



Finnforest Corporation

Kerto Business Unit
P O Box 24
FIN-08101 Lohja
Finland
Tel: 00 358 1046 56499 Fax: 00 358 1046 56222
website: www.finnforest.com

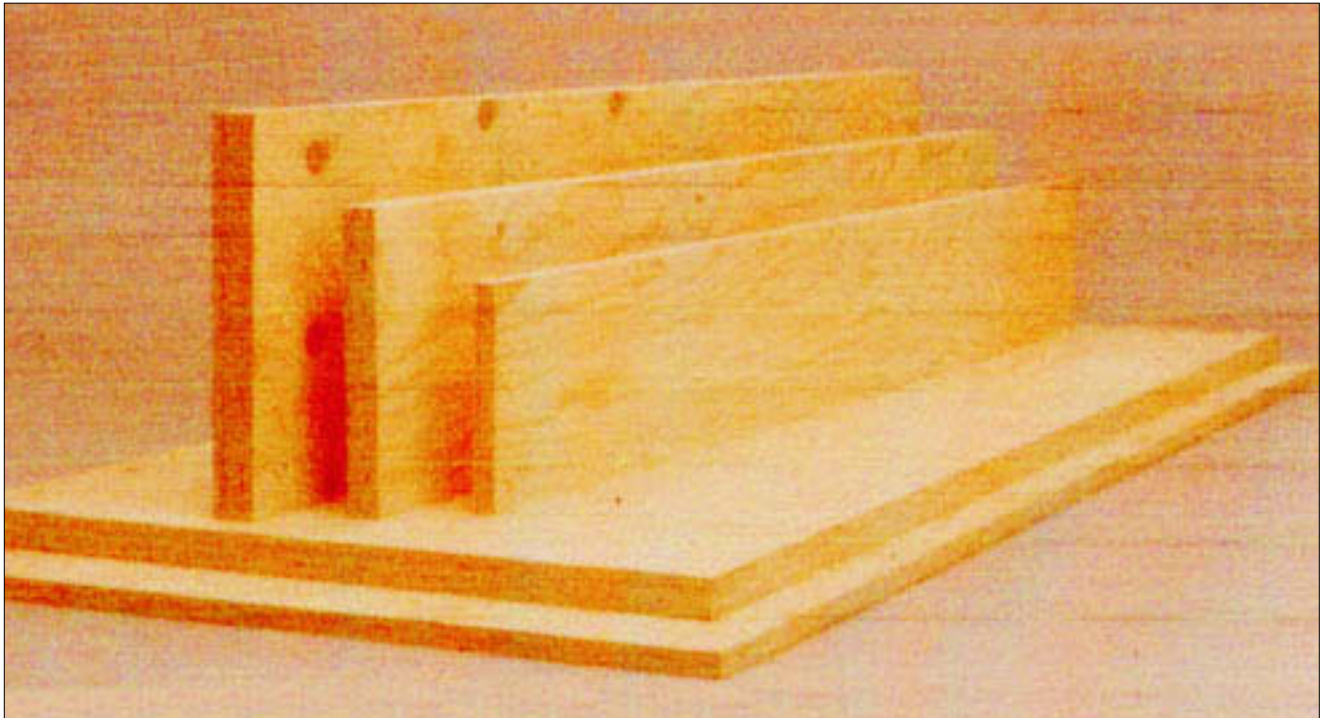
**Agrément
Certificate
No 00/3717**

Designated by Government
to issue
European Technical
Approvals

KERTO-LVL (LAMINATED VENEER LUMBER)

Bois lamelle
Lagenholz

Product




• THIS CERTIFICATE REPLACES CERTIFICATE No 90/2419 AND RELATES TO KERTO-LVL (LAMINATED VENEER LUMBER), A WOOD-BASED MATERIAL FOR USE IN STRUCTURAL MEMBERS (EG BEAMS, TIES, STRUTS) OR STRUCTURAL FRAMING AND ALSO FOR THE FABRICATION OF BUILT-UP COMPONENTS SUCH AS TRUSSES AND PANELS.

• The product has been assessed in accordance with BS 5268-2 : 1996 in a service class 1 or 2 environment.

