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Agrément Certificate
16/5293
Product Sheet 2

SUDPLY PINE PLYWOOD

SUDPLY FOR ROOFING

This Agrément Certificate Product Sheet(1) relates to Sudply for Roofing, a loadbearing plywood board for internal use in dry and humid conditions as roof decking and sarking 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 roof 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 achieves a reaction to fire classification of D-s2, d2 or better in accordance with BS EN 13986 : 2004, Table 8, depending on end use, and its use is restricted in some cases (see section 7).

Resistance to moisture — provided adequate precautions are taken, the product has satisfactory moisture resistance (see section 8).

Durability — the product, incorporated into a completed roof, 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

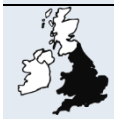
Date of Second issue: 27 October 2022

Originally certificated on 21 March 2016

Hardy Giesler
Chief Executive Officer

Regulations

In the opinion of the BBA, Sudply for Roofing, 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 sections 4.1, 4.2, 6.1, 6.3 and 6.5 of this Certificate.

Requirement: **B3(1)(3)** **Internal fire spread (structure)**
Comment: The product can contribute to satisfying this Requirement. See sections 7.2 to 7.4 of this Certificate.

Requirement: **B3(4)** **Internal fire spread (structure)**
Comment: The product may be restricted by this Requirement. See section 7.1 of this Certificate.

Requirement: **B4(1)** **External fire spread**
Comment: The product, in some circumstances, is restricted by this Requirement. See section 7.5 of this Certificate.

Requirement: **C2(c)** **Resistance to moisture**
Comment: The product can contribute to a roof structure, suitably designed to prevent excessive condensation. See section 8 of this Certificate.

Regulation: **7(1)** **Materials and workmanship**
Comment: The product is acceptable. See section 11 and the *Installation* part of this Certificate.

Regulation: **7(2)** **Materials and workmanship**
Comment: The product is restricted by this Regulation. See section 7.1 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)(2)], 1.1.2[(1)(2)] and 1.1.3[(1)(2)] of this Standard. See sections 4.1, 4.2, 6.1, 6.3 and 6.5 of this Certificate.

Standard: 2.3 Structural protection
Comment: The product can contribute to satisfying this Standard with reference to clause 2.3.1[(1)(2)]. See section 7.2 to 7.4 of this Certificate.

Standard: 2.4 Cavities
Comment: The products are restricted by this Standard with reference to clause 2.4.2[(1)(2)]. See section 7.1 of this Certificate.

Standard:	2.6	Spread to neighbouring buildings
Comment:		The product is restricted under clause 2.6.4[(1)(2)] of this Standard in some circumstances. See section 7.6 of this Certificate.
Standard:	3.15	Condensation
Comment:		A vapour control layer must be provided on the room side of the construction to prevent damage arising from the passage of moisture vapour from the interior of the building, in accordance with clause 3.15.3[(1)(2)] of this Standard. See section 8 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 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:	**29**	**Condensation**
Comment:		A vapour control layer must be provided on the room side of the construction to prevent damage due to interstitial condensation. See section 8 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 sections 4.1, 4.2, 6.1, 6.3 and 6.5 of this Certificate.
Regulation:	**35(1)(3)**	**Internal fire spread — Structure**
Comment:		The product can contribute to satisfying this Requirement. See sections 7.2 to 7.4 of this Certificate.
Regulation:	**35(4)**	**Internal fire spread — Structure**
Comment:		The product may be restricted by this Regulation. See section 7.1 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* (1.3) and 12 *General* of this Certificate.

Additional Information

NHBC Standards 2022

In the opinion of the BBA, Sudply for Roofing, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards*, Part 7 *Roofs*, Chapters 7.1 *Flat roofs, terraces and balconies* and 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 13986 : 2004.

Technical Specification

1 Description

1.1 Sudply for Roofing is an untreated coniferous plywood board comprising softwood flakes/veneers bonded together with phenol-formaldehyde resin.

1.2 The board is available with the characteristics shown in Table 1.

Table 1 Board characteristics

Surface finish	Face Veneer Grades(1)	Edge type	Board size (mm x mm)	Board thickness (mm)	No. of ply
				11	3
				12	5
	C/C			15	5
	CP/C			18	5
	C+/C	Square	2400 x 1200	18	7
	B/C		2440 x 1220	21	7
Rough	Film-faced			24	7
Touch Sanded				24	9
Sanded				30	11
Overlaid			2400 x 600	12	5
			2400 x 1200	15	5
	C+/C	Tongue-and-groove	2440 x 610	18	7
	CP/C	(2 long edges)	2440 x 1220	18	7
	B/C			21	
		Tongue-and-groove	2400 x 600	18	7
		(4 edges)	2440 x 610	21	7

(1) Visual appearance of face veneers.

1.3 The nominal density of the board ranges from 502 to 590 kg·m^{-3}.

1.4 The board has a nominal moisture content of 8.4%.

2 Manufacture

2.1 The product is manufactured in Brazil by Indústria de Compensados Sudati Ltda in Palmas, Ibaiti and Ventania.

2.2 Logs are fed into soaking chambers and peeled into thin layers in lathes. The layers are dried and sorted into different grades prior to application of glue. Layers are cold- and hot-pressed to bind together into boards. Boards are water-sprayed (to avoid warping), trimmed, sanded and profiled (eg tongue-and-groove if necessary).

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 operated by the manufacturer are being maintained.

3 Delivery and site handling

3.1 Handling, storage and delivery of the product should be carried out in accordance with the requirements of PD CEN/TR 12872 : 2014 and BS 8103-3 : 2009.

3.2 The boards should be stored in a dry environment and, to prevent distortion, stacked flat and clear of the floor on level bearers at centres not exceeding 600 mm.

