CI/SfB

i4

UPM-Kymmene Wood Ltd
Victoria House
55 Queen Street
Maidenhead
Berkshire SL6 1LT
Tel: 01628 513300 Fax: 01628 513400
e-mail: woodltd@upm-kymmene.com
website: www.wisa.com

Agrément Certificate No 04/4097

BBA BRITISH BOARD OF AGRÉMENT
TECHNICAL APPROVALS FOR CONSTRUCTION

Designated by Government to issue European Technical Approvals

WISA BIRCH PLYWOOD

Contre-plaqué
Sperrholz

Product

• *THIS CERTIFICATE RELATES TO WISA BIRCH PLYWOOD, FOR USE IN ACCORDANCE WITH THE RECOMMENDATIONS OF BS 5268-2 : 2002.*

Regulations

1 The Building Regulations 2000 (as amended) (England and Wales)

The Secretary of State has agreed with the British Board of Agrément the aspects of performance to be used by the BBA in assessing the compliance of plywood with the Building Regulations. In the opinion of the BBA, Wisa Birch Plywood, if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements.

Requirement:	A1(1)	Loading
Comment:		When contributing to the structural strength and stability of a timber structure, the product will be satisfactory provided the design is in accordance with sections 10.1 to 10.5 of this Certificate.
Requirement:	B2 (1)	Internal fire spread (linings)
Comment:		The product has a Class 3 surface and is a combustible material. See sections 12.1 and 12.2 of this Certificate.
Requirement:	Regulation 7	Materials and workmanship
Comment:		The product is acceptable, but has been assessed as untreated and is therefore restricted in the House Longhorn beetle (*Hylotrupes bajulus L*) areas. See sections 14.1 and 14.2 of this Certificate.

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

In the opinion of the BBA, Wisa Birch Plywood, if used in accordance with the provisions of this Certificate, will satisfy or contribute to satisfying the various Regulations and related Technical Standards as listed below.

Regulation:	10	Fitness of materials and workmanship
Standard:	B2.1	Selection and use of materials, fittings, and components, and workmanship
Comment:		The product can contribute to a construction meeting this Standard. See the *Installation* part of this Certificate.
Standard:	B2.2	Selection and use of materials, fittings, and components, and workmanship
Comment:		The product is an acceptable material. See sections 14.1 and 14.2 of this Certificate.
Regulation:	11	Structure
Standard:	C2.1	Stability
Comment:		When designed in accordance with this Certificate, the product has sufficient strength and stiffness to transmit the design loads without excessive deflection. See sections 10.1 to 10.5 of this Certificate.
Regulation:	12	Structural fire precautions
Standards:	D2.1 and D2.2	Structural protection — Principles
Standards:	D3.1 and D3.2	Compartmentation — Principles
Standards:	D3.15 to D3.17	Compartmentation — Junctions
Standard:	D5.1	Separating walls and separating floors — Principles
Standards:	D5.9 to D5.11	Separating walls and separating floors — Junctions
Comment:		The product may be incorporated into a construction meeting regulatory requirements.
Standards:	D6.1 to D6.4	Concealed spaces — Principles
Comment:		Cavity barriers must be provided in accordance with the requirements for the product, which has a Class 3 surface. See section 12.1 of this Certificate.
Standard:	D8.2	Fire spread to adjoining buildings — Non-combustible materials
Comment:		The product may be used in restricted areas as defined by this Standard.
Regulation:	18	Resistance to condensation
Standard:	G4.1	Condensation — Interstitial condensation
Comment:		The boards can be incorporated into a structure suitably designed to prevent excessive condensation. See section 9.4 of this Certificate.

3 The Building Regulations (Northern Ireland) 2000

In the opinion of the BBA, Wisa Birch Plywood, if used in accordance with the provisions of this Certificate, will satisfy or contribute to satisfying the various Building Regulations as listed below.

