MORE FROM WOOD.

EGGER

BUILDING WITH WOOD

NATURAL, SUSTAINABLE AND RELIABLE – WOOD CONSTRUCTION WITH EGGER MATERIALS

www.egger.com

“Wood teaches me to work with precision and to look for straightforward solutions.”

Hermann Kaufmann, architect

CONTENTS

Construction of lasting value

Wood construction is based on a wealth of experience and uses modern technology

Wood is a natural and high-tech product. Building with wood has a long tradition through the ages and also has a place in the future as well. No building material is more sustainable, hardly any means of construction is more energy-efficient, faster or reliable. Thanks to its technical characteristics, modern wood construction effortlessly meets **today's thermal insulation requirements**.
The building material creates a pleasant living atmosphere. This helps explain why wood construction is so popular in Scandinavia, Central Europe and increasingly so in Eastern European countries such as the Czech Republic and Slovakia. Next to time and cost savings, the reasons include the high degree of prefabrication and dry construction in addition to the outstanding insulating properties of wood. For example, the thermal insulation performance of 6,5 cm of coniferous wood is equal to that of 40 cm of solid brick. Furthermore, wood construction components have a high load-bearing capacity with a relatively low net weight. This makes walls constructed from wood thinner, to provide a noticeable **gain in usable space** on the interior.

EGGER wood-based materials and solid structural wood were used in the award-winning construction of the Tirol house.

Wood represents a natural and healthy living environment. Modern wood construction systems also meet all contemporary requirements for energy efficiency and optimised room air quality. With one of the oldest construction materials in the world, the builder has access to a wealth of experience and can choose from numerous proven styles and systems.

Renewable *resources*

The construction material that grows outside your door

Wood has a higher load-bearing capacity than steel. And producing a component made of solid structural wood or wood-based materials consumes a fraction of the energy that would have to be invested in the production of a steel girder with the same weight. The **carbon footprint** of wood construction is correspondingly smaller. In fact, wood takes CO_2 out of the atmosphere and stores it as carbon. 1 m³ of OSB board binds 864 kg of CO_2.* After the material usage phase, wood can be used thermally and transformed into energy. Provided the resources are used responsibly, this renewable raw material will always be available in sufficient quantities.

* Calculated from the 02/2010 EGGER EPDs based on GWP 100 production.

Log wood is processed directly into solid structural wood, OSB and DHF.

ORIGINS OF WOOD

Around 300 years ago, forestry introduced the principle of sustainability in order to maintain the foundation for its own existence: “Only harvest as much wood as the forest is able to sustain.” This is a top priority for EGGER.

This is why EGGER, even for raw materials with origins that are not certified for sustainable management, excludes wood that 1. has been harvested illegally, 2. comes from regions where traditional or civil basic rights are violated, 3. comes from non-certified forests with a high protection value or 4. comes from genetically modified trees.

We keep transportation routes short and procure wood from the regions around our plants in order to protect the environment. EGGER therefore prefers wood with FSC and PEFC-certified origins where it is available.

Resource conservation requires using it according to the cycle of materials principle. For example, EGGER uses log wood where this is essential for the quality of the products: for solid structural wood and OSB. We process sawmill by-products into chipboard and fibreboard. Biomass that cannot be used in materials is used to generate energy in our own production plants.

A strong *partner*

EGGER produces OSB boards on highly modern equipment in Wismar (D) and Radauti (RO).

Reliable service and established know-how guarantee quality in wood construction

Modern wood-based materials combined with proven calculation models makes wood the construction material of the future. The leading companies in manufacturing wood-based materials, such as EGGER, are driving innovations. EGGER regularly has the performance of its products measured and confirmed by external test institutes. In doing so, we are on the cutting edge of important trends in the industry. For example, all EGGER products met the declaration obligations for environmental compatibility according to the new Construction Product Regulations (BauPV), before they became binding for the Europe-wide approval of new construction products in July 2013. The EPDs for EGGER products meet the requirements of the new EN 15804 standard. We have an interest in networking with architects and fabricators, construction companies and builders in order to drive innovation and shape a sustainable wood construction culture. This is also why we view **service and the exchange of knowledge** as important elements of our product development process.
We are always working on expanding our distribution network, as well as the high quality of our products and consulting services. As a partner of fabricators, EGGER also promotes knowledge of wood construction through information materials and regular workshops.

EGGER believes in building with wood. In order to jointly drive innovations and build a sustainable wood construction culture, our employees in addition to a worldwide distribution network will advise you in your purchasing and planning. Cooperation through partnership is in the best interests of EGGER.

Wood construction expertise

Versatile use of EGGER wood-based materials

Single-family dwellings, kindergartens, hotels and more – as the reference projects that follow illustrate, EGGER wood-based materials are found in all types of **modern wood constructed buildings**.

A FAMILY HOME

Due to the healthy room climate, the optimum use of floor space and the short construction period, the Troppmann family in Upper Austria decided on wood-based materials for the construction and interior design of their home. EGGER OSB and DHF were used in the vapour permeable wall and ceiling construction of the award-winning project. The highest sound and fire protection requirements were met with the interior design.

MODEL HOME

For the “Modelhome 2020” project by VELUX in Pressbaum near Vienna, the architects Hein-Troy designed Austria’s first CO_2-neutral single-family dwelling. The energy used in the construction of the “Sunlighthouse” is offset by the home’s photovoltaic and solar-thermal systems within 30 years. The builders emphasised sustainability through the choice of materials.

DAY-CARE

A day-care with adjacent residential buildings and a demanding energy concept, in the course of just six months – in order to realise this project in Wismar (D), architect Martin Wollensak chose wood frame structural elements made of EGGER OSB and DHF. He also used the materials for sheathing on the roof. Parts of the interior walls were designed by the architect in OSB boards and were left visibly exposed.