3.3 Each board carries a label bearing the product name, grade, size, thickness and production date, and ordering number and ID for traceability.

3.4 For delivery, boards should be covered in transit to protect from weather and minimise changes in moisture content. Care should be taken to protect the edges and corners, and the protective cover must not be removed until boards are ready for installation.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Sudply for Roofing.

Design Considerations

4 General

4.1 Sudply for Roofing is satisfactory for internal use in dry and humid conditions as decking on pitched roofs or flat roofs(1) and as a pitched roof lining for tiles or slates (sarking) as defined in PD CEN/TR 12872 : 2014, BS 8103-3 : 2009 and BS 6229 : 2018 (see also section 4.2).

(1) However, it should not be used as a flat roof decking in buildings where the insulation is installed above the supporting deck and the thermal design does not eliminate the possibility of condensation, or where occupancy conditions are likely to lead to high levels of humidity. In Scotland, cold deck roof systems are not recommended.

4.2 Roof structures incorporating the product must be designed to resist the load requirements specified in BS EN 1991-1-1 : 2002 and BS EN 1991-1-4 : 2005.

4.3 Humid conditions corresponding to service class 2 of BS EN 1995-1-1 : 2004 are characterised by a moisture content in the material corresponding to a temperature of 20°C and a relative humidity of the surrounding air exceeding 85% for only a few weeks per year.

4.4 Design and installation of the product should be in accordance with BS EN 1995-1-1 : 2004 and PD CEN/TR 12872 : 2014 or BS 8103-3 : 2009. During installation, the boards should be protected from the weather and should be completely dry when the weatherproof membrane is applied.

4.5 In accordance with BS EN 636 : 2012, the product is satisfactory for use in environmental conditions covered by use classes 1 and 2 for wood and wood-based products, as defined in BS EN 335 : 2013. In such environments, the board must be 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, or 20% at any time, therefore the use of the product in

unheated conditions should be minimised. Prolonged exposure of the product to an air temperature of 20°C and a relative humidity of 90% should be limited, as this may result in the recommended moisture content being exceeded.

4.6 The design thermal conductivity (λ value) of plywood, 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 roof constructions into which it is incorporated.

4.7 The permissible thickness of the board is dependent upon application and support centres, as defined in BS 8103-3 : 2009.

4.8 Roof timbers on which the product is supported should be designed and used in accordance with BS EN 1995-1-1 : 2004 and/or the relevant national Building Regulations. Roof voids should be ventilated in accordance with BS 5250 : 2021.

4.9 On a flat roof, decking constructed from Sudply plywood provides a suitable substrate for waterproofing specifications of:

- built-up reinforced bituminous membranes roofing to BS 8217 : 2005
- mastic asphalt roofing to BS 8218 : 1998
- other built-up roof waterproofing systems covered by a current BBA Certificate, when laid in accordance with that Certificate.

4.10 In conventional timber flat roof decking, a vapour control layer must be provided in cold roof designs to prevent damage to the structure owing to the passage of moisture (vapour) from the interior of the building.

5 Practicability of installation

The board 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 buildings within the scope of BS 8103-3 : 2009 (low-rise buildings), plywood flat roof decks without permanent access should be designed with the minimum board thickness and maximum support centres outlined in BS 8103-3 : 2009, Table 77. Other thicknesses and spans might be appropriate, provided they are supported by performance tests or the calculated design carried out by a suitably qualified and experienced individual.

6.2 The board is suitable for use as flat roof decking with the concentrated load resistances shown in Table 2.

Table 2 Concentrated load resistance

Board thickness (mm)	No. of ply	Edge finish	Joist spacing (mm)	Concentrated load resistance (kN)	Position
15	5	Square	450	2.8	Midspan
15	5	Tongue-and-groove	450	2.0	Joint
18	5	Square	600	3.1	Midspan
18	5	Tongue-and-groove	600	3.1	Joint
18	7	Square	600	4.9	Midspan
18	7	Tongue-and-groove	600	3.5	Joint

6.3 Characteristic values for flat roof decking structural design using the product may be taken from BS EN 12369-2 : 2011, based on the classes shown in Table 3 of this Standard for each board specification, and used in accordance with BS EN 1995-1-1 : 2004. For boards not shown in BS EN 12369-2 : 2011, Table 3, characteristic values should be determined by testing in accordance with BS EN 789 : 2004 and BS EN 1058 : 2009.

6.4 When tested for bending strength and modulus of elasticity in accordance with BS EN 310 : 1993, the board achieved the classifications given in Table 3 of this Certificate, in accordance with BS EN 636 : 2012.

Table 3 Classification

	11 mm (3 Ply)		12 mm (5 ply)		15 mm (5 ply)		18 mm (5 ply)		18 mm (7 ply)	
Direction[(1)]	0	90	0	90	0	90	0	90	0	90
Bending strength	F20	F5	F20	F10	F25	F10	F25	F10	F25	F10
Modulus of elasticity	E40	–	E30	E10	E40	E10	E40	E10	E60	E15

(1) 0 = parallel to grain, 90 = perpendicular to grain.

6.5 When tested for impact resistance in accordance with BS EN 1195 : 1998, the 15 mm board with joist spacing of 450 mm, and the 18 mm board with joist spacing of 600 mm achieved Class I impact classification in accordance with the requirements of BS EN 12871 : 2013.

7 Behaviour in relation to fire

7.1 The board achieved a reaction-to-fire classification of D-s2, d2 or better in accordance with BS EN 13986 : 2004, Table 8, depending on end use.