Regulation:	B2	Fitness of materials and workmanship
Comment:		The product is acceptable. See sections 14.1 and 14.2 of this Certificate.
Regulation:	D1	Stability
Comment:		The product will sustain and transmit the design load without excessive deflection or deformation. See sections 10.1 to 10.5 of this Certificate.
Regulation:	E3	Internal fire spread — Linings
Comment:		The product has a Class 3 surface. See sections 12.1 and 12.2 of this Certificate.

4 Construction (Design and Management) Regulations 1994 (as amended)
Construction (Design and Management) Regulations (Northern Ireland) 1995 (as amended)

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

See section:	8 *Practicability of installation* (8.1 and 8.2).

Technical Specification

5 Description

5.1 Wisa Birch Plywood is made entirely from birch and is uncoated and untreated. Bonding of the veneers is by phenolic resin cross-bonded weather-resistant gluing according to EN 314-2 : 1993/class 3 (non-covered exterior). The phenolic resin adhesive complies with BS EN 301 : 1992, Type 1.

5.2 Nominal thickness, thickness range, unit weight and available panel sizes are given in Table 1 for sanded Wisa Birch Plywood from UPM, ZAO Chudovo-RWS and UPM, UPM-Kymmene Otepaa AS. The properties relate to a moisture content of 10%±2%. Wisa Birch Plywood is made from veneers 1.4 mm thick at the time of pressing. The grain direction of external and odd-numbered veneers is parallel to the shorter edges of the board. The grain direction of intermediate veneers is perpendicular to the shorter edges.

Table 1 Thickness, weights and sizes(1)

Nominal thickness (mm)	Minimum thickness (mm)	Maximum thickness (mm)	Weight (kgm^{-2})
4	3.5	4.1	2.8
6.5	6.1	6.9	4.6
9	8.8	9.5	6.3
12	11.5	12.5	8.4
15	14.3	15.3	10.5
18	17.1	18.1	12.6
21	20.0	20.9	14.7
24	22.9	23.7	16.8
27	25.2	26.8	18.9
30	28.1	29.9	21.0

(1) Available panel sizes:
1200/1220/1250 x 2400/2440/2500 mm
1500/1525 x 3000/3050 mm.

5.3 Tolerances applicable to panels produced from both locations are:

>1000 mm	±1 mm
1000–2000 mm	±2 mm
2000–3000 mm	±3 mm
squareness tolerance	±1 mm/1000 mm

5.4 Face veneer qualities are classified in accordance with Finnish Standard SFS 2413 and these grades comply with or exceed the grading requirements of EN 635-2 : 1995. Standard face grades are S (EN 635 grade II) for painting or coating, BB (grade III) for painting or thicker coatings and WG (grade IV) for reverse sides.

5.5 Process and quality control checks include:

- moisture content and dimensions of veneers
- application of resin
- pressing conditions

on the finished board

- dimensions
- bond quality
- strength.

6 Delivery and site handling

6.1 The boards are delivered to site in bundles. Each bundle is labelled with the name of the manufacturer, name of the product, the thickness, size and number of boards and the BBA identification mark. The boards are edge-stamped with the CE marking, the name of the product, and the manufacturer's production details.

6.2 As for other wood-based materials the precautions relating to transportation, storage and handling, described in BS 5268-2 : 2002, clause 7.5, should be taken.

Design Data

7 General

Wisa Birch Plywood is satisfactory for structural use in accordance with the recommendations of BS 5268-2 : 2002 in built-up members such as beams, or framed structures, including sheathing, flooring and roofing.

8 Practicability of installation

8.1 The board is easily cut and fixed using conventional woodworking techniques. Normal precautions should be exercised to avoid inhalation of wood dust when cutting, drilling and sanding the boards.

8.2 The boards can withstand normal site handling and fixing; if damaged they must not be used. Normal precautions should be observed when handling large panels.

9 Behaviour in relation to moisture

9.1 The hygroscopic properties of the board differ from those of solid timber, and under the same exposure conditions its equilibrium moisture content can be 2% to 3% less than, and the time taken to reach its equilibrium moisture content greater than, that for solid timber.

