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BBA APPROVAL INSPECTION TESTING CERTIFICATION
TECHNICAL APPROVALS FOR CONSTRUCTION

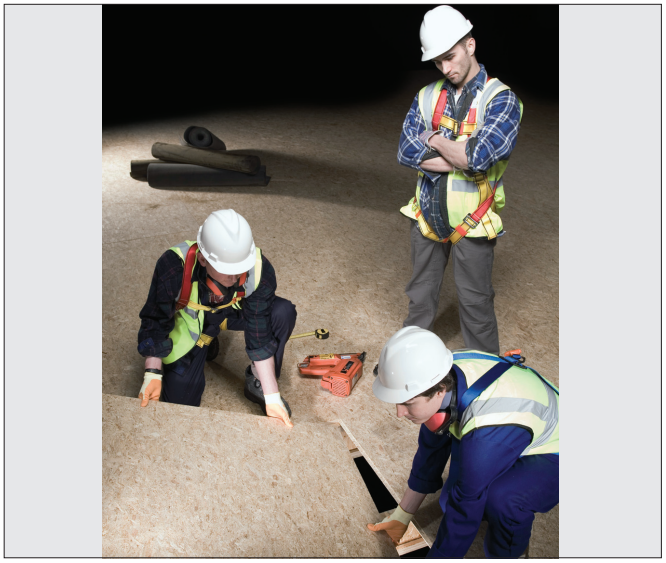
Agrément Certificate
01/3857
Product Sheet 1

NORBORD STERLING OSB

STERLING OSB/3 FOR FLOORING

This Agrément Certificate Product Sheet(1) relates to Sterling OSB/3 for Flooring, a loadbearing oriented strand board for use as flooring in domestic and non-domestic buildings.

(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

Structural performance — the product, when incorporated into a structure, can contribute to structural strength and stiffness by distributing the dead and imposed loads to the supporting structure (see section 6).

Behaviour in relation to fire — the product may be regarded as having a Class 3 surface spread of flame rating (see section 7).

Resistance to moisture — provided adequate precautions are taken, the product, when incorporated into a construction, should perform satisfactorily (see section 8).

Durability — the product, incorporated into the completed flooring, will have a life equal to that of the building in which it is installed (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 Second issue: 30 April 2015

Originally certificated on 30 September 2010

Brian Chamberlain
Head of Technical Excellence

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

Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.

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Regulations

In the opinion of the BBA, Sterling OSB/3 for Flooring, 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:	A1	Loading
Comment:		The product has sufficient strength and stiffness to sustain and transmit design loads to the primary structure without excessive deflection. See section 6 of this Certificate.
Requirement:	B3(1)(3)(4)	Internal fire spread (structure)
Comment:		The product can contribute to meeting regulatory requirements. See section 7 of this Certificate.
Regulation:	7	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)	Durability, workmanship and fitness of materials
Comment:		The use of the product satisfies the requirements of this Regulation. See section 11 and the *Installation* part of this Certificate.
Regulation:	9	Building standards applicable to construction
Standard:	1.1(a)(b)	Structure
Comment:		The product has sufficient strength and stiffness to sustain and transmit design loads to the primary structure without excessive deflection, in accordance with clauses 1.1.1[(1)], 1.1.2[(1)] and 1.1.3[(1)] of this Standard. See section 6 of this Certificate.
Standard:	2.2	Separation
Standard:	2.3	Structural protection
Standard:	2.9	Escape
Comment:		The product can contribute to meeting regulatory requirements in accordance with clauses 2.2.1[(1)], 2.2.2[(1)], 2.2.3[(1)], 2.2.4[(1)], 2.2.6[(1)], 2.2.8[(1)] and 2.3.2[(1)]. See section 7 of this Certificate.
Standard:	7.1(a)(b)	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:		All comments given for this 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

Regulation:	23(a)(i)(iii)(b)	Fitness of materials and workmanship
Comment:		The product is acceptable. See section 11 and the *Installation* part of this Certificate.
Regulation:	30	Stability
Comment:		The product has sufficient strength and stiffness to sustain and transmit design loads to the primary structure without excessive deflection. See section 6 of this Certificate.
Regulation:	35(3)(4)	Internal fire spread — Structure
Comment:		The product can contribute to meeting regulatory requirements. See 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), 3 *Delivery and site handling* (3.2) and 12 *General* of this Certificate.

