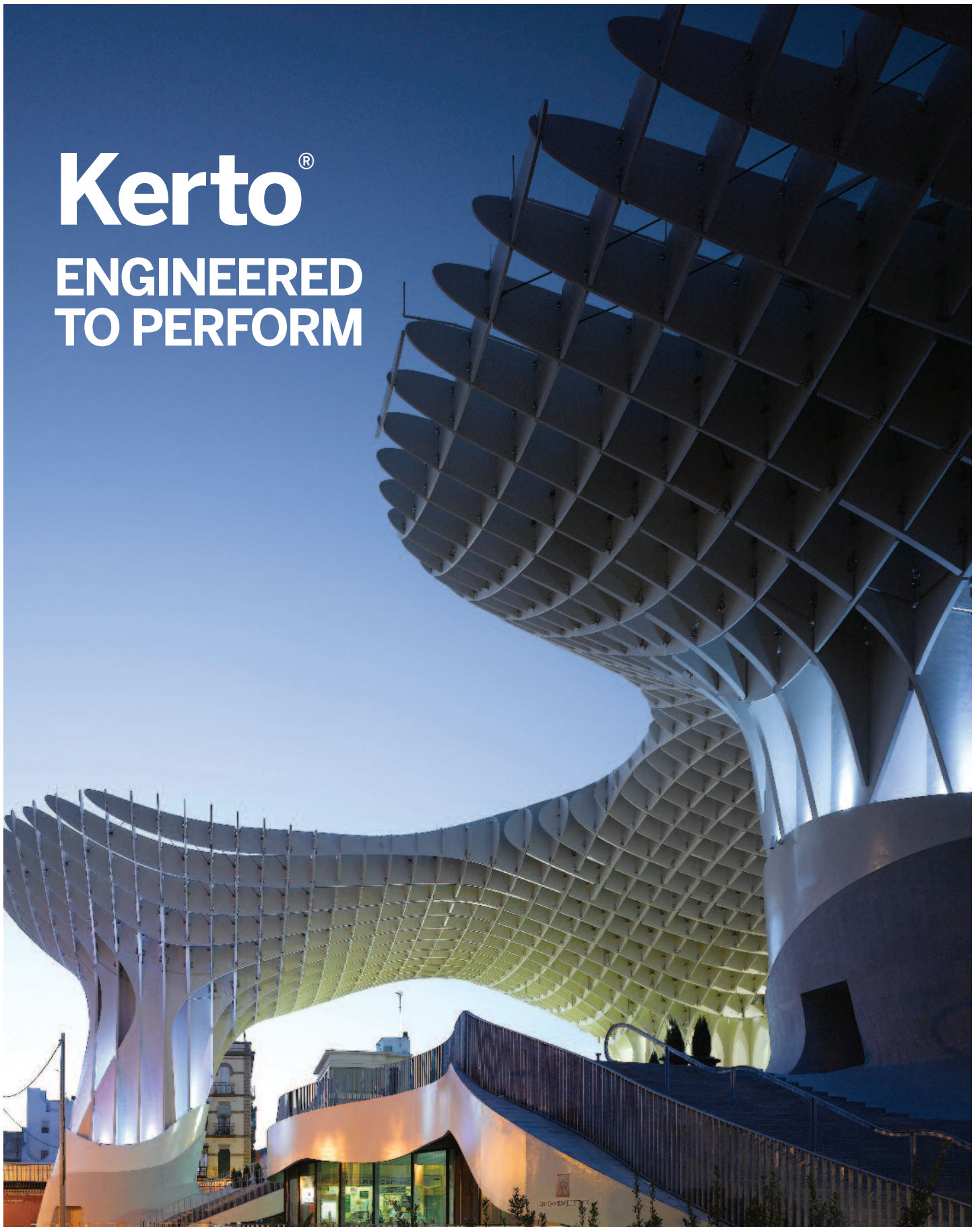


Kerto[®]

**ENGINEERED
TO PERFORM**



MetsäWood



ENGINEERED TO PERFORM

Kerto is a laminated veneer lumber (LVL) product used in all types of construction projects, from new buildings to renovation and repair. Kerto is incredibly strong and dimensionally stable, and it does not distort or shrink. It derives its high strength from the homogeneous bonded structure.

