

kerto[®]

A WOOD PRODUCT FOR ADVANCED STRUCTURAL ENGINEERING

finnforest



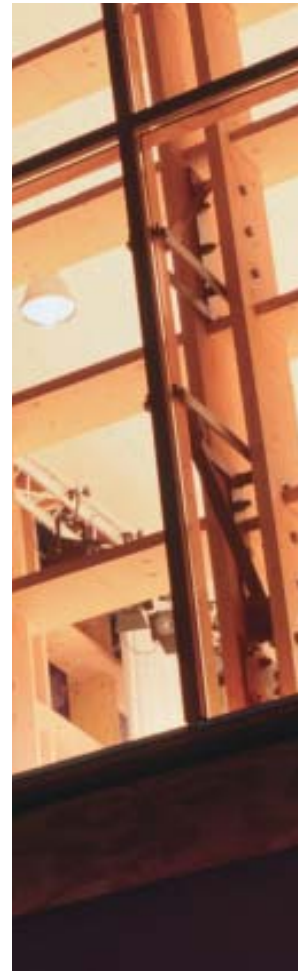
KERTO – A WOOD PRODUCT FOR ADVANCED STRUCTURAL ENGINEERING



CONTENTS

KERTO

A Wood Product for advanced structural engineering	3
Kerto-S affords long spans	4
Kerto-T for wall studs	5
Kerto-Q stabilises structures	6
Kerto at a glance	8
Further processing	9
Excellent service	10
Available globally	11



KERTO

Kerto is a laminated veneer lumber (LVL) product used in all construction jobs, from new buildings to renovation and repair. It is used in a variety of applications including beams, joists, trusses, frames, components of roof, floor and wall elements, components of door and vehicle industry, concrete formwork and scaffold planking.

Kerto is a strong and dimensionally stable product which does not warp or twist. It derives its high strength from the homogeneous bonded structure which also keeps the effects of any defective single veneers down to a minimum.

Kerto is produced from 3 mm thick, rotary-peeled softwood veneers that are glued together to form a continuous billet. The billet is cut to length and sawn into beam, plank or panel sizes according to the customer's order.

ADVANTAGES

STRONG: high characteristic strength values, ideal for load-bearing structures

DIMENSIONING: easy to optimize due to the large variety of available sizes

STRAIGHT: precise in dimensions, does not warp or twist

PLEASANT MATERIAL: beautiful, sound-insulating, fire-safe

EASY TO BUILD: light weight and excellent workability

ENVIRONMENTALLY FRIENDLY: wood procured according to the Pan-European Forest Certification (PEFC) standard

COMPREHENSIVE DISTRIBUTION AND SERVICE: reliable deliveries, comprehensive distribution network all over the world and versatile services to help in design and dimensioning



KERTO-S AFFORDS LONG SPANS

A notable feature of Kerto-S is that the grains run longitudinally throughout its veneer layers. The finished panel is cross-cut and rip-sawn to order. Kerto-S is normally supplied in the form of straight beams but it may also be cut to required shapes.

Kerto-S unites excellent technical performance with ease of use. Strength, dimensional precision and stability are the essential qualities of Kerto-S. In fact, as beams it is a perfect choice whenever the requirements include long spans and minimal deflection. They fit in with all roof shapes, also performing well as joists and lintels, intruded constructions and frames. Kerto-S is also a much-used material in the manufacture of prefabricated components.

Kerto's light weight is of great advantage especially during building repairs. The erection work can be carried out by fitters, without any heavy hoisting machinery, even in confined spaces. Kerto-S can be coated, to blend in with the rest of the architecture thus making a harmonious whole.

Kerto-S: Standard sizes

Thickness (mm)	Height (mm)									
	200	225	260	300	360	400	450	500	600	
27	•	•								
33	•	•	•							
39	•	•	•	•						
45	•	•	•	•	•					
51	•	•	•	•	•	•				
57	•	•	•	•	•	•	•			
63	•	•	•	•	•	•	•	•		
75	•	•	•	•	•	•	•	•	•	•



KERTO-T FOR WALL STUDS

Kerto-T is just like Kerto-S, but made from lighter veneers. Nevertheless, its straightness and dimensional stability are as good as with Kerto-S. This makes it ideal for studs to be used as load-bearing and non-bearing structures in external and internal walls.