OFFICE BLOCK

The architect Bruno Moser previously demonstrated how to build with EGGER wood-based materials at the plant in Radauti (RO). His administration building was awarded the gold certificate by the "Österreichische Gesellschaft für Nachhaltige Immobilienwirtschaft" (ÖGNI) (German Association for Sustainable Construction) according to the award procedures of the "Deutsche Gesellschaft für Nachhaltiges Bauen" (DGNB) (German Association for Sustainable Construction). EGGER built the TechCenter in Unterradlberg (AT) and the Forum in Brilon (D), which is shown in the photo, using the same construction method. The format and size of the buildings are based on the dimensions of EGGER OSB. Moser designed the walls and ceilings made of OSB boards, gluelam and solid structural wood.

PASSIVE HOUSES

The Naumann & Stahr engineering office from Leipzig designed a wood frame supporting structure with highly efficient thermal insulation for seven houses in Weißenfels (D). The houses constructed in a period of just five months meet the passive house standard. Wall panels made of EGGER OSB are positioned between the double-T wood girders arranged in a grid. They were nailed between the inner walls. In the vapour permeable structure, the OSB boards serve as a vapour barrier and an airtight layer in addition to reinforcement.

HOTEL

A total of 2000 m² of EGGER OSB was used by the planners at Tatanka Ideenvertriebs GmbH to construct Hotel Arlmont in St. Anton (AT) in a natural setting. On the wooden ceilings, the architects positioned the material as a decorative accent. OSB formwork gave the concrete surface a distinctive texture.

The right *material*

High quality standards: OSB boards in the cooling star rotating unit at the EGGER plant.

Moisture-resistant OSB/3 is the proven multipurpose wood construction board

Long, thin chips called strands significantly increase the load-bearing capacity of OSB board compared to conventional chipboard. EGGER prepares the strands for the core layer and surface layers of the OSB board seperately, in order to obtain optimum technical properties thanks to the specific strand geometry. The visually appealing, **highly resilient and dimensionally stable material** is suitable as a load-bearing and reinforcing element in a roof, wall or ceiling. Tailored to the application, the EN 300 European product standard differentiates between the following OSB board types: OSB/2, OSB/3 and OSB/4. Low-emission glue according to the E1 standard is used for EGGER OSB boards so that they can be installed openly in interior rooms.

In vapour permeable construction, using materials that allow vapour to pass through such as vapour permeable wood fibreboard (DHF) is recommended.

EGGER BUILDING PRODUCTS

OSB boards are specialised for specific application possibilities depending on the usage class. Here moisture resistance plays a decisive role.
For example, OSB/2 is designed for load-bearing applications in dry conditions. The environmentally friendly EGGER OSB 3 is a multipurpose board, and therefore the right choice for virtually all wall, ceiling and roof construction solutions. It can also be used for load-bearing applications in humid conditions. More inherently stable than OSB/2, it does not expand as much in response to humidity. EGGER OSB 3 is available in a board thickness of 6 to 25 mm with tongue and groove on two or four sides. From the plant in Wismar, we also offer EGGER OSB 4 TOP in board thicknesses of up to 40 mm for elevated static requirements.

Wood construction with EGGER OSB and EGGER DHF can be dimensioned and carried out on the basis of the following standards:

- EGGER OSB 3: CE marking according to EN 13986.
- EGGER OSB 4 TOP: CE marking according to EN 13986 and general building authority approval Z-9.1-566.
- EGGER DHF: CE marking according to EN 13986/ EN 622-5 and general building authority approval Z-9.1-454.

OSB technology is a success story. EGGER produces the boards in a wide range of formats, thicknesses and qualities.

EGGER sawn timber meets the strict requirements for European standards. Vapour permeable EGGER DHF is available with straight edges and with tongue and groove.

DHF AND SOLID STRUCTURAL WOOD MATERIALS

With today's construction methods the air-tight, well insulated building shell exchanges moisture with its surroundings. Therefore it is best to use vapour permeable wood fibreboard with moisture-resistant glue (DHF) for roof and wall cladding. EGGER DHF is produced on the latest ContiRoll lines. We use a moisture-resistant, 100 percent formaldehyde-free PU resin as the binding agent. The fresh wood fibres that are used are by-products from sawn timber production. EGGER also offers a broad range of high quality solid structural wood. It comes from local forests.

10 fundamentals of wood construction

While there are special features to building with wood, the process is straightforward

There are certain technical elements involved in a wood construction project compared to mineral-based building materials. The most important principles can literally be counted on your fingers. Ten points are crucial for the **high and reliable quality** of a wood construction project.

1 THERMAL INSULATION

The thermal conductivity of wood is low which means it has good natural insulating properties. Wood structures with good insulation can therefore reduce the demand for heating to a minimum. Thermal bridging has to be largely excluded in order to accomplish this. This also reduces the risk of moisture accumulating on cold surfaces of structural components. A professionally built wooden structure also protects against the heat of summer. Here controlled ventilation not only establishes a pleasant room climate and high air quality but, with the airtight building shell of today's structures, is essential to avoid excessive moisture.

2 MOISTURE PROTECTION

Structures suffer from ongoing exposure to moisture. This is why structural wood construction elements such as the supporting framework and sheathing made of wood-based material boards require effective protection. But chemical wood preservation is not required here. The environmental impact and health risks also advise against this. Wood is better protected through structural solutions and vapour permeable construction. Even during the construction phase, wooden components largely have to be protected against moisture in order to avoid damage.

3 FIRE PROTECTION

When a builder chooses wood construction, proof of adequate fire protection often plays a major role. The requirements are regulated by the national Construction Product Regulations (CPR/BauPV). EGGER has had the reaction to fire of its products determined and certified in accordance with the applicable standards. With careful planning and the use of the right products, wood construction meets the common requirements. The classification can be improved with specific treatment.