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

7.3 A roofs resistance to external fire exposure will depend significantly on the roof covering and can also be affected by other components of the roof, eg insulation materials, substrates/decking, and membranes. These constructions should therefore be evaluated by reference to the requirements of the documents supporting the relevant national Building Regulations and any consequent restrictions imposed by those documents, on a case-by-case basis. In the absence of a rating, the construction should not be used within 20 metres of a boundary (24 metres in Scotland).

7.4 Where the boards are to be carried over compartment walls, designers must ensure that the roof/wall junction detail provides sufficient resistance to fire penetrating into the neighbouring compartment.

7.5 In England and Wales, the product, when used in pitches greater than 70°,excluding upstands, should not be used on buildings that have a storey at least 18 m above ground level and contain: one or more dwellings, an institution, a room for residential purposes (excluding any room in a hostel, hotel or boarding house), student accommodation, care homes, sheltered housing, hospitals or dormitories in boarding schools.

7.6 In Scotland, the product, when used in pitches greater than 70°, excluding upstands, should not be used on buildings that have a storey more than 11 m above ground level.

8 Resistance to moisture

8.1 In common with all timber products, plywood is subject to moisture movement. As a guide, an increase in moisture content of 1% increases the length by 0.02%, the width by 0.03% and the thickness by 0.5%.

8.2 Under similar environmental conditions, plywood 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 PD CEN/TR 12872 : 2014, must be provided when installing the boards.

8.4 To minimise subsequent movement, before installation all wet site operations should be completed and the board 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 or fixing, as determined using a properly calibrated moisture meter, should be as given in BS 8103-3 : 2009, Annex A, Table A.1 (ie 12% for flat roof sheathing and for sarking for pitched roofs).

8.5 In a roof construction, in calculations for interstitial condensation according to BS 5250 : 2021, the water vapour resistance factor (μ) of plywood can be taken as 70 (wet cup) or 200 (dry cup) from BS EN 12524 : 2000, Table 1, or determined by testing in accordance with BS EN ISO 12572 : 2001.

9 Formaldehyde content

When tested for release of formaldehyde in accordance with BS EN 717-2 : 1995, the product achieved Class E1 formaldehyde specification in accordance with BS EN 13986 : 2004. Therefore, when 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 that will affect habitability.

10 Maintenance

As the product has suitable durability (see section 11), is normally confined within the roofing structure and, in most cases, is covered with finishes, maintenance is not required.

11 Durability

11.1 The product has adequate durability and will have a life equal to that of the roof 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 Sudply for Roofing 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 boards can withstand normal site handling and fixing. Damaged boards should not be used. Normal safety precautions should be observed when handling large boards.

13 Procedure

13.1 Installation of boards should be by use of conventional methods in accordance with PD CEN/TR 12872 : 2014 or BS 8103-3 : 2009 and the Certificate holder's recommendations.

13.2 The boards must be laid after all wet site operations have been completed.

14 Test and investigations

14.1 An assessment was made of test reports relating to:

- strength and stiffness under point load
- impact resistance
- density
- formaldehyde content
- bonding quality
- reaction to fire.

14.2 From test results in accordance with BS EN 1195 : 1998, calculations were carried out to establish the resistance of the boards to the concentrated loads given in BS EN 1991-1-1 : 2002 for specified Use Categories.

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

14.4 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 : 2021 *Management of moisture in buildings — Code of practice*

BS 6229 : 2018 *Flat roofs with continuously supported coverings — Code of practice*

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

BS 8217 : 2005 *Reinforced bitumen membranes for roofing — Code of practice*

BS 8218 : 1998 *Code of practice for mastic asphalt roofing*

BS EN 310 : 1993 *Wood-based panels — Determination of modulus of elasticity in bending and of bending strength*

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

BS EN 636 : 2012 + A1 : 2015 *Plywood — Specifications*

BS EN 717-2 : 1995 *Wood-based panels — Determination of formaldehyde release — Formaldehyde release by the gas analysis method*

BS EN 789 : 2004 *Timber structures — Test methods — Determination of mechanical properties of wood based panels*

BS EN 1058 : 2009 *Wood-based panels — Determination of characteristic 5-percentile values and characteristic mean values*

BS EN 1195 : 1998 *Timber structures — Test methods — Performance of structural floor decking*

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 for 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 1995-1-1 : 2004 + A2 : 2014 *Eurocode 5 : Design of timber structures — General — Common rules and rules for buildings*

NA to BS EN 1995-1-1 : 2004 + A2 : 2014 UK National Annex to *Eurocode 5 : Design of timber structures — General — Common rules and rules for buildings*

BS EN 12369-2 : 2011 *Wood-based panels — Characteristic values for structural design — Plywood*

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

BS EN 12871 : 2013 *Wood-based panels — Determination of performance characteristics for load bearing panels for use in floors, roofs and walls*

BS EN 13986 : 2004 + A1 : 2015 *Wood-based panels for use in construction — Characteristics, evaluation of conformity and marking*

BS EN ISO 12572 : 2016 *Hygrothermal performance of building materials and products — Determination of water vapour transmission properties — Cup method*

PD CEN/TR 12872 : 2014 *Wood-based panels — Guidance on the use of load-bearing boards in floors, walls and roofs*

15 Conditions

15.1 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.

15.2 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.

15.3 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.

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

15.5 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.

15.6 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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Agrément Certificate
16/5293
Product Sheet 3

SUDPLY PINE PLYWOOD

SUDPLY FOR SHEATHING

This Agrément Certificate Product Sheet(1) relates to Sudply for Sheathing, a plywood board for use in dry and humid conditions as sheathing 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 has a D-s1, d0 reaction to fire classification to BS EN 13986 : 2004, Table 8, and its use is restricted (see section 7).

Resistance to moisture — provided adequate precautions are taken, the product has adequate moisture resistance (see section 8).

