certificate.

3 The Building Regulations (Northern Ireland) 1994 (as amended)

In the opinion of the BBA, Britmet Tileform roofing sheets, 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:		Britmet Tileform roofing sheets are acceptable. See section 14 of this Certificate.
Regulation:	C5	Resistance to ground moisture and weather
Comment:		The product meets the requirements of this Regulation. See section 9 of this Certificate.
Regulation:	E6	Internal fire spread — structure
Comment:		The roof space should be sub-divided in accordance with this Regulation.
Regulation:	E8	External fire spread
Comment:		The product meets the requirements of this Regulation. See section 11 of this Certificate.

4 Construction (Design and Management) Regulations 1994

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

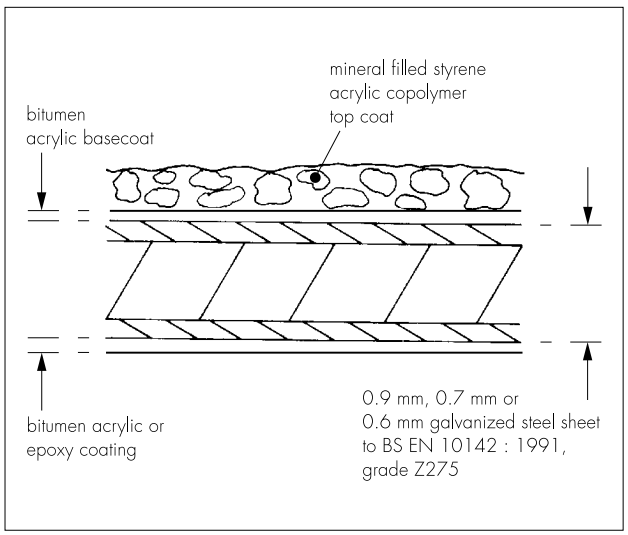
See sections: *5* (5.2) *Description*, *7 Delivery and site handling*, 12 (12.2) *Resistance to damage*, 14 (14.1) *Durability* and 16 (16.6) *Procedure*.

Technical Specification

5 Description

5.1 Britmet Tileform roofing sheets are available in a 0.9 mm or 0.7 mm thick Pantile 2000 profile and a 0.9 mm or 0.6 mm thick Boldroll profile (the original Pantile profile, as described in the second issue of this Certificate, is still available to special order). The products are formed from galvanized steel sheet DX51D + Z275 to BS EN 10142 : 1991, to shapes simulating conventional tiles. The weather face is primed with an acrylic bitumen primer and finished with a mineral-filled styrene acrylic co-polymer of minimum thickness 250 µm (see Figure 1). The underside of the product is coated with either a 7 µm thick epoxy or a minimum 80 µm thick bitumen acrylic.

Figure 1 Section through Britmet Tileform



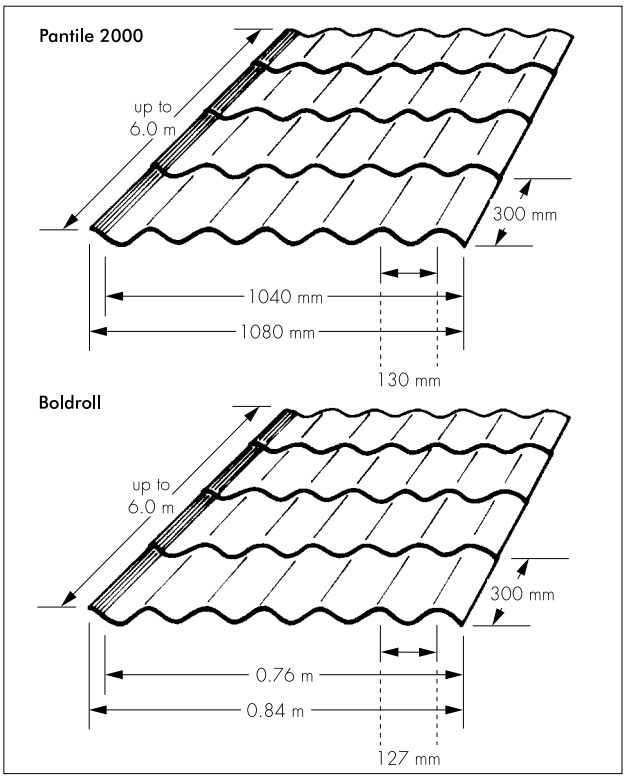
5.2 Britmet Tileform roofing sheets are shown in Figure 2. Dimensions are shown in Table 1.

