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Agrément Certificate

03/4049

Product Sheet 2

CEMBRIT ROOFING AND CLADDING PRODUCTS

CEMSIX

This Agrément Certificate Product Sheet⁽¹⁾ relates to Cemsix, corrugated, fibre-reinforced cement roof and wall cladding sheets available in plain or acrylic finishes.

(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

Strength — the product has adequate strength to resist the loads associated with installation of a roof or an external wall cladding (see section 6).

Properties in relation to fire — the product will enable a roof or an external cladding to be unrestricted under the Building Regulations (see section 7).

Weather resistance — the product will resist the passage of moisture into a building (see section 8).

Durability — under normal service conditions, the product will provide a durable covering with a service life of in excess of 30 years (see section 10).

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 Fourth issue: 6 August 2015

John Albon

Originally certificated on 16 June 2008

Certificate amended on 2 September 2015 to update product colours

Head of Approvals — Construction Products

Claire Curtis-Thomas

Chief Executive

The BBA is a UKAS accredited certification body — Number 113.

The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk

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Regulations

In the opinion of the BBA, Cemsix, 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(1)(2)	External fire spread
Comment:	The product has a an A2-s1, d0 classification and is unrestricted by these Requirements. A roof incorporating the product is also unrestricted provided the installation complies with the conditions set out in section 4.2 of this Certificate. See also section 7 of this Certificate.
Requirement: C2(b)	Resistance to moisture
Comment:	A roof or wall cladding incorporating the product meets this Requirement provided the installation complies with the conditions set out in section 4.2 of this Certificate. See also section 8 of this Certificate.
Regulation: 7	Materials and workmanship
Comment:	The product is acceptable. See sections 10.1 to 10.3 and the <i>Installation</i> 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 satisfies the requirements of this Regulation. See sections 9 and 10.1 to 10.3 and the <i>Installation</i> 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 2.1.15 ⁽²⁾ , 2.2.7 ⁽²⁾ and 2.2.10 ⁽¹⁾ . See section 7 of this Certificate.
Standard: 2.6	Spread to neighbouring buildings
Standard: 2.8	Spread from neighbouring buildings
Comment:	A roof incorporating the product is unrestricted under these Standards, with reference to clauses 2.6.4 ⁽¹⁾⁽²⁾ and 2.8.1 ⁽¹⁾⁽²⁾ . See section 7 of this Certificate.
Standard: 2.7	Spread on external walls
Comment:	Walls incorporating the product have a 'low risk' reaction to fire, with reference to clause 2.7.1 ⁽¹⁾⁽²⁾ . See sections 4.2 and 7 of this Certificate.
Standard: 3.10	Precipitation
Comment:	The product will contribute to a roof or external wall satisfying this Standard, provided the installation complies with the conditions set out in section 4.2 of this Certificate, with reference to clauses 3.10.1 ⁽¹⁾⁽²⁾ and 3.10.8 ⁽¹⁾⁽²⁾ . See also section 8 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 made 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)(iii)(b)(i)	Fitness of materials and workmanship
Comment:	The product is acceptable. See sections 10.1 to 10.3 and the <i>Installation</i> part of this Certificate.	
Regulation:	28(a)(b)	Resistance to moisture and weather
Comment:	A roof or wall cladding incorporating the product will fulfil this Regulation provided the installation complies with the conditions set out in section 4.2 of this Certificate. See also section 8 of this Certificate.	
Regulation:	35(4)	Internal fire spread - Structure
Regulation:	36(a)(b)	External fire spread
Comment:	The product has an A2-s1, d0 classification and is unrestricted by these Regulations. A roof incorporating the product is also unrestricted under these Regulations provided the installation complies with the conditions set out in section 4.2 of this Certificate. See also section 7 of this Certificate.	

Construction (Design and Management) Regulations 2015

Construction (Design and Management) Regulations (Northern Ireland) 2007

Information in this Certificate may assist the client, Principal Designer/CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

See sections: 1 *Description* (1.2), 12 *Cutting and drilling* (12.2) and 13 *Health and safety* of this Certificate.