4 SOUND PROTECTION

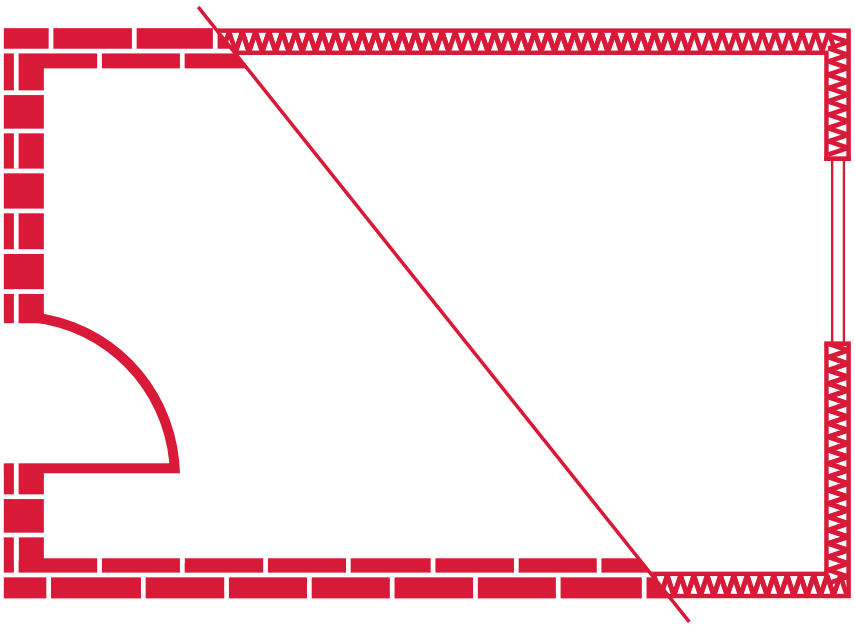
Wood construction offers good sound protection. The combination of decoupled components and additional loading delivers results that are at least equivalent to solid construction. Proper execution not only takes into account the direct sound transmission of a component, but also the transmission paths of the adjacent building elements. Special attention has to be paid to the joints and feedthroughs. This is where taking care pays off: Rework to correct sound protection defects is elaborate and expensive.

5 ROOM CLIMATE

There is good reason that the room climate in wood construction buildings is perceived as pleasant. A room with wood sheathing is proven to have a particularly consistent temperature range. Furthermore, wood naturally maintains a relative humidity that is perceived as very comfortable: Wood has an absorbing effect when the proportion of water vapour in the air increases, and releases moisture when the air gets dry. This is also why it should only be treated with vapour permeable coatings, waxes and oils.

6 TIME SAVINGS

In contrast to a concrete and masonry structure, a wooden house is built using dry construction. Drying time is therefore largely eliminated. Furthermore, the degree of prefabrication for the supplied structural elements is very high. A family home can be assembled to a rain-proof state in a day. It is wind and waterproof once it is constructed. A pleasant side effect of fast-paced construction: Costs are easier to control and the building is ready for occupancy sooner.



7 ADDED SPACE

New building regulations to reduce energy consumption are becoming stricter. The demands from builders are also increasing for the thermal insulation of a building. With solid construction, low U-values can only be achieved by means of high wall thicknesses. This reduces the amount of living space as well as the incidence of light through window openings. The advantage of slim wood construction comes to bear here. For example, a brick wall with thermal insulation has to be one-third thicker than an insulated wall in wood frame construction in order to achieve the same U-value. With an exterior wall length of 40 metres, wood construction therefore gains 5,6 m^2 of additional living space per storey.

8 PROCESSING

Processing and handling the environmentally friendly, lightweight and competitively priced wood materials is straightforward. EGGER OSB boards can be sawn, milled and drilled like sawn timber using conventional wood processing machines. A slightly lower infeed rate has to be selected. EGGER OSB features low thickness swelling and high dimensional stability, and can be installed with all fasteners suitable for chipboard such as screws, cleats and nails. The crosswise orientation of the strands ensures a firm fit, even on the outside edge of the board.

9 EARTHQUAKE SAFETY

As a proportion of its net weight, wood bears 14 times as much weight as concrete and is as resistant to pressure as steel-reinforced concrete. Therefore wood construction is excellent for earthquake safety. This is confirmed by experiences and construction traditions in seismically active regions of the world, such as the centuries-old wooden houses in Istanbul, wood construction buildings in Japan and multi-storey housing complexes in Seattle. In order to utilise the good vibration behaviour and ductile joints of the individual elements for earthquake safety, the building does however have to be planned and carried out with diligence.

10 SAFETY

In addition to the national building regulations in the countries, numerous European standards establish the performance required for wood-based materials in regards to reaction to fire, moisture, strength, cold and sound. If the builder only uses proven products that have also been tested and certified according to strict standards, the risk of defects is drastically reduced. EGGER materials meet all of the required standards.

