Poland as one of the biggest producers of EWP in Europe

Polen als einer der grössten Hersteller von Holzwerkstoffen in Europa

La Pologne compte parmi les plus importants acteurs du matériau bois en Europe

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What are EWP's ?

Engineered Wood Products are a combination of small pieces of wood elements (fibres) that create together larger high strength structural elements or components. The modern and innovative eco-production processes of EWP's make possible the more efficient use of raw wood, even pieces that have defects or underutilized species. EWP's are designed and manufactured to maximize the natural strength and stiffness characteristics of wood. The products are very stable and offer mostly better structural strength than typical wood building materials. These products are available in a wide variety of thicknesses, sizes, grades, and exposure durability classifications, making the finished elements ideal for use in unlimited construction, industrial and home project application.

EWP's are well-know and being produced all over the world. Currently one of the biggest producers of EWP's in Europe is Poland, no doubt about it.

Except for traditional products such as oriented strand board, plywood or fibreboard, Poland in particular is offering interesting solutions for modern energy-efficient building: **I-joist**, **Laminated Veneer Lumber** and **Multi Function Panel.**

1. I-joists

I-joists with LVL-wood flange and web from structural hardboard or OSB. Photos: STEICO

An I-joist, known also as engineered wood joist or I-beam is a product designed to eliminate problems that occur with conventional wood joists (e.g. deflection). The I-joist is an engineered wood product that has great strength in relation to its size and weight. The biggest notable difference from dimensional lumber is that the I-joist carries heavy loads with less lumber than a dimensional solid wood joist. An I-joist has two main parts: the web and flange. The web is sandwiched between a top and bottom flange, creating the characteristic "I" shape. The flange of I-joists produced in Poland can be made from laminated veneer lumber (pine / spruce veneers) or soft wood. The web of the strongest I-joist from Poland is made from structural fibreboard, jointed along to the length with a V-groove profile and with water-resistant glue by pressing the web into the top and bottom flange – this solution is offering very high shear capacity. Polish manufacturers offer the webs in form of oriented strand boards also (OSB 3 or OSB 4).

1.1. Production plants of I-joists

In Poland the I-joists are produced in three modern factories: STEICO (plant in Czarnków), Kronopol (plant in Żary) and Dudek Group (plant in Kotórz Mały). The biggest production capacity and the widest variety of sizes is offered by STEICO plant in Czarnków: approximately 9 000 000 rm of I-joists per year (production capacity based on 2016). The production at STEICO factory in Czarnków creates more than 85% share of the polish I-beams market.

Manufactories of I-joists in Poland

The preparation and manufacturing processes of the flanges, the webs and the application of durable adhesives are carried out using the latest automated assembly lines. To guarantee a consistently high quality of polish I-beams, both internal and external parties control the production process. All I-joists made in Poland obtain a European technical certificate and are stamped with CE-logo.

The modern production and quality control process of I-joists in manufactory STEICO in Czarnków

1.2. Areas of application

Engineered I-joists are used as structural components on floor, roof and wall applications, in residential and commercial construction. Carefully selected components used in the flange and web create a high quality engineered solution for all of the application's areas, designed to reduce movement and other issues associated with traditional solid timber constructions. Thanks to engineered properties I-beams are dimensionally stable, avoiding the need for mid span blocking to be installed and reducing the risk of nail popping in plasterboard caused by timber shrinkage.

I-joists: secondary beams in floor construction. Photo: Hebeldom / STEICO

I-joists: service holes made in the middle of the web. Photo: Szreder A.C.

I-joists: rafters in roof construction. I-joists support on ridge beam made from *LVL R* Photo: Aleksandra Knychas / STEICO

Pre-insulated I-joists: connection at eaves using variable pitch seat connector Simpson VPA. Photo: Szreder A.C.

