VMG LIGNUM

VMG LIGNUM LVL BROCHURE

AU & NZ VERSION

CONTENT

ABOUT THE COMPANY

VMG LIGNUM COMPANIES SPECIALIZE IN THE PRODUCTION AND SUPPLY OF SUSTAINABLE ENGINEERED WOOD PRODUCTS FOR CONSTRUCTION.

VMG LIGNUM provides a unique opportunity to obtain three different products from a single source: LVL (laminated veneer lumber), I-joist and structural particle boards (P4-P7). All our high-quality engineered wood products are manufactured in Lithuania and can be ordered directly from our production centre in Naujoji Akmene. VMG LIGNUM develops a building system of prefabricated components for new-build construction projects, as well as renovation using engineered wood products. VMG LIGNUM also offers an extensive range of versatile building design, structural modelling, and consulting services.

PRODUCTION CAPABILITIES:

VMG LIGNUM JOIST
15 million m/year

VMG LIGNUM LVL
120,000 m³/year

VMG LIGNUM BOARD
200,000 m³/year

WE PROVIDE ADAPTABLE SOLUTIONS FOR COOPERATION:

- Technical guidance throughout the production process
- Manufacturing of products in accordance with the specified dimensions
- Certified products that meet international quality requirements
- Production in small, medium and ultra-large volumes
- A comprehensive quality control procedure in our laboratory
- On-time delivery to the desired country and continent

VMG LVL

Laminated veneer lumber (LVL) is an engineered wood product. Its production uses rotary-made veneers with a thickness of 2.5–4 mm. VMG Lignum LVL produced from pine veneers.

In order to glue veneers, adhesives resistant to outdoor conditions are used, the emissions of which are restricted by high ecological requirements, corresponding to Class 1 for load-bearing timber structures according to the standard EN 301:2006.

LVL demonstrates characteristics of a homogeneous material. It is widely applicable to various structures, ranging from new to renovated/reconstructed buildings. LVL can be used for:

wall structures (panels, posts, frames, lintels)

roof structures (rafters, panels, consoles)

floor structures (beams, panels)

interior products (stairs, doors, furniture)

scaffolding

concrete formwork

bridges

engineering and infrastructure structures (e.g. wind power plants or mobile antenna towers)

LVL is one of the most stable and strongest wood products. LVL is easy to process: drill, cut, mill, etc. It is also easy to combine with other wood products.

FIRE RESISTANCE OF LVL

VMG LIGNUM LVL, like other wood products, is classified as a flammable material. However, with the appropriate selection of properties, it can be fire resistant*

When burning, laminated veneer lumber chars, which protects and insulates the LVL structure, thus slowing down the burning process.

The fire resistance of LVL is better than that of sawn timber because the charring rate of LVL is lower. The flammability class of additionally

non-protected LVL is D-s2,d0. The fire resistance and flammability class indicators of LVL can

be improved by the use of additional covering. The fire resistance of VMG LIGNUM LVL can be calculated according to the AS/NZS 2098 and its national annexes.

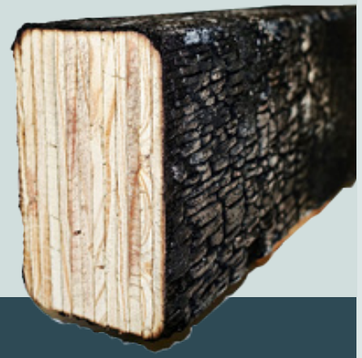


Fig. 1 Charred LVL beam

*Fire resistance means the ability of a building structure or element (construction product) to withstand the specified loads and/or thermal-insulating properties and/or remain unaffected (tight, free of cracks) for a period of time determined by a standard fire resistance test.

PRODUCTION OF LVL

Fig. 2 Production process

In the production of LVL, logs with suitable parameters are first selected. Then they are debarked, soaked and peeled. The obtained veneer sheets are cut, sorted according to moisture content, dried, and then graded according to strength class. The sorted sheets are coated with glue, layered and pressed with a cold press and then with a hot press. The obtained raw LVL panels are cut into products with the required dimensions.