It is easy to construct high walls, which can be counted on remaining straight. Kerto-T can be used with any sheet materials that are easily fixed without special tools.



Kerto-T: Typical sizes

Thickness: mainly 39 - 45 mm

Width: mainly < 200 mm

Length: mainly < 8,5 m



KERTO-Q STABILISES STRUCTURES

Kerto-Q is cross-bonded Kerto. This means that one-fifth of the veneers are glued crosswise. This structure improves the lateral bending strength and stiffness of the panel, thus increasing the shear strength when used as a beam. With cross-bonded veneers, there is an essential reduction in moisture-dependent variations across the width of the panel. Kerto-Q comes in the same dimensions and lengths as Kerto-S, except that its maximum thickness is 69 mm.

Full-length Kerto-Q is a popular material in floor and wall panels, because it stabilizes the whole structure, and a good fire resistance is achieved with a properly chosen thickness. Kerto-Q panels are also appreciated for their natural beauty, now that ecological considerations carry special weight.

Kerto-Q provides a functional solution in structural components, also when a high shear strength is one of the requirements. Like all Kerto products, also Kerto-Q is known for its strength, straightness and dimensional stability.

Kerto-Q: Standard sizes													
Thickness (mm)	Width (mm)												
	200	225	260	300	360	400	450	500	600	900	1200	1800	2500
27	•	•	•	•	•	•	•	•	•	•	•	•	•
33	•	•	•	•	•	•	•	•	•	•	•	•	•
39	•	•	•	•	•	•	•	•	•	•	•	•	•
45	•	•	•	•	•	•	•	•	•	•	•	•	•
51	•	•	•	•	•	•	•	•	•	•	•	•	•
57	•	•	•	•	•	•	•	•	•	•	•	•	•
63	•	•	•	•	•	•	•	•	•	•	•	•	•
69	•	•	•	•	•	•	•	•	•	•	•	•	•



Kerto-Q: Veneer structure

Thick- ness (mm)	Z	X	Veneer structure
	qty	qty	
27	7	2	II-III-II
33	9	9	II-III-II
39	10	3	II-III-III-II
45	12	3	II-III-III-II
51	14	3	II-III-III-II
57	15	4	II-III-III-II
63	16	5	II-III-III-II
69	23	5	II-III-III-II

z = veneer running longitudinally to main panel direction |
 x = veneer running crosswise to main panel direction -

KERTO AT A GLANCE

Characteristic values of mechanical properties

Values according to LVL standard (EN 14374 structural LVL) to be used in design according to Eurocode 5 (EN 1995)
N/mm² or kg/m³

Property	Symbol	Kerto-S * Thickness 27 - 90 mm	Kerto-Q * Thickness 27 - 69 mm	Kerto-T **
Characteristic 5 % values				
Bending strength				
Edgewise	$f_{m,0,edge,k}$	44.0	32.0	27.0
Size effect parameter	s	0.12	0.12	0.15
Flatwise	$f_{m,0,flat,k}$	50.0	36.0	32.0
Tensile strength				
Parallel to grain	$f_{t,0,k}$	35.0	26.0	24.0
Perpendicular to grain, edgewise	$f_{t,90,edge,k}$	0.8	6.0	0.5
Compressive strength				
Parallel to grain	$f_{c,0,k}$	35.0	26.0	24.0
Perpendicular to grain, edgewise	$f_{c,90,edge,k}$	6.0	9.0	4.0
Perpendicular to grain, flatwise	$f_{c,90,flat,k}$	1.8	1.8	1.0
Shear strength				
Edgewise	$f_{v,0,edge,k}$	4.1	4.5	2.4
Flatwise	$f_{v,0,flat,k}$	2.3	1.3	1.3
Modulus of elasticity				
Parallel to grain	$E_{0,k}$	11600	8800	8800
Perpendicular to grain, edgewise	$E_{90,edge,k}$	350	2000	-
Perpendicular to grain, flatwise	$E_{90,flat,k}$	100	100	-
Shear modulus				
	$G_{0,k}$	400	400	300
Density				
	ρ_k	480	480	410
Mean values				
Modulus of elasticity				
Parallel to grain	$E_{0,mean}$	13800	10500	10000
Perpendicular to grain, edgewise	$E_{90,edge,mean}$	430	2400	-
Perpendicular to grain, flatwise	$E_{90,flat,mean}$	130	130	-
Shear modulus				
Edgewise	$G_{0,mean}$	600	600	400
Flatwise	$G_{0,mean}$	600	-	400

* VTT certificate No 184/03.

