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EGGER WOOD CONSTRUCTION PROCESSING GUIDELINE

EGGER OSB

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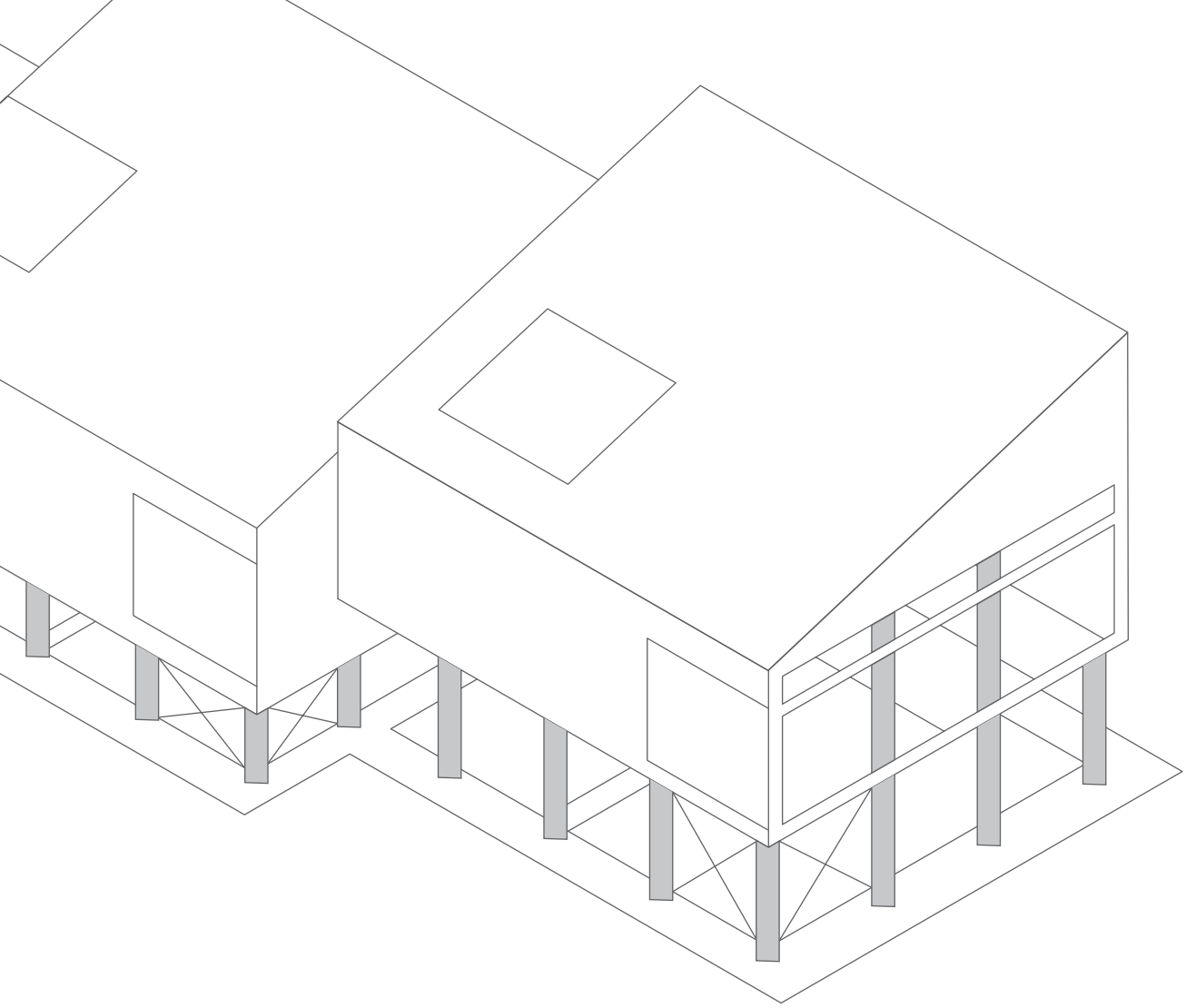


WOOD CONSTRUCTION PROCESSING GUIDELINE

EGGER OSB 2
EGGER OSB 3
EGGER OSB 4 TOP

CONTENTS

1 GENERAL NOTES 04

2 INFORMATION ON PHYSICAL PROPERTIES 05

3 EGGER OSB 07

3.1 Product description 07

3.2 Product Features and Applications 08

4 TECHNICAL PROCESSING RECOMMENDATIONS 09

4.1 General information 09

4.2 Recommendations for the installation of dry screed made of wood-based materials 11

4.3 Recommendations for tested glue systems to use as air sealants 13

5 STATIC DIMENSIONING / PRE-DIMENSIONING 14

5.1 Rated values for EGGER OSB 4 TOP according to Z-9.1-566 15

5.2 Rated values for EGGER OSB 3 TOP according to EN 300 16

5.3 EGGER OSB rated value tables 17

- Implementation conditions for sheathing according to EN 1995-1-1 or DIN EN 1995-1-1/NA
- Pre-dimensioning of wall panels for the allowable horizontal force Fv
- Pre-dimensioning of horizontal sheathing as single span girders for vertical loads
- Pre-dimensioning of horizontal sheathing as double span girders for vertical loads
- Pre-dimensioning of roof sheathing for vertical loads

6 LOW-SLOPE ROOFS WITH SEALING OR METAL ROOFING 22

6.1 General information 22

6.2 Requirements for the substructures 24

6.3 Special instructions for non-ventilated low-slope roofs 25

6.4 Special instructions for ventilated low-slope roofs 25

7 STRUCTURAL PROPERTIES AND OTHER MATERIAL CHARACTERISTICS 26

8 SURFACE COATING 28

APPENDIX INFORMATIVE 31

Orientation for determining applied loads for OSB in shelf board, platform and similar applications 31

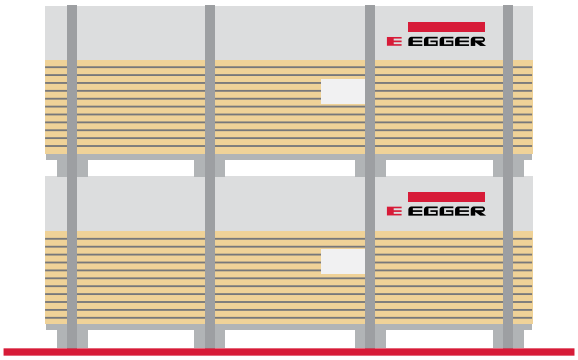
1 GENERAL NOTES

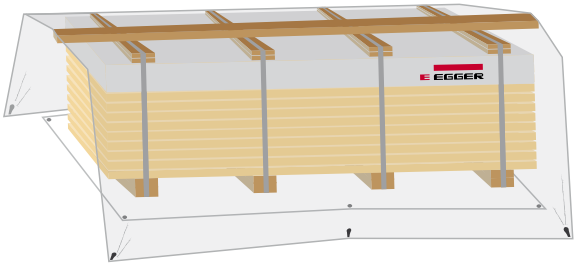
The information that follows applies equally to all types of EGGER OSB boards. Observing thisinformation is essential for the proper application of the boards and in order to achievesatisfactory results.

STORAGE AND TRANSPORT

Correct storage and protective measures for transportation are required to avoid problems while processing. The following straightforward principles should generally be observed:

- Store EGGER OSB lying flat on several squared timbers with a maximum open span of 80 cm (31.50”). The squared timbers have to be of uniform height. With a board thickness › 12 mm (0.47”), use sleepers spaced at approximately 60 cm (23.62”).
- If several packages are stacked one on top of the other, the squared timbers have to be vertically aligned. The steel straps around the packages should be removed promptly in order to avoid compression stress in the package during storage in a warehouse.
- Upright storage (standing nearly vertical) is only possible for few boards on a dry surface. In this case, tongue and groove boards must only stand on the groove edge.
- For transportation by lift truck, the squared timbers must be of sufficient height to avoid damage.
- Prior to installation, the boards in the package must be sufficiently protected against the elements by covering with a suitable tarpaulin or polythene cover.
- The storage facilities should be air-conditioned without the risk of high humidity and temperature fluctuations.
- It is advisable to acclimatise boards on site for up to 48-hours, to ensure moisture content is at the correct level on site prior to installation.





DISPOSAL

Wood-based material waste in the delivery condition may be used for material or energy applications. According to Annex III of the Scrap Wood Directive, they are generally assigned to the waste codes (EWC codes) 030105, 150103 or 170201. The allowable form of disposal is decided on a regional basis according to the waste code. When wood-based materials are used for energy generation, this is possible in enclosed combustion plants that do not require a permit, with a thermal output of more than 15 kW, or in combustion plants according to the 13th Federal Emission Protection Ordinance (BimSchV) (large-scale combustion plants) and according to the 17th Federal Emission Protection Ordinance (BimSchV) (waste incineration plants), insofar as wood-based materials are approved as fuel in the latter.

2 INFORMATION ON BUILDING CHARACTERISTICS

For the correct application of EGGER OSB, it is essential to be familiar with the structural-physical propertiesand to take the influencing variables for diffusion and convection into account during planning and construction.

THERMAL BRIDGE

A thermal bridge is an area of a structure where heat is transferred more quickly. They are differentiated into 2 main types:

- a geometric thermal bridge exists when the exterior surface is larger than the corresponding interior surface. An outside corner of a wall is a typical example.
- Material-related thermal bridges are the result of different materials in a layer of a building cross-section. Here a typical example is the rafter area in the heat insulation layer of the roof.

SUMMER HEAT INSULATION

To maintain interior rooms at a comfortable temperature, protection against overheating due to exposure to the sun's rays in the summer is an important requirement. An interior temperature of 26 °C should not be exceeded.

Heat insulation materials that, in addition to low thermal conductivity, also have a high specific heat capacity make it possible to effectively delay the transfer of heat in the summer in addition to serving as effective thermal insulation in the winter due to the greater phase shift.

PHASE SHIFT

Phase shift refers to the time that passes between the occurrence of the highest temperature amplitude on the exterior and the corresponding interior temperature amplitude.

If the values lie in the range of 9 to 12 hours, the structure can store part of the heat from the warmer-day phase and release it directly back to the exterior during the cooler night phase.This makes it possible to maintain a more pleasant temperature on the interior.

WATER VAPOUR DIFFUSION

Water vapour flows through the building element between the interior and exterior of the building element due to the thermal gradient of vapour pressure. Proof for the safe volume of condensate has to be provided in the planning phase.