Durability — the product 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

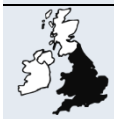
Date of Second issue: 27 October 2022

Originally certificated on 21 March 2016

Hardy Giesler
Chief Executive Officer

Regulations

In the opinion of the BBA, Sudply for Sheathing, 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 sections 4.1 and 6 of this Certificate.
Requirement:	**B3(1)(2)(3)(4)**	**Internal fire spread (structure)**
Comment:		The product can contribute to satisfying the regulatory requirements. See sections 7.1 and 7.2 of this Certificate.
Requirement:	**C2(c)**	**Resistance to moisture**
Comment:		The product can be incorporated into a wall structure, suitably designed to prevent excessive interstitial and surface condensation. See section 8 of this Certificate.
Regulation:	**7(1)**	**Materials and workmanship**
Comment:		The product is acceptable. See section 11 and the *Installation* part of this Certificate.
Regulation:	**7(2)**	**Materials and workmanship**
Comment:		The product is restricted by this Regulation. See sections 7.1 to 7.3 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)(2)], 1.1.2[(1)(2)] and 1.1.3[(1)(2)] of this Standard. See sections 4.1 and 6 of this Certificate.
Standard:	2.1	Compartmentation
Standard:	2.2	Separation
Standard:	2.3	Structural protection
Comment:		The product is restricted by these Standards in some cases with reference to clauses 2.1.12[(2)], 2.2.4[(2)], 2.2.5[(2)], 2.2.6[(1)(2)], 2.2.7[(1)], 2.2.8[(1)] and 2.3.2[(1)(2)]. See sections 7.1 and 7.2 of this Certificate.
Standard:	2.4	Cavities
Comment:		The product is restricted by this Standard with reference to clause 2.4.2[(1)(2)]. See section 7.1 of this Certificate.

Standard: Comment:	2.6	Spread to neighbouring buildings The product is restricted by this Standard with respect to clauses 2.6.5(1) and 2.6.6(2). See sections 7.1, 7.2 and 7.3 of this Certificate.
Standard: Comment:	3.15	Condensation A vapour control layer must be provided on the room side of the construction to prevent damage arising from the passage of moisture vapour from the interior of the building, in accordance with clauses 3.15.3(1)(2), 3.15.6(1)(2) and 3.15.7(1)(2) of this Standard. See section 8 of this Certificate.
Standard: Comment:	7.1(a)(b)	Statement of sustainability The product can contribute to satisfying 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: Comment:	**12**	**Building standards applicable to conversions** All comments given for 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: Comment:	**23(a)(i)(iii)(b)**	**Fitness of materials and workmanship** The product is acceptable. See section 11 and the *Installation* part of this Certificate.
Regulation: Comment:	**28(b)**	**Resistance to moisture and weather** Walls constructed from the product can satisfy this Regulation. See section 8 of this Certificate.
Regulation: Comment:	**29**	**Condensation** A vapour control layer must be provided on the room side of the construction to prevent damage due to interstitial condensation. See section 8 of this Certificate.
Regulation: Comment:	**30**	**Stability** The product has sufficient strength and stiffness to sustain and transmit design loads to the primary structure without excessive deflection. See sections 4.1 and 6 of this Certificate.
Regulation: Comment:	**35(1)(2)(3)(4)**	**Internal fire spread — Structure** The product is restricted by this Regulation. See section 7.1 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* (1.3) and 12 *General* of this Certificate.

Additional Information

NHBC Standards 2022

NHBC accepts the use of Sudply for Sheathing, provided it is installed, used and maintained in accordance with this Certificate, in relation to *NHBC Standards*, Part 6 *Substructure (excluding roofs)*, Chapters 6.2 *External timber framed walls* and Chapter 6.3 *Internal walls*.

CE marking

The Certificate holder has taken the responsibility of CE marking the product in accordance with harmonised European Standard BS EN 13986 : 2004.

Technical Specification

1 Description

1.1 Sudply for Sheathing is an untreated coniferous plywood board comprising softwood flakes/veneers bonded together with phenol-formaldehyde resin.

1.2 The board is available with the characteristics shown in Table 1.

Table 1 Board characteristics

Surface finish	Face Veneer Grades[(1)]	Edge type	Board size (mm x mm)	Board thickness (mm)	No. of ply
Rough Touch sanded Sanded Overlaid	C/C CP/C C+/C B/C Film-faced	Square	2440 x 1220 2400 x 1200	9	3
				11	3
				12	5
				12.5	5
				15	5
				18	5
				18	7
				21	7
				24	7
				24	9
				30	11
	C+/C CP/C B/C	Tongue-and-groove (2 long edges)	2440 x 1220 2440 x 610 2400 x 1200 2400 x 600	12	5
				12.5	5
				15	5
				18	5
				18	7
				21	7
		Tongue-and-groove (4 edges)	2440 x 610 2400 x 600	18	7
				21	7

(1) Visual appearance of face veneers.

1.3 The nominal density of the board ranges from 502 to 590 kg·m^{-3}.

1.4 The board has a nominal moisture content of 8.4%.

2 Manufacture

2.1 The product is manufactured in Brazil by Indústria de Compensados Sudati Ltda in Palmas, Ibaiti and Ventania.

2.2 Logs are fed into soaking chambers and peeled into thin layers in lathes. The layers are dried and sorted into different grades prior to application of glue. Layers are cold- and hot-pressed to bind together into boards. Boards are water-sprayed (to avoid warping), trimmed, sanded and profiled (eg tongue-and-groove if necessary).

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 operated by the manufacturer are being maintained.

3 Delivery and site handling

3.1 Handling, storage and delivery of the product should be carried out in accordance with the requirements of PD CEN/TR 12872 : 2014 and BS 8103-3 : 2009.

