

## Indústria de Compensados Sudati Ltda

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Agrément Certificate  
**16/5293**  
Product Sheet 2

### SUDPLY PINE PLYWOOD

### SUDPLY FOR ROOFING

This Agrément Certificate Product Sheet<sup>(1)</sup> 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 structure, can contribute to structural strength and stiffness by distributing the dead and imposed loads to the supporting structure (see section 6).

**Resistance to moisture** — provided adequate precautions are taken, the product has adequate moisture resistance (see section 7).

**Durability** — the product, incorporated into the completed roofing, will have a life equal to that of the building in which it is installed (see section 10).

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

On behalf of the British Board of Agrément

Date of First issue: 21 March 2016

Simon Wroe  
Head of Approvals — Engineering

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](http://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, 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:	C2(c)	Resistance to moisture
Comment:		The product can contribute to a roof structure, suitably designed to prevent excessive condensation. See section 7 of this Certificate.
Regulation:	7	Materials and workmanship
Comment:		The product is acceptable. See section 10 and the <i>Installation</i> 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 10 and the <i>Installation</i> 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 <sup>(1)(2)</sup> , 1.1.2 <sup>(1)(2)</sup> and 1.1.3 <sup>(1)(2)</sup> . See sections 4.1, 4.2, 6.1, 6.3 and 6.5 of this Certificate.
Standard:	3.15	Condensation
Comment:		The product can contribute to a roof structure, suitably designed to prevent excessive condensation, with reference to clauses 3.15.3 <sup>(1)(2)</sup> , 3.15.6 <sup>(1)(2)</sup> and 3.15.7 <sup>(1)(2)</sup> . 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 <sup>(1)(2)</sup> and Schedule 6 <sup>(1)(2)</sup> . (1) Technical Handbook (Domestic). (2) Technical Handbook (Non-Domestic).



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

Regulation:	23(a)(i)(iii)(b)	Fitness of materials and workmanship
Comment:		The product is acceptable. See section 10 and the <i>Installation</i> part of this Certificate.
Regulation:	29	Condensation
Comment:		The product can be incorporated into a roof structure, suitably designed to prevent harmful effects from interstitial condensation. See section 7 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.

### 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 and 1.3), 3 *Delivery and site handling* (3.3) and 12 *General* of this Certificate.

## Additional Information

### NHBC Standards 2016

NHBC accepts the use of Sudply for Roofing, provided it is installed, used and maintained in accordance with this Certificate, in relation to *NHBC Standards, Part 7 Roofs, Chapters 7.1 Flat roofs 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. 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 Sdply for Roofing are untreated coniferous plywood boards comprising softwood flakes/veneers bonded together with phenol-formaldehyde resin.

1.2 Sdply roofing boards are available with the characteristics shown in Table 1.

Table 1 Board characteristics

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

(1) Visual appearance of face veneers.

1.3 The nominal density of the boards ranges from 502 to 590 kg·m<sup>-3</sup>.

1.4 The boards have 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 lathe machines. 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 Quality control includes checks on raw materials, the production process and on the finished product.

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.

### 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<sup>(1)</sup> 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 : 2003.

(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 Sudply boards 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. Prolonged exposure to an air temperature of 20°C and a relative humidity of 90% may result in the recommended moisture content being exceeded.

4.6 The design thermal conductivity ( $\lambda$  value) of plywood, given in BS EN 12524 : 2000, is  $0.13 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$  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 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 : 2011.

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

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

4.10 In conventional timber flat roof decking, a vapour control layer (VCL) 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 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 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 boards are 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 Sudply boards may be taken from BS EN 12369-2 : 2011, based on the classes shown in Table 3 for each board specification, and used in accordance with BS EN 1995-1-1 : 2004. For boards not shown in 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 boards achieved the classifications given in Table 3, 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)	
	0	90	0	90	0	90	0	90	0	90
Direction <sup>(1)</sup>	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 Resistance to moisture



7.1 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%.

7.2 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.

7.3 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.

7.4 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 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 decking and sarking for pitched roofs).

7.5 In a roof construction, in calculations for interstitial condensation according to BS 5250 : 2011, the water vapour resistance factor ( $\mu$ ) 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.

## 8 Formaldehyde content

When tested 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.

## 9 Maintenance

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

## 10 Durability



10.1 The product has adequate durability and should have a life equal to that of the roof in which it is installed.

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

10.3 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

### 11 General

11.1 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.

11.2 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.

### 12 Procedure

12.1 Installation of the boards is in accordance with PD CEN/TR 12872 : 2014 or BS 8103-3 : 2009, and the Certificate holder's recommendations.

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

## Technical Investigations

### 13 Test and investigations

13.1 An assessment was made of test reports relating to:

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

13.2 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.

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

13.4 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 : 2011 *Code of practice for control of condensation in buildings*
- BS 6229 : 2003 *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 *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*
- BS EN 1991-1-4 : 2005 *Eurocode 1 : Actions on structures — General actions— Wind actions*
- BS EN 1995-1-1 : 2004 *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 *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*
- PD CEN/TR 12872 : 2014 *Wood-based panels — Guidance on the use of load-bearing boards in floors, walls and roofs*

## 14 Conditions

14.1 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.

14.2 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.

14.3 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.

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

14.5 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.

14.6 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.