The finished products are packed and shipped to the customer. During the entire process, continuous quality control is carried out, which allows ensuring the high quality of each product and compliance with the relevant requirements.

Where required, products can be processed with CNC machines, i.e. milled, drilled, etc.

COMPARISON OF BEAMS WHEN THE SPAN IS 7 m

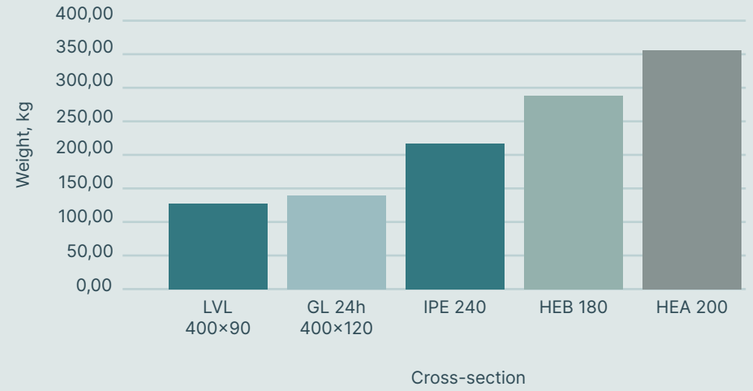


Fig. 2 Comparison of LVL beams with steel profile cross-sections (when the span is 7 m, continuous load is 2 kN/m, variable load is 3kN/m, and self-weight is estimated)

STRENGTH TO WEIGHT (DENSITY) RATIO

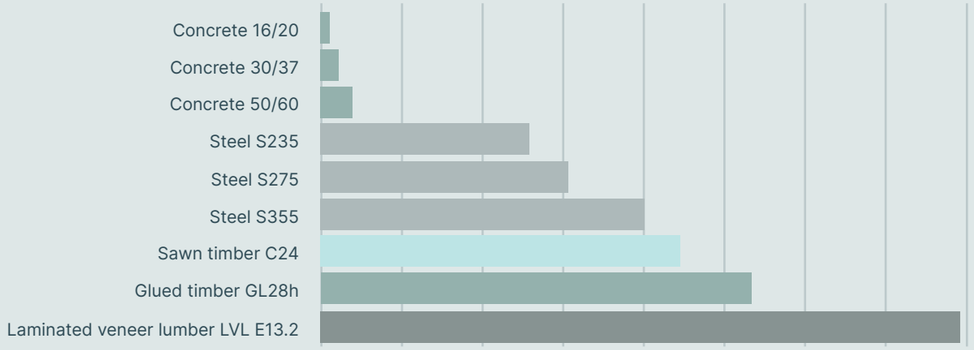


Fig. 3 Strength to weight (density) ratio

In order to demonstrate the advantage of wood over steel, preliminary calculations were made under the same conditions. On Fig. 3, we see that when a 7 m span is spanned with LVL beams, they will weigh less than steel profile beams. This is because the density of wood is about 15 times lower than that of steel.

On Fig. 3, we see how the strength-to-density ratio of materials changes. The higher the strength-to-density ratio, the stronger and lighter the material. As we see from Fig. 3, LVL structures lighter than steel structures will be required to withstand the same loads.

Calculation example:

Strength-to-density ratio of LVL:

$$\frac{f}{\rho} = \frac{35}{5{,}1} = 6863$$

Where f is the compressive strength of LVL [MPa], and ρ is the characteristic density of LVL [kN/m^3]

Strength-to-density ratio of steel:

$$\frac{f}{\rho} = \frac{275}{77} = 3572$$

Where f is the compressive strength of steel [MPa], and ρ is the characteristic density of steel [kN/m^3]

APPLICATIONS OF VMG LIGNUM LVL PRODUCTS

In the construction of individual houses, LVL can be used in the following structures:

① Stud (VMG LIGNUM LVL P)
② Roof beam/rafter (VMG LIGNUM LVL P)
③ Floor joist (VMG LIGNUM LVL P)
④ Ridge beam (VMG LIGNUM LVL P)
⑤ Ceiling supporting beam (VMG LIGNUM LVL P)
⑥ Lintel (VMG LIGNUM LVL P)
⑦ Wall and window beam (VMG LIGNUM LVL P)
⑧ Parapet frame (VMG LIGNUM LVL P)

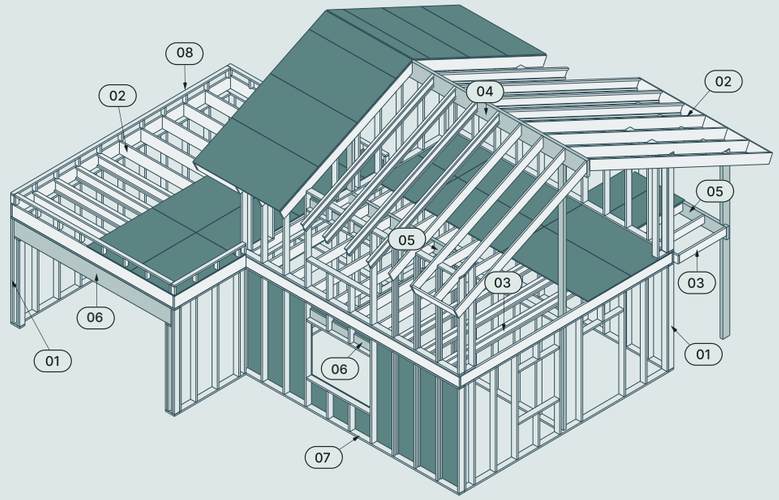


Fig. 4 Use of LVL in an individual house

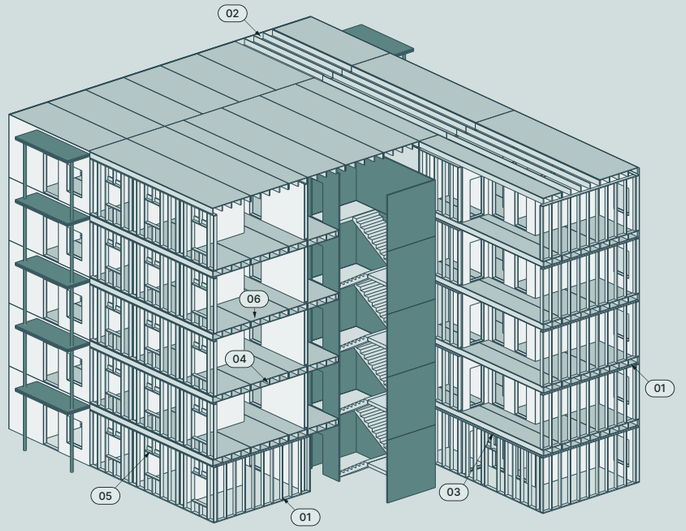


Fig. 5 Use of LVL in a high-rise building

In the construction of multi-apartment buildings, LVL can be used in the following structures:

① Stud (VMG LIGNUM LVL P)
② Roof rafter (VMG LIGNUM LVL P)
③ Ceiling framing beam (VMG LIGNUM LVL P)
④ Combined closed ceiling panel (VMG LIGNUM LVL P)
⑤ Lintel (VMG LINGUM LVL P)
⑥ Combined open ceiling panel (VMG LIGNUM LVL P)

In an industrial, storage, sports and similar building, LVL can be used as:

① Portal frame (VMG LIGNUM LVL P)
② Roof truss and its elements (VMG LIGNUM LVL P)
③ Columns (VMG LINGUM LVL)
④ Strip for one or more spans (VMG LIGNUM LVL P)
⑤ Lintel (VMG LIGNUM LVL P)
⑥ Horizontal wall beam (VMG LIGNUM LVL P)