WATER VAPOUR DIFFUSION EQUIVALENT AIR LAYER THICKNESS s_d-VALUE

The s_d-value refers to the layer thickness of a material in metres, with a resistance to the flow of water vapour equivalent to one metre of air. The lower the s_d-value of a material, the easier it is for water vapour to pass through this material. A material with a s_d-value of more than 100 metres is designated as a vapour barrier. The s_d-value of a material is calculated as the product of the layer thickness [m] and µ-value.

WATER VAPOUR DIFFUSION RESISTANCE INDICATOR µ-VALUE

The µ-value is a material-specific factor. It states how well water vapour can diffuse in a material compared to air. As a rule, EGGER OSB boards constitute vapour barrier sheathing /cladding with a sd-value of 2.0 m.

AIR TIGHTNESS

Measures to avoid the uncontrolled exchange of air that can result in heat loss, the heating up of buildings, impairment of the room climate and moisture damage due to convection. Great care must be taken in planning and carrying out the vapour barrier layer.

Sheathing / cladding made of wood-based material boards according to EN 13986 is considered air-tight. Board joints and connections to adjacent building elements as well as feedthroughs must be permanently sealed and made air-tight with suitable adhesive tape – see the brochure with application technology recommendations.

Note

- In order to meet the high standards for air-tightness for passive houses, EGGER OSB 4 TOP is recommended because of the higher raw density.
- Glued T&G board joints are not considered permanently air-tight.

CONVECTION

Transportation of moisture through the air as a transport medium, is forced by the thermal pressure difference orsuction / back pressure resulting e.g. from wind energy because the joints in the building shell are not air-tight.

Caution, Condensation!

- The volume of condensation due to heat and moisture can exceed the evaporation potential of the structure by a factor of 1,000.
- Moisture must be excluded by construction measures (e.g. joint sealing tape).
- Accumulating condensation is not subject to diffusion and can no longer be transported through a material by diffusion processes. It may lead to an increase in the moisture content of the material above the allowable level and cause corresponding subsequent damage.

MOISTURE BALANCE

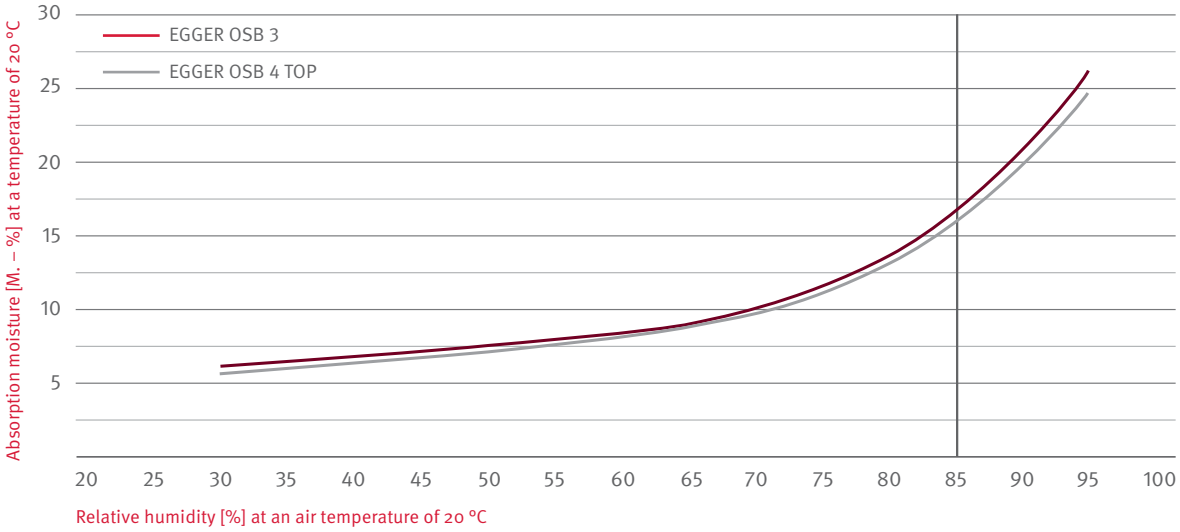
Depending on the relative humidity and temperature, wood-based materials reach a certain moisture balance. For wood-based materials using PU resins, the value is approximately 3 % below the moisture balance of solid wood.

According to EN/TS 12872, the following moisture balance (see table) can be expected for wood and wood-based materials in the state of use provided that they are installed properly and the formation of condensation is prevented.

Installation Conditions	Approx. material moisture content
Building with permanent central heating	6 to 9 %
Building with part-time central heating	9 to 15 %
Unheated new building	15 to 18 %

At a relative humidity of 85 %, the material moisture balance of EGGER OSB can be expected to bebelow 18 %. This meets the requirements for application in usage class 2.

ABSORPTION MOISTURE [M.-%] DEPENDING ON THE RELATIVE HUMIDITY AT A TEMPERATURE OF 20°C



LENGTH CHANGES DUE TO MOISTURE

Wood and wood-based materials change their dimensions in length, width and thickness depending on the moisture content of the material.

Changes in the length of EGGER OSB boards due to the moisture content of the material can be expected at 0.03 % for each one percentof change in the material moisture content.

3 EGGER OSB

3.1 PRODUCT DESCRIPTION

EGGER OSB is a flat hardboard with a three-layer structure of orienteddistributed strands (micro-veneers) according to DIN EN 300:2006 (OSB). It is mainly made of coniferous wood from sustainably managed forestry operations. For certain board qualities and to meetcorresponding requirements, mixed wood or certain types of deciduous wood are also used. The special strand preparation and a high degree of strand orientation in the fibre direction for the surface layers assure excellent technical characteristics.

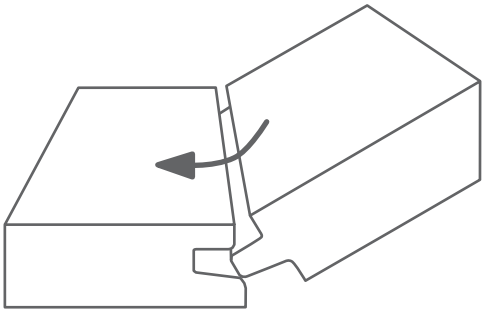
RAW MATERIALS USED

- Decorticated coniferous wood from forest thinnings and maintenance
- Paraffin wax emulsion
- Formaldehyde-free PU resin in the core layer and surface layers for moisture-resistantglued board types – EGGER OSB 3 and OSB 4 TOP.
- MUF resin (melamine-urea-formaldehyde resin) in the surface layers (OSB 2)
- MUF resin (melamine-urea-formaldehyde resin) in the surface layers and core layer (OSB 3 E1)
- Water

The resin application technology ensures that the moisture balance from the plant is similar to the final moisture content of 8 ± 3 percent in application.

T&G PROFILE

The asymmetrical, conical T&G profile of the flooring boards and sheathing panels guarantees perfectly fitting and fast installation in floor, ceiling and wall applications. It also ensures the required transmission of force in case of boards that are joined as reinforcement (plate effect). In addition, the structure is made more wind-proof. Fitting T&G boards on the adjacent walls is straightforward by angling them into the groove.



T&G profile in the quick-format

USAGE CLASS

According to EN 1995-1-1 (EC5), EGGER OSB 3, OSB 4 TOP and OSB 3 E1 is suitable for applications in usage class 1 and 2, while EGGER OSB 2 is suitable for applications in usage class 1.

Usage class 1 (dry conditions, service class SC1):
Defined by a moisture content in the building materials that corresponds to a temperature of 20°C anda relative humidity in the ambient air that only exceeds a value of 65 % for a few weeks per year.

Usage class 2 (humid conditions, service class SC2):
Defined by a moisture content in the building materials that corresponds to a temperature of 20°C anda relative humidity in the ambient air that only exceeds a value of 85% for a few weeks per year.

3.2 PRODUCT FEATURES AND APPLICATIONS

MONITORING

EGGER OSB is a regulated building product and offers a high level of product and application security for the fabricator. Regular external monitoring of the products by means of CE certification as well as national and international construction approvals guarantee the highest quality standards.

- CE Marking
- Building authority approval, Z-9.1-566
- International approvals, e.g.: JAS, BBA, KOMO, PS2-10, GOST
- ISO 9001 certified quality management
- BDF/QDF and/or GHAD
- C-o-C certification according to FSC (CW) and PEFC
- European Timber Regulation EUTR

NORMATIVE FRAMEWORK

EGGER OSB is produced in the context of European norms and therefore guarantees standardised, problem-free application within the European normative framework in all member states of the European Union, such as:

- EN 300:2006
- EN 13986:2004
- EN 12369-1:2001
- EN 1995-1-1:2004 + AC1:2006 + A1:2008
- EN 1995-1-2:2004 + AC:2009

ENVIRONMENTAL COMPATIBILITY

EGGER OSB is produced under the strictest compliance with all environmentally relevant requirements and subject to the conservation of resources. All products are regularly subjected to voluntary environmental hygiene reviews.

- IBU environmental product declaration (EPD) according to ISO 14025, type III and/or EN 15804
- BDF/QDF positive list
- GHAD recommendations
- No use of chemical wood preservation
- Low-emission / formaldehyde-free binding agents
- Wood fresh from the forest

FIELDS OF APPLICATION

EGGER OSB is the ideal material for all structural applications in new construction, redevelopment and renovation projects. Further applications include:

⇢ REPLACING OLD FLOORING

- Straightforward processing, no special tools required
- Easy handling thanks to low weight, even on construction sites that are difficult to access
- Formats optimised to minimise waste, perfectly fitting T&G profiles
- Dry, clean and easy to install
- High static load-bearing ability
- Suitable as a base for all conventional floor coverings
- Perfect solution for old floorboards or concrete floors.