3.2 The boards should be stored in a dry environment and, to prevent distortion, stacked flat and clear of the floor on level bearers at centres not exceeding 600 mm.

3.3 Each board carries a label bearing the product name, grade, size, thickness and production date, and ordering number and ID for traceability.

3.4 For delivery, boards should be covered in transit to protect from weather and minimise changes in moisture content. Care should be taken to protect the edges and corners, and the protective cover must not be removed until boards are ready for installation.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Sudply for Sheathing.

Design Considerations

4 General

4.1 Sudply for Sheathing is satisfactory for use in dry and humid conditions as wall sheathing as specified for plywood in PD CEN/TR 12872 : 2014.

4.2 Fabrication and installation of the sheathing boards, including the provision of moisture movement gaps, must be in accordance with PD CEN/TR 12872 : 2014 and BS EN 1995-1-1 : 2004. Exposure to the elements should be minimised during installation.

4.3 Timber structures in which the product is incorporated must be designed and constructed to comply with BS EN 1995-1-1 : 2004.

4.4 In accordance with BS EN 636 : 2012, the product is satisfactory for use in environmental conditions covered by use classes 1 and 2 for wood and wood-based products, as defined in BS EN 335 : 2013. In such environments, the boards must be covered and fully protected from the elements. It is recommended that the moisture content of the product should not exceed 16% for any significant period, or 20% at any time, therefore the use of the product in unheated conditions (see 4.3) should be minimised. Prolonged exposure of the product to an air temperature of 20°C and a relative humidity of 90% should be limited, as this may result in the recommended moisture content being exceeded.

4.5 The design thermal conductivity (λ value) of plywood, 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 wall constructions into which it is incorporated.

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 The design racking resistance of a timber-frame wall incorporating plywood sheathing nailed to studding should be calculated in accordance with the guidance given in BS EN 1995-1-1 : 2004 and its UK National Annex, by a chartered structural engineer or similarly experienced and qualified person, based upon the vertical design load on the wall and the nail spacing and nail characteristics used to attach the sheathing.

6.2 As a guide, when calculated in accordance with BS EN 1995-1-1 : 2004, Method B, the basic racking resistance of a timber-frame wall(1) without vertical loading and with 9 mm thick sheathing fixed with nails(2) at 100 mm spacing is 3.62 $kN \cdot m^{-1}$ and, at 150 mm spacing, 2.77 $kN \cdot m^{-1}$.

(1) Studs: timber grade C16, minimum size 38 mm by 75 mm and spaced at a maximum of 600 mm.
(2) Nails: minimum diameter 3.1 mm, minimum length 50 mm and ultimate tensile strength 700 $N \cdot mm^{-2}$.

6.3 When tested for soft body impact resistance in accordance with BS EN 596 : 1995, the 12 mm and 12.5 mm boards with supports at 600 mm centres achieved adequate impact resistance. Therefore, they are suitable for use as sheathing on walls with soft body impact class III, classified in accordance with BS EN 12871 : 2013. Thicker boards with supports up to 600 mm centres can achieve an impact classification at least equal to that of the 12 mm and 12.5 mm boards tested. Other board thicknesses and support centres are suitable for use where the wall will not be subject to impact for the life of the building, excluding the period of construction.

7 Behaviour in relation to fire

7.1 The board has a reaction-to-fire classification of D-s2, d0 in accordance with BS EN 13986 : 2004, Table 8. This relates to the full thickness range referred to in section 1 of this Certificate.

7.2 In England and Wales, the product should not be used on external walls of buildings that have a storey at least 18 m above ground level and contain: one or more dwellings, an institution, a room for residential purposes (excluding any room in a hostel, hotel or boarding house), student accommodation, care homes, sheltered housing, hospitals or dormitories in boarding schools.

7.3 In Scotland, the product may be used on buildings more than 1 m from a boundary. The product should not be used on external walls of domestic buildings with a floor more than 30 m above the ground. Additional restrictions apply for separating elements.

7.4 Designers should refer to the relevant national Building Regulations and guidance for detailed conditions of use, particularly in respect of requirements for fire resistance, cavity barriers, service penetrations and combustibility limitations for other materials and combustibility limitations for other materials and components used in the overall wall construction, for example, thermal insulation and cladding.

7.5 Where the product is incorporated in a wall construction where fire resistance is required by the documents supporting the national Building Regulations, the fire resistance should be confirmed by tests or assessments by a suitably accredited laboratory.

8 Resistance to moisture

8.1 In common with all timber products, plywood is subject to moisture movement. As a guide, an increase in moisture content of 1% increases the length by 0.02%, the width by 0.03% and the thickness by 0.5%.

8.2 Under similar environmental conditions, plywood 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 PD CEN/TR 12872 : 2014, should be provided when installing the boards.

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 moisture content of the board prior to installation, determined with a properly-calibrated moisture meter, should be close to the service class equilibrium moisture content (emc) values given in PD CEN/TR 12872 : 2014, Table 1, an extract of which is reproduced in Table 2 of this Certificate.

Table 2 Equilibrium moisture content and conditions of use

Service class	Approximate equilibrium moisture content (emc)	Conditions of use
1	4% ≤ emc ≤ 11%	dry installations, no risk of wetting in service
2	11% ≤ emc ≤ 17%	risk of wetting during installation and risk of occasional wetting in service
3	emc > 17%	risk of regular wetting in service

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 : 2021.

8.6 The water vapour resistance factor (μ) of plywood, as given in BS EN 13986 : 2004, should be either taken as the design value given in BS EN 12524 : 2000 [70 (wet cup), 200 (dry cup)] or determined in accordance with BS EN ISO 12572 : 2016. Such values may be used in any interstitial condensation calculations to BS 5250 : 2021.