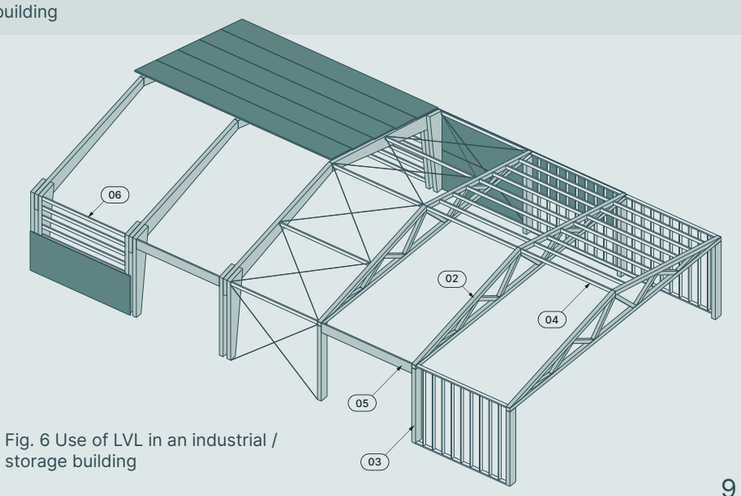
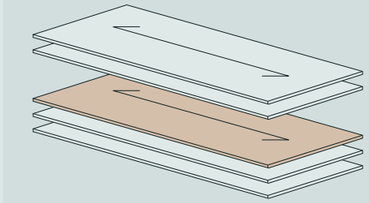


Fig. 6 Use of LVL in an industrial / storage building

VMG LIGNUM LVL

All VMG LIGNUM LVL products for the Australian market are made with veneers glued in parallel.

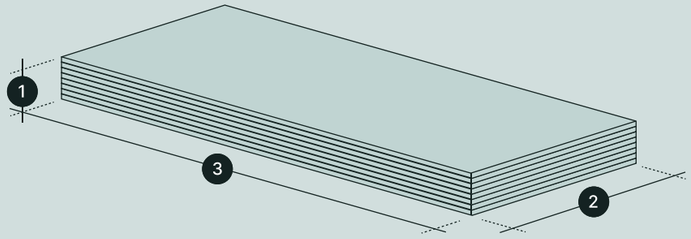
Panels and beams made of VMG LIGNUM LVL P are effectively used owing to their height-to-thickness ratio. VMG LIGNUM LVL P can be used both vertically and horizontally. The produced panel is cut into products of standard dimensions. Where required, they can be cut according to the dimensions ordered by the customer.



VMG LIGNUM LVL P advantages:

- Easy to process
- Dimensional stability (no twists, cracks or splinters)
- Homogeneous properties of the material
- Moisture content 8-15%
- Easy to combine with other prod
- Can also be used for large spans
- Effective use of the material
- Renewable organic raw material of natural origin
- Variety of dimensions (large dimensions)

SIZES AND ARRANGEMENT OF LAYERS



1. Thickness
2. Width
3. Length 2500 – 18000 mm

Table 1. VMG LIGNUM LVL E10

Thickness mm	Width mm	Number of veneers	Layering
35	90-300	12	
45	90-300	15	

Table 2. VMG LIGNUM LVL P E13.2

Thickness mm	Width mm	Number of veneers	Layering
35	90-140	12	
45	90-400	15	
63	95-400	21	

PROCESSING

VMG LIGNUM LVL standard processing

Processing	Description
Coating	Can be coated
Anti-termite treatment	Only into the glue, no for the surface
Sanding	The surface is sanded, the edges are not
Other cuts	Cut to size by request

Where necessary, the products can be additionally processed by optical or calibration sanding. Optical sanding reduces the thickness of the product by about 2 mm (1 mm per surface). Calibration sanding is another possible sanding method. It can reduce the thickness of the product by about 3 mm (1.5 mm per side of the surface), and the thickness tolerance (deviation) after calibration is ± 0.5 mm. Calibration sanding is not recommended for surfaces that will be visible because it may reveal the dark glue line.