Table 1 Dimensions

	Pantile 2000	Boldroll
thickness of sheet (mm)	0.9, 0.7	0.9, 0.6
weight of sheet (kgm^{-2})	11, 9	11, 8
width of sheet (m)	1.08	0.84
cover width (m)	1.04	0.76
maximum length of sheet* (m)	6.0	6.0
module width (mm)	130	127
module course height (mm)	300	300
side lap (mm)	40	80
end lap (mm)	300	300

*Supplied cut to length avoiding the need for end laps. Lengths up to 10 m can be supplied for special orders.

Figure 2 Dimensions



5.3 Britmet Tileform is available in six colours: terracotta, antique red, grey, sage green, tudor brown and charcoal.

5.4 Accessories* with the same coating specification are:

ridge cap
eaves soffit and fascia flashing
parapet flashing
standard eaves flashing
apron flashing
verge flashing
soffit and fascia flashing
standard bargeboard
valley.

*Accessories are available in standard 2 m lengths, shorter lengths are available to order.

5.5 Other accessories include:

Fixings — cadmium electroplated and dichromate passivated carbon steel self-drilling screws with a self-sealing washer and plastic [EVA (ethylene-vinyl acetate)] cap.

Touch-up kit — bitumen primer and acrylic top coat for use at cut edges and surface repairs.

Butyl strip sealant — 6 mm and 10 mm diameters used for side laps.

Eave comb filler blocks — used at eaves, ridges, valleys and hips to prevent penetration of large items but still provide adequate ventilation.

6 Manufacture

6.1 Degreased galvanized steel sheets are cut to the required length and pressed in a two-stage operation to form the profiled roofing sheet. Each face of the sheet is sprayed with a minimum thickness of 80 µm of bitumen acrylic primer and oven cured. The weatherface is then coated with a minimum thickness of 250 µm of mineral filled styrene acrylic copolymer paint and the completed sheets are cured in a heated environment.

6.2 Dimensional and visual checks are conducted on deliveries of galvanized steel sheets. The primer and textured coating are supplied to Britmet Tileform Ltd's specification.

6.3 Quality control on the product includes checks for primer coating thickness, colour, and adhesion.

6.4 The accessories are produced from the same type of sheet by pressing.

7 Delivery and site handling

7.1 The sheets are wrapped in polyethylene foam and delivered to site on pallets of up to 30 with a temporary waterproof cover. The pallets are unloaded using forklift trucks.

7.2 A label bearing the handling and storage instructions is affixed inside each pallet load.

7.3 Britmet Tileform roofing sheets bear the BBA identification mark incorporating the number of this Certificate.

7.4 During transport the edges and corners of the sheets must be protected to prevent damage.

7.5 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 Britmet Tileform roofing sheets are suitable for use as a roofing system on a timber or steel structure, with a minimum pitch of 5°.

8.2 On roof pitches from 5° to 10°, Britmet Tileform should preferably be laid using only single sheets from the ridge to the eaves. Where this is not possible, an overlap of 300 mm (one module) is required and is sealed using two 6 mm diameter beads of butyl strip sealant.

8.3 On roof pitches from 5° to 10°, the side overlaps are sealed with a continuous 10 mm diameter bead of butyl strip sealant with stitching screws every 600 mm (ie, every alternate module). On roof pitches greater than 10°, the side overlap is sealed with a continuous 6 mm diameter bead of butyl strip sealant with stitching screws every 900 mm (ie, every third module).

9 Weathertightness

Britmet Tileform roofing sheets, when installed in accordance with this Certificate and with a proper underlay, have satisfactory resistance to the passage of rain and snow.