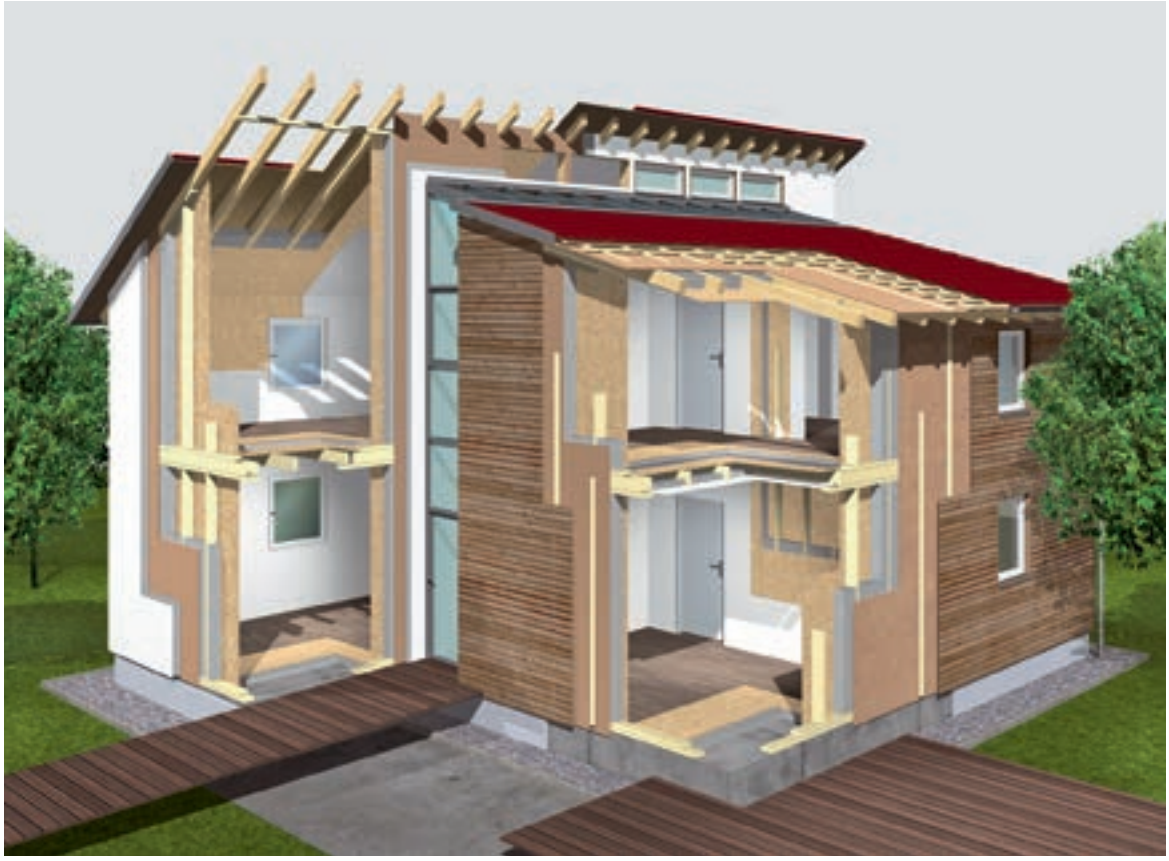
FURTHER INFORMATION

- Also read our tips and processing instructions starting on page 26.
- Definitions and standards are explained in the glossary in the appendix to this brochure.
- The fundamentals of wood construction are also shared in our EGGER Innovative work-shops. For further information, please visit **www.egger.com**.

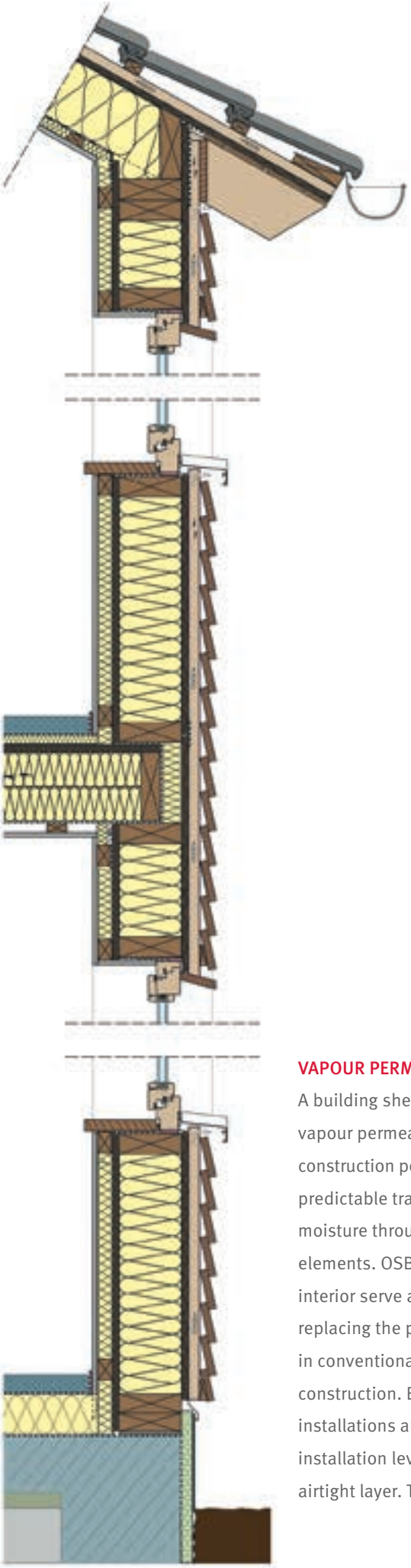
Structures in *wood frame construction*

Vapour permeable construction is increasingly proving itself in wood construction

Many European regions have their own traditions for wood frame construction. Vapour permeable construction began to assert itself in Central Europe at the beginning of the 1990s. This ecological and **high-quality solution** is now widespread. The benefit of vapour permeable wood frame construction is that the walls and roof are wind-proof but open to water vapour. They are airtight but not vapour-proof. Interior load-bearing wood-based material sheathing is used in the structure for this purpose, serving as a vapour barrier and at the same time acting as reinforcement and ensuring the required air tightness. EGGER is convinced of the benefits of vapour permeable construction, and considers increased safety and the robustness of the structure to be the best arguments in favour of this approach. On the pages that follow, we present the construction of the roof, ceiling, exterior walls and interior walls in detail. We also identify alternative solutions.

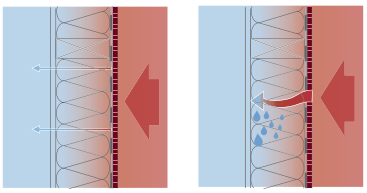


Modern wood frame construction: Vapour permeable construction meets the high requirements for thermal insulation as well as sound and fire protection.



PRINCIPLE

In vapour permeable construction, materials that act as a vapour barrier are used on the inside of the building while the materials towards the outside are as vapour permeable as possible. The house has to be wind-proof on the outside and airtight on the inside. Convection of warm interior air in the building shell must be prevented.



Diffusion Convection

VAPOUR PERMEABLE WOOD FRAME CONSTRUCTION

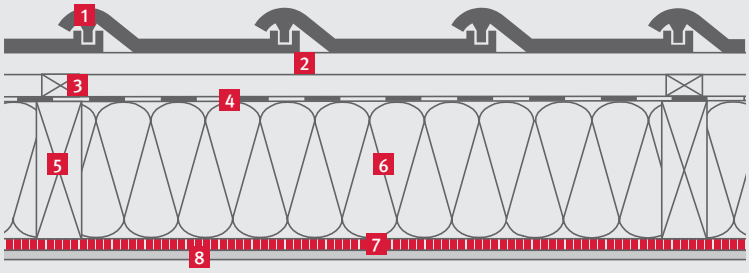
A building shell constructed using vapour permeable wood frame construction permits the controlled, predictable transportation of moisture through the building elements. OSB boards on the interior serve as a vapour barrier, replacing the plastic film used in conventional wood frame construction. Building services installations are located in one installation level in front of the airtight layer. This reduces the risk of interior air penetrating the structure. A moisture-repellent, vapour permeable sheathing of wood-based material boards or films is applied as well.
A ventilated facade protects the underlay boards or sheeting against precipitation. Both conventional insulation and cellulose or wood fibres can be used as thermal insulation without any problems.