IMPREGNATION AND OTHER COATING METHODS

The customer can choose to cover the LVL surface in various ways by painting or coating them in accordance with the instructions and recommendations of the coating suppliers. The structural properties of LVL will not be affected by these types of surface coating.

The customer can use the following coating methods:

- protection against moisture, which ensures greater resistance to the temporary effects of weather conditions during storage and transportation as well as at the construction site;
- anti-mold treatment reduces the risk of mold and blue stains and is recommended for use in the structures of attics and sheds as well as roofs;
- coating with fire-resistant materials improves the fire resistance of LVL products;

TECHNICAL SPECIFICATION

TABLE OF STRENGTHS

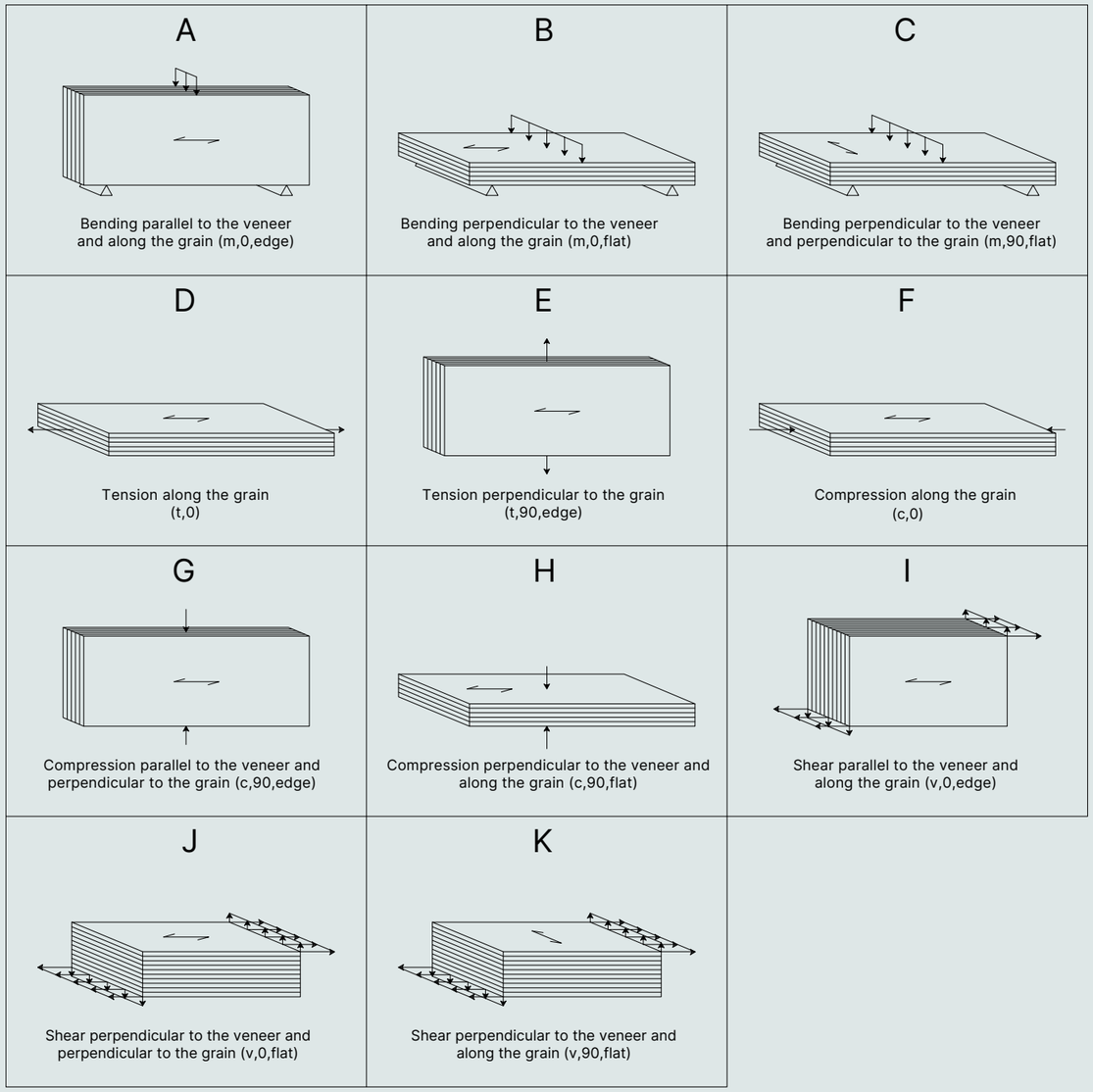


Fig. 7 Strength and stiffness orientations

Table 3. Characteristic and mean values of VMG LIGNUM LVL P used in design

	Value	Symbol	Figure	Unit of measure	E10	E13.2
Bending strength	Edgewise, parallel to grain (depth 150 mm)	f_b	A	N/mm²	30	53,7
	Flatwise, parallel to grain	$f_{b,flat}$	B	N/mm²	35	52,8
Tension strength	Parallel to grain (length 13,5d) [for AU d = 95 mm]	f_t	D	N/mm²	23	43,6
Compression strength	Parallel to grain for service class 1	f_c	F	N/mm²	30	39,2
Shear strength	Edgewise parallel to grain	$f_{v,edge}$	I	N/mm²	3,2	5,15
	Flatwise, parallel to grain	$f_{v,flat}$	J	N/mm²	2,3	3,25