⇢ IINTERIOR DESIGN / EXHIBITION STANDS

- Decorative design of surfaces
- Functional selection of formats
- Highly robust materials
- Suitable for structural and decorative applications

⇢ PROTECTIVE BOARDS

- Construction site fencing
- Blinds
- Cover boards
- Masonry protection
- Emergency safety barriers

⇢ INDUSTRIAL PACKAGING

- OSB classified according to the international ISPM 15 standard
- No treatment for insects required
- Comparable to packaging plywood
- Tested by BFSV Hamburg
- Optimum fit of the fasteners
- Consistent board quality without blemishes

⇢ CONCRETE FORMWORK

- Good availability with consistent quality
- “Permanent” formwork
- Foundation formwork
- Ceiling frame formwork
- Fair-faced concrete formwork
- Offcut board
- Can be used multiple times

Advice for users

EGGER offers numerous sources of assistance and information for all of its customers as additional services, e.g.:

- T +49 (0) 3841/301-2-1260
- E-Mail: buildingproducts@egger.com
- Extensive planning and product documentation
- www.egger.com/buildingproducts ⇢ Technical information portal on the internet
- Technical Field Service

4 TECHNICAL PROCESSING RECOMMENDATIONS

4.1 GENERAL INFORMATION

The following should be checked on site prior to installation:

- Board thickness
- Board type / allowable moisture range
- Compliance mark
- CE Marking

SAWING, DRILLING, MILLING

EGGER OSB can be sawn and milled like solid wood using all conventional wood processing equipment, including large stationary machines and (electric) handheld machines. We recommend the use of hard-metal cutting tools. For clean cuts if the boards will be visible after installation, observe the following:

- Sharp tooling
- Vibration-free work piece guidance
- Correct blade exposure

Select a slightly lower feed rate compared to solid wood. During the use of manually guided power tools without dust extraction by suction a breathing mask should be used.

All electrical and handheld machines suitable for solid wood can be used for drilling EGGER OSB.

EGGER OSB features low thickness swelling and high dimensional stability (seetechnical data: dimension changes due to the influence of moisture).

When used as a load-bearing, reinforcing element, the regulations according to DIN 68800-2, “Wood Preservation – Preventive Construction Measures” apply.

INSTALLATION INSTRUCTIONS

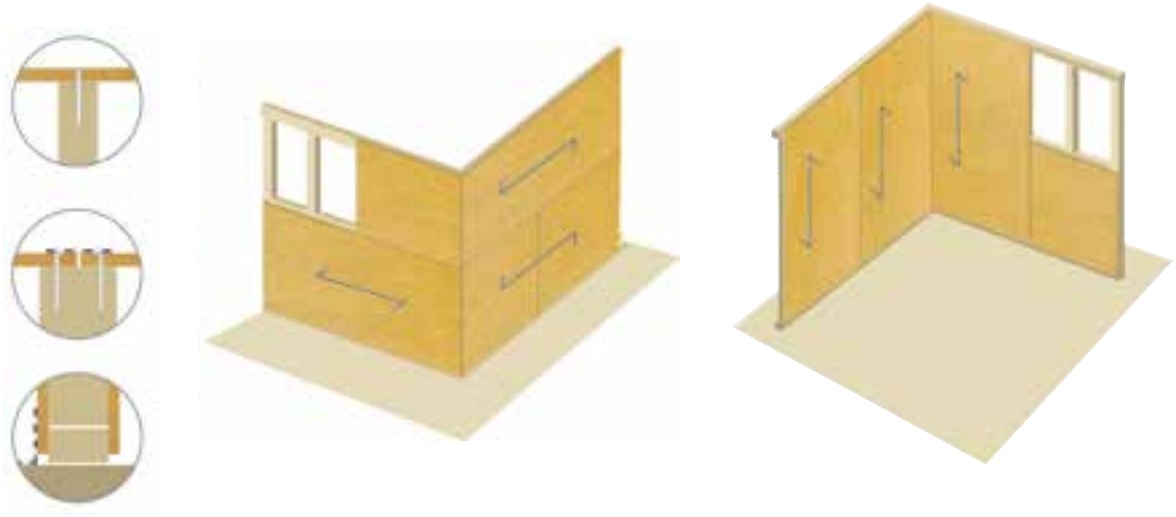
EN / TS 12872 defines fundamental rules for the installation of wood-based materials in roof, wall and ceiling applications.

Expansion gaps for the length changes according to the expected climate conditions must be left towards walls and adjacent building elements (see graphics).

For edge lengths › 10 m (33’), additional expansion gaps of 10 – 15 mm (0.39” – 0.59”) have to be provided in the board sheathing.

When installing ceramic materials, permanently elastic expansion gaps have to be left every 3 – 4 m (118.11” – 157.48”).

In case of multilayer processing, also in combination with other materials such as drywall boards, an adequate offset of the board joints has to be maintained.



FASTENING

EGGER OSB can be fastened using all suitable fasteners such as screws, cleatsand nails.

"The length of the fasteners should be 2.5 x the board thickness and no less than 50 mm (1.97”).
When cleats are used, a minimum wire thickness of 1.53 mm (0.06”) should be chosen. Corrosion-resistant fasteners, for example in galvanised or stainless steel, are preferred."

Because of the higher pull-out resistance, only flathead nails with circular groove, screw nails orribbed nails should be used (see EN 1995-1-1).

The crosswise orientation of the strands in EGGER OSB results in a firm fit of the fasteners, even at the very outside edge of the board. The dense core layer structure ensures high pull-out resistance along the edge.

Tension and pinching has to be avoided during fastening according to DIN 1052.

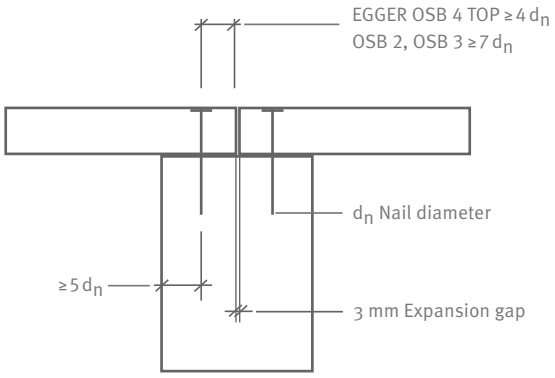
GUIDELINES FOR NAIL SPACING ACCORDING TO APPROVAL Z-9.1-566* IN WOOD AND EGGER OSB

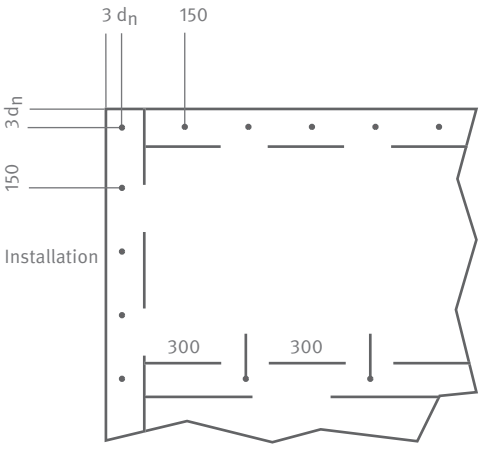
Spacing	e_{max} between each other	e_{min} between each other in wood II to the fibres	From the unstressed edge ⊥ fibres	From the stressed edge ⊥ fibres
Spacing in wood	≤ 40 × d_n	10 × d_n	5 × d_n	7 × d_n
Spacing in EGGER OSB	≤ 40 × d_n	5 × d_n	2,5 × d_n	4 × d_n

* Without pre-drilling

d_n = nominal diameter of the fasteners

For the precise regulations, see EN 1995-1-1, Section 8.3 and 8.4.





Fastening recommendations for non-load-bearing sheathing made of EGGER OSB

4.2 RECOMMENDATIONS FOR THE INSTALLATION OF DRY SCREED MADE OF WOOD-BASED MATERIALS

INSTALLATION RECOMMENDATIONS

In the installation of wood-based material boards on floors, one differentiates between floating installation and the installation on sleepers / beam layer.

The installation of wood-based materials for floor structures is regulated in CEN/TS 12872 and EN 13810-1.

Furthermore, the current, accepted state-of-the-art is documented in the information bulletins of the Bundesarbeitskreis Trockenbau (BAKT) (Federal Dry Construction Workgroup).

BOARD MOISTURE CONTENT / MOISTURE PROTECTION

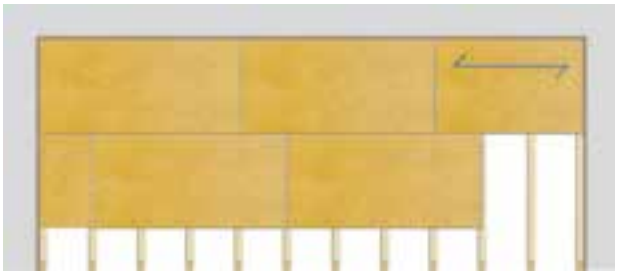
- Dry screed made of wood-based materials should only be installed in enclosed buildings after the installation of windowsand doors.
- Sufficient thermal insulation has to provided for installation in rooms that are not over basementsin order to avoid the formation of condensate on the underside of the boards and therefore warping of the floor.
- A moisture barrier is generally required for installation on solid ceilings. PE-films are suitable, d › 0.2 mm (0.008”) installed with a minimum overlap of 30 cm (11.81”) at the joints and extending up the walls to the upper edge of the flooring.
- The board moisture should correspond to the subsequent moisture content in use.
- When sleepers are used, selecting dry wood with u ‹ 15% is important since shrinking of the substructure can lead to bothersome creaking noises.
- The installation of wet building materials, for example plastering, painting and wallpapering, should be completedand the resulting high relative humidity dissipated by means of adequate ventilation or other suitablemeasures.
- After installation, the boards have to be covered (e.g. PE film) if the floor covering is not being installed right away.

BOARD THICKNESS

- In case of floating installation with EGGER OSB, a board thickness of 18mm (0.71”) must be selected. In case of high single point loads or for the installation of ceramic materials, the board thickness must be correspondingly greater (d › 25 mm (0.98”).
- For installation on sleepers, the board thickness depends on the expected loads and the span of the substructure. Corresponding recommendations are provided by the rated value tables inthe product brochures for EGGER OSB.

LAYING

- Thanks to the interlocking installation of the wood-based material boards, there is virtually no waste – especially in the case of a floating installation. Cross joints have to be excluded. The board joints should be offsetby at least 30cm (11.81”).



Floating, interlocking installation: Offset 30cm (11.81”)Interlocking installation on sleepers: Minimum offset 1 span width

- Free-floating board joints parallel to the sleepers are not permitted according to EN 1995-1-1 (Eurocode 5). Longer boards have to be trimmed so they line up with the beam layer. Therefore, the grid for the substructure should be tailored to the available board formats in order to minimise waste.
- In case of old floor boards, first check the old screw connections and re-tighten them if necessary. Floor boards rubbing against each other must be cut free. Special attention must be paid to functional edge joints.

EDGE SPACING / EXPANSION GAPS

- For floating installation, the installed wood-based material boards require a minimum spacing of 15 mm (0.59”) to adjacent walls. This spacing makes it possible to install the boards free of stress and to ventilate the floor structure.
  The baseboards must be carried out so that ventilation of the floor is assured. Glued plastic baseboards are not suitable.

- In the construction of ceiling plates, the expansion gap to the adjacent building elements has to be determined based on the factor for the moisture-related length change (0.03% / one percent) and the room length.