8.7 In accordance with normal good practice for wood-based sheathing materials used in cold frame construction, external walls in which the product is incorporated must include an effective vapour control layer on the room side, suitable weather protection on the outside surface, a ventilated cavity and a damp-proof course. The product should be treated as conventional sheathing board with regard to detailing at openings, eaves and sole plate, the fixing of wall ties and breather paper, and the effect of openings on racking strength.

8.8 The moisture content of sheathing material is affected by the humidity conditions existing in the cavity of which it forms one face. The cavity should be of conventional construction for timber-framed buildings, freely drained and ventilated. The outer masonry leaf should have adequate resistance to wind-driven rain, particularly in regions classified as severe exposure. Raked mortar joints or high-porosity masonry should be avoided, particularly in severe exposure regions.

9 Formaldehyde content

When tested for release of formaldehyde in accordance with BS EN 717-2 : 1995, the product achieved a Class E1 formaldehyde specification in accordance with BS EN 13986 : 2004. Therefore, when 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 that will affect habitability.

10 Maintenance

As the product has suitable durability (see section 11), will normally be confined within the building structure and in most cases covered with finishes, maintenance is not required.

11 Durability

11.1 The product has adequate durability and will have a life equal to that of the structure 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 any damage occurs, repairs can be carried out in accordance with the Certificate holder's instructions.

Installation

12 General

12.1 Sudply for Sheathing 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 boards can withstand normal site handling and fixing. Damaged boards should not be used. Normal safety precautions should be observed when handling large boards.

13 Procedure

13.1 Installation of the boards is in accordance with PD CEN/TR 12872 : 2014 and the Certificate holder's recommendations.

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

Technical Investigations

14 Tests and investigations

14.1 An assessment was made of test reports relating to:

- impact resistance
- density
- formaldehyde content
- bonding quality
- reaction to fire.

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

14.3 The manufacturing process was evaluated, including the methods adopted for quality control, and details were obtained of the quality and composition of materials used.

Bibliography

BS 5250 : 2021 *Management of moisture in buildings — Code of practice*

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

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

BS EN 596 : 1995 *Timber structures — Test methods — Soft body impact test of timber framed walls*

BS EN 636 : 2012 + A1 : 2015 *Plywood — Specifications*

BS EN 717-2 : 1995 *Wood-based panels — Determination of formaldehyde release — Formaldehyde release by the gas analysis method*

BS EN 1995-1-1 : 2004 + A2 : 2014 *Eurocode 5 : Design of timber structures — General — Common rules and rules for buildings*
NA to BS EN 1995-1-1 : 2004 + A2 : 2014 UK National Annex to *Eurocode 5 : Design of timber structures — General — Common rules and rules for buildings*

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

BS EN 12871 : 2013 *Wood-based panels — Determination of performance characteristics for load bearing panels for use in floors, roofs and walls*

BS EN 13986 : 2004 + A1 : 2015 *Wood-based panels for use in construction — Characteristics, evaluation of conformity and marking*

BS EN ISO 12572 : 2016 *Hygrothermal performance of building materials and products — Determination of water vapour transmission properties — Cup method*

PD CEN/TR 12872 : 2014 *Wood-based panels — Guidance on the use of load-bearing boards in floors, walls and roofs*

15 Conditions

15.1 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.

15.2 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.

15.3 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.

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

15.5 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.

15.6 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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Agrément Certificate
16/5293
Product Sheet 1

SUDPLY PINE PLYWOOD

SUDPLY FOR FLOORING

This Agrément Certificate Product Sheet(1) relates to Sudply for Flooring, a loadbearing plywood board for internal use in dry and humid conditions as flooring on joists 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 floor 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 has a reaction to fire classification of D_{FL}-s1 to BS EN 13986 : 2004, Table 8 (see section 7).

Resistance to moisture — provided adequate precautions are taken, the product has satisfactory moisture resistance (see section 8).

Durability — the product, incorporated into a completed floor, 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: 21 October 2022

Originally certificated on 21 March 2016

Hardy Giesler
Chief Executive Officer

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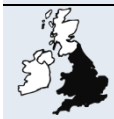
Regulations

In the opinion of the BBA, Sudply 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 sections 4.1, 6.1, 6.2 and 6.4 of this Certificate.
Requirement:	**B3(1)(3)(4)**	**Internal fire spread (structure)**
Comment:		The product can contribute to satisfying this Requirement. See section 7 of this Certificate.
Requirement:	**C2(c)**	**Resistance to moisture**
Comment:		The product can contribute to a floor structure, suitably designed to prevent excessive condensation. See section 8 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)**	**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)(2), 1.1.2(1)(2) and 1.1.3(1)(2) of this Standard. See sections 4.1, 6.1, 6.2 and 6.4 of this Certificate.
Standard:	2.1	Compartmentation
Standard:	2.2	Separation
Standard:	2.3	Structural protection
Standard:	2.9	Escape
Comment:		The product can contribute to satisfying the regulatory requirements in accordance with clauses 2.1.1(2), 2.1.12(2), 2.2.1(1)(2), 2.2.2(1)(2), 2.2.3(1)(2), 2.2.4(1)(2), 2.2.5(2), 2.2.6(1), 2.2.8(1), 2.3.2(1)(2) 2.9.5(1) and 2.9.24(2). See section 7 of this Certificate.
Standard:	3.15	Condensation
Comment:		A vapour control layer must be provided on the room side of the construction to prevent damage arising from the passage of moisture vapour from the interior of the building, in accordance with clause 3.15.3(1)(2) of this Standard. See section 8 of this Certificate.
Standard:	7.1(a)(b)	Statement of sustainability
Comment:		The product can contribute to satisfying 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 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 section 11 and the *Installation* part of this Certificate.
Regulation:	**29**	**Condensation**
Comment:		Constructions incorporating the product can be designed to satisfy this Regulation. See section 8 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 sections 4.1, 6.1, 6.2 and 6.4 of this Certificate.
Regulation:	**35(3)(4)**	**Internal fire spread — structure**
Comment:		The product can contribute to satisfying the regulatory requirements. See section 7 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* (1.3)and 12 *General* of this Certificate.