9.2 Where a building construction is likely to be sensitive to the relative movement of Wisa Birch Plywood members, it is recommended, in accordance with BS 5268-2 : 2002, that the members should:

- be checked for moisture content at the time of the installation; the determination of moisture content by a calibrated moisture meter will be sufficiently accurate for this purpose
- have a moisture content at the time of installation close to the moisture content they will attain in service.

9.3 Guidance on expected moisture contents in solid timber is given in BS 5268-2 : 2002, Table 1.

9.4 The water vapour resistivity of the product may be taken as between 1000 $MNsg^{-1}$ and 6000 $MNsg^{-1}$ as given in BS 5250 : 2002, Table C1. Such values may

be used, as appropriate, in any interstitial condensation rise calculations to BS 5250 : 2002. The higher value should be used where the product is on the cold side of a construction and the lower value when on the warm side.

10 Structural performance

10.1 Design and detailing of the board members should be carried out in accordance with BS 5268-2 : 2002, using the additional information given in this section.

10.2 The grade stresses and moduli given in Table 2 apply to long-term loading of BS 5268-2 : 2002, in Services Classes 1 and 2. For the durations of load, the stresses and moduli should be multiplied by the modification factor K_{36} given in BS 5268-2 : 2002, Table 39.

10.3 Section properties are given in Table 3.

10.4 For standard flooring, roofing and timber-frame wall applications as specified in BS 8103-3 : 1996, BS 5268-6.1 : 1996, the standard fixing specifications for nailed or screwed plywood-to-timber connections given in those standards may be used. For the specific design of connections, the basic loads given in BS 5268-2 : 2002, Tables 63 and 68 for Group II plywoods may be used. For designs using BS 5268-2 : 2002 Annex G, a characteristic density of 630 kgm^{-3} should be used.

10.5 When installed in accordance with the requirement of this Certificate, the product has adequate resistance to the concentrated static and impact loads likely to be sustained when used as floor decking, wall sheathing or roof decking.

Table 2 Grade stresses and moduli for service classes 1 and 2 for WISA Birch Plywood 1.4 mm veneer sanded

Lay-up properties	Thicknesses in mm and the number of plies									
Nominal thickness	4	6.5	9	12	15	18	21	24	27	30
Number of plies	3	5	7	9	11	13	15	17	19	21
Strength properties	Grade stress in Nmm^{-2}									
Extreme fibre in bending										
face grain parallel to span	24.41	18.85	16.89	15.89	15.30	14.89	14.59	14.41	14.22	14.11
face grain perpendicular to span	3.93	10.74	11.89	12.30	12.52	12.63	12.70	12.74	12.78	12.82
Tension										
parallel to face grain	16.96	15.63	15.11	14.82	14.63	14.52	14.45	14.37	14.33	14.26
perpendicular to face grain	10.82	12.15	12.67	12.96	13.15	13.26	13.33	13.41	13.45	13.52
Compression										
parallel to face grain	11.33	10.41	10.07	9.89	9.78	9.67	9.63	9.59	9.56	9.52
perpendicular to face grain	7.19	8.11	8.45	8.63	8.74	8.85	8.89	8.93	8.96	9.00
Bearing										
on face	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79
Rolling shear										
in face veneer	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19
in back veneer	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19
at first glueline	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19
Transverse (planar) shear in bending										
face grain parallel to grain	1.03	1.19	0.99	1.03	0.97	0.99	0.96	0.97	0.95	0.96
face grain perpendicular to grain	—	0.66	0.87	0.82	0.89	0.87	0.89	0.89	0.90	0.89
Panel shear										
parallel and perpendicular to face grain	3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33
Stiffness properties	Grade modulus in Nmm^{-2}									
Mean modulus of elasticity in bending										
face grain parallel to span	8236	6369	5698	5360	5158	5024	4929	4859	4804	4760
face grain perpendicular to span	515	2382	3053	3391	3592	3726	3821	3892	3947	3991
Mean modulus of elasticity in tension and compression										
face grain parallel to span	5347	4922	4756	4667	4612	4574	4547	4526	4510	4497
face grain perpendicular tospan	3403	3828	3995	4084	4139	4176	4204	4224	4241	4254
Mean shear modulus for panel shear										
parallel and perpendicular to face grain	290	290	290	290	290	290	290	290	290	290
Mean shear modulus for transverse (planar) shear										
parallel to face grain	85	100	103	104	104	103	103	103	103	103
perpendicular to face grain	—	62	78	85	89	92	93	95	95	96