Additional Information

NHBC Standards 2014

NHBC accepts the use of Sterling OSB/3 for Flooring, provided it is installed, used and maintained in accordance with this Certificate, in relation to *NHBC Standards*, Part 5 *Substructures and ground floors*, Chapter 5.2 *Suspended ground floors* and Part 8 *Services and internal finishing*, Chapter 8.3 *Floor finishes*.

CE marking

The Certificate holder has taken the responsibility of CE marking the product in accordance with harmonised European Standard BS EN 13986 : 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 Sterling OSB/3 for Flooring comprises softwood flakes/strands bonded together with phenolic resins, MDI (methylene diphenyldiisocyanate) binder and waxes.

1.2 The board is available with the following panel sizes and characteristics:

Thickness (mm)	15, 18 and 23
Width (mm) x height (mm)(1)	1200 x 2400, 1220 x 2440, 1250 x 2500
Nominal density (kg·m^{-3})	620
Edge	square or tongue-and-groove
Finish	sanded or unsanded.

(1) Other sizes are available on request.

2 Manufacture

2.1 The board is manufactured to the specification detailed in BS EN 300 : 2006 for OSB/3, relating to loadbearing oriented strand boards used in humid conditions.

2.2 Logs, to the Certificate holder's specification, are debarked and cut to length before passing through a waferiser machine. After drying and screening to remove fines, the strands/flakes are blended with resins, binder and wax and formed into a three-ply mat. In the outer two layers the strands/flakes (and woodgrain) are bound with resin and oriented in the direction of the major axis; in the core layer, the strands are bound with a binder and oriented in the direction of the minor axis. The board is formed by curing the mat under pressure and temperature and cutting to size.

2.3 Quality control includes checks on raw materials and on the finished product, in accordance with the requirements of BS EN 300 : 2006, for appearance, dimensions, moisture resistance and content, swelling, strength and elasticity.

2.4 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.

2.5 The management system of Norbord Europe Ltd has been assessed and registered as meeting the requirements of ISO 9001 : 2008 by British Standards Institute (Registration No. Q05688).

3 Delivery and site handling

3.1 Each board bears the legends 'Sterling OSB/3', 'EN300' and 'E1' (formaldehyde class) and the production reference, size, thickness and the BBA logo incorporating the number of this Certificate. The bundles of tongue-and-groove boards are protected with OSB edge protectors and cardboard, and bundles of some sizes of plain edge boards are covered with cardboard.

3.2 For delivery, boards are banded together in bundles up to 1.7 tonnes in weight and 900 mm in height. They are covered in transit to minimise changes in moisture content. When handling, particular care should be taken to protect the edges and corners. Banding should be cut on arrival at site but protective coverings should not be removed until the boards are ready for conditioning (see section 8.4).

3.3 Handling, storage and delivery of the product should be carried out in accordance with the requirements of DD CEN/TS 12872 : 2007.

3.4 To prevent distortion, boards should be stacked flat and clear of the floor, on level bearers, at centres not exceeding 600 mm. The top board should be covered to prevent warping.

3.5 The boards should be stored in a dry environment.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Sterling OSB/3 for Flooring.

4 General

4.1 Sterling OSB/3 for Flooring is satisfactory for use as domestic or non-domestic flooring as specified for OSB/3 in DD CEN/TS 12872 : 2007 or BS 8103 : 2009. The product may be continuously supported or suspended over joists or battens.

4.2 The range of moisture content at the time of laying depends mainly on the type and intensity of heating to be employed in the building. Guidance provided in BS 8103-3 : 2009, Annex A, Table A.1, indicates that, under normal circumstances, moisture content ranges encountered for various heating conditions are:

unheated:	15 % to 19 %
intermittent heating:	10 % to 14 %
continuous heating:	9 % to 11 %
underfloor heating:	6 % to 8 %.

4.3 Design and installation of the product should be in accordance with BS EN 1995-1-1 : 2004 and DD CEN/TS 12872 : 2007 or BS 8103-3 : 2009.

4.4 In accordance with BS EN 300 : 2006, the product is satisfactory for use in environmental conditions covered by biological hazard class 2 for wood and wood-based products, as defined in BS EN 335 : 2013. In such environments, the board is covered and fully protected from the elements. As a general rule, it is recommended that the moisture content of the product should not exceed 16% for any significant period nor 20% at any time. Prolonged exposure to an air temperature of 20°C and a relative humidity of 90% may result in the recommended moisture content being exceeded.