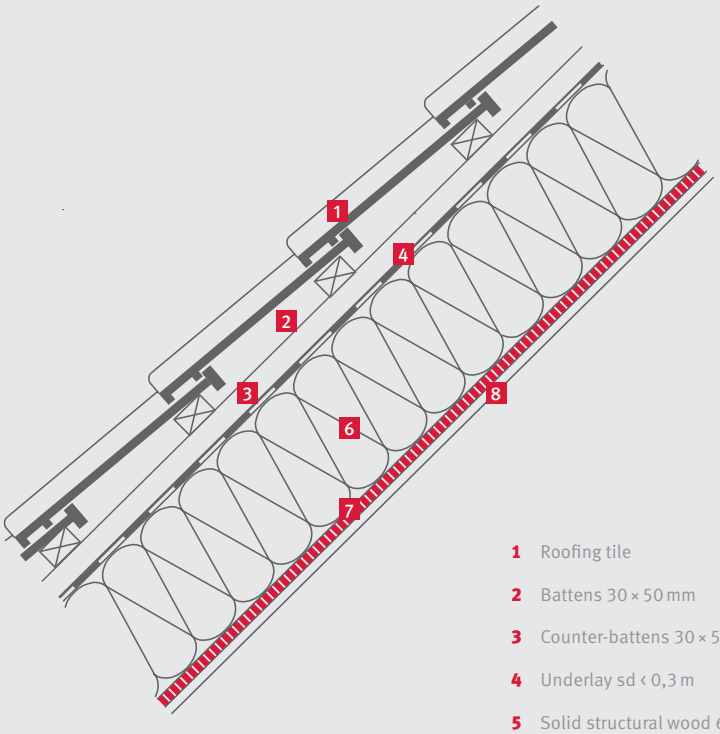
Graphics: Informationsdienst HOLZ "Holzrahmenbau" 2008, source: Ludger Dederich

Roof

vapour permeable ventilated roof without installation level

The benefits of vapour permeable construction are revealed in several ways. For example, a roof using this technique offers good structural protection of the wood and guards against moisture, making it particularly durable. A ventilated structure supports a broad selection of roofing materials for architectural design.





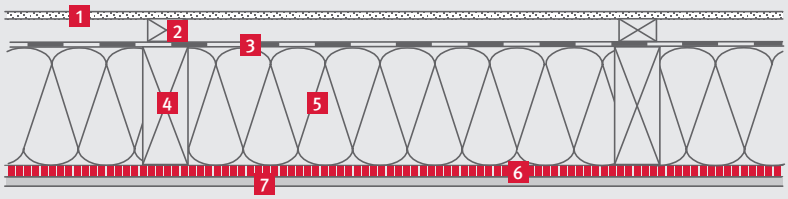
1 Roofing tile
2 Battens 30 × 50 mm
3 Counter-battens 30 × 50 mm
4 Underlay sd < 0,3 m
5 Solid structural wood 60 × 180 mm, $a_r \leq 83$ cm
6 Thermal insulation 180 mm
7 EGGER OSB 3 15 mm
8 Drywall 12,5 mm

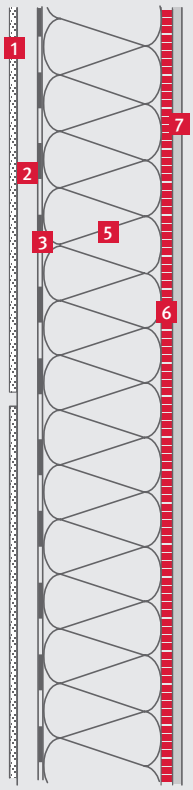
ALTERNATIVES

Another way to construct a roof in wood frame construction is to use vapour permeable wood fibreboard as an alternative to the underlay (4). EGGER DHF for example assumes the role of the underlay and, in addition, offers greater stability and the puncture resistance required in the construction phase.
In addition to the underlay (4), EGGER OSB 3 can also be used to assure puncture resistance. However, the structure is no longer vapour permeable in this case. This requires even greater attention to carefully construct the airtight interior layer. An additional vapour barrier film is required, with airtight interior seals using suitable adhesive tape.

Vapour permeable exterior wall
with ventilated facade, without installation level

Vapour permeable construction with a ventilated facade is an effective way to achieve good thermal insulation with a wood frame construction wall. This structure is very robust. Summer heat protection is improved with the ventilated facade. This also opens up many different possibilities for sheathing the exterior wall.





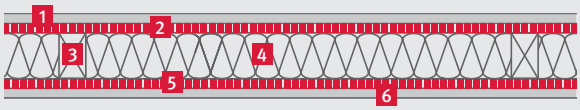
1 Ventilated facade
2 Battens 30 × 50 mm
3 Vapour permeable facade membrane sd < 0,3 m
4 Solid structural wood 60 × 160 mm, a_r = 62,5 cm
5 Thermal insulation 160 mm
6 EGGER OSB 3 15 mm
7 Drywall 12,5 mm

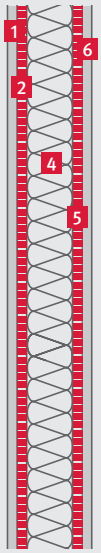
ALTERNATIVES

As an alternative to a wind-proof, vapour permeable facade membrane (3), vapour permeable wood fibreboard can be used on the exterior wall. EGGER DHF for example also acts as reinforcement for the building. The benefit of controlled water vapour transportation is retained at the same time. In place of the facade membrane (3), EGGER OSB 3 can also be used in combination with a thermal insulation composite system. This does however make the structure less vapour permeable. Careful construction of the airtight layer on the inside requires greater attention. An additional vapour barrier film is required, with airtight interior seals using suitable adhesive tape.