** VTT statement RTE2719/05

The design of Kerto shall be made according to the national building codes and local Kerto type approvals. Alternatively, the national application document of EC5 and the values above can be used as a design basis.

Physical properties

	Kerto-S	Kerto-Q	Kerto-T
Moisture content (when leaving the mill)	10 %	10 %	10 %
Dimensional variation coefficient *			
Thickness	0.0024	0.0024	0.0024
Width	0.0032	0.0003	0.0032
Length	0.0001	0.0001	0.0001
Density (kg/m ³)	510	510	440
Fire resistance, charring rate (mm/min.)	0,70	0,70	**
Reaction to fire	D-s1, d0	D-s1, d0	**

* Dimensional variation of cross-section due to moisture content (change of moisture content in % x dimensional variation coefficient x cross-section in mm)

** Design shall be made according to the national type approval.

General tolerances for Kerto products

Thickness	+1 /-2 mm
Height	+/- 1 mm
< 200 mm	+/- 2 mm
200..600 mm	+/- 0,5 %
> 600 mm	+/- 5 mm
Length	



FURTHER PROCESSING

Kerto can be processed before end use according to the customer's reason for use. The further processing service is a fundamental part of the customer service and supply chain. Processing can be done at the basic production, or service centres of certain countries, depending on competitiveness and economic efficiency from the customer's point of view.

VARIETY OF PROCESSING POSSIBILITIES

- SANDING: OPTICAL OR CALIBRATING
- TONG & GROOVE
- SPECIAL SAWING: BOTH STRAIGHT AND TAPERED SHAPES
- GLUING: RE-GLUING FOR INCREASED THICKNESSES
- COATING: VARNISHING OR PAINTING
- CNC MACHINING: DRILLING, END SLOPING, EDGE EASING, NOTCHING



EXCELLENT SERVICE

LOGISTICS

Finnforest provides all its customers with the most suitable, precisely-tailored and optimally cost-efficient delivery arrangement for their orders. Cooperation agreements between Finnforest and the best transport companies guarantee dependable and reliable services at all times.

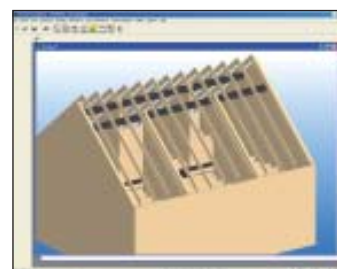
The cornerstone of Finnforest Corporation's efficient logistics services is our presence in all of the main markets. There is a subsidiary, a sales company or an agent in every country, in addition to distribution centres. In other markets, transport services are entrusted to topflight cooperation partners.

TECHNICAL SERVICES

Technical know-how of the floor and roof systems is provided by dedicated software. National support centres are located in Germany, France and the UK.

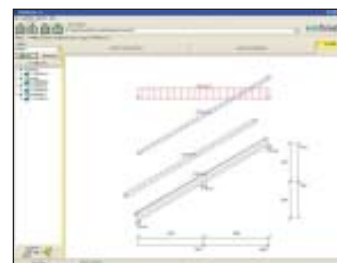
FINNFRAME

Finnframe creates timber framed floors or roofs out of Finnforest's building products. It includes complete construction drawings, details, materials, structural calculations and quotations. Finnframe is currently available in the UK, France, Germany and Finland. It has been adapted to national requirements: language, details, framing, products, design parameters, printouts and prices.



FINNWOOD

Finnwood is a general single member designing software to size, e.g. beams or columns. Finnwood can be used together with Finnframe, e.g. hole calculations, or also independently.



CERTIFIED QUALITY

Finnforest Kerto wood procurement has been certified according to the Pan-European Forest Certification (PEFC) standard, which indicates that the wood meets the requirements of sustainable forest management. Kerto production has also been granted the ISO 9001 quality certificate.



Finnforest Kerto is manufactured in two mills in Finland: Lohja and Punkaharju, with a total annual production capacity of 230 000 m³.