I-joists: as wall studs by modular houses production process. Photo: Rebel Module

I-joists: as wall studs by the pre-fabrication of energy efficient wall panels. Photo: Ekoinbud

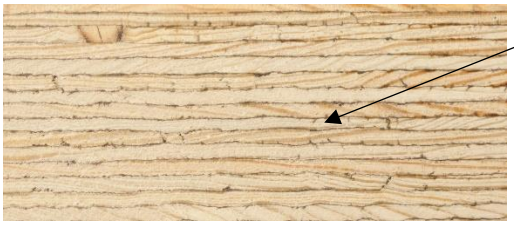
1.3. Practical points / main advantages of I-joists

- reduction of thermal bridging (app. 40% comparing to dry solid timber elements)
- easy installation of services thanks to possibility of mechanical holes making in the webs
- high dimensional stability through controlled moisture content (app. 10-12%)
- strict manufacturing tolerances
- lightweight, easy to handle and install (app. 50% lighter compared to dry solid wood)
- high load bearing capacity
- manufactured to standard depths and widths to match industry standards
- available preinsulated to form a solid cross section for ease of installation

2. Laminated Veneer Lumber (LVL)

Laminated Veneer Lumber *LVL R*. Photo: STEICO

Laminated veneer lumber (LVL) is an engineered wood product made of multiple graded layers of thin wood assembled with adhesives. The defects that occur in each single veneer sheet are randomized troughout the product during the assembly or "lay-up" process.This disperses knots and irregular growth, producing a practically homogeneous cross section. LVL is typically used for headers, beams, rimboards, and edge-forming material. Made in a factory under controlled specifications, it is stronger, straighter, and more uniform. Due to its composite nature, it is much less likely than conventional lumber to warp, twist, bow, or shrink. Currently LVL is defined as one of the most rigid engineered wood product in the world.



The multiple layers of 3mm laminated spruce and pine veneers. Photo: STEICO

The declared mechanical values of LVL produced in Poland confirm the high quality. For example, the vertical bending strength is 44 N/mm² and the characteristic flat bending strength is 50 N/mm². This means that the bending strength is twice that of normal C 24 and much higher comparing to BSH. The compression strength is an impressive 40 N/mm², and the modulus of elasticity has an average of 14.000 N/mm². This means in: slender structural elements, less materials and reduced costs.

2.1. Production plant of LVL

In Poland LVL is produced in one manufactory: STEICO plant in Czarna Woda. STEICO LVL is made from softwood - app. 90% pine and 10% spruce. The Polish LVL's factory (founded in 2015) is at the moment the most innovative production line of this kind of engineered elements in Europe. The production line allows a large variety of formats:

- elements up to 18m long
- elements up to 2.5m wide
- thickness rage from 21 till 90mm

The production capacity is approximately 80 000 m3 of LVL per year (production capacity is about 60 000 m3 in year 2016). In result of the currently investment in Czarna Woda the production capacity in 2018 should grow up to app. **180 000 m3** LVL per year. Additionally in 2017 plant Czarna Woda will start to produce the new EWP based on LVL elements - glulam.

Manufactories of I-joists in Poland

The preparation and manufacturing processes of LVL are performed using the latest automated assembly lines. To guarantee the high quality of Polish LVL, both internal and external parties control the production process. LVL made in Poland has the CE-mark.

The modern production and quality control process of LVL in manufactory STEICO in Czarna Woda

2.2. Areas of application

Laminated veneer lumber is a versatile wood-based product. Together with other EWP's like I-joists, oriented strand board (OSB) or multi-functional panel (MFP), LVL can be used for many structural applications. In Poland two basic types of laminated veneer lumber are being produced: *LVL R* and *LVL X*.

LVL R with all veneers laid in the same direction, delivering a powerful engineered timber product for rectangular cross sections: flanges for I-joists, joists, beams, rafters, studs, dawn nad top plates, purlins, ridge, window and door lintels, main beams, various elements in industrial applications etc.

LVL X with app. one-fifth of the veneers glued crosswise, improving the lateral bending strength and stiffness of the board. *LVL X* guarantees high dimensional stability and it is suitable if high compression strength is required: e.g. rimboard, structural board etc.