• Kerto-LVL is manufactured by Finnforest Corporation and marketed in the UK by Finnforest UK, 46 Berth, Tilbury Freeport, Tilbury, Essex RM18 7HS,
Tel: 01375 856 855,
Fax: 01375 856 399 or
5 Sundial Court, Tolworth Rise South, Surbiton, Surrey KT5 9NN,
Tel: 020 8330 7333
Fax: 020 8330 1222.

Regulations

1 The Building Regulations 1991 (as amended) (England and Wales)

 The Secretary of State has agreed with the British Board of Agrément the requirements of the Building Regulations to which laminated veneer lumber structural members can contribute in achieving compliance. In the opinion of the BBA, Kerto-LVL, if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements.

Requirement: **A1**

Comment:

Loading

When relied on to contribute 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 10.8 of this Certificate.

Requirement: **B2**

Comment:

Internal fire spread (surfaces)

The product has a Class 3 surface and is a combustible material. See sections 11.1 to 11.4 of this Certificate.

Requirement: **B3(1)**

Comment:

Internal fire spread (structure)

The fire resistance of the product can be determined using the procedures referenced in sections 11.1 to 11.4 of this Certificate.

Requirement: **Regulation 7**

Comment:

Materials and workmanship

The product is acceptable but has been assessed as untreated and therefore its use is restricted in the House Longhorn beetle areas. See sections 12.1 and 12.2 of this Certificate.

Electronic Copy

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



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

Regulation:	10	Fitness of materials
Standard:	B2.1	Selection and use of materials and components
Comment:		The product is acceptable. See section 12.1 of this Certificate.
Regulation:	11	Structure
Standard:	C2.1	Construction
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 10.8 of this Certificate.
Regulation:	12	Structural fire precautions
Standard:	D2.1	Fire resistance
Comment:		The fire resistance of the product can be determined using the procedures referenced in sections 11.1 to 11.4 of this Certificate.
Standard:	D2.2	Non-combustibility
Comment:		In common with other timber products, the product is a combustible material and its use will be subject to restrictions under this Standard. See sections 11.1 to 11.4 of this Certificate.
Regulation:	13	Means of escape from fire, facilities for fire-fighting and means of warning of fire in dwellings
Standard:	E6.1	Internal fire spread — General
Comment:		The product has a Class 3 surface. See sections 11.1 to 11.4 of this Certificate.

3 The Building Regulations (Northern Ireland) 1994 (as amended)



In the opinion of the BBA, Kerto-LVL, if used in accordance with the provisions of this Certificate, will satisfy the various Building Regulations as listed below.

Regulation:	B2	Fitness of materials and workmanship
Comment:		The product is a durable material. See section 12.1 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 10.8 of this Certificate.
Regulation:	E4	Internal fire spread — Linings
Comment:		The product has a Class 3 surface. See sections 11.1 to 11.4 of this Certificate.
Regulation:	E6	Internal fire spread — Structure
Comment:		The fire resistance of the product can be determined using the procedures referenced in sections 11.1 to 11.4 of this Certificate.

4 Construction (Design and Management) Regulations 1994

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.*

Technical Specification

5 Description

5.1 Kerto-LVL (Laminated Veneer Lumber) is available in grades S and Q and comprise laminated Norway spruce or Scots pine veneers 3.2 mm in thickness, bonded together by a type WBP, phenol-formaldehyde adhesive to

BS EN 301 : 1992. For Kerto-S each lamination comprises a series of veneers, each 1900 mm long, laid with the grain running parallel. For Kerto-Q additional 3.2 mm thick veneers are laid cross grain. All veneers are scarf jointed except the middle one which is butt jointed. The joints are staggered by at least 100 mm. The veneers are C grade as defined by the American Plywood Association. The outer veneers are additionally graded for visual quality.

5.2 The range of standard sizes (in mm) are:

thickness	27, 33, 39, 45, 51, 57, 63, 69, 75 ⁽¹⁾
width	200, 260, 300, 360, 400, 450, 500, 600, 900, 1800 ⁽²⁾

(1) Kerto-S

(2) Kerto-Q

and the manufacturing tolerances (in mm) are:

all thicknesses	± 2
width < 200	± 1
width > 200	± 3
length < 6000	± 3
6000 < length < 18000	± 8
length > 18000	± 12.