Kerto is produced from 3 mm thick, rotary-peeled softwood veneers that are glued together to form a continuous sheet. The sheet is cut to length and sawn into beams, planks or panels in the sizes that customers require.

Kerto products are CE marked and certified by VTT Technical Research Centre of Finland, no 184/03.

“ENVIRONMENTALLY FRIENDLY CONSTRUCTION MATERIALS”

Renewable and recyclable, wood is a highly eco-effective building material throughout its life cycle. Wood raw material comes from the sustainably managed and PEFC-certified Metsä Group's Finnish forests, ensuring that the origin of the raw material is traceable.

The manufacture of wood products consumes less energy and results in less carbon dioxide and other emissions than the manufacture of other building materials. In addition, wooden structures operate as carbon sinks. The manufacturing is mainly based on renewable energy, and the energy and material efficiency of the production processes is continuously being improved.

The products are lightweight, which means that transportation also has a small environmental impact.

EXAMPLES OF USE

- *Beams*
- *Joists*
- *Trusses*
- *Frames*
- *Components of floor, wall and roof elements*
- *Components for the door and vehicle industry*
- *Concrete formwork*
- *Scaffold boards*

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PEFC/16-37-006

Promoting sustainable
forest management
for more info: www.pefc.org



KERTO-S CREATES LONG SPANS

One of the notable features of Kerto S is that the wood grain runs longitudinally through all the 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 can also be specially cut and shaped as required.

Kerto S combines excellent technical performance with ease of use. Its essential qualities include strength, dimensional precision and stability. It is the ideal choice for beams whenever long spans and minimal deflections are required.

Kerto S beams are suitable for all roof shapes, also performing well as joists and lintels, in trussed constructions and frames. Kerto S is also a widely used material in the manufacture of prefabricated components.

Kerto's light weight is of great advantage in repair and renovation work. Erection and installation can be carried out by building contractors, without any heavy hoisting machinery, even in confined spaces. Kerto S can be coated, to blend in with the rest of the architecture, creating a harmonious aesthetic.