- A sufficient clearance must be maintained from supports and similar in the room.

FASTENERS

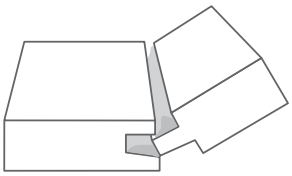
- Wood screws with a straight shaft (pre-drilling required) and drywall screws / chipboard screws are suitable,respectively with a full-length thread. When installing screws without pre-drilling, the screw should be driven betweenthe feet of the installer so that the person's weight presses the board against the substructure and the formation of burrs on the underside of the board is prevented. Burring could lead to creaking noises later on.

- The screw heads have to be countersunk and filled with putty.

- The pull-out resistance of ribbed nails, cleats and nails is not sufficient. Creaking noises may develop as a result.

ATTENTION!

Driving screws in too deep can result in the undesirable transmission of sound.



Tongue and groove gluing

T&G PROFILE GLUING

PVAC glues in stress group D3 and D4 are suitable for gluing the boards in the tongue and groove. The glue has to be applied according to the illustration that follows.

Hardening for at least 24 hours under pressure is required. The required pressing forces can be applied with wedges and/or tension belts. The wedges have to be removed entirely after gluing, since they otherwise transmit noises and therefore significantly impair sound insulation as well as preventing the expansion movements of the flooring. All board edges have to be glued in order to prevent possible creaking noises.

For the dry screed systems listed below, you will find the compositions and their technical data in the wood construction catalogue at www.egger.com/buildingproducts (free download):

1. DRY SCREED ON WOOD FLOORING OVER A BEAM LAYER

Option 1: Dry screed with wood-based materials and wood fibre sound-proofing underlay.

Option 2: Dry screed with wood-based materials and mineral fibre sound-proofing underlay.

Option 3: Dry screed with loading for elevated impact sound.

Option 4: Cement / asphalt screed on sound-proofing underlay.

2. DRY SCREED ON CONCRETE CEILING

Option 1: Concrete ceiling – improved sound protection and heat insulation

Option 2: Concrete ceiling – improved sound protection and heat insulation with wood fibre insulation.

Option 3: High thermal insulation, e.g. in rooms that are not over basements.

Option 4: Height equalisation of an old concrete ceiling with dry fill.

Option 5: Utility flooring, visible, for high point loads e.g. in commercial facilities.

4.3 RECOMMENDATIONS FOR TESTED GLUE SYSTEMS TO USE AS AIR SEALANTS

Product name	Type designation	Product information	Area of application
Ampacoll® BK 535	Butyl rubber tape	Width: 50, 80 and 120 mm	Sealing feed-throughs in exterior and interior applications, taping joints and building element grooves that move.
Ampacoll® XT	Acrylic adhesive tape	Width: 60, 75, 100 and 150 mm	Air and wind-proof taping of sheeting and boards in exterior and interior applications
Ampacoll® Primer 531	Primer	–	Primer for all rough, fibrous and porous subsurfaces, especially EGGER DFF
pro clima TESCON no.1	Adhesive tape, elastic, vapour permeable and waterproof	Width: 60, 75 and 150 mm	Interior and exterior applications, taping butt joints and seams of OSB, joints to non-mineral building elements
pro clima TESCON Vana	Adhesive tape, pliable, vapour permeable and waterproof	Width: 60, 75 and 150 mm	Taping butt joints and seams of OSB, joints to non-mineral building elements
pro clima Budax top	One-sided butyl rubber tape	Width: 60, 75 and 150 mm	Interior and exterior applications
pro clima RAPID CELL	Adhesive tape without separating layer for fast processing	–	Taping butt joints of wood-based material boards, OSB
ISOCELL AIRSTOP	Tear-proof system adhesive tape for air-tight sealing	Width: 50, 60, 80, 100, 150, 170 and 200 mm	Tear-proof system adhesive tape for air-tight sealing, adhesive layer extremely resistant to ageing and suitable for almost all subsurfaces.
ISOCELL AIRSTOP ULTRA	Easy to stretch adhesive tape for air-tight sealing in exterior and interior applications. High adhesion spectrum even for challenging sub-surfaces such as PP films.	Width: 50 und 60 mm	For air-tight taping in exterior and interior applications, high adhesion spectrum even for difficult subsur-faces such as PP films.
ISOCELL AIRSTOP ELASTO + ELASTO Dichtpflaster	Easy to stretch adhesive tape PE substrate reinforced with fibre roving, with high-quality acrylate adhesive layer.	Width: 50 und 60 mm Pads: 180 mm	For air-tight taping, pads for quickly sealing larger openings, e.g. injec-tion openings (tear-proof, with high adhesive application)
ISOCELL AIRSTOP flex	Slightly transparent adhesive tape	Width: 60, 80 and 150 mm	For air-tight taping, adhesive layer extremely resistant to ageing for virtually all sub surfaces, can be covered in plaster.
SIGA-Sicrall	High-performance tape, adhesive on one side	Width: 60 mm length: 40 m	For taping overlaps and EGGER OSB joints in interior applications
SIGA-Rissan 60	High-performance adhesive	Width: 60 mm length: 25 m	For taping round feed-throughs in interior applications
SIGA-Rissan 100/150	Pre-folded high-performance tape, adhesive on one side	Width: 100 a. 150 mm length: 25 m	For taping EGGER OSB boards on con-crete slabs or bitumen sheeting on the plinth in interior applications
SIGA-Primur	High-performance adhesive	Tubular bag: 600 ml Cartridge: 310 ml	For joints to plastered masonry in interior applications
SIGA-Corvum 30/30	Pre-folded high-performance tape, adhesive on one side	Width: 30/30 mm length: 25 m	For taping EGGER OSB corners, beams, stringers and skylights in interior applications
SIGA-Corvum 12/48	Pre-folded high-performance tape, adhesive on one side	Width: 12 und 48 mm length: 25 m	For taping window and door frames in interior applications
SIGA-Sicrall 150	High-performance tape, adhesive on one side	Width: 150 mm length: 40 m	For taping over injection openings and larger leaks in interior applica-tions
EISEDICHT Air sealing sleeves	Various cable sleeves for sealing	www.eisedicht.de/en	For sealing NYM / antenna / telepho-ne cables, PG pipes, solar lines, HT pipes, pipework onroofs with a slope up to 40°

5 STATIC DIMENSIONING / PRE-DIMENSIONING

Static dimensioning of supporting structures and building elements with EGGER OSB 3 according to EN 300 and EGGER OSB 4 TOP according to DIBt approval Z-9.1-566.

The static dimensioning of wood structures is carried out on the basis of the applicable national and/or European standards.

Eurocode 5 was implemented as the EU-wide body of rules and regulations with EN 1995-1-1:2004 for the dimensioning of wood structures.

EGGER OSB 3

Characteristic values for EGGER OSB 3 according to EN 300 as the basis for static dimensioning according toEN 1995-1-1 (EC 5 with national application document (NAD) or DIN 1052:2008:12 can be found in EN 12369-1 “Wood-based materials – characteristic values for the calculation and dimensioning of wood structures”.

In regards to thermal conductivity, sound protection and fire protection according to EN 300, the regulations of EN 13986:2004, Section 5 apply to OSB boards in conjunction with the national application document (NAD), e.g. DIN V20000-1:2013.

EGGER OSB 4 TOP

For EGGER OSB TOP, the general building authority approval Z-9.1-566 of the DIBt was updated in 2013 and the certificate of conformity (Ü-Zeichen) was confirmed. OSB TOP boards are subject to ongoing external monitoring by an accredited institute, so that the allowable calculation values listed below for stresses and E-modules as well as the characteristics values can be taken directly from the approval document and applied.

In regards to thermal conductivity, fire protection and sound protection, the regulations of EN 13986, section 5, table 8 and 11 as well as the regulations according to the general building authority approval apply.

The calculation value for condensate analysis is established in the approval for the thickness range of 8 – 40 mm (0.31” – 1.57”) μ = 200 / 200 (dry cup / wet cup).

The spacing between nails is the same as for veneered construction plywood according to DIN 1052-2:1988-04, section 6.2.14 (Also see the section on fastening).

Note

As a rule, sheathing materials for wood construction are tailored to the grids e = 62.5 cm (24.61”) or 83.3 cm (32.80”).

The grid for the structure should only be established after the available board formats have been determined. The “most expensive” sheathing material determines the grid.

When sheathing is applied over a beam layer, the direction of the strong main axis has to be taken into account for OSB.(Main axis = parallel to the direction of the surface layer strands.) The board joint must be on thebeam, i.e. the available board length and grid have to be matched in order toreduce waste.

Floor to ceiling sheathing for wall elements is preferred since the analysis can be carried out according to a more straightforward dimensioning procedure. Horizontal joints require a backing,resulting in additional costs. As a rule, the minimum board thickness for wall and bottom ceiling sheathing should be the board thickness open span (mm) / 50 in order to avoid buckling.

5.1 RATED VALUES FOR EGGER OSB 4 TOP ACCORDING TO Z-9.1-566

CHARACTERISTIC STRENGTH VALUES AND RIGIDITY

EGGER OSB 4 TOP according to Z-9.1-566 in N/mm²

Thickness (mm)	Strength values (N/mm²)							
	Deflection		Pulling		Pressure		Pressure perpendicular to the board plane	Pressure in the board plane
t_{nom}	f_m		f_t		f_c		f_v	f_r
	0° [1]	90° [2]	0°	90°	0°	90°	–	–
8 – 10	25	15	12	10	19	16	9,0	1,6
›10 ‹18	25	15	12	10	19	16	9,0	1,6
18 – 25	25	15	12	10	19	16	9,0	1,6
›25 – 30	25	15	12	10	17	15	8,0	1,6
›30 – 40	20	15	10	10	15	14	6,0	1,6

Thickness (mm)	Rigidity values (N/mm²)							
	Deflection		Pulling		Pressure		Pressure perpendicular to the board plane	Pressure in the board plane
t_{nom}	E_m		E_t		E_c		G_v	G_r
	0°	90°	0°	90°	0°	90°	–	–
8 – 10	7.000	3.000	4.300	3.200	4.300	3.200	1.500	160
›10 ‹18	7.000	3.000	4.300	3.200	4.300	3.200	1.500	160
18 – 25	7.000	3.000	4.300	3.200	4.300	3.200	1.500	160
›25 – 30	7.000	3.000	4.300	3.200	4.300	3.200	1.300	140
›30 – 40	6.000	3.000	4.000	3.200	4.000	3.200	1.200	140

Thickness (mm)	Additional characteristic values / embedment strength (N/mm²)	
	σ_l	
t_{nom}	0°	–
8 – 10	40,0	40,0
›10 ‹18	40,0	40,0
18 – 25	40,0	40,0
›25 – 30	40,0	40,0
›30 – 40	35,0	35,0

[1] 0°-Main axis [2] 90°-secondary axis

5.2 RATED VALUES FOR EGGER OSB 3 TOP ACCORDING TO EN 300

CHARACTERISTIC STRENGTH VALUES AND RIGIDITY

EGGER OSB 2 and OSB 3 according to EN 300:2006
The typical static calculation values are based on EN 12369-1.