5.3 Quality controls on the dried veneer include checks on grading, dimensions and moisture content. Appropriate controls are applied throughout the production process, including checks on veneer drying temperature, veneer grade, quality and weight of glue-spread and curing temperature. Each finished laminate is subject to visual inspection before being cut to length; any defective areas are cut out and rejected. Regular tests are made to determine the strength of the glue bond and the bending strength parallel to the grain.

6 Delivery and site handling

6.1 Kerto-LVL is delivered banded and wrapped in plastic to minimise changes in moisture content due to weather. The lengths of members may be limited by handling or transportation consideration, but may be up to 26 m.

6.2 On site Kerto-LVL must be stored clear of the ground, be appropriately stacked and protected against the weather.

Design Data

7 General

Kerto-LVL is satisfactory for use in structural members, eg beams, ties, struts, or structural framing and also for the fabrication of built-up components such as trusses and panels.

8 Practicability of installation

8.1 Kerto-LVL is easily cut and fixed using conventional woodworking tools.

8.2 In common with similar timber products, when using power tools for cutting, it is recommended that eye protection and a dust mask are used.

8.3 Kerto-LVL can withstand normal site handling.

8.4 Normal precautions should be taken when handling, lifting and installing the product. The density of the product is given in section 10.8.

9 Behaviour in relation to moisture

9.1 Kerto-LVL is for use in a service class 1 or 2 environment⁽¹⁾. Tests indicate that the equilibrium moisture content of the product in a given environment is lower than that of solid timber. In these environments, where the moisture content of solid timber does not exceed 18%, the moisture content of the product will not exceed 14%. The product will attain an average moisture content of 10% in service class 1 conditions.

(1) As defined in BS 5268-2 : 1996.

9.2 Where a building construction is likely to be sensitive to the relative movement of members, it is recommended, in accordance with BS 5268-2 : 1996, 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, and
- have a moisture content at the time of installation close to the moisture content they will attain in service.

9.3 The product will not shrink in the same manner as solid timber, therefore care is needed to avoid problems of differential movement when combining different materials.

9.4 The product will arrive on site with a typical moisture content of 10% to 15%.

10 Structural performance

10.1 Design and detailing of Kerto-LVL members should be carried out in accordance with BS 5268-2 : 1996 using the grade stresses and moduli given in this Certificate.

10.2 The grade stresses (given in Nmm^{-2}) for service class 1 or 2 exposure conditions for the product in Table 1.

Table 1 Grade stresses* and moduli of elasticity for dry exposure conditions (Nmm^{-2})

	Grade		
	Kerto-S		Kerto-Q
	Service Class 1	Service Class 2	Service Class 1 and 2
Bending			
edgewise (as a joist)	19.5	17.5	13.2
flatwise (as a plank)	19.7	17.6	14.8
Tension			
parallel to grain	13.5	12.1	8.9
edgewise perpendicular to grain	0.33	0.3	2.0
Compression			
parallel to grain	16.5	14.8	11.1
edgewise perpendicular to grain	3.2	2.9	5.2
flatwise perpendicular to grain	1.6	1.4	1.4
Shear			
edgewise	2.2	2.0	2.3
flatwise	1.6	1.5	0.6
MOE parallel to grain			
min	12000	11500	8360
mean	13500	12850	9500
G parallel to grain			
min	400	380	380
mean	600	570	570

*Modification factors are applied in certain circumstances (see section 9).

10.3 These stresses relate to specific conditions and are compatible with those assumed for solid timber given in BS 5268-2 : 1996. The modification factors K_3 , K_4 , K_5 , K_7 , K_{12} and K_{13} , as given in BS 5268-2 : 1996, may be applied when the actual service conditions are different. The modification factor K_8 for load sharing may also be used but with a reduced value of 1.04.

10.4 A length factor K_L should be applied for members in axial tension

$$K_L = \left(\frac{2440}{L} \right)^{0.125}$$

where

L = length (mm) with a minimum value of 2440 mm.

10.5 The flatwise grade stresses for the product given in Table 3 relate to a maximum nominal thickness of 45 mm.

10.6 The mean modulus of elasticity should be used to calculate deflections and displacements under both dead and imposed loads and in the calculation of K_{12} .