10 Strength and stability

10.1 Britmet Tileform has adequate resistance to the effects of wind suction likely to be met in service.

10.2 Pantile 2000 and Boldroll profiles weigh between 8 kgm^{-2} and 11 kgm^{-2}, considerably less than conventional roofing materials. Hence, the roof must be securely attached to the structure to prevent wind uplift under adverse conditions.

11 Properties in relation to fire

When assessed to BS 476 : Part 3 : 1958, Britmet Tileform roofing sheets without an underlay achieved an EXT.S.AA rating.

12 Resistance to damage

12.1 The 0.9 mm thick Pantile 2000 and 0.9 mm thick Boldroll profiled galvanized steel sheets will not be deformed by heavy impacts or maintenance traffic, but some damage is likely on the 0.6 mm thick Boldroll and 0.7 mm thick Pantile 2000 profiles.

12.2 Impacts or maintenance traffic may damage the coating and affect the appearance of all Britmet Tileform roofing sheets. Damaged areas should be repaired using the bitumen primer and textured coating touch-up kit in accordance with Britmet Tileform Ltd's application instructions.

13 Maintenance

13.1 Provided the sheets are installed in accordance with sections 15 and 16 of this Certificate, they will not be distorted by maintenance work.

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

13.3 Small damaged areas may be treated using the touch-up kit.

13.4 The roof should be cleared of leaves and other organic matter at regular intervals.

14 Durability

14.1 The acrylic coating, bitumen primer and galvanizing will protect the steel substrate for a period in excess of 25 years, but some slight colour change will take place. Localised maintenance treatment may be necessary to restore areas where the coating has been damaged or eroded.

14.2 Normal precautions in design are necessary to shed water clear of the surface to avoid drain marks forming.

14.3 In coastal areas, where the roofing sheets may be exposed to wind-driven spray, the exposed underside of the lower courses of sheets may suffer corrosion. To prevent this, the eaves should be detailed to minimise the extent of exposed area.

Installation

15 General

15.1 The standard of installation should comply with BS 8000 : Part 6 : 1990.

15.2 Britmet Tileform roofing sheets are installed on a timber or steel frame. The structure is designed and built in accordance with BS 5427 : Part 1 : 1996.

15.3 The roof construction must be adequate to resist the loadings detailed in BS 6399 : Part 1 : 1996 and Part 2 : 1997. The maximum permitted purlin spacing depends on the size of the purlin and the thickness of tilesheet used, as shown in Table 2. The roof construction should be in accordance with the requirements of BS 5534 : Part 1 : 1997.

Table 2 Size of purlins

Recommended purlin/ batten size	Maximum purlin/ batten spacing	Permitted thickness of tilesheet
75 x 75 mm	2 m	0.9 mm only
50 x 50 mm	1.5 m	0.9/0.7/0.6 mm
50 x 38 mm	1.2 m	0.9/0.7/0.6 mm

Britmet Tileform may also be fixed directly to Zed Purlins using the fastenings described in Table 3.

15.4 The roof space must be adequately ventilated in accordance with BS 5250 : 1989.

15.5 The underlay must be to BS 747 : 1994 or be covered by an Agrément Certificate and installed in accordance with that Certificate.

16 Procedure

16.1 Britmet Tileform should be installed in accordance with the manufacturer's instructions and the conditions set out in this Certificate.

16.2 Installation must always commence from the right-hand verge or hip. From the ridge to the eaves Britmet Tileform is fastened to each purlin through the crown of the profile using the appropriate self-drilling screws described in Table 3 at a rate of two per sheet for Boldroll and three per sheet for Pantile 2000.

Table 3 Fastening details

Purlin type (thickness)	Fastener[1]	
	Pantile 2000	Boldroll
Timber (over 45 mm)	PHT8213[2] HT82A13[3]	PHT8213 HT82A13
Steel (1.5 mm to 3 mm)	PHT5713[2] HT57A13[3]	PHT6313[2] HT63A13[3]
Steel (5 mm to 12 mm)	PM15.4[2] 15.4[3]	PM15.4 15.4

(1) Supplied by Buildex Ltd, alternatives from other reputable suppliers may be used.
(2) With BX22 style cap.
(3) Buildex Teks Screws with BX4 cap.