LVL R: secondary beams in floor construction. Photo: STEICO

LVL R and LVL X: pre-fabricated floor elements. Photo: STEICO

LVL R: primary beam in floor construction. Photo: STEICO

LVL X: rimboard in floor construction. Photo: STEICO

LVL R: ridge beam in roof construction. Photo: Genero

LVL R: top plates in walls construction. Photo: STEICO

2.3. Practical points / main advantages of LVL

- one of the strongest wood-based construction materials relative to its density
- exceptional dimensional stability through controlled moisture content (app. 9%) more durable and less prone to shrinking or warping comparing to solid timber
- strict manufacturing tolerances
- high connection capacity and fixing withdrawal strength
- the wood resource can be optimised by grading and selecting veneer for different parts of a LVL cross section and making a range of products with different properties
- one of the most efficient using of timber resources
- reduction of thermal bridging (app. 30-50% comparing to dry solid timber elements)
- easily cut and machined using traditional tools
- swelling coefficient = 0,03% per 1 % moisture change

3. MFP

MFP. Photo: Pfleiderer

Construction chipboard MFP is a wood-based board - multi-functional, widely applied in construction industry and finishing and decoration works. Thanks to manufacturing under constant quality control the boards are free of defects, loose knots or twisted fibers. The unique, uniform structure achieved in a special technological process increases the board resistance to deformation, makes cutting easier, minimises edge fraying, allows to precisely drill openings and stabilises mounting of screws, staples and nails. MFP is highly durable - it does not bend or break under loads that materials used for wall and floor finishing can be exposed to. It has no weak points, it is uniformly resistant to loads in every part (up to 20 MPa).

Solid structure of MFP boards results in the fact that it is more water resistant than other building boards. Its swelling coefficient is only 10% and is more advantageous than traditional OSB board (15%). It allows for example to use it for kitchen and bathroom, floors, balcony structures, terraces, on roofings.

The product is homogenous in its construction, it can be put together with any side and any edge up, which makes its application economical and helps to avoid producing excessive waste. Larger sheets can be used for roof or wall constructions, while smaller ones – for minor finishing works. Moreover, the cutted elements can be used for the small parts of the surface – such as a lucarne or along the eavesdormers.

3.1. Production plant of MFP

In Poland MFP boards are produced in one manufactory: Pfleiderer plant in Wieruszów. The polish MFP's production line was founded in 2010. The production allows follow formats:

- size 1250x2500mm
- thickness 10, 12, 15, 18, 22mm

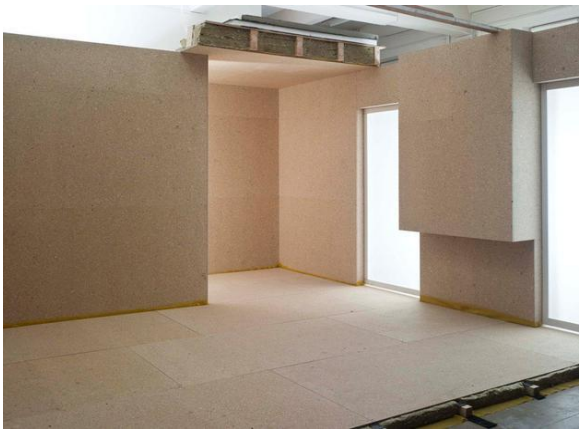
Manufactory of MFP boards in Poland

The manufacturing processes of MFP is carried out using the latest automated assembly lines. MFP made in Poland carries the CE-mark.

3.2. Areas of application

MFP boards are used as structural and decorative components on the floor, roof and wall applications, in residential and commercial construction, mostly as:

- floor covering
- ceiling covering
- roofing
- exterior walls covering
- partition walls overlay
- eco houses - for detached wooden houses and holiday homes using skeleton construction technology
- interior finishing
- furniture making - material for construction of furniture in wet places e.g. bathroom furniture
- constructions for shops and market places
- packaging
- functional structures



MFP bards as walls and floors covering

MFP boards as roofing

MFP boards as ceiling covering

MFP formwork boards

3.3. Practical points / main advantages of MFP boards

- **moisture resistance** (swelling index 10%): in comparison with other building materials, construction board MFP does not deform permanently under the influence of moisture and tolerates wet conditions better. It can be used in bathrooms, balconies and roof casings. Located in the living room or bedroom, it provides a unique microclimate and dry walls and floor
- **fire resistance** (flammability class D-s1,d0): increased resistance to fire is one of the most important advantages of the construction board MFP. In the production process is used exclusively highly pressed shavings and fire-retardant glue, so the board can be successfully used in the construction of roofs and attics. This is the highest class of wood-based material (wood) that can be obtained without special additives
- **strength** (bending strength up to 20 MPA): MFP board makes it possible to cope with transverse and longitudinal loads. The board can be use for the decoration of walls and floor, it is also ideal to hang a heavy shelf, cabinet with tools, or a bookcase