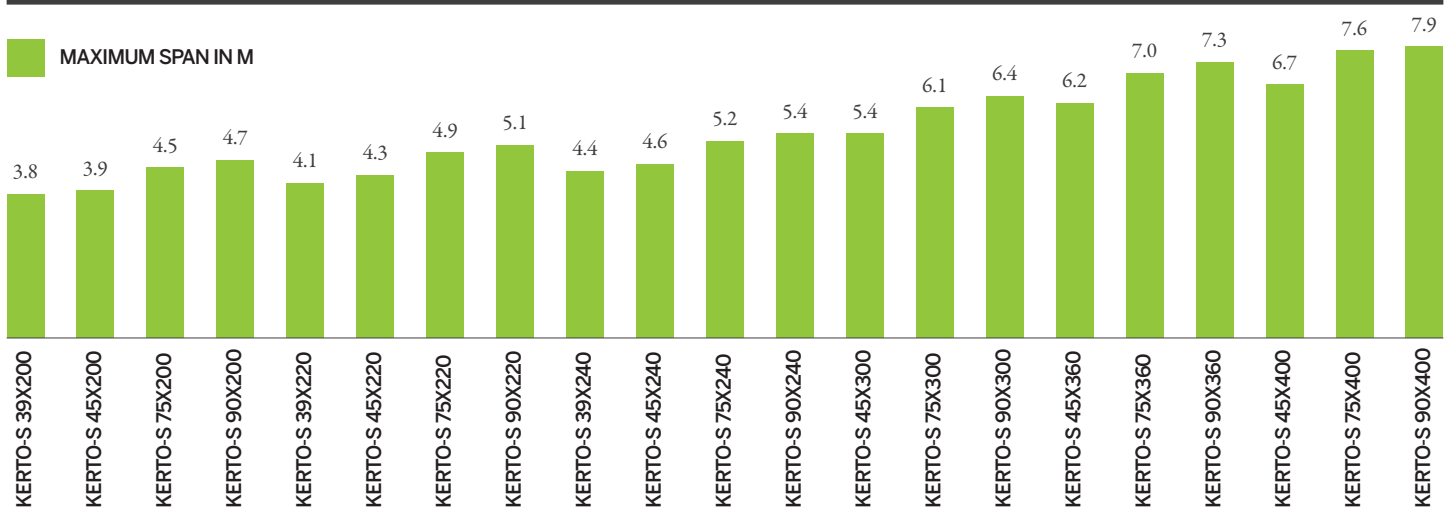
KERTO S: STANDARD SIZES

THICKNESS (MM)	HEIGHT (MM)					
	200	220	240	300	360	400
39	•	•	•	•		
45	•	•	•	•	•	
57		•	•	•		
75	•	•	•	•	•	•
90		•	•	•		

Other sizes available on request



MAXIMUM SPAN FOR KERTO USED AS JOISTS AT 600MM SPACING IN RESIDENTIAL FLOORS



Kerto assumed restrained against torsional buckling. Load 1.5kN live load and 0.75 dead load.
 Span is the design span between the centres of two supports.
 Calculation according to BS EN 1995-1 modifications factors are used for medium term and LVL
 The deflection limits are:
 $W_{fin} = l/250$
 $w_{inst} = l/333$ and 12mm

KERTO S PERMISSIBLE UNIFORM LOADS KN/M

SPAN (M)	DEPTH 200(MM)				DEPTH 220(MM)				DEPTH 240(MM)				DEPTH 300(MM)				DEPTH 360(MM)			DEPTH 400(MM)					
	WIDTH				WIDTH				WIDTH				WIDTH				WIDTH			WIDTH					
	39	45	75	90	39	45	57	75	90	39	45	57	75	90	39	45	57	75	90	45	75	90	45	75	90
3	2.78	3.21	5.35	6.42	3.63	4.19	5.31	6.98	8.38	4.62	5.33	6.75	8.88	10.65	8.41	9.70	12.29	16.17	19.41	13.08	21.81	26.17	15.07	25.11	30.13
3.5	1.80	2.07	3.45	4.14	2.35	2.72	3.44	4.53	5.43	3.01	3.47	4.40	5.79	6.95	5.57	6.43	8.14	10.72	12.86	10.45	17.41	20.89	12.28	20.46	24.55
4	1.22	0.89	0.98	1.11	0.49	0.38	0.35	0.63	0.76	0.43	0.49	0.45	0.82	0.98	0.60	0.94	0.87	1.57	1.88	1.59	2.64	3.17	2.14	3.56	4.27
4.5	0.87	0.89	1.48	2.00	1.15	1.17	1.49	1.96	2.35	1.31	1.51	1.91	2.52	3.02	2.47	2.85	3.61	4.75	5.70	4.73	7.88	9.46	6.30	10.50	12.60
5	0.64	0.59	0.98	1.47	0.84	0.78	0.99	1.30	1.56	0.87	1.00	1.27	1.67	2.00	1.65	1.90	2.41	3.17	3.81	3.18	5.30	6.36	4.26	7.10	8.51
5.5	0.48	0.40	0.67	1.11	0.64	0.54	0.68	0.89	1.07	0.60	0.69	0.87	1.15	1.38	1.14	1.32	1.67	2.20	2.63	2.21	3.69	4.43	2.97	4.96	5.95
6	0.37	0.29	0.48	0.86	0.49	0.38	0.48	0.63	0.76	0.43	0.49	0.62	0.82	0.98	0.81	0.94	1.19	1.57	1.88	1.59	2.64	3.17	2.14	3.56	4.27
6.5	0.29	0.21	0.35	0.68	0.39	0.28	0.35	0.46	0.55	0.31	0.36	0.45	0.60	0.72	0.60	0.69	0.87	1.15	1.38	1.16	1.94	2.33	1.57	2.62	3.15

The load combination as per BS EN 1990 domestic floors standard construction.
 Span is the design span between the centres of two supports.
 Calculation according to BS EN 1995-1 modifications factors are used for medium term and LVL.
 The deflection limits are:
 $W_{fin} = l/250$
 $w_{inst} = l/333$ and 12mm

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. 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.

Large sized Kerto Q is a popular material in floor and wall panels because it stabilizes the whole structure, and good fire resistance is achieved with a properly chosen thickness. Kerto Q panels are also appreciated for their natural beauty. Kerto Q provides a functional solution in structural components, also when a high shear strength is one of the requirements. Like all Kerto products, Kerto Q is known for its strength, straightness and incredible dimensional stability.

Kerto Q is available in the same standard widths as Kerto S. Additionally, the widths of 900, 1200, 1800 and 2500 mm are available.