Thickness (mm)	Strength values (N/mm²)							
	Deflection		Pulling		Pressure		Pressure perpendicular to the board plane	Pressure in the board plane
t_{nom}	f_m		f_t		f_c		f_v	f_r
	0° [1]	90° [2]	0°	90°	0°	90°	–	–
8 – 10	18,0	9,0	9,9	7,2	15,9	12,9	6,8	1,0
›10 ‹18	16,4	8,2	9,4	7,0	15,4	12,7	6,8	1,0
18 – 25	14,8	7,4	9,0	6,8	14,8	12,4	6,8	1,0

Thickness (mm)	Mean rigidity values (N/mm²)							
	Deflection		Pulling		Pressure		Pressure perpendicular to the board plane	Pressure in the board plane
t_{nom}	E_m		E_t		E_c		G_v	G_r
	0°	90°	0°	90°	0°	90°	–	–
8 – 10	4.930	1.980	3.800	3.000	3.800	3.000	1.080	50
›10 ‹18	4.930	1.980	3.800	3.000	3.800	3.000	1.080	50
18 – 25	4.930	1.980	3.800	3.000	3.800	3.000	1.080	50

[1] 0°-Main axis [2] 90°-secondary axis

5.3 EGGER OSB RATED VALUE TABLES

IMPLEMENTATION CONDITIONS FOR SHEATHING ACCORDING TO DIN 1052-2008-8.7.2 OR EN 1995-1-1

PRE-DIMENSIONING FOR PLATE STRUCTURE LOAD CARRYING ACTION

⇢ The following points have to be taken into account for the realisation of panels that serve the function of plate structures.

- Free board joints are allowable only in roof and ceiling plates, but no floating joints parallel to the supporting members.
- The distance between fasteners has to be constant along all edges of the board. Without more detailed analysis of the load capacity, the distance must be at least 20*d.
- Mandatory fastener spacing for acceptance of a continuous joint: Nailsand cleats along the board edges ‹ 150 mm (5.91”), screws ‹ 200 mm (7.87”), in other areas ‹ 300 mm (11.81”).
- For the edge spacing of the fasteners in case of ribs and plates having shear connections on all sides,the spacing for the edge with no load can be used.
- Single openings with edge lengths ‹ 200 × 200 mm (7.87” × 7.87”) or a diameter ‹ 80 mm (3.15”) can be disregarded.
- More detailed analysis is also required when the rib spacing is greater than 50 times thesheathing thickness.

⇢ Furthermore, the following conditions have to be observed especially for roof and ceiling plate structures:

- Edge straps must be carried out resistant to pushing and pulling on all sides.
- A maximum of 3 panel rows and an open span for the panel of less than 12.5 m (492.13”) may be carried out.
- The allowable panel height in the load direction is › 1/4.
- The boards that form the panel have to be fastened on all rafters / ribs with fasteners atthe spacing av.
- The board joints have to be offset by one rafter or rib space.
- The maximum rafter / rib spacing is 0.75 times the length of the boards in the direction of therafters / ribs.

PRE-DIMENSIONING FOR BOARD LOAD CARRYING ACTION

Pre-dimensioning is carried out based on the load case combinations (LK) according to DIN 1055-100. LK 1 and 2 are applied for the analysis in the ultimate limit state for load capacity.

For the analysis in the ultimate limit state of suitability,dimensioning is carried out according to 3 requirements:

a ⇢ Elastic initial deflection as a result of changeable loads without creep deformationw
Q,inst ≤ l/300

b ⇢ Final deflection with creep effects (all load effects) Σ wfin – wG,inst ≤ l/200

c ⇢ "Usability / visual impairment
Σ wnet,fin = Σ wfin – w0 ≤ l/200"

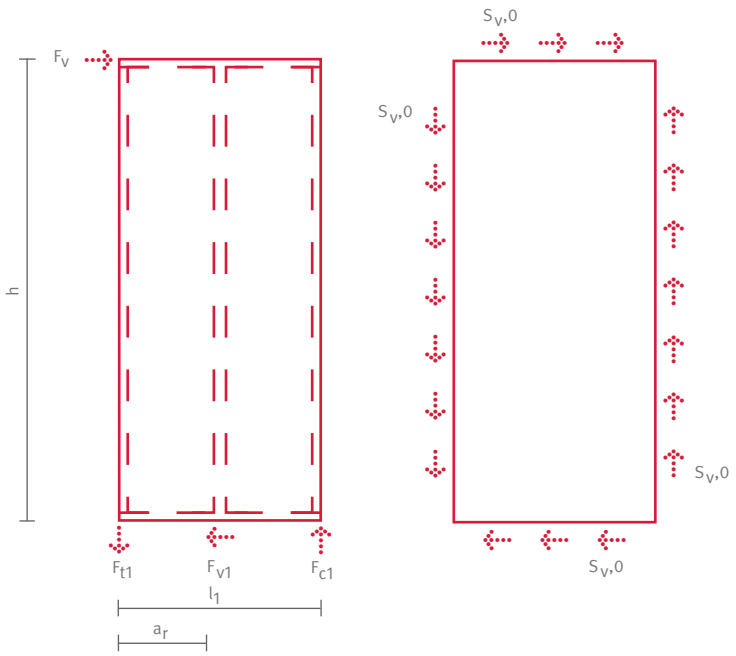
For dimensioning, the range of applications in usage class (NK) 1 and NK 2 has to be taken into account.

The dimensioning tables that follow were prepared based on the regulations for EGGER OSB 4 TOP according to approval Z-9.1-566 as well as the rules for dimensioning wood structures according to DIN 1052:2008. For the simplified stress analysis of the sheathing, the shear flow over the length of the plate can be assumed as constant. The tables serve as recommendations and cannot replace the case-by-case analysis by a structural engineer.

PRE-DIMENSIONING OF WALL PANELS FOR THE ALLOWABLE HORIZONTAL FORCE F_v

Stud spacing a_r (cm)*	all. F_V (kN/a_r) Wall panels in the height h under horizontal stress									
		h = 2,50 m			h = 2,65 m			h = 2,80 m		
		10 mm	12 mm	15 mm	10 mm	12 mm	15 mm	10 mm	12 mm	15 mm
62,5	**1-e**	1,89	2,17	2,71	1,79	2,05	2,57	1,71	1,95	2,44
	2-e	3,18	3,78	4,73	3,08	3,65	4,56	2,95	3,48	4,35
83,5	**1-e**	3,25	3,77	4,71	3,09	3,58	4,48	2,95	3,41	4,26
	3-e	5,87	7,04	8,80	5,91	6,94	8,67	5,65	6,78	8,47
100	**1-e**	4,34	5,10	6,38	4,24	4,96	6,17	4,05	4,71	5,89
	2-e	6,49	7,79	9,73	6,45	7,64	9,55	6,16	7,39	9,24
125	**1-e**	6,36	7,56	9,45	6,24	7,29	9,11	5,90	6,96	8,70
	2-e	8,80	10,56	13,20	8,86	10,40	13,01	8,47	10,16	12,70

* Panel with one, two or three stud gaps a_r.
For sheathing on both sides, the allowable values F_V(kN/a_r) have to be doubled.



PRE-DIMENSIONING OF HORIZONTAL SHEATHING AS SINGLE SPAN GIRDERS FOR VERTICAL LOADS

The tables that follow cannot replace a detailed analysis by a structural engineer for the respective construction project.

EGGER OSB 4 TOP

Single span girders – required board thickness with load distribution level

Category	Application examples	q_k	Q_k	g_k	Supporting member spacing [mm]					
			[kN/m²]		415	500	625	833	1000	1250
A1	**Attics** not for residential applications	1,00	1,00	0,50	15	15	15	15	18	18
				1,50	15	15	15	15	18	22
A3	**Living space** without adequate lateral distribution	2,00	1,00	0,50	15	15	18	22	25	30
				1,50	15	15	18	25	30	40
A3+TW	**Living space** with partition wall without lateral distribution	2,80	1,00	0,50	15	15	18	22	30	40
				1,50	15	15	18	25	30	40
B1	**Office areas** Offices, practices, wards	2,00	2,00	0,50	15	15	18	22	25	30
				1,50	15	15	18	25	30	40
B2	**Offices / work surfaces** Hospital, hotel, kitchen	3,00	3,00	0,50	15	15	18	22	30	40
				1,50	15	15	18	25	30	40
B2+TW	**Offices / work surfaces** with partition walls	3,80	3,00	0,50	15	18	22	25	40	2x30
				1,50	15	18	22	30	40	2x30
C1	**Day-care centres, day nurseries** Areas with tables	3,00	4,00	0,50	15	18	22	30	40	2x30
				1,50	15	18	22	30	40	2x30
C2	**Theatre, convention facilities,** lecture halls with fixed seating	4,00	4,00	0,50	15	18	22	30	40	2x30
				1,50	15	18	22	30	40	2x30
C3	**Museums and exhibition spaces** in public buildings	5,00	4,00	0,50	15	18	22	30	40	2x30
				1,50	15	18	22	40	40	2x30

EGGER OSB 3

Single span girders – required board thickness with load distribution level

Category	Application examples	q_k	Q_k	g_k	Supporting member spacing [mm]				
			[kN/m²]		415	500	625	833	1000
A1	**Attics** not for residential applications	1,00	1,00	0,50	15	15	15	22	25
				1,25	15	15	18	22	25
A3	**Living space** without adequate lateral distribution	2,00	1,00	0,50	15	15	18	22	2x22
				1,25	15	15	18	25	2x22
A3+TW	**Living space** with partition wall without lateral distribution	2,80	1,00	0,50	15	15	22	25	2x22
				1,25	15	18	22	25	2x25
B1	**Office areas** Offices, practices, wards	2,00	2,00	0,50	15	15	18	22	2x22
				1,25	15	15	18	25	2x22
B2	**Offices / work surfaces** Hospital, hotel, kitchen	3,00	3,00	0,50	15	15	22	2x22	2x22
				1,25	15	18	22	2x22	2x25
B2+TW	**Offices / work surfaces** with partition walls	3,80	3,00	0,50	15	18	22	2x22	2x25
				1,25	18	22	25	2x22	–

g_k = net weight

q_k = characteristic surface load capacity

Q_k = characteristic single load, here through covering as surface load

TW = 0.80 kN/m² allowance for partition walls with max. 3.0 kN/m and at right angles to the beam layer

PRE-DIMENSIONING OF HORIZONTAL SHEATHING AS DOUBLE SPAN GIRDERS FOR VERTICAL LOADS

The tables that follow cannot replace a detailed analysis by a structural engineer for the respective construction project.