Non-load-bearing interior
wall with normal sound protection

An interior wall can be easily constructed with OSB boards. The structure is straightforward, cost-effective and has proven itself in residential construction for many years. To avoid sound transmission, special care must be taken with the joints and feedthroughs.
With OSB sheathing, additional hollow wall anchors are not required for mounting shelves and cabinets.





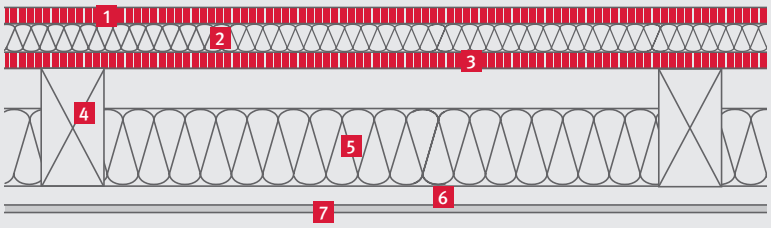
1 Drywall 12,5 mm
2 EGGER OSB 3 12 mm
3 Solid structural wood 40 × 60 mm, a_r = 62,5 cm
4 Thermal insulation 60 mm
5 EGGER OSB 3 12 mm
6 Drywall 12,5 mm

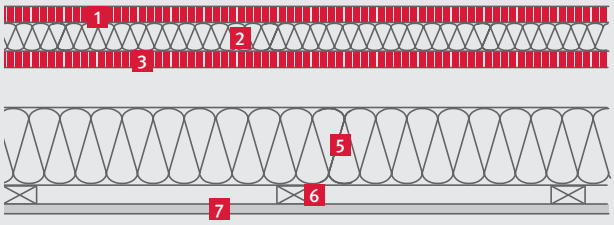
ALTERNATIVES

Instead of drywall sheathing, other materials such as melamine faced chipboard or coated MDF boards can be used as design elements.

Ceiling
with OSB dry screed

Ceiling structures with OSB sheathing (1, 3) feature very high stability and robustness. The good vibration resistance and low deflection of the OSB boards ensure a high level of comfort when used. Using a dry screed shortens the construction period and lowers the level of moisture in the new structure. Good impact sound insulation and decoupled components noticeably improve sound protection.





1 EGGER OSB 3 N&F 22 mm as dry screed
2 Sound-proofing underlay 30 mm
3 EGGER OSB 3 T&G 22 mm
4 Solid structural wood as wood beams a_r = 83,3 cm
5 Cavity insulation 100 mm
6 Battens 30 × 50 mm
7 Drywall 12,5 mm

ALTERNATIVES

A load-bearing ceiling structure can also be constructed as an exposed wood beam ceiling. In this case the OSB is visible, transforming it into a design element, or it can be painted in colour. It does however have to be sanded first. However, eliminating the sheathing and insulation on the underside is not without consequences. Sound transmission in the house is increased so that impact sound protection is perceptibly poorer. Furthermore, an exposed wood beam ceiling does not achieve the same fire protection values as a ceiling structure with sheathing on the underside.

Why build with wood, *Mr. Ritterbach?*

EGGER wood-based materials and solid structural wood are at home on construction sites in Europe. An interview with Carsten Ritterbach, Head of Product Management EGGER Building Products, about the wood construction trend.

Mr. Ritterbach, wood is the new favourite of architects. In the meantime they are using it to build town houses and even high rises. How do you explain the boom of this building material?

Wood is not only straightforward to process as a building material, but also highly sustainable. Resource conservation is becoming increasingly important among builders. Short construction times that can be realised thanks to the high degree of prefabrication are another factor, as is the DIY aspect: wood is a straightforward building material.

What sets apart building with wood today?

Modern construction methods such as wood frame construction with OSB are part of the wood construction standard today. Experience and new calculation methods are making new combinations of wood and wood-based materials possible. This allows the potential of the building material to be more fully realised. Architects in particular are pleased with the building material since it gives them great design flexibility.

Does a wood construction house always have to look like it was built out of wood?

No, not really – it depends on the region. In St. Johann in Tirol for example, the home of EGGER, building log houses is a tradition. Modern architecture however is tending to conceal the visible wood surface on the exterior, increasingly counting on plaster facades, facade boards bonded with cement or synthetic resin, compact laminate or metal sheathing.

What construction techniques protect a wood construction building against fire?

It's true that wood burns. But it burns in predictable ways. Numerous studies and reports have shown that wood often stands up to fire more than other building materials. However, drywall or gypsum fibreboard which is not combustible is normally used anyway for added protection and as a substrate for plaster. Loam rendering directly on OSB is increasingly gaining popularity as well. It provides corresponding fire protection as well. Aside from that, proven safe compositions exist thanks to numerous tests, standards and construction guidelines.

How far-reaching are the changes for a construction company in order to switch from solid construction to building with wood?

The devil is in the detail. Wood construction is a sure thing if you work carefully and provided that the fundamental rules of building physics are observed. Moisture penetration from the outside in the construction phase, for example due to rain, also has to be avoided as far as possible. Our brochure with important hints and processing instructions is intended to help communicate the essential basic knowledge.

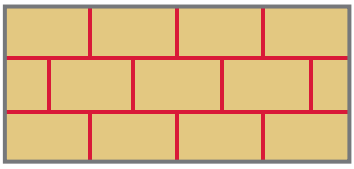
About processing: *Just ask And we will answer.*

What are the key criteria in selecting the OSB boards?

The usage class for an OSB board determines where it can be used in the structure. Details are found on pages 14 and 15. To avoid waste, it is best to establish the grid for the supporting structure based on the size of the available board formats. The board dimensions are specified in the main and secondary axes. For wall cladding and the sheathing on the underside of ceilings, we recommend a thickness that is approximately equal to the open span in mm divided by 50 in order to prevent deformation.