The thickness range is 27- 69 mm in steps of 6 mm.



KERTO S: STANDARD SIZES

THICKNESS (MM)	DEPTH/WIDTH (MM)					
	200	220	240	300	360	400
27		•	•	•		
30		•	•	•		
33	•	•	•	•	•	
39	○	○	○	○	○	
45	○	○	○	○	○	
51	○	○	○	○	○	○
57	○	○	○	○	○	○
63	○	○	○	○	○	○
69	○	○	○	○	○	○

- **Standard**

Standard maximum length is 12m. Kerto can be delivered as sanded product. The quality of the finish needs to be specified.

- **Available on request as a special order.**

Production capacity is max width 2.5m and length 25m. Kerto can be delivered as sanded product. The quality of the finish needs to be specified.

KERTO Q: VENEER STRUCTURE

THICKNESS (MM)	Z QTY	X QTY	VENEER STRUCTURE
27	7	2	II-III-II
33	9	2	II-III-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-III-II
63	16	5	II-III-III-III-II
69	18	5	II-III-III-III-II

Z = veneer running longitudinally to main panel direction |

X = veneer running crosswise to main panel direction -



KERTO® FOR INDUSTRIAL APPLICATIONS



APPLICATIONS

Because of its strength, straightness and incredible dimensional stability, Kerto is an excellent material to use in a wide variety of industrial applications.

- *Flooring and roofing panels for the construction industry*
- *Components for the pre-fab housing industry*
- *Door frames*
- *Composite windows*
- *Floor, wall and roof battens*
- *Scaffolding boards*
- *Concrete formwork*
- *Vehicle industry*
- *Stair stringers*



KERTO® AT A GLANCE

DESIGN VALUES [N/MM²] AND PHYSICAL PROPERTIES

PROPERTY	SYMBOL	KERTO-S 1) 21-90 MM	KERTO-Q 1) 27-69 MM
BENDING STRENGTH			
Edgewise	$f_{m,0,edge,k}$	44.0	32.0
Size effective parameter	s	0.12	0.12
Flatwise, parallel to grain	$f_{m,0,flat,k}$	50.0	36.0
Flatwise, perpendicular to grain	$f_{m,90,flat,k}$	-	8.0
TENSION STRENGTH			
Parallel to the grain	$f_{t,0,k}$	35.0	26.0
Perpendicular to the grain edgewise	$f_{t,90,edge,k}$	0.8	6.0
COMPRESSION STRENGTH			
Parallel to the grain	$f_{c,0,k}$	35.0	26.0
Perpendicular to the grain edgewise	$f_{c,90,edge,k}$	6.0	9.0
Perpendicular to the grain flatwise	$f_{c,90,flat,k}$	1.8	2.2
SHEAR STRENGTH			
Edgewise	$f_{v,0,edge,k}$	4.1	4.5
Parallel to grain, flatwise	$f_{v,0,flat,k}$	2.3	1.3
Perpendicular to grain, flatwise	$f_{v,90,flat,k}$	-	0.6
MODULUS OF ELASTICITY			
Parallel to grain	$E_{0,mean}$	13,800	10,500
Compression, perpendicular to grain edgewise	$E_{c,90,edge,mean}$	430	2,400
Compression, perpendicular to grain, flatwise	$E_{c,90,flat,mean}$	130	130
Bending, perpendicular to grain of surface veneer	$E_{m,90,mean}$	-	2,000
SHEAR MODULUS			
Edgewise	$G_{0,edge,mean}$	600	600
Flatwise, parallel to grain	$G_{0,flat,mean}$	600	120
DENSITY, KG/M³			
	ρ_k	480	480
Moisture content (when leaving the mill)		10 %	10 %
DIMENSIONAL VARIATION CO-EFFICIENT 3)			
Thickness		0.0024	0.0024
Width/height		0.0032	0.0003
Length		0.0001	0.0001
Average density (kg/m ³)		510	510
Fire resistance, charring rate (mm/min.)		$\beta_n = 0.70$	$\beta_n = 0.70$
Reaction to fire		D-s1,d0	D-s1, d0
1) VTT certificate 184/03			
2) Dimensional variation of cross-section due to moisture content (change of moisture content in % x dimensional variation co-efficient x cross-section in mm)			

TOLERANCES OF KERTO PRODUCTS

DIMENSION	SIZE, MM	TOLERANCE, MM OR %
Thickness	all standards	+ (0,8+0,03 t) mm and -(0,4+0,03 t) mm 51-75 mm max. ± 2 mm
Width	< 400 >400	± 2 mm ± 0,5 %
Length	All	± 5,0 mm

t is the thickness. Special tolerances available on request.