4.5 The design thermal conductivity (λ value) of OSB, given in BS EN 12524 : 2000, is 0.13 $W \cdot m^{-1} \cdot K^{-1}$ and as such will not have a significant effect on the thermal transmittance (U value) of the floor constructions into which it is incorporated.

4.6 In suspended timber floor applications:

- the boards must have a minimum thickness of 15 mm (in domestic applications) and 18 mm (in non-domestic applications)
- timber support work must be designed and used in accordance with BS EN 1995-1-1 : 2004 and/or the relevant national Building Regulations
- ventilation underneath ground floors must be provided in accordance with BS 5250 : 2011. The ground beneath the floor should be free of topsoil and vegetation matter and be covered to resist moisture and prevent plant growth.

4.7 The product will provide a suitable substrate for loose-laid floor coverings or those bonded with solvent or water-based adhesives. Resilient floor coverings such as cork, linoleum, rubber or vinyl should be laid in accordance with BS 8203 : 2001.

5 Practicability of installation

The product is designed to be installed by a competent general builder, or a contractor, experienced with this type of product.

6 Structural performance

6.1 For domestic loading for buildings within the scope of BS 8103-3 : 2009 (low-rise buildings), Sterling OSB/3 floor decks should be designed with a minimum panel thickness of 15 mm for joist spacing up to 450 mm, and 18 mm for joist spacing up to 600 mm, for domestic loading.

6.2 For floor applications not covered by BS 8103-3 : 2009, designers need to ensure that the selected board will meet the load requirements specified in BS EN 1991-1-1 : 2002. Characteristic values for structural design using Sterling OSB/3 may be taken from BS EN 12369-1 : 2001.

7 Behaviour in relation to fire

7.1 When tested in accordance with BS 476-7 : 1997, the board achieved a Class 3 surface spread of flame rating.

7.2 Calculations carried out in accordance with BS 5268-4.2 : 1990 show that an intermediate floor construction comprising Sterling OSB/3 board supported on timber joists at least 37 mm wide and with a ceiling of 12.5 mm thick plasterboard fixed in accordance with the requirements given in BS 5268-4.2 : 1990, Table 11, has a fire resistance rating of 30 minutes' loadbearing capacity, 15 minutes' integrity and 15 minutes' insulation.

7.3 The fire resistance of other floor constructions incorporating the product may be calculated with reference to BS EN 1995-1-2 : 2004 or, where necessary, by undertaking an appropriate test at a laboratory UKAS-accredited for the test concerned.

8 Resistance to moisture

8.1 In common with all timber products OSB is subject to moisture movement. As a guide, an increase in moisture content of 1% increases the length and width of a board by 0.3 mm per metre run.

8.2 Under similar environmental conditions, OSB will take longer to equilibrate and will attain an equilibrium moisture content approximately 2% to 3% lower than solid timber.

8.3 To avoid distortion and damage to finishes, movement gaps in accordance with the recommendations of BS 8103-3 : 2009 should be provided when installing the board.

8.4 To minimise subsequent movement, before installation the boards should be conditioned as close as is practicable to the environmental conditions likely to occur in service. To achieve this, the maximum moisture content of the board at the time of installation, as determined with a properly-calibrated moisture meter, should be as given in BS 8103-3 : 2009, Annex A (ie 12% for flooring).

8.5 Damp-proof membranes and vapour control layers should be incorporated as necessary in accordance with the requirements of BS 8103-3 : 2009 and BS 5250 : 2011.

8.6 The water vapour resistance factor (μ) of OSB, as given in BS EN 13986 : 2004, should be either taken as the design value given in BS EN 12524 : 2000 [30 (wet cup), 50 (dry cup)] or determined in accordance with BS EN ISO 12572 : 2001. Such values may be used in any interstitial condensation calculations to BS 5250 : 2011. The experimental value of water resistance factor determined in accordance with BS EN ISO 12572 : 2001 (wet cup) for the 15mm thick Sterling OSB/3 board is 147.

8.7 When used in high risk areas, such as kitchens and bathrooms, the product must be protected from wetting, eg by providing a continuous waterproof covering, turned up and sealed at junctions with walls and where services pass through the floor.