EGGER OSB 4 TOP

Double-span girder, load applied to one side – required board thickness with load distribution level

Category	Application examples	q_k	Q_k	g_k	Supporting member spacing [mm]					
			[kN/m²]		415	500	625	833	1000	1250
A1	**Attics** not for residential applications	1,00	1,00	0,50	15	15	15	15	18	18
				1,50	15	15	15	15	18	22
A3	**Living space** without adequate lateral distribution	2,00	1,00	0,50	15	15	15	18	22	25
				1,50	15	15	15	22	25	30
A3+TW	**Living space** with partition wall without lateral distribution	2,80	1,00	0,50	15	15	15	18	22	25
				1,50	15	15	15	22	25	30
B1	**Office areas** Offices, practices, wards	2,00	2,00	0,50	15	15	15	18	22	25
				1,50	15	15	15	18	25	25
B2	**Offices / work surfaces** Hospital, hotel, kitchen	3,00	3,00	0,50	15	15	15	18	22	25
				1,50	15	15	18	22	25	30
B2+TW	**Offices / work surfaces** with partition walls	3,80	3,00	0,50	15	15	15	18	25	30
				1,50	15	15	18	22	25	30
C1	**Day-care centres, day nurseries** Areas with tables	3,00	4,00	0,50	15	15	18	25	30	40
				1,50	15	15	18	25	30	40
C2	**Theatre, convention facilities,** lecture halls with fixed seating	4,00	4,00	0,50	15	15	18	25	30	40
				1,50	15	15	18	25	30	40
C3	**Museums and exhibition spaces** in public buildings	5,00	4,00	0,50	15	15	22	25	30	40
				1,50	15	18	22	30	40	2x30

EGGER OSB 3

Double-span girder, load applied to one side – required board thickness with load distribution level

Category	Application examples	q_k	Q_k	g_k	Supporting member spacing [mm]				
			[kN/m²]		415	500	625	833	1000
A1	**Attics** not for residential applications	1,00	1,00	0,50	15	15	15	18	22
				1,25	15	15	15	18	22
A3	**Living space** without adequate lateral distribution	2,00	1,00	0,50	15	15	15	18	22
				1,25	15	15	18	22	2x22
A3+TW	**Living space** with partition wall without lateral distribution	2,80	1,00	0,50	15	15	15	18	22
				1,25	15	15	18	22	2x22
B1	**Office areas** Offices, practices, wards	2,00	2,00	0,50	15	15	18	22	25
				1,25	15	15	18	22	2x22
B2	**Offices / work surfaces** Hospital, hotel, kitchen	3,00	3,00	0,50	15	15	18	22	2x22
				1,25	15	15	18	25	2x22
B2+TW	**Offices / work surfaces** with partition walls	3,80	3,00	0,50	15	15	18	25	2x22
				1,25	15	18	22	25	2x22

g_k = net weight

q_k = characteristic surface load capacity

Q_k = characteristic single load, here through covering as surface load

TW = 0.80 kN/m² allowance for partition walls with max. 3.0 kN/m and at right angles to the beam layer

PRE-DIMENSIONING OF ROOF SHEATHING FOR VERTICAL LOADS

According to the provisions of DIN 1052 and approval Z-9.1-566, the least favourable possibleload case and an allowable deflection of l/400 for the plate effect were assumed.

MINIMUM THICKNESSES EGGER OSB 3

Rafter spacing		Required board thickness d (mm) g (kN/m² DF)															
a_r [cm]	α (°)	0,25		0,50		1,00		1,25		0,25		0,50		1,00		1,25	
		s_k = 0,85 kN/m²								s_k = 1,25 kN/m²							
		1 field	2 field	1 field	2 field	1 field	2 field	1 field	2 field	1 field	2 field	1 field	2 field	1 field	2 field	1 field	2 field
62,5	**0**	15	15	15	15	18	15	18	18	15	15	18	15	18	15	22	18
	15	15	15	15	15	18	15	18	15	15	15	18	15	18	15	18	15
	30	15	12	15	15	15	15	18	15	15	12	15	12	18	15	18	15
	45	15	12	15	12	15	12	18	12	12	12	15	12	15	12	18	12
83,3	**0**	18	15	18	15	18	15	22	18	18	15	18	15	18	15	22	18
	15	15	15	18	15	18	15	22	18	15	15	15	15	18	15	22	18
	30	15	12	15	15	15	15	18	18	15	15	15	15	18	15	18	18
	45	15	12	15	15	15	15	18	15	15	12	15	15	15	15	18	15
100,0	**0**	18	15	22	18	22	18	25	22	18	15	22	18	25	18	25	22
	15	18	15	22	18	22	18	25	18	18	15	22	18	22	18	25	22
	30	15	15	18	18	22	18	22	18	15	15	18	18	22	18	22	22
	45	15	15	18	15	18	18	22	18	15	15	18	15	18	18	22	18
125,0	**0**	22	18	25	22	25	22	–	25	25	22	25	22	–	25	–	25
	15	22	18	25	22	25	22	–	25	25	22	25	22	–	25	–	25
	30	22	18	22	22	25	22	25	25	22	22	25	22	25	25	–	25
	45	22	18	22	22	22	22	25	25	22	18	22	22	25	25	25	25

MINIMUM THICKNESSES EGGER OSB 4 TOP

Rafter spacing		Required board thickness d (mm) g (kN/m² DF)															
a_r [cm]	α (°)	0,25		0,50		1,00		1,25		0,25		0,50		1,00		1,25	
		s_k = 0,85 kN/m²								s_k = 1,25 kN/m²							
		1 field	2 field	1 field	2 field	1 field	2 field	1 field	2 field	1 field	2 field	1 field	2 field	1 field	2 field	1 field	2 field
62,5	**0**	15	12	15	15	18	15	18	15	15	15	15	15	18	15	18	15
	15	15	12	15	15	18	15	18	15	15	15	15	15	15	15	18	15
	30	15	12	15	12	15	15	15	15	15	12	15	12	15	15	15	15
	45	15	12	15	12	15	15	15	15	12	12	15	12	15	12	15	12
83,3	**0**	15	15	18	15	18	15	22	18	15	15	18	15	18	15	22	18
	15	15	15	15	15	18	15	18	18	15	15	15	15	18	15	18	18
	30	15	12	15	15	15	15	18	15	15	15	15	15	15	15	18	18
	45	15	12	15	15	15	15	18	15	15	12	15	15	15	15	18	15
100,0	**0**	18	15	22	18	22	18	25	22	18	15	22	18	22	18	25	22
	15	18	15	22	18	22	18	22	18	15	15	18	18	22	18	25	22
	30	15	15	18	18	18	18	22	18	15	15	18	15	22	18	22	18
	45	15	15	18	15	18	18	18	18	15	15	18	15	18	18	22	18
125,0	**0**	22	18	22	22	25	22	30	25	22	22	25	22	30	25	30	25
	15	22	18	22	22	22	22	25	25	22	22	25	22	25	25	30	25
	30	18	18	22	18	22	22	25	22	22	18	22	22	25	22	25	22
	45	18	18	18	18	25	22	22	22	18	18	22	18	22	22	25	22

s_k = snow load
g_k = net weight

6 LOW-SLOPE ROOFS WITH SEALING OR METAL ROOFING

6.1 GENERAL INFORMATION

In case of low-slope roofs (› 3°) and flat roofs (‹ 3°, at least 2 % slope) with sealing and/ormetal roofing, moisture management in the structure is of special importance in order toensure a long lifespan.

EGGER OSB boards are well suited for this type of construction and constitute a safe, stable substructure for high-quality roof sealing systems consisting of bitumen or plastic roofing membranes. EGGER OSB is also excellent for applications in combination with roofing systems made of copper, aluminium, titanium-zinc or stainless steel.

ADVANTAGES AND DISADVANTAGES OF VENTILATED AND NON-VENTILATED STRUCTURES

Ventilated structures

Advantages	Disadvantages
Straightforward moisture protection due to vapour permeable construction	High structural components
Individual use of the roof surface	Several building element layers
Better heat protection in the summer	High cost for connections, low degree of prefabrication

Non-ventilated structures

Advantages	Disadvantages
Compact construction	Challenging moisture management
Effective use of building elements	Limited use of roof space
Straightforward connection details	More sensitive to deformation
High degree of prefabrication	

NON-VENTILATED STRUCTURES

The following constraints for execution have to be met:

SELECTING THE BUILDING MATERIALS

- Only use EGGER OSB of technical class OSB/3 and OSB/4
- Mounting of the clips / sliding clips for metal roofing with ribbed nails (preferably stainless steel)
- Moisture content of the wood structure (rafters) ‹ 20 % at the time of installation
- At the time of installation, the moisture content of OSB should not exceed 12 %.
- Roofing membranes should be black or dark grey, metal roofing should be non-reflective (zinc sheeting)
- Vapour barrier on the room side with sd ≥ 100m is not allowable
- For covering the upper side of the OSB in metal roofing applications (especially zinc sheeting),a textured separating layer has to be used. Other suitable separating layers may also be used for roofs with a slope › 15°. Using textured separating layers in metal roofing applications results in improved sound protection by up to 6 dB.

STRUCTURAL REQUIREMENTS

- The slope of the roof for the structure must be at least 2 % (≥ 3°)
- OSB board thickness ≥ 22mm (according to statics)
- Limit the board size to max. 2,500 × 1,250 mm (98.43” × 49.21”) and ensure that the joints betweenthe OSB boards are carried out properly: To avoid stresses due tomoisture and length increases of the sheathing according to the construction, board formatsof 2,500 × 1,250 mm (98.43” × 49.21”) generally require a 3 mm (0.12”) expansion gap to be maintained. With T&G boards, 1 mm (0.04”) is alreadyintegrated in the tongue & groove joint.
- The insulation must be installed so that there are no hollow spaces.
- No shading by superstructures or neighbouring buildings and trees.