Does an expansion gap always have to be maintained?

Yes. Wood-based materials respond to moisture changes by swelling and shrinking. These dimension changes may result in stresses if an expansion gap of 2 – 3 mm is not maintained between OSB formats with a size of 2 500 × 1 250 mm. A 1 mm gap is integrated into the tongue and groove joint of EGGER T&G boards. When rooms have an edge length of more than 10 m, additional expansion joints of 10 – 15 mm are recommended, especially for the installation of closely fitted and/or glued T&G boards.
For improved stability, the board joints should be offset (see graphic). The OSB boards for a dry screen must have a gap of at least 10 to 15 mm from the nearest wall.



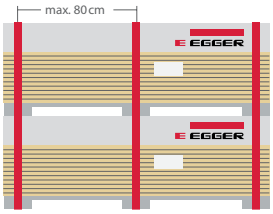
Interlocking installation: Offset by one grid space, at least 30 cm.

How are OSB boards glued together via tongue and groove?

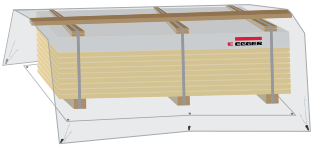
OSB boards with tongue & groove are glued with water-resistant PVAc and PU glues (stress group D3 and D4). To exclude creaking noises, all board edges have to be glued for surface installation. It takes at least 24 hours for the glue to set. Wedges or tension belts are used to achieve the required bonding pressure. **ATTENTION** do not forget to fully remove the wedges afterwards. They impair sound insulation and prevent expansion movements of the floor.

Are OSB board scraps difficult to dispose of?

No. Untreated wood-based material waste is generally treated like wood for waste law purposes. It can either be used as material or as an energy source. Energy use as biomass is possible in enclosed combustion plants that do not require a permit, with an installed thermal output of more than 15 kW, and in large-scale combustion plants.

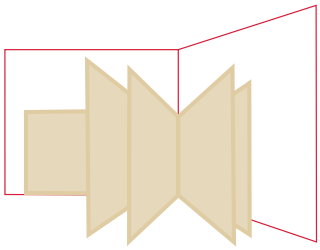


Cut straps on the packages on the construction site.



Package protected by film cover.

For acclimatisation on the construction site: Boards set up with slats.



For acclimatisation on the construction site: Boards clamped in a corner of the room.

What is the right way to transport and store OSB boards?

OSB and DHF boards are stored so they are well protected against direct exposure to the elements, if possible lying flat on squared timbers of the same height with a maximum span of 80 cm. To stack several packages on top of each other, ensure that all squared timbers line up vertically. The straps around the packages should be removed promptly in storage at the facilities of the fabricator so as to avoid compression stress. Never stand T&G boards on the tongue. The storage facilities should be air-conditioned without major humidity and temperature fluctuations. Prior to installation, we recommend letting the boards acclimatise to the ambient relative humidity for 48 hours.

EGGER
More from wood

A family company with an international presence

The company founded by Fritz Egger Senior produced its first chipboard in 1961. In the course of five decades, the plant in St. Johann in Tirol, Austria grew into an internationally successful company and full-range supplier of wood-based materials. The core values of the family company including reliability, quality and sustainability continue to apply to the present. EGGER has also been producing OSB boards at the plant in Wismar (DE) since the year 2000, and expanded its production at the plant in Radauti (RO) in 2011. For sawn timber, EGGER commenced operation of the sawmill in Brilon (DE) in 2008.

RATIOS

EGGER with 17 plants across Europe and 7 100 employees is among the leading companies in the wood-based material industry today. The turnover of the EGGER Group in the 2012/2013 business year was EUR 2,18 billion. Notwithstanding its international presence, the company is owned by the Egger family and grows based on its own performance.

On the sawing line at the EGGER plant in Brilon (D), wood from the region is processed into EGGER solid structural wood.

In addition to structural wood-based materials, EGGER also produces decorative products, laminate flooring and pre-fabricated furniture components. The largest plants today include the fully integrated site in Brilon (D, photo) with its sawmill, the OSB plant in Wismar (DE) and OSB production at the plant in Radauti, Romania, all of which belong to the EGGER Building Products division.

EGGER *glossary*

ABZ → General building authority approval (abZ) is a building authority certification of usability for building products with special characteristics. Since the characteristic rated values are determined according to EN standards, these are contained in the CE declaration of performance and can therefore be applied throughout the EU. ■

AIR TIGHTNESS → The airtight layer (as a rule, this is also the vapour barrier on the interior) prevents air from flowing through the structure and the water vapour it carries from causing structural damage. The air tightness of the building shell is crucial for the quality of the structural design. This makes it a key requirement for the prevention of structural damage and a good energy balance. ■

BAUPVO → The Building Products Regulation (BauPvo) became binding and replaced the previous Building Products Directive on 1 July 2013. It regulates bringing building products into circulation, the free movement of goods and the reduction of technical barriers to trade in the European Economic Area. Harmonised technical specifications are intended to result in uniform EU-wide product and test standards, and therefore harmonised performance specifications for building products. The Building Products Regulation (BauPVO) establishes requirements for the declaration of performance and the CE marking of building products. ■

CASCADING USE → Using a raw material in several stages is called cascading use. It results in the highly sustainable and effective use of raw materials in addition to reducing their consumption. Raw materials and the products made from them are used as long as possible. As a rule, a usage cascade permits the use of materials one or more times with decreasing added value, as well as a final energy use or recycling of the material. Renewable raw materials such as wood in particular are very well suited for multiple use. ■

DHF → The term DHF stands for EGGER vapour permeable wood fibreboard. It is used as wind-proof and water-repellent exterior sheathing on roof and wall structures. Its μ-value is 11. In combination with OSB on the interior, this type of vapour permeable construction is far more robust and permanent than structures with film materials. ■

E1 STANDARD → The E1 standard governs the formaldehyde limits for wood-based material boards. In most European countries, only wood-based material boards that do not exceed the emission limit of 0,1 ppm may be sold. EGGER OSB and DHF fall below these limits. ■