Additional Information

CE marking

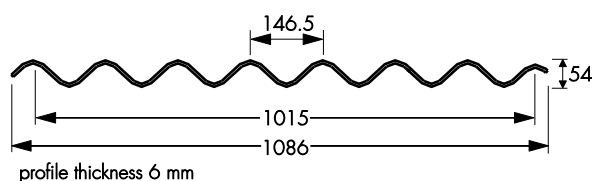
The Certificate holder has taken the responsibility of CE marking the product in accordance with harmonised European Standard BS EN 494 : 2004. An asterisk (*) appearing in this Certificate indicates that data shown are given in the manufacturer's Declaration of Performance.

Technical Specification

1 Description

1.1 Cemsix comprises fully-compressed corrugated sheets of Portland cement, cellulose, polymeric fibres and filler, available in the profile and size shown in Figure 1. Polypropylene cords are inserted along the full length of each corrugation for increased strength.

Figure 1 Cemsix — profile and dimensions



(dimensions in mm)

1.2 The product has the following nominal characteristics:

Thickness (mm)	6.0
Width (mm)	1086
Length (mm)	Various lengths between 1375 mm to 3660 mm
Weight of roof as laid (kg·m ⁻²)	17
Mechanical resistance ^{(1)*}	Class C1X ⁽²⁾
Density (kg·m ⁻³)	1700
Water impermeability*	pass
Dimension variations*	pass
Resistance to warm water*	pass

Resistance to soak/dry*	pass
Resistance to freeze/thaw*	pass
Resistance to heat/rain	pass.

(1) When tested to BS EN 494 : 2004.

(2) Class C1X – height of corrugations 40-80 mm, minimum breaking load 4250 N·m⁻¹ and minimum bending moment 55 Nm·m⁻².

1.3 The product is available unpainted or with a factory-applied finish available in Blue, Tile Red, Black, Van Dyke Brown, Olive Green, Laurel Green, Blue-black and Cemscape Anthracite colours.

1.4 A range of associated profiled and non-profiled fittings is available in natural grey colour or in an acrylic finish:

- Cemsix barge board
- Cemsix roll top barge board
- one piece finial
- Cemsix cranked barge board
- Cemsix cranked roll top barge board
- two-piece roll top finial
- Cemsix cranked crown ridge
- Cemsix two-piece close fitting ridge
- Cemsix two-piece plain wing ridge
- Cemsix cranked crown ventilation ridge
- Cemsix two-piece ventilation ridge
- Cemsix open protected ridge
- plain wing angle ridge
- Cemsix movement joint
- Cemsix apron flashing piece.

1.5 The sheets are designed to be fixed with roofing screws and with or without mitred corners and punched holes.

2 Manufacture

2.1 The product is manufactured from Portland cement, cellulose and polymeric fibres and other constituents using the Hatschek process. The sheets are fully compressed in a second operation to bring them up to a density of 1700 kg·m⁻³ and heat cured. Cured sheets are coated on the underside with an anti-blocker and on the surface and edges with a primer and an acrylic finish, before stoving and cooling.

2.2 Fittings are manufactured using the same process as the corrugated sheets but as flat sheets without reinforcement. The flat sheets are shaped into the required profiles.

2.3 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 being operated by the manufacturer are being maintained.

2.3 The management systems of Cembrit Holdings A/S [Cembrit S.A (Poland) and Cembrit a.s. (Czech Republic)] have been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 and BS EN ISO 14001 : 2004 by 3EC International Czech Republic (Certificate E-0394C/14) and Bureau Veritas Poland (Certificate PL0041691P).

2.4 The products are manufactured in the Czech Republic and Poland and marketed/distributed in the UK by Cembrit Ltd, 57 Kellner Road, London SE28 0AX, tel: 020 8301 8900, e-mail: sales@cembrit.co.uk, website: www.cembrit.co.uk.

3 Delivery and site handling

3.1 The sheets are delivered on non-returnable pallets and are protected by a shrink-wrapped polythene cover. They should be stored on a dry, level base in dry conditions under cover, away from the possibility of damage.