Table 3 Section properties of WISA Birch Plywood: sanded

Nominal thickness (mm)	Number of plies	Mean thickness (mm)	Section properties for a 1 m width: Area (10^3 mm^2)	Section modulus (10^3 mm^3)	Second moment of area (10^3 mm^4)	Approximate mass per unit area (kgm^{-2})
4	3	3.6	3.6	2.16	3.89	2.5
6.5	5	6.4	6.4	6.83	21.8	4.5
9	7	9.2	9.2	14.1	64.9	6.4
12	9	12.0	12.0	24.0	144	8.4
15	11	14.8	14.8	36.5	270	10.4
18	13	17.6	17.6	51.6	454	12.3
21	15	20.4	20.4	69.4	707	14.3
24	17	23.2	23.2	89.7	1041	16.2
27	19	26.0	26.0	113	1465	18.2
30	21	28.8	28.8	138	1991	20.2

11 Physiological properties

The boards are of a type known to release little or no formaldehyde gas and are classified as E1 according to BS EN 13986 : 2002, Annex B, Note 2. Tests conducted on similar products have produced a concentration of less than 0.1 parts per million of formaldehyde in a typical domestic situation. Therefore the quantity of gas emitted by the boards when used for conventional flooring, roofing and wall sheathing will not increase the level of gas within the building to an extent which will affect habitability.

12 Behaviour in relation to fire

12.1 The surface of the boards is classified as Class 3 as defined in BS 476-7 : 1987 and in accordance with BS EN 13986 : 2002, Table 8 the surface of the boards is classified as D_{fl}-s1 for flooring and D-s2, d0 for wall sheathing and roofing, as defined in EN 13501-1 : 2002.

12.2 In common with other wood-based products, the boards are a combustible material.

13 Thermal insulation

According to Table 11 of BS EN 13986 : 2002 the thermal conductivity (λ value) of the boards is 0.17 Wm^{-1}K^{-1} and as such will not have a significant effect on the thermal transmittance (U value) for the constructions into which they are incorporated.

14 Durability

14.1 The board is satisfactory for use in accordance with BS 5268-2 : 2002.

14.2 The board has been assessed as untreated, therefore, its use is restricted in the House Longhorn beetle (*Hylotrupes bajulus L*) areas as defined in the Approved Document to Regulation 7 : 1992 of the Building Regulations 1991. Proposals for House Longhorn beetle areas to be covered by a revision to Approved Document A are under consideration, therefore, in the interim, Table 1 of Approved Document to Regulation 7 : 1992 remains valid.

14.3 Care should be taken in designing, detailing and constructing buildings to ensure that moisture does not accumulate within the board. Exposure to damp or wet conditions for long periods may lead to failure of the material through fungal attack or physical breakdown (see BS 5268-2 : 2002, clause 4.2).

14.4 In certain applications, such as flat roof-decking to NHBC Standards, preservative treatment may be necessary.

14.5 As with all wood-based building materials, care should be taken in detailing buildings to prevent vermin and other pest infestation.

Installation

15 General

Wisa Birch Plywood should be handled and installed in the same manner as other structural wood-based boards. Guidance on design and workmanship is given in BS 5268-2 : 2002.

Technical Investigations

The following is a summary of the technical investigations carried out on Wisa Birch Plywood.

16 Technical investigations

16.1 Tests were carried out by the Technical Research Centre of Finland (VTT) to determine the mechanical properties. The tests were carried out in accordance with the methods described in EN 789 : 1996.

16.2 Grade bending stresses, grade elastic moduli for bending, and density were derived from the test results.

16.3 Grade stresses for other properties were derived from the known properties of the species and the measured density of the plywood, in accordance with the principles used to calculate the grade stresses for BS 5268-2 : 2002.