Modulus of elasticity	Parallel to grain	$E_{mean\ flatwise}$	B	N/mm²	10 300	13 680
	Parallel to grain	$E_{,mean\ edgewise}$	A	N/mm²	10 300	13 930
Density		ρ_{mean}	-	kg/m³	510	610
Bearing strength	Perpendicular, edgewise	$f_{p,edge}$	G	N/mm²	11	11,9
	Perpendicular, flatwise	$f_{p,flat}$	H	N/mm²	5,5	5,82

** The starred positions are still to be determined.
MDV - manufacturer's declared value

TOLERANCE TABLE

The thickness, width and length of VMG LIGNUM LVL are measured according to the standard AS/NZS 4357.0:2022, at the actual humidity.
The permitted tolerances for VMG LIGNUM LVL are indicated in Table 4 and are applicable when the humidity of the beams is 10 ± 2%.

Table 4. Maximum deviations permitted for VMG LIGNUM LVL beams*

	Nominal value	Maximum deviations
Thickness *t*	*35 mm ≤ t ≤ 63 mm*	+4, -0 mm
Width *b*	*b ≤ 400 mm*	+2, -0 mm
	b > 400 mm	+5, -0 mm
Length *l*	*2,5 ≤ l ≤18 m*	+10, -0 mm
Maximum deviation from the correct cross-section angle		1:50

* The maximum permissible deviations from the nominal values and nominal angles; non-ground and non-impregnated and non-painted beams are evaluated according to AS/NZS 4357.0:2022.

	Spring & Bow	Squaresness	Twist
Straightness	1 mm in 1000 mm	1 mm in 100 mm	$\frac{\text{Length (mm) x Width (mm)}}{3500 \text{ Thickness (mm)}}$

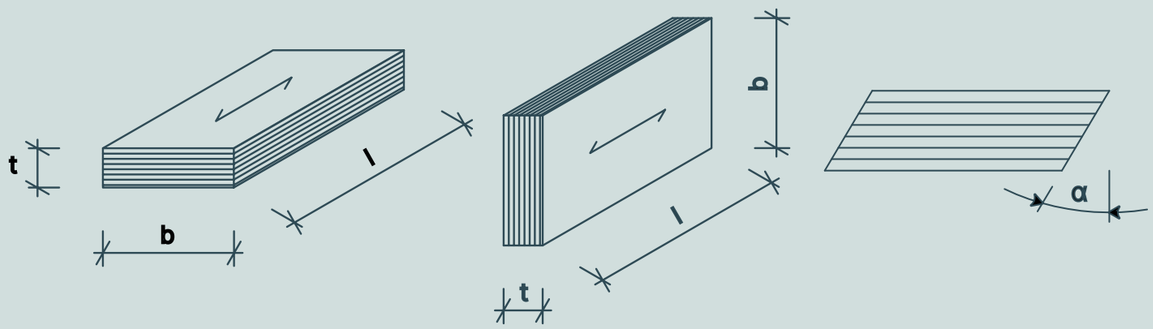


Fig. 8 Dimensions of VMG LIGNUM LVL (b – width, l – length, t – thickness, α – angle). The arrow shows the direction of the upper layer fibre.