NOTES ON BUILDING PHYSICS

- Correct structural-physical planning and execution in regards to heat and moisture protection. The evaporation reserve should be at least 250 g of water per m² (10.76 square feet), or the structure has to correspond tothe composition illustrated in Section 6.2.
- The construction of roofs that are not ventilated must be carried out as permanently air-tight.
- The upper side of the roof has to enable adequate warming in order to ensure dryingby reverse diffusion to the inside of the room.
- Flat roofs that have been wetted due to weather conditions have to dry before the structure is closed.
- The processing recommendations of the metal roofing and membrane manufacturers have to be observed!
- In case of roof sheathing with a large overhang at the eaves, preventive surface treatment against blueness or mould, or insulation on the upper side to prevent excessive cooling at night,or using different materials (solid wood board sheathing) may be advisable to prevent discolourationas a result of condensation.

ADDITIONAL REQUIREMENTS AND RECOMMENDATIONS

- No permanent shading by vegetation (trees), neighbouring buildings or superstructures.
- The air-tightness of the roof structure including joints and seams, feedthroughs andjoints between the roof and other building elements has to be checked with a blower door.
- Cellulose insulating materials (wood fibre insulation / cellulose insulation) are recommended due to theirbuffering capacity when exposed to moisture.

VENTILATED STRUCTURES

The following constraints for execution have to be met:

SELECTING THE BUILDING MATERIALS

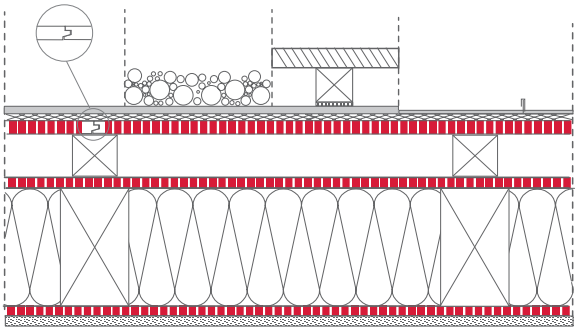
- Roof sheathing EGGER OSB 3 or OSB 4 TOP
- Vapour permeable underlay with sd ≤ 0.3m, e.g. EGGER DHF
- Vapour barrier on the room side with s_d ≥ 3,0 m, e.g. 15 mm EGGER OSB 3 or OSB 4 TOP

STRUCTURAL REQUIREMENTS

- The slope of the roof for the structure must be at least 2% (≥ 3°)
- OSB board thickness ≥ 22 mm (according to statics)
- Ventilation cross-section ≥ 80 mm, or ≥ 150 mm for green roofsOpposite ventilation openings in line of sight,spacing ≤ 15 m (49')
- No built-in components that disrupt ventilation
- EGGER OSB 3, taped air-tight

Note

Flat roofs with special installations such as gravel fill, green roofs or terrace coveringsas well as shaded structures require separate analysis.



6.2 REQUIREMENTS FOR SUBSTRUCTURES FOR METAL ROOFING

Formwork made of wood-based material boards such as OSB can be used as the fastening layer for the roof structure consisting ofmetal roofing – also see the technical rules for metal roofers of ZVSHK St. Augustin, 2009. The OSB boards that are used have to meet usage class 2 (SC2) according to DIN EN 1995-1-1 and DIN 68800-2:2012 as a minimum.

The following EGGER OSB board types are suitable for this application:

- EGGER OSB 4 TOP
- EGGER OSB 3

- The requirements of DIN 68800-2 and EN 335 for wood preservation in construction have to be met.
- The minimum thickness d of the OSB board has to be 22 mm (0.87”) and the maximum board length l has to be 2.5 m (98.43”).
- Expansion gaps with a minimum width of 2 mm (0.08”) must be left between the boards. Otherwise,length changes due to moisture fluctuations can cause the metal roofing to buckle. Interlocking installation of the OSB boards is required.
- Metal roofing should be fastened with ribbed nails, min. 2.5 x 25 mm (0.10” x 0.98”) made of stainless steel. Using sliding clips made of stainless steel to fasten the metal roofing is recommended.
- A suitable separating layer must be used on roof sheathing made of EGGER OSB boards. The information from the metal manufacturer regarding the use of a separating layer with a moisture balancing layer (textured separating layer) between the metal roofing and OSB boards has to be observed.
- In case of vertical and steeply sloped surfaces (facades, dormers), a suitable separating layer to dissipatecondensate is required. Due to the vertical arrangement, any water can drainand a separating layer with moisture balancing layer (textured separating layer) is not required.
- No separating layer is prescribed for gluing with adhesive that contains bitumen, e.g. for masonry capping, window sills or similar building elements.
- General information on building physics is found in the technical rules for metal roofers of the ZVSHK in Section 5.1, and on facade coverings in Section 13.
- The suitability of the separating layer may have to be proven in case of roof covering requirements regarding radiant heat and flying sparks.

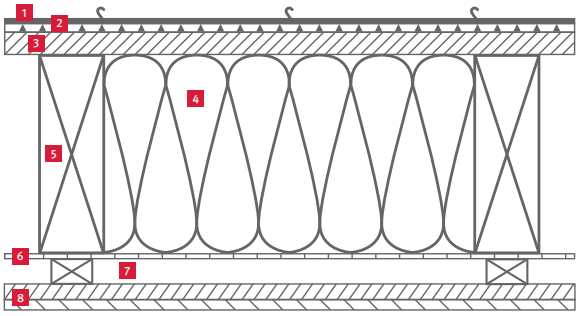
Note

Non-ventilated low-slope roof structures with metal roofing are not regulated by DIN 68800-2:2012.

- The composition of the system has to exclude the unhealthful accumulation of moisture.
- The functionality of non-ventilated structures has to be proven in coordination with builders and planners by means of calculations and moisture dynamics simulations according to EN 15026 (e.g. WUFI).

6.3 SPECIFIC INFORMATION FOR NON-VENTILATED LOW-SLOPE ROOFS
with a slope ≥ 3° to ≤ 15° and metal roofing on formwork made of EGGER OSB

SCHEMATIC DIAGRAM



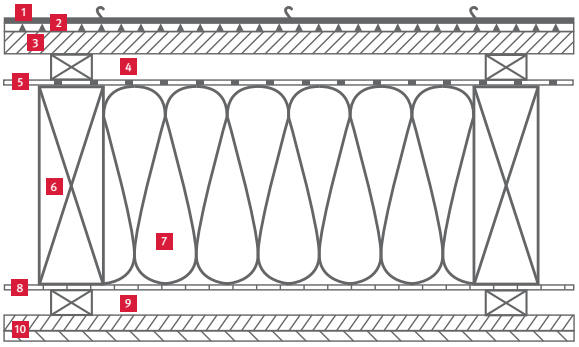
1. Metal roofing (slat system, double standing seam)
2. Textured separating layer
3. EGGER OSB 3 / OSB 4 TOP, d › = 22 mm (0.87”)
4. Thermal insulation according to the requirements
5. Rafters (solid structural wood or glued-laminated timber recommended)
6. Moisture-variable vapour barrier, taped air-tight
7. Installation level, if required
8. Inner cladding

ADDITIONAL REQUIREMENTS AND RECOMMENDATIONS:

- No permanent shading by vegetation (trees), neighbouring buildings or superstructures.
- The air-tightness of the roof structure including joints and seams, feedthroughs andjoints between the roof and other building elements has to be checked with a blower door.
- Cellulose insulating materials (wood fibre insulation / cellulose insulation) are recommended due to theirbuffering capacity when exposed to moisture.

6.4 SPECIFIC INFORMATION FOR VENTILATED LOW-SLOPE ROOFS
with a slope ≥ 3° to ≤ 15° and metal roofing on ventilated formwork made of EGGER OSB

SCHEMATIC DIAGRAM



1. Metal roofing
2. Textured separating layer
3. EGGER OSB / OSB TOP, d › = 22 mm (0.87”)
4. Ventilated according to DIN DIN 4108-3 and the technical rules of the ZVSHK
5. Vapour-permeable underlay
6. Rafters (solid structural wood or glued-laminated timber recommended)
7. Thermal insulation according to the requirements
8. Moisture-variable vapour barrier, taped air-tight
9. Installation level, if required
10. Inner cladding

ADDITIONAL REQUIREMENTS AND RECOMMENDATIONS

- No permanent shading by vegetation (trees), neighbouring buildings or superstructures.
- The air-tightness of the roof structure including joints and seams, feedthroughs andjoints between the roof and other building elements has to be checked with a blower door.

7 STRUCTURAL-PHYSICAL AND OTHER MATERIAL CHARACTERISTICS

CALCULATION VALUES FOR EGGER OSB

Property	Test standard	Unit	EGGER OSB 3	EGGER OSB 4 TOP
Calculation value, μ-value (dry cup/wet cup)	EN ISO 12572	–	200/150	200/200
Thermal conductivity λ_R	EN 13986	W/(mK)	0,13	0,13
Specific heat storage capacity c	EN 12524	J/(kgK)	1.700	1.700
Building materials class	DIN 4102-1		B2	B2
Reaction to fire (t › = 9 mm (0.35”))	EN 13501-1		D-s2, d0	D-s2, d0
Length changeper 1 % material humidity change	EN 318	%/%	0,03	0,03
Formaldehyde emissions	EN 717-1	ppm	‹0,03	‹0,03
Thickness tolerance unsanded	EN 324	mm	± 0,5	± 0,5
Thickness tolerance sanded	EN 324	mm	± 0,3	± 0,3
Edge straightness	EN 324	mm/m	± 1,5	± 1,5
Squareness	EN 324	mm/m	≤ 2,0	≤ 2,0
Dimensional tolerance length / width	EN 324	ppm	± 3,0/ ± 3,0	± 3,0/ ± 3,0

t = board thickness

The calculation values for the water vapour diffusion resistance factor correspond to the generalbuilding authority approvals Z-.1-562 and Z-9.1-566 as well as DIN V 20000-1.

s_d-VALUE TABLE FOR EGGER OSB

Board thickness d (mm)	EGGER OSB 3 (dry/wet)	EGGER OSB 4 TOP (dry/wet)
10	2,0 / 1,5	2,0 / 2,0
12	2,4 / 1,8	2,4 / 2,4
15	3,0 / 2,2	3,0 / 3,0
18	3,6 / 2,7	3,6 / 3,6
20	4,0 / 3,0	4,0 / 4,0
22	4,4 /3,3	4,4 / 4,4
25	5,0 / 3,7	5,0 / 5,0
30	–	6,0 / 6,0
40	–	8,0 / 8,0

REACTION TO FIRE

According to EN 1995-1-2 the burning rate β_0 of the wood-based material boards (e.g. with a raw density ρ of 550 kg/m³ = conservative calculation) can be determined according to the following formula:

$\beta_0 = 0{,}9 * k_p * k_t$ where $k_p = (450/\rho)\ 0{,}5 = (450/550)\ 0{,}5 = 0{,}9045$

$k_t = (20/t_p)\ 0{,}5$ ..... is for a board thickness ‹ 20 mm (0.79")

$k_t = 1{,}0$ ..... is for a board thickness ≥ 20 mm (0.79").