16.4 Assessment of formaldehyde emissions, behaviour of fire, water vapour resistance and thermal conductivity was made on the basis of existing data for similar materials.

Bibliography

BS 476-7 : 1987 *Fire tests on building materials and structures — Method for classification of the surface spread of flame of products*

BS 5268-2 : 2002 *Structural use of timber — Code of practice for permissible stress design, materials and workmanship*
BS 5268-6.1 : 1996 *Structural use of timber — Code of practice for timber frame walls — Dwellings not exceeding four storeys*

BS 8103-3 : 1996 *Structural design of low-rise buildings — Code of practice for timber floors and roofs for housing*

BS EN 301 : 1992 *Adhesives, phenolic and aminoplastic, for load-bearing timber structures: Classification and performance requirements*

BS EN 13986 : 2002 *Wood-based panels for use in construction — Characteristics, evaulation of conformity and marking*

EN 314-2 : 1993 *Plywood — Bonding quality — Requirements*

EN 635-2 : 1995 *Plywood – Classification by surface appearance — Hardwood*

EN 789 :1995 *Timber structures — Test methods — Determination of mechanical properties of wood-based panels*

EN 13501-1 : 2002 *Fire classification of construction products and building elements — Classification using test data from reaction to fire tests*

SFS 2413 : 1971 *Quality requirements for appearance of plywood with outer plies of birch*

Conditions of Certification

17 Conditions

17.1 This Certificate:

(a) relates only to the product that is described, installed, used and maintained as set out in this Certificate;

(b) is granted only to the company, firm or person identified on the front cover — no other company, firm or person may hold or claim any entitlement to this Certificate;

(c) is valid only within the UK;

(d) has to be read, considered and used as a whole document — it may be misleading and will be incomplete to be selective;

(e) is copyright of the BBA;

(f) is subject to English law.

17.2 References in this Certificate to any Act of Parliament, Regulation made thereunder, Directive or Regulation of the European Union, Statutory Instrument, Code of Practice, British Standard, manufacturers' instructions or similar publication, are references to such publication in the form in which it was current at the date of this Certificate.

17.3 This Certificate will remain valid for an unlimited period provided that the product and the manufacture and/or fabrication including all related and relevant processes thereof:

(a) are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA;

(b) continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine; and

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

17.4 In granting this Certificate, the BBA is not responsible for:

(a) the presence or absence of any patent or similar rights subsisting in the product or any other product;

(b) the right of the Certificate holder to market, supply, install or maintain the product; and

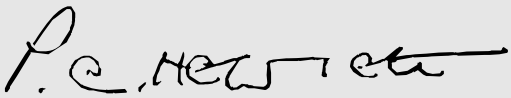
(c) the nature or standard of individual installations of the product or any maintenance thereto, including methods and workmanship.

17.5 Any recommendations relating to the use or installation of this product which are contained or referred to in this Certificate are the minimum standards required to be met when the product is used. They do not purport in any way to restate the requirements of the Health & Safety at Work etc Act 1974, or of any other statutory, common law or other duty which may exist at the date of this Certificate or in the future; nor is conformity with such recommendations to be taken as satisfying the requirements of the 1974 Act or of any present or future statutory, common law or other duty of care. In granting this Certificate, the BBA does not accept responsibility to any person or body for any loss or damage, including personal injury, arising as a direct or indirect result of the installation and use of this product.

BBA BRITISH BOARD OF AGRÉMENT
TECHNICAL APPROVALS FOR CONSTRUCTION

In the opinion of the British Board of Agrément, Wisa Birch Plywood is fit for its intended use provided it is installed, used and maintained as set out in this Certificate. Certificate No 04/4097 is accordingly awarded to UPM-Kymmene Wood Ltd.

On behalf of the British Board of Agrément



Date of issue: 31st March 2004

Chief Executive

British Board of Agrément
P O Box No 195, Bucknalls Lane
Garston, Watford, Herts WD25 9BA
Fax: 01923 665301

e-mail: mail@bba.star.co.uk
website: www.bbacerts.co.uk