3.2 The shrink-wrapped cover must not be removed during transportation or storage and must not be regarded as sufficient protection for open storage.

3.3 The low corrugation of the sheets must always be placed at the same side of the stack. Individual stacks must not exceed 1200 mm in height.

3.4 To prevent surface damage during handling, the sheets should be lifted clear of 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 Cemsix.

Design Considerations

4 Use

4.1 Cemsix is satisfactory for use on pitched roofs with a minimum slope of 5° (end laps and end and side sealing must be specified according to pitch) or as a cladding on the outer face of external walls. It is essential that such roofs and walls are designed and constructed to incorporate the normal precautions (eg adequate ventilation) to prevent moisture penetration and the formation of condensation.



4.2 Roofs and wall cladding incorporating the product and subject to the national Building Regulations should be constructed in accordance with the relevant recommendations of BS 5427-1 : 1996, BS 5502-20 : 1991, BS 5502-21 : 1990 and BS 8219 : 2001 (in particular, clause 6.6 on lap treatment and roof pitches). A construction appropriate to location, paying due attention to design detailing, workmanship and materials to be used, should be selected.

4.3 Other roofs and wall cladding which incorporate the sheets but which are not subject to the national Building Regulations should be constructed in accordance with the relevant recommendations given in the Standards and specified in section 4.2.

5 Practicability of installation

Installation is designed to be carried out by a competent general builder, or contractor, experienced with this type of product.

6 Strength

6.1 The product has adequate resistance to damage during site handling and installation on conventional roofs.

6.2 When tested for fragility in accordance with ACR[M]001 : 2000 *Test for Fragility of Roofing Assemblies*, the product achieved a Class C 'non-fragile assembly' rating.

6.3 When tested to BS EN 494 : 2004, the product achieved the results given in section 1.2.

6.4 When designed and installed in accordance with the relevant clauses of BS 5427-1 : 1996, BS 8219 : 2001 and the Certificate holder's instructions, the product has adequate resistance to uniformly-distributed wind and snow loads. Where wind suction loads may exceed 1500 N·m⁻², the Certificate holder's advice should be sought on the need for extra fixings, increased lap or reduced purlin spacing. Further guidance is given in BRE Digest 439 *Roof loads due to local drifting of snow*.

7 Properties in relation to fire



7.1 A roof incorporating the product is deemed to satisfy national requirements under Commission Decision 2000/553/EC and will be unrestricted by the national Building Regulations

7.2 The product has an A2-s1, d0 classification in accordance with EN 13501-1 : 2005. Its use as cladding is therefore unrestricted by the national Building Regulations.

7.3 Cavity barriers should be used to satisfy the requirements of the National Building Regulations.

8 Weather resistance



8.1 After 24 hours' immersion in water, the nominal water absorption of the sheets was 13% of dry weight. Dark patches on the underside of the sheets can occur at times of high humidity, particularly during the early stages of the product's life. This is a temporary discoloration and is not a cause for concern.

8.2 When tested in accordance with BS EN 494 : 2004, the product had adequate resistance to water penetration.

9 Maintenance



The sheets do not require routine maintenance, but any damaged sheets must be replaced (see section 15). Fixing accessories should be inspected at regular intervals and replaced as necessary.

10 Durability



10.1 The sheets displayed no evidence of significant deterioration following tests which included warm water immersion, cyclic freezing and thawing, cyclic soaking and drying, and heat-rain cycling.

10.2 In common with other cementitious materials, the matrix material will carbonate and become brittle with time.

10.3 The sheets will have a service life in excess of 30 years.

10.4 In common with all fibre-cement sheets, differential carbonation may cause slight bowing of the sheets. The coating on the reverse side of the product is designed to reduce this possibility.

10.5 In common with all building materials used externally, extensive exposure to sunlight over the years will cause fading of the surface colouring.

10.6 The acrylic coating has good colour stability and will prevent organic growth on the surface for a period of 10 years. Thereafter, the sheets will weather by retaining dirt and organic growth in the same manner as traditional roofing materials.