10.7 Joints made with nails, screws, bolts or timber connectors should be designed in accordance with Section 6 of BS 5268-2 : 1996. For the purpose of joint design the product should be treated as for timber of strength class C27. The maximum diameter of nails inserted parallel to the glue line should be 4 mm.

10.8 The density of (kgm^{-3}) of members at a 10% moisture content may be taken as follows:

Kerto-S

characteristic	460
mean	510

Kerto-Q

characteristic	500
mean	510.

11 Behaviour in relation to fire



11.1 Guidance is given in BS 5268-4 : Section 4.1 : 1978 on the methods of assessment of fire resistance of timber members. The charring rate for category (a) species listed in Table 1 of this Standard is applicable.

11.2 The product is assessed as having a Class 3 surface spread of flame classification in accordance with BS 476-7 : 1997.

11.3 In common with other timber products, the product is a combustible material.

11.4 The product is assessed as designated P in relation to ignitability in accordance with BS 476-5 : 1979.



12.1 Untreated Kerto-LVL is satisfactory for use in a service class 1 or 2 environment as defined in BS 5268-2 : 1996. It will have a durability comparable to that of plywood of similar timber species incorporating WBP phenol-formaldehyde adhesive.



12.2 The product has been assessed as untreated and therefore its use is restricted in the House Longhorn beetle *Hylotrupes bajulus* L areas defined in the Approved Document to Regulation 7 : 1992, of the Building Regulations. 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.

Installation

13 General

Kerto-LVL should be handled and installed in the same manner as sawn timber. Guidance on design and workmanship is given in BS 5268-2 : 1996.

Technical Investigations

The following is a summary of the technical investigations carried out on Kerto-LVL (Laminated Veneer Lumber).

14 Testing and analysis

Test data relating to the following were evaluated:

- statistic determination of grade stresses and moduli,
- equilibrium moisture content of Kerto-LVL in various controlled environments,
- nail, bolt, split-ring and shear connectors, and performance compared against that of various sawn softwood species.

15 Other investigations

15.1 Assessments were made of the applicability to Kerto-LVL of the modification factors for grade stresses given in BS 5268-2 : 1996.

15.2 Assessment on the basis of existing data was made of:

practicability of installation
behaviour in fire
durability
preservative treatment.

15.3 The manufacturing processes were examined, including the methods adopted for quality control, and details obtained of the quality and composition of the materials used.

Bibliography

- BS 476 *Fire tests on building materials and structures*
BS 476-5 : 1979 *Method of test for ignitability*
BS 476-7 : 1997 *Method of test to determine the classification of the surface spread of flame of products*
BS 5268 *Structural use of timber*
BS 5268-2 : 1996 *Code of practice for permissible stress design, materials and workmanship*
BS 5268-4 *Fire resistance of timber structures*
BS 5268-4.1 : 1978 *Recommendations for calculating fire resistance of timber members*
BS EN 301 : 1992 *Adhesives, phenolic and aminoplastic, for load-bearing timber structures: Classification and performance requirements*

Conditions of Certification

16 Conditions

16.1 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) has to be read, considered and used as a whole document — it may be misleading and will be incomplete to be selective;
- (d) is copyright of the BBA.

16.2 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,

shall be construed as references to such publication in the form in which it was current at the date of this Certificate.

16.3 This Certificate will remain valid for an unlimited period provided that the product and the manufacture and/or fabricating process(es) 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 by the BBA or its agents; and
- (c) are reviewed by the BBA as and when it considers appropriate.

16.4 In granting this Certificate, the BBA makes no representation as to:

- (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 of individual installations of the product, including methods and workmanship.

16.5 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.



In the opinion of the British Board of Agrément, Kerto-LVL (Laminated Veneer Lumber) is fit for its intended use provided it is installed, used and maintained as set out in this Certificate. Certificate No 00/3717 is accordingly awarded to Finnforest Corporation.

On behalf of the British Board of Agrément

Date of issue: 11th May 2000


Chief Executive

Electronic Copy

British Board of Agrément
P O Box No 195, Bucknalls Lane
Garston, Watford, Herts WD2 7NG
Fax: 01923 665301

©2000

e-mail: mail@bba.star.co.uk
<http://www.bbacerts.co.uk>



For technical or additional
information, tel: 01923 665300.
For information about Agrément
Certificate validity and scope, tel:
Hotline: 01923 665400