Additional Information

NHBC Standards 2022

In the opinion of the BBA, Sudply for Flooring, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards*, Part 5 *Substructure*, *ground floors*, *drainage and basements*, Chapter 5.2 *Suspended ground floors* and Part 9 *Finishes*, Chapter 9.3 *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.

Technical Specification

1 Description

1.1 Sudply for Flooring is an untreated coniferous plywood board comprising softwood flakes/veneers bonded together with phenol-formaldehyde resin.

1.2 The board is available with the characteristics shown in Table 1.

Table 1 Board characteristics

Surface finish	Face Veneer Grades[1]	Edge type	Board size (mm x mm)	Board thickness (mm)	No. of ply
Rough Touch Sanded Sanded Overlaid	C/C CP/C C+/C B/C Film-faced	Square	2400 x 1200 2440 x 1220	15 18 18 21 24 24 30	5 5 7 7 7 9 11
	C+/C CP/C B/C	Tongue-and-groove (2 long edges)	2400 x 600 2400 x 1200 2440 x 610 2440 x 1220	15 18 18 21	5 5 7 7
		Tongue-and-groove (4 edges)	2400 x 600 2440 x 610	18 21	7 7

(1) Visual appearance of face veneers.

1.3 The nominal density of the board ranges from 502 to 590 kg·m^{-3}.

1.4 The board has a nominal moisture content of 8.4%.

2 Manufacture

2.1 The product is manufactured in Brazil by Indústria de Compensados Sudati Ltda in Palmas, Ibaiti and Ventania.

2.2 Logs are fed into soaking chambers and peeled into thin layers in lathes. The layers are dried and sorted into different grades prior to application of adhesive. Layers are cold- and hot-pressed to bind together into boards. Boards are water-sprayed (to avoid warping), trimmed, sanded and profiled (eg tongue-and-groove if necessary).

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 operated by the manufacturer are being maintained.

3 Delivery and site handling

3.1 Handling, storage and delivery of the product should be carried out in accordance with the requirements of PD CEN/TR 12872 : 2014 and BS 8103-3 : 2009.

3.2 The boards should be stored in a dry environment and, to prevent distortion, stacked flat and clear of the floor on level bearers at centres not exceeding 600 mm.

3.3 Each board carries a label bearing the product name, grade, size, thickness and production date, and ordering number and ID for traceability.

3.4 For delivery, boards should be covered in transit to protect from weather and minimise changes in moisture content. Care should be taken to protect the edges and corners, and the protective cover must not be removed until boards are ready for installation.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Sudply for Flooring.

Design Considerations

4 General

4.1 Sudply for Flooring is satisfactory for internal use as flooring in dry and humid conditions as specified for plywood in PD CEN/TR 12872 : 2014 or BS 8103-3 : 2009 (see also section 4.2). The product may be continuously supported or suspended over joists or battens.

4.2 Humid conditions corresponding to service class 2 of BS EN 1995-1-1 : 2004 are characterised by a moisture content in the material corresponding to a temperature of 20°C and a relative humidity of the surrounding air exceeding 85% for only a few weeks per year.

4.3 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%.

4.4 Design and installation of the product should be in accordance with BS EN 1995-1-1 : 2004 and PD CEN/TR 12872 : 2014 or BS 8103-3 : 2009.

4.5 In accordance with BS EN 636 : 2012, the product is satisfactory for use in environmental conditions covered by use classes 1 and 2 for wood and wood-based products, as defined in BS EN 335 : 2013. In such environments, the board must be 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, or 20% at any time, therefore the use of the product in unheated conditions (see section 4.3) should be minimised. Prolonged exposure of the product to an air temperature of 20°C and a relative humidity of 90% should be limited, as this may result in the recommended moisture content being exceeded.

4.6 If wetted, boards must be allowed to dry out thoroughly before being subjected to the full design load.

4.7 The design thermal conductivity (λ value) of plywood, 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 construction into which it is incorporated.

4.8 In suspended timber floor applications:

- the board 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 : 2021. The ground beneath the floor should be free of topsoil and vegetation matter and be covered to resist moisture and prevent plant growth.

4.9 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 : 2017.

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), the board should be designed with a minimum board thickness of 15 mm for joist spacing up to 450 mm, and 18 mm for joist spacing up to 600 mm.

6.2 For floor applications not covered by BS 8103-3 : 2009, designers need to ensure that the selected board will satisfy the load requirements specified in BS EN 1991-1-1 : 2002. Characteristic values for structural design using the product may be taken from BS EN 12369-2 : 2011, based on the classes shown in Table 3 of this Standard for each board specification, and used in accordance with BS EN 1995-1-1 : 2004. For boards not shown in BS EN 12369-2 : 2011, Table 3, characteristic values should be determined by testing in accordance with BS EN 789 : 2004 and BS EN 1058 : 2009.