FURTHER PROCESSING

Kerto can be further processed in many different ways according to its end-use and the customer's particular wishes. The further processing service is an integral part of the customer service and supply chain.



TYPES OF FURTHER PROCESSING

Further processing takes place at the production plant or at a service centre in a particular country, whichever is more competitive and economically efficient for the customer.

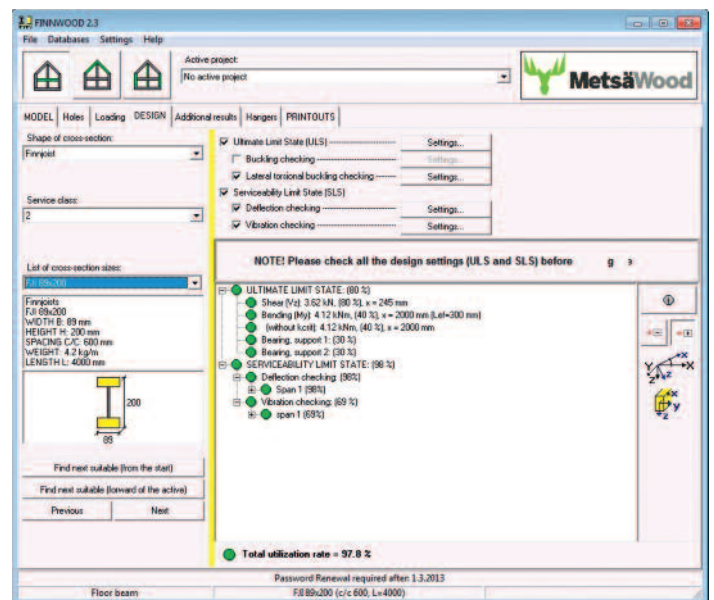
- *Sanding: optical or calibrating*
- *Profiling of the beam edge, e.g. tonguing and grooving*
- *Special sawing: both straight and tapered shapes*
- *Gluing: re-gluing for increased thicknesses*
- *CNC machining: drilling, end sloping, edge easing, notching*
- *Build-up, e.g. box slabs and roof trusses*
- *Protective treatments, e.g. against mould*

FINNWOOD SOFTWARE

Individual structures made of Kerto and other Metsä Wood building products can be calculated with Finnwood software.

The user-friendly interface makes designing structural members such as floor joists and roof beams fast and effective. Finnwood designs according to Eurocode 5, and its national annexes.

Finnwood software can be obtained free of charge, visit metsawood.co.uk for details



INSPIRATIONAL IDEAS



Cafeteria of Jean-Baptiste Corot school in Savigny-sur-Orge, France



Base ball stadium, Kuopio, Finland



Kindergarden and school Leskenlehti, Helsinki, Finland



Martin Nadaud gymnasium, Saint Pierre des Corps, France

The versatility of Kerto makes it an ideal material for the modern construction industry. Examples of innovative uses have been gathered from around the world during the thirty-year heritage of Kerto. Kerto was awarded the Schweighofer Prize, Europe's top innovation prize in 2007.

Find out more from our website:
metsawood.co.uk

“AN IDEAL
CONSTRUCTION
MATERIAL”

For more information visit www.metsawood.co.uk or call our technical team on 01205 883 835.

Metsä Wood is a wood products company delivering service-oriented solutions developed in collaboration with its customers. Its premium solutions are based on ecological, high quality Nordic wood as a raw material.

Wood is the only building material that is truly renewable, if well managed. Forest certification schemes give assurance that the timber is legal and from sustainable sources. Metsä Wood sources certified timber over uncertified and is an approved Chain of Custody supplier.

MW0029 Mar 12.

The photographs in this brochure are for illustration purposes only.

Metsä Wood reserves the right to change the range without notice.

Every effort has been made to ensure that colours are accurate within the limitations of natural lighting conditions and the four colour printing process.

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