STORAGE AND TRANSPORTATION

Each delivery packaging bears the number and dimensions of the products and the delivery address or order number.

The plastic packaging is only intended to protect the products during shipment and does not provide sufficient weather protection. The bottom of each package must always be open to allow for the free circulation of air and evaporation of moisture.

If the products are stored in the same place for more than a week, the packages must be covered with an additional protective coating, but ensuring that the packages will “breathe”. During storage, it is necessary to regularly monitor the condition of the product and the protective film in order to avoid direct damage.

Under no circumstances can VMG LIGNUM LVL be stored in direct contact with the ground.

VMG LIGNUM LVL products can be stored on the construction site only temporarily. In this case, a firm, straight and dry platform must be used. The height of the ground-mounted supports must be at least 30 cm.

During the transportation and storage of the product, direct exposure to moisture, such as rain or water splashes, must be avoided.

When lifting several packages at the same time, the distance between the forks must be sufficiently wide to ensure safe lifting.

The legs/supports of the packages must be vertically aligned so that the product does not twist or crack. There must be the appropriate number of supports of the suitable size, and they must be evenly distributed along the entire length of the package.

INSTALLATION RECOMMENDATIONS

VMG LIGNUM LVL products must be used with care in order to protect them from damage and dirt.

When installing and using VMG LIGNUM LVL products, the general instructions for wooden structures must be observed. VMG LIGNUM LVL products can be processed using common woodworking tools. When using standard woodworking tools and machines, make sure to wear appropriate PPE (personal protective equipment).

1. As with wood products, the colour of these products may change as a result of exposure to light.
2. As with coniferous wood, mould formation is possible if there is an increased amount of moisture. In this case, the mould must be removed immediately by sanding or coating with appropriate chemicals.
3. When coating the surface, it is necessary to follow the rules and regulations of the surface coating manufacturer.
4. After use, VMG LIGNUM LVL products must be disposed of in accordance with national regulations and directives. The products can usually be reused or recycled, composted or burned to produce energy.
5. For composting, the LVL must be shredded, and a long composting process must also be taken into account.
6. The products can also be landfilled, although LVL degrades very slowly.

PACKAGING FORMATS

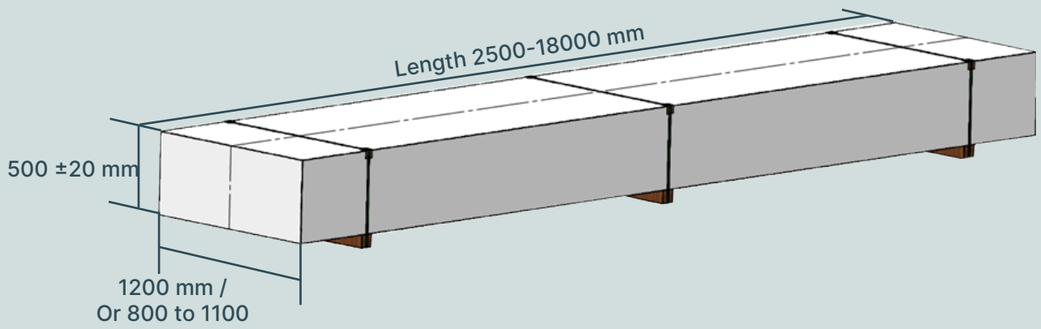


Fig. 9 VMG LIGNUM LVL standard packaging

VMG LIGNUM

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