6.3 The board is suitable for use as flooring with the concentrated load resistances shown in Table 2.

Table 2 Concentrated load resistance

Board thickness (mm)	No. of ply	Edge finish	Joist spacing (mm)	Concentrated load resistance (kN)	Position
15	5	Square	450	2.8	Midspan
15	5	Tongue-and-groove	450	2.0	Joint
18	5	Square	600	3.1	Midspan
18	5	Tongue-and-groove	600	3.1	Joint
18	7	Square	600	4.9	Midspan
18	7	Tongue-and-groove	600	3.5	Joint

6.4 When tested for impact resistance in accordance with BS EN 1195 : 1998, the 15 mm board with joist spacing of 450 mm, and the 18 mm board with joist spacing of 600 mm, achieved Class I impact classification in accordance with the requirements of BS EN 12871 : 2013.

6.5 When tested for bending strength and modulus of elasticity in accordance with BS EN 310 : 1993, the board achieved the classifications given in Table 3 of this Certificate, in accordance with BS EN 636 : 2012.

Table 3 Classification for strength and modulus of elasticity in bending to BS EN 636 : 2012

	15 mm (5 ply)		18 mm (5 ply)		18 mm (7 ply)	
Direction(1)	0	90	0	90	0	90
Bending strength	F25	F10	F25	F10	F25	F10
Modulus of elasticity	E40	E10	E40	E10	E60	E15

(1) 0 = parallel to grain, 90 = perpendicular to grain.

7 Behaviour in relation to fire

7.1 The board has a reaction-to-fire classification of D_{FL}-s1 in accordance with BS EN 13986 : 2004, Table 8.

7.2 The fire resistance of a floor construction 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 United Kingdom Accreditation Service (UKAS) laboratory accredited for the test concerned.

8 Resistance to moisture

8.1 In common with all timber products, plywood is subject to moisture movement. As a guide, an increase in moisture content of 1% increases the length by 0.02%, the width by 0.03% and the thickness by 0.5%.

8.2 Under similar environmental conditions, plywood 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, expansion gaps in accordance with the requirements of PD CEN/TR 12872 : 2014 must be provided when installing the boards.

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 moisture content of the board prior to installation, determined with a properly calibrated moisture meter, should be close to the service class equilibrium moisture content (emc) values given in PD CEN/TR 12872 : 2014, Table 1, an extract of which is reproduced in Table 4 of this Certificate.

Table 4 Equilibrium moisture content and conditions of use

Service class	Approximate equilibrium moisture content (emc)	Conditions of use
1	4% ≤ emc ≤ 11%	dry installations, no risk of wetting in service
2	11% ≤ emc ≤ 17%	risk of wetting during installation and risk of occasional wetting in service
3	emc > 17%	risk of regular wetting in service

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 : 2021.

8.6 The water vapour resistance factor (μ) of plywood, as given in BS EN 13986 : 2004, should be either taken as the design value given in BS EN 12524 : 2000 [70 (wet cup), 200 (dry cup)] or determined in accordance with BS EN ISO 12572 : 2016. Such values may be used in any interstitial condensation calculations to BS 5250 : 2021.

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

When tested for release of formaldehyde in accordance with BS EN 717-1 : 2004, the product achieved a Class E1 formaldehyde specification in accordance with BS EN 13986 : 2004. Therefore, when 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 (see section 11), 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 board will have adequate durability and will 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 Sudply for Flooring is 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 must not be used. Normal safety precautions should be observed when handling large boards.

13 Procedure

13.1 Installation of the board should be in accordance with PD CEN/TR 12872 : 2014 or BS 8103-3 : 2009, and the Certificate holder's recommendations.

13.2 Exposure to weather 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.

Technical Investigations

14 Test and investigations

14.1 Tests were conducted and the results assessed to determine:

- strength and stiffness under point load
- impact resistance
- density
- formaldehyde content
- bonding quality
- reaction to fire.

14.2 From test results in accordance with BS EN 1195 : 1998, calculations were carried out to establish the resistance of the boards to concentrated loads given in BS EN 1991-1-1 : 2002 for specified Use Categories.

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

14.4 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 : 2021 *Management of moisture in buildings — Code of practice*

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

BS 8203 : 2017 *Code of practice for installation of resilient floor coverings*

BS EN 310 : 1993 *Wood-based panels — Determination of modulus of elasticity in bending and of bending strength*

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

BS EN 636 : 2012 + A1 : 2015 *Plywood— Specifications*

BS EN 717-1 : 2004 *Wood-based panels. Determination of formaldehyde release. Formaldehyde emission by the chamber method*

BS EN 789 : 2004 *Timber structures — Test methods — Determination of mechanical properties of wood based panels*

BS EN 1058 : 2009 *Wood-based panels — Determination of characteristic 5-percentile values and characteristic mean values*

BS EN 1195 : 1998 *Timber structures — Test methods — Performance of structural floor decking*

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 for buildings*

BS EN 1995-1-1 : 2004 + A2 : 2014 *Eurocode 5 : Design of timber structures — General — Common rules and rules for buildings*
NA to BS EN 1995-1-1 : 2004 + A2 : 2014 UK National Annex to *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*
NA to BS EN 1995-1-2 : 2004 UK National Annex to *Eurocode 5 : Design of timber structures — General — Structural fire design*

BS EN 12369-2 : 2011 *Wood-based panels — Characteristic values for structural design — Plywood*

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

BS EN 12871 : 2013 *Wood-based panels — Determination of performance characteristics for load bearing panels for use in floors, roofs and walls*

BS EN 13986 : 2004 + A1 : 2015 *Wood-based panels for use in construction — Characteristics, evaluation of conformity and marking*

BS EN ISO 12572 : 2016 *Hygrothermal performance of building materials and products — Determination of water vapour transmission properties — Cup method*

PD CEN/TR 12872 : 2014 *Wood-based panels — Guidance on the use of load-bearing boards in floors, walls and roofs*

15 Conditions

15.1 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.

15.2 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.

15.3 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.

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

15.5 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.

15.6 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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