Installation

11 General

11.1 Cemsix corrugated sheets are installed in accordance with the Certificate holder's recommendations, BS 5502-21 : 1990, BS 5427-1 : 1996 and BS 8219 : 2001 using conventional roofing techniques. Care is required to avoid damaging the coating.

11.2 In situations not covered by this Certificate, such as sprocketed eaves (bellcast) or special roof constructions, the Certificate holder's advice should be sought.

11.3 When used on large roof areas, sheets should be selected from the same batches to ensure consistent appearance.

11.4 Where roof pitches are between 5° and 10°, guidance for lap treatment and slope length, determined by the degree of exposure, should be followed in accordance with BS 8219 : 2001.

12 Cutting and drilling

12.1 Mitring of corners should be strictly in accordance with the Certificate holder's instructions and carried out on the ground.

12.2 When cutting sheets using a machine that may generate excessive concentrations of dust, the actions recommended in section 13 must be followed.

13 Health and safety

13.1 If it is necessary to cut sheets by a method which generates excessive concentrations of dust, the measures defined in the Health and Safety Executive's Guidance Note EH44 *Dust in the workplace: general principles of protection* must be followed.

13.2 Any roof or wall clad in the product should be treated as fragile, and care should be taken when walking on a roof constructed with the product. The precautions detailed in BS 5502-20 : 1991 regarding permanent walkways, roof ladders, cat ladders and roof notices must be followed.

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

14 Procedure

14.1 Regular checks should be carried out to ensure that gaps between mitred corners and end overlaps remain constant.

14.2 Sheets should be fixed twice at every purlin. Holes for fixing the sheets must be drilled in their exact positions, over the centre line of the purlins.

14.3 When the sheets are fixed as a pitched roof covering, screw holes must be drilled through the crown of the corrugation and should be between 2 mm and 3 mm larger than the screw diameter to allow for small movements of the sheets. When the sheets are used as vertical cladding, two fixings must be applied per rail in the valleys of the corrugations.

14.4 When fixing sheets with concealed nail-fixing hooks, additional holes (eg at the ridge) may be required in corrugation valleys.

Holes must be drilled and should be 8 mm in diameter.

15 Repair

15.1 Damaged sheets must be replaced in accordance with the Certificate holder's instructions.

15.2 Abraded areas of sheets may be re-coated. Any difference in colour between new and existing sheets should be acceptable under normal circumstances, but differences between existing and re-coated areas of sheets may be more noticeable.

15.3 The Certificate holder's advice should be sought concerning the suitability of coatings for remedial work.

Technical Investigations

16 Tests

16.1 Tests were carried out on uncoated sheets and the results assessed to determine:

- water absorption
- dimensions
- density
- bending moment
- water permeability
- water vapour permeability
- effects of warm water
- effects of soak/dry cycling
- effects of freeze/thaw cycling
- effects of heat/rain cycling.

16.2 Tests were carried out on coated sheets and the results assessed to determine:

- coating thickness
- effect of water immersion
- effect of alkali immersion and adhesion
- water vapour permeability
- algal growth
- effect of accelerated artificial weathering and colour stability.

16.3 Tests were carried out on uncoated and coated fittings in relation to BS EN 494 : 2012 to determine:

- dimensions
- resistance to freeze/thaw cycling.

17 Investigations

17.1 An assessment was made of test data from independent laboratories relating to:

- fire classification to EN 13501-1 : 2005
- impact test to ACR[M]001 : 2000.

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 5427-1 : 1996 *Code of practice for the use of profiled sheet for roof and wall cladding on buildings — Design*

BS 5502-20 : 1991 *Buildings and structures for agriculture — Code of practice for general design considerations*

BS 5502-21 : 1990 *Buildings and structures for agriculture — Code of practice for selection and use of construction materials*

BS 8219 : 2001+A1 : 2013 *Installation of sheet roof and wall coverings — Profiled fibre cement — Code of practice*

BS EN 494 : 2004 *Fibre-cement profiled sheets and fittings — Product specification and test methods*

BS EN ISO 9001 : 2008 *Quality management systems — Requirements*

Conditions of Certification

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.