AVAILABLE GLOBALLY

AUSTRALIA

Tilling Timber Pty. Ltd, 31-45 Orchard St. Kilsyth, 3137 Victoria, Australia
tel. +61 3 9725 0222 fax. +61 3 9723 6757

AUSTRIA

Finnforest Österreich GesmbH, IZ-NÖ Süd, Str. 13, Obj. 47, A-2351 Wr. Neudorf, Austria
tel: +43 2236 62 640-0, fax: +43 2236 63 288

CHINA

Finnforest Corporation, Far East Int plaza Building B, Rm 701, No 317 Xiang Xia Road, Shanghai 200051 P.R.C, China
tel. +86 21 6235 1180, fax. +86 21 6235 0087

CZECH REPUBLIC

Finnforest CZ s.r.o., Skály 215, PO BOX 18, CZ 763 62 Tlumacôv, Czech Republic
tel. +420 577 100 011, fax. +420 577 100 023

DENMARK

Moelven Danmark A/S, Smedeland 3, 2600 Glostrup, Danmark
tel. +45 4343 4800, fax. +45 4343 6343

FRANCE

Finnforest France SAS, 7 rue de Fossé Blanc, Bâtiment F, F-92230 Gennevilliers, France
tel. +33 141 32 36 36, fax. +33 141 32 36 37

GERMANY

Finnforest Merk GmbH, Industriestrasse 2, 86551, Aichach, Germany
tel. +49 8251 9080, fax. +49 8251 6005

HUNGARY

Finnforest Magyarország Kft, Rozália Park 6, Biatorbágy 2051, Hungary
tel. +36 2353 0800, fax. +36 2331 2490

ICELAND

Joco L.M. Johansson EHF, Thorsgata 24, 101 Reykjavik, Iceland
tel. +354 562 2830, fax. +354 562 3223

ITALY

Finnforest Italia S.R.L, Viale Caldara, 20, 20122 Milano, Italy
tel. +39 02 5411 8571, fax. +39 02 5412 4028

JAPAN

Finnforest Nippon Co., Ltd., (WBG Marive East 20 F) 261-7120, 2-6, Nakase, Mihama-ku, Chiba-shi, Japan
tel. +81 43 299 3067, fax. +81 43 299 3068

NETHERLANDS

Finnforest Holland B.V., Kerkenbos 11-03 B, NL-6546, BC Nijmegen, Netherlands
tel. +31 2 4374 1444, fax. +31 2 4374 1440

NORWAY

Moelven Limtre AS, Box 143 2391, Moelv, Norge
tel. +47 06 123, fax. +47 6233 4001

POLAND

Finnforest Polska Sp. z o.o., ul. Mirkowska 45, 05-520 Konstancin-Jeziorna, Poland
tel. +48 22 754 8380, fax. +48 22 754 8381

SPAIN

Finnforest Ibérica S.L, Carrer de la Mina 25 1-1, 08190 Sant Cugat del Vallés BCN, Spain
tel. +34 93 675 6313, fax. +34 93 675 6314

SWEDEN

Moelven Töreboda AB, Box 49, 54521, Töreboda, Sweden
tel. +46 5064 8100, fax. +46 5061 6263

SWITZERLAND

Metsä Group Schweiz AG, Wiesenstr. 7-9, CH-8032, Zürich, Switzerland
tel. +41 1387 8044, fax. +41 1387 8045

UNITED KINGDOM

Finnforest UK Ltd., The Old Golf Course, Fishtoft Road, PE21 OBJ, Boston, Lincolnshire, United Kingdom
tel. +44 1205 362 461, fax. +44 1205 310 026

USA

Finnforest USA, P.O. Box 545, MI-48066-0545, Roseville, USA,
tel. +1 8006 225 850, fax. +1 5862 968 773

KERTO BUSINESS UNIT

Finnforest Corporation, P.O. Box 24, FI-08101 LOHJA, Finland
tel. +358 10 46 56499, fax. +358 10 46 56222

finnforest

Finnforest is the largest wood products industry corporation in Europe. With a turnover of EUR 2 billion and 8,000 employees it operates in over 20 countries. Finnforest, a core business of the Metsäliitto Group, offers wood-based product and service solutions to its customers in the construction, industrial, distribution and retailing segments. In Scandinavia, the operations are the responsibility of Moelven.

For more information:
www.finnforest.com
www.moelven.com