16.3 At the ridge and eaves the roofing sheets are fastened through every alternate profile. For side stitching, the roofing sheets are fastened through every alternate profile to the verge rafters.

16.4 Each roofing sheet is securely fastened to the purlins before subsequent sheets are laid. The sheets are overlapped (40 mm for Pantile 2000 and 80 mm for Boldroll) with butyl strip sealant (10 mm diameter bead for pitch angles from 5° to 10°, 6 mm diameter bead for pitch angles greater than 10°) placed along the length of the join. Stitching screws are used (every second module for

pitch angles from 5° to 10° and every third module for pitch angles greater than 10°) to pull the sheets together and form a tight side lap. The sheets should extend over the eaves by 30 mm.

16.5 Where the length of the roof is greater than the length of a single tilesheet, the eaves roofing sheets are laid and fixed first. The ridge sheets are staggered and lapped over the eaves sheets and joined together using the overlap screws through alternate profiles. Mitring of the overlaps is performed to reduce the total thickness of sheet which the fixing nails have to penetrate.

16.6 Where required, Britmet Tileform roofing sheets and accessories should be carefully cut using non-abrasive tools, (eg, a nibbler) formed and installed to provide a weathertight finish. Care should be taken to remove swarf and steel cuttings and cut edges should be protected by applying the primer and top coat from the touch-up kit.

16.7 Flashings and ridges must be fastened using the overlap screws and all screws covered with plastic caps. Alternatively, the screws may be coated with the touch-up paint.

16.8 Ventilated comb fillers are secured in position along the eaves, ridges, hips and valleys to allow airflow.

16.9 To prevent electrochemical corrosion direct contact with copper or its alloys should be avoided and copper roofs should not drain onto the installation.

Technical Investigations

The following is a summary of the technical investigations carried out on Britmet Tileform.

17 Tests

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

impact resistance
scratch resistance
abrasion resistance
damage in handling
effect of artificial weathering
effect of salt spray.

17. 2 Tests were carried out at BRE to determine the product's resistance to wind-driven rain.

17.3 An assessment was made of independent tests to BS 476 : Part 3 : 1958.

18 Other 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 method of manufacture.

18.2 A visit was made to a site in progress to assess the practicability of installation and ease of repair.

18.3 Visits were made to established sites to assess the performance in use.

18.4 An assessment was made of:

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

Bibliography

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

BS 747 : 1994 *Specification for roofing felts*

BS 5250 : 1989(1995) *Code of practice for control of condensation in buildings*

BS 5427 *Code of practice for the use of profiled sheet for roof and wall claddings on buildings*
Part 1 : 1996 *Design*

BS 5534 *Code of practice for slating and tiling (including shingles)*
Part 1 : 1997 *Design*

BS 6399 *Loading for buildings*
Part 1 : 1996 *Code of practice for dead and imposed loads*
Part 2 : 1997 *Code of practice for wind loads*

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

BS EN 10142 : 1991 *Specification for continuously hot-dip zinc coated low carbon steel sheet and strip 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 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) has to be read, considered and used as a whole document — it may be misleading and will be incomplete to be selective;

(d) is copyright of the BBA.

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, shall be construed as 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 fabricating process(es) 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 by the BBA or its agents; and

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

19.4 In granting this Certificate, the BBA makes no representation as to:

(a) the presence or absence of any patent 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 nature of individual installations of the product, including methods and workmanship.

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.

BBA BRITISH BOARD OF AGRÉMENT
ASSESSMENT OF PRODUCTS FOR CONSTRUCTION

In the opinion of the British Board of Agrément, Britmet Tileform is fit for its intended use provided it is installed, used and maintained as set out in this Certificate. Certificate No 89/2272 is accordingly awarded to Britmet Tileform Ltd.

On behalf of the British Board of Agrément

Date of Third issue: 26th July 1999

Chief Executive

**Original Certificate issued on 1st August 1989 and subsequently reissued on 17th March 1994. This amended version issued to include updated national Building Regulations and associated text, the addition of CDM Regulations, updated Conditions of Certification, change of company name and telephone and facsimile numbers, replacement of the Pantile profile by the Pantile 2000 profile and updated installation procedures.*

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