EPD → An environmental product declaration (EPD) provides quantified environmental information about the lifecycle of a product or service. It documents data reviewed by independent institutions in the form of a lifecycle inventory analysis (input and output analysis) for the respective product. An EPD is a type III declaration pursuant to ISO 14025 and therefore serves as the basis for the certification of building sustainability. EGGER has prepared EPDs for all products and these are available for download from the website. ■

HEAT PROTECTION → Protection against the heat of summer results in a pleasant living atmosphere. The construction method and thermal insulation have a major influence on protection against the cold in winter. In order to protect living areas, especially in the attic, against overheating in the summer, the thermal insulation that is used should also reduce the transfer of heat to the interior of the room and noticeably delay it thanks to its storage capacity. Wood with its specific heat storage capacity of 2100 J/kg is the material with the highest heat storage capacity among thermal insulation materials. This is also why thermal insulation boards made of wood offer better heat protection in summer compared to conventional thermal insulation materials. ■

MAIN AND SECONDARY AXIS → Because of the different strand orientation in the core layer and surface layers, OSB boards exhibit different load bearing characteristics in the lengthwise and crosswise directions. The main axis has a higher load bearing capacity and lies in the production direction for the board. It can be recognised by the mainly lengthwise orientation of the strands on the surfaces. The secondary axis is at right angles to the main axis. In the specification of the board formats (e.g. 2 500 × 1 250 mm), the first dimension identifies the main axis for the board. ■

OSB → The term OSB stands for oriented strand (structural) board, describing a wood-based material board with main and secondary axes of oriented strands (chips). OSB is a high quality wood-based material board used in numerous applications, for example as a vapour barrier, reinforcement and airtight layer in roof, wall and ceiling structures. ■

PUNCTURE RESISTANCE → Board materials for roof underlay have to protect against accidents, i.e. they must meet higher puncture resistance requirements. Board materials are generally considered puncture-resistant if they are carried out with a tongue and groove joint and if they withstand a single load (weight) of at least 1,5 kN on the undisturbed surface or 1,0 kN at the joints. This requirement has to be met for the largest allowable span specified by the manufacturer. ■

SOLID STRUCTURAL WOOD → Solid structural wood is kiln dried structural timber that, thanks to its moisture content (HF ‹ 20%), inherent stability and planed surface, meets all requirements for a dimensionally stable, load-bearing building product (stud, ceiling beam, rafter) and therefore constitutes the basis of loss-free and high quality wood construction. ■

THERMAL CONDUCTIVITY → The thermal conductivity (λ) describes how much heat passes through a material. The lower the thermal conductivity, the less heat is able to pass through a material. The thermal conductivity of thermal insulation materials as well as wood products is particularly low. ■

THERMAL TRANSFER COEFFICIENT (U-VALUE) → The thermal transfer coefficient or U-value measures the thermal flow though a component due to a temperature difference between the exterior and interior. The thermal transfer coefficient is a specific value of a structural element. It is largely determined by the thermal conductivity and thickness of the materials used. ■

USAGE CLASS → Usage classes describe the ambient conditions to which the components are exposed after installation. They serve as an indication of the durability of building products and are relevant for selecting the correction coefficient in the stability check (statics). Three fields of application are identified:

Usage class 1 – dry conditions
Components are exposed to a temperature of 20 degrees and relative humidity that exceeds 65 percent for only a few weeks per year. Such conditions are found in fully enclosed and heated buildings.

Usage class 2 – humid conditions
Components are exposed to an average temperature of 20 degrees and relative humidity that exceeds 85 percent for only a few weeks per year. These conditions are found in cases where building elements that are roofed or protected against the elements.

Usage class 3 – exterior
Building elements have to withstand ambient conditions that lead to higher wood moisture than in usage class 2. This applies to structures that are directly exposed to the weather or where elevated levels of condensate may form. ■

VAPOUR BARRIER → In construction technology, vapour barrier is a component layer (e.g. OSB, film or building paper) that reduces the diffusion of water vapour into the building structure, preventing the formation of harmful condensate within a structural element. Unlike a vapour seal, the vapour barrier is not intended to prevent water vapour diffusion entirely. In practice the sd values for vapour barrier are between 2 and 30 m. ■

WIND-PROOF → The wind-proof layer (normally on the exterior) prevents air from flowing through the thermal insulation layer and cooling. The air tightness of the building shell is crucial for the quality and durability of the structural design. Having a wind-proof building shell and individual components is a key requirement that influences the prevention of structural damage and a good energy balance. ■

Overview of the standards

DIN EN 300: Boards made of long, thin, oriented chips (OSB) – definitions, classification and requirements (2006-09).

DIN EN 350-2: Durability of wood and wood products – natural durability of solid wood – part 2: guideline for the natural durability and treatability of select wood types of special importance in Europe (1994-10).

EN 12369-1: Wood-based materials – characteristic values for the calculation and dimensions of wood structures – part 1: OSB, chipboard and fibreboard (2001-04).

EN/TS 12872: Wood-based materials – guideline for the use of load-bearing boards in floors, walls and ceilings. Date of issue: 2007-10.

EN 13501-1: Classification of building products and building types according to reaction to fire – part 1: classification with the results of tests on the reaction to fire of building products. Date of issue: 2010-01.

EN 13986: Wood-based materials for use in the building trade – characteristics, evaluation of conformity and labelling. Date of issue: 2005-03.

EN 15804: Sustainability of buildings – environmental product declarations – basic rules for the product category of building products. Date of issue: 2012-04.

EN 1995-1-1: Wood construction buildings – part 1: calculation and implementation (1988- 04).

EGGER
Building Products

WORKSHOPS FOR THE WOOD CONSTRUCTION PROFESSIONAL

EGGER makes sure that architects, fabricators and distributors have a crucial knowledge advantage in the market. EGGER experts share knowledge about market trends, innovations and EGGER products in the course of its workshops. Application technology consulting, invitations to trade fairs and events as well as the publication of our partners' reference projects completes the programme. For more information, please visit www.egger.com/services

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