9 Formaldehyde content

In common with other wood-based panels which include formaldehyde as a component of the resin, the board may emit small amounts of formaldehyde gas. The extractable formaldehyde content of the boards is not greater than 8.0 mg per 100 g when measured in accordance with BS EN 120 : 1992. This complies with the lower, Class E1, formaldehyde specification included in BS EN 300 : 2006. Therefore, when the product is used in accordance with this Certificate, the quantity of formaldehyde gas emitted from the board alone will not raise the overall building level to an extent which will affect habitability.

10 Maintenance

As the product has suitable durability, will normally be confined within the building structure and, in most cases, will be covered with finishes, maintenance is not required.

11 Durability

11.1 The product will have adequate durability and should have a life equal to that of the floor in which it is installed.

11.2 Care should be taken when designing, detailing and constructing buildings to ensure that moisture does not accumulate within the product.

11.3 Under normal conditions of use the product is unlikely to suffer damage, but if damage does occur, repairs can be carried out in accordance with the Certificate holder's instructions.

Installation

12 General

12.1 Sterling OSB/3 for Flooring can be cut and fixed using conventional woodworking tools. Normal precautions should be taken to avoid inhalation of wood dust when cutting, drilling and sanding the boards.

12.2 The board can withstand normal site handling and fixing. Damaged boards should not be used. Normal safety precautions should be observed when handling large panels.

13 Procedure

13.1 Installation of the product should be in accordance with DD CEN/TS 12872 : 2007 or BS 8103-3 : 2009, and the Certificate holder's recommendations.

13.2 The boards should be completely dry and laid after all wet site operations have been completed.

13.3 Exposure to the elements should be minimised during installation. If wetted, boards must be allowed to dry out thoroughly before applying any floor coverings or surface coatings, or subjecting them to the full design load.

14 Tests

Tests were carried out and the results assessed to determine:

- material characteristics in accordance with the requirements of BS EN 300 : 2006 for OSB/3
- surface spread of flame in accordance with BS 476-7 : 1997
- hard body impact resistance in accordance with BS EN 1128 : 1996.

15 Investigations

15.1 An assessment was made of the product's durability and behaviour in relation to moisture.

15.2 The fire resistance of a flooring construction was calculated in accordance with BS 5268-4.2 : 1990.

Bibliography

BS 476-7 : 1997 *Fire tests on building materials and structures — Method of test to determine the classification of the surface spread of flame of products*

BS 5250 : 2011 *Code of practice for control of condensation in buildings*

BS 5268-4.2 : 1990 *Structural use of timber — Fire resistance of timber structures — Recommendations for calculating fire resistance of timber stud walls and joisted floor constructions*

BS 8103-3 : 2009 *Structural design of low-rise buildings — Code of practice for timber floors and roofs for housing*

BS 8203 : 2001 *Code of practice for installation of resilient floor coverings*

BS EN 120 : 1992 *Wood based panels — Determination of formaldehyde content — Extraction method called the perforator method*

BS EN 300 : 2006 *Oriented Strand Boards (OSB) — Definitions, classification and specifications*

BS EN 335 : 2013 *Durability of wood and wood-based products — Use classes — Definitions, application to solid wood and wood based products*

BS EN 1128 : 1996 *Cement-bonded particleboards — Determination of hard body impact resistance*

BS EN 1991-1-1 : 2002 *Eurocode 1 : Actions on structures — General actions— Densities, self-weight, imposed loads for buildings*

BS EN 1995-1-1 : 2004 *Eurocode 5 : Design of timber structures — General — Common rules and rules for buildings*
BS EN 1995-1-2 : 2004 *Eurocode 5 : Design of timber structures — General — Structural fire design*

BS EN 12369-1 : 2001 *Wood-based panels — Characteristic values for structural design : OSB, particleboards and fibreboards*

BS EN 12524 : 2000 *Building materials and products — Hygrothermal properties — Tabulated design values*

BS EN 13986 : 2004 *Wood-based panels for use in construction — Characteristics, evaluation of conformity and marking*

BS EN ISO 12572 : 2001 *Hygrothermal performance of building materials and products — Determination of water vapour transmission properties*

DD CEN/TS 12872 : 2007 *Wood-based panels — Guidance on the use of load-bearing boards in floors, walls and roofs*

ISO 9001 : 2008 *Quality management systems — Requirements*

16 Conditions

16.1 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.

16.2 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.

16.3 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.

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

16.5 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.

16.6 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.

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