According to the above formula (1), the burning rate for EGGER OSB boards with the following thickness is:

Nominal thickness	Burning rate β_0	
	EGGER OSB 3 according to EN 300 Characteristic raw density = 550 kg/m³	EGGER OSB 4 TOP Characteristic raw density ≥ 600 kg/m³
t_p = 12 mm	β_0 = 1,05 mm/min	β_0 = 0,99 mm/min
t_p = 15 mm	β_0 = 0,94 mm/min	β_0 = 0,89 mm/min
t_p = 18 mm	β_0 = 0,85 mm/min	β_0 = 0,81 mm/min
t_p ≥ 20 mm	β_0 = 0,81 mm/min	β_0 = 0,77 mm/min

8 SURFACE COATING

EGGER OSB is primarily a structural wood-based material. However, its attractive appearance alsoallows it to be used as a decorative element. Here the following principles have to be observed:

- A suitable protective coating should be applied to visible non-load-bearing OSB sheathing in exterior applications not exposed directly to the elements. More information is found in a separate brochure.
- Due to the product characteristics, the possibility that individual strands may separate cannot be excluded, especially when exposed to high levels of moisture (e.g. also water-based coatings).
- Blueness may be seen on occasion and does not impair the strength of the material. when pine wood is used, you should ask us about decorative applications where necessary.
- Prior to lamination, the OSB surfaces have to be prepared accordingly (e.g. sanded,free of dust and grease, absorbent, dry).
- Compliance with the processing instructions of the coating manufacturer is mandatory.
- Butt joints of sanded boards have to be checked for possible height differences and may have to be sanded again.
- Any joints or screw holes in sanded floors can be filled with a mixtureof glue and swarf, or putty suitable for wood-based material boards.

OILS AND WAXES

Natural products are ideal complements for EGGER OSB. A large variety of them is availablein the market for various floor, wall and ceiling applications. Their glazing character is excellent for accentuating the natural OSB texture and makes the surface appear warm.

COATINGS AND STAINS

Paints and glazes are modern, usually water-based coatings that not only protect against moisture, but also offer protection against the effects of UV radiation. They may be enhanced with additives to prevent blueness. This is recommended in particular for exterior applications exposed to the elements. Straightforward application with spraying equipment or brushes is standard.

PLASTER / THERMAL INSULATION COMPOSITE SYSTEMS FOR EXTERIOR APPLICATIONS

Plaster facades are very popular in many regions. While plaster cannot be applied directly over EGGER OSB,the combination with a thermal insulation composite system a sensibleenergy-saving measure for the wood construction building shell. Rather than in the cavity of the structure, some of the insulating layer thickness can berelocated to the exterior skin of the building shell, therefore allowing thewood cross-sections to be reduced to the static requirements.

Note

- For detailed product recommendations, see the application technology recommendation brochure.
- In Germany, thermal insulation composite systems require general building authority approval from the DIBt.

CERAMIC COVERINGS

Wood-based material boards are not ideal as a substructure for ceramic coverings. If this application is chosen regardless, the principles described in this document should be followed. However, the manufacturer cannot guarantee optimum installation results.

⇢ SUBSTRUCTURE

Rather than on the wood-based material board of the substructure, the tiles should be installed on an additional, floating separating layer.

The OSB boards must have a board thickness of at least 25 mm (0.98”) for floors and 18 mm (0.71”) for walls, with fastening that is resistant to bending.

A substructure that meets the requirements must be established before installing ceramic coverings on EGGER OSB. Following the technical datasheets of the manufacturers is mandatory.

The flooring boards have to be force fit and glued to each other in the tongue and groove. They are screwed to the substructure (also see Section 2.3 on fastening). The deflection of thesubstructure and the OSB boards must be limited to l/600.

⇢ COVERING

"The reverse side has to be smooth and the maximum format is 20 x 20 cm (7.87” × 7.87”).
Connections to adjacent building elements or interior and exterior corners are carried out as permanently elastic expansion joints. "

⇢ SEALING

The surface must be sealed to protect it against moisture absorption (e.g. with bituminous sheeting, brushable sealing systems).

Further information is found in our application technology recommendation brochure.
Anwendungstechnische Empfehlungen.

PARQUET AND FLEXIBLE FLOOR COVERINGS

⇢ GENERAL INSTALLATION INSTRUCTIONS

EGGER OSB is offered in the form of flooring boards with T&G on 4 sides, in the thicknesses of 15, 18, 22 and 25 mm (0.59”, 0.71”, 0.87”, 0.98”). Full surface gluing or firmly screwing EGGER OSB is recommended for the installation of parquet.

- In case of floating installation under parquet / pre-finished flooring, two boards with a minimum thickness of 15 mm (0.59”) should be glued and screwed at right angles to each other.
- For the floating installation of EGGER OSB boards and gluing of wood types sensitive to swelling pressure(e.g. maple, beech) and/or parquet dimensions (e.g. 10 mm (0.39”) solid parquet, 22 mm (0.87”) wood strip flooring), note that if high swelling pressure develops (e.g. high relative humidity), severe stress may build up on the upper side of the parquet flooring.

⇢ GLUING FLOOR COVERINGS AND PARQUET ON EGGER OSB:

- EGGER OSB is generally well suited for the installation of elastic and textile floor coverings.
- When gluing parquet onto EGGER OSB, as with chipboard,the wood can be expected to swell more due to the relatively lower absorptive capacity compared togluing on screed.
- The lower absorptive capacity of EGGER OSB also means that the strengthof dispersion adhesives and synthetic resin solvent adhesives develops more slowly compared to screed.
- A surface covered with EGGER OSB is a relatively flat subsurface. Therefore, the risk that hollows may form during the installation of the parquet flooring is far lower as a rule that in case ofinstallation e.g. on cement screed.

STAUF KLEBSTOFFWERKE GMBH RECOMMENDATION

On EGGER OSB, almost all types of floor coverings and parquet can be used with the adhesives from theSTAUF product range, subject to observing the information in the table below. The STAUF adhesive application tables should be followed for the selection of the corresponding adhesive types.

Suitable primers for adhesives / putty on OSB

	STAUF Floor covering adhesives	STAUF Dispersion parquet adhesives	STAUF Synthetic resin solvent parquet adhesives	STAUF Thermosetting resin adhesives *	STAUF SPP-95 [1]
STAUF VDP-130					•
STAUF VDP-140	•	•			
STAUF VPU-155				• [2]	
STAUF VEP-190				• [2]	•
STAUF VLM-100			•		
Adhesive primer Mixture of: 1 RT WFR and 1,5 RT VLM-90			•		

* For the application of STAUF SMP-940* on sanded mastic asphalt, priming with STAUF VEP-190 is required.

[1] Add STAUF reinforcing fibres if applicable

[2] Priming is only required for dirty and dusty OSB, as needed.

Suitable adhesive systems

	STAUF Floor covering adhesives	STAUF Dispersion parquet adhesives	STAUF Synthetic resin solvent parquet adhesives	STAUF Thermosetting resin adhesives *	Pre-treatment of the subsurface
textile floor coverings	•				Clean the subsurface thoroughly; prime and putty depending on the condition and requirements.
Elastic floor coverings	•				
Linoleum	•				
Laminate (full-surface gluing)				•	
Raw parquet		•	•	•	
Finished parquet		•	•	•	
Wood-block paving	Gluing generally not possible, please enquire with us				

The preceding information corresponds to the current state of development. However, it cannot be considered binding in any case since we have no influence on the installation and the installation requirements vary locally. Claims arising from this informationare therefore excluded. This also applies to the commercial and technical consulting service provided free of charge and with no commitment.
We therefore recommend conducting adequate tests directly in order to determine whether the product is suitable for the intended application (2906).

PCI AUGSBURG RECOMMENDATIONS

- Sand the subsurface with 40 grit or use sanded OSB
- Priming with PCI special primer VG2
- Compensating layer (if required) with PCI dispersion putty DIS 44 for layer thicknessesup to max. 1 mm (0.04”) or PCI wood putty HSP34 for layer thicknesses from 3 to 15 mm (0.12” to 0.59”)

e.g.

- Linoleum flooring:
  PCI linoleum adhesive LKL334 (EC1)
- PVC floor coverings: PCI-PVC flooring adhesive PKL324
- Cork flooring: PCI cork contact adhesive KKL347
- Carpet: PCI carpet flooring adhesive (EC1)

APPENDIX (INFORMATIVE)

Orientation for determining applied loads for EGGER OSB in shelf board, platform and similar applications

- The tables that follow were developed on the basis of the dimensioning theory described in DIN 1052 – Wood Construction: 1988

STATIC DIMENSIONING

The static dimensioning of wood structures is carried out on the basis of the applicable national and/or Europeanstandards. Eurocode 5 is being implemented over the medium term as the EU-wide body of rules and regulations for the dimensioning of wood structures. For the characteristic values for EGGER OSB for static dimensioning according to Eurocode 5, see DIN EN 12369-1 and/or the building authority approvals.

The dimensioning tables below were prepared based on the regulations for EGGER OSB 3 according toEN 13986 and EGGER OSB 4 TOP according to approval Z-9.1-566 as well as the rules for dimensioning wood structures according to DIN 1052:1988. They are merely intended to enable fast pre-dimensioning for orientation.

Note

The tables are intended as recommendations, which means they cannot replace the case-by-case analysis by a structural engineer.

EGGER OSB 3 – PRE-DIMENSIONING OF HORIZONTAL SHEATHING AS DOUBLE-SPAN GIRDER FOR VERTICAL LOADS

The following table specifies the required board thickness with the application of vertical loads only (e.g. shelf boards) without a plate effect, as double-span girders. In this case the deflection is limited to l/300.

Double-span girder, one-sided load / allowable vertical load (kN/m²)

Open spane (m)	Board thickness d (mm)						
	8	10	12	15	18	22	25
0,35	1,73	3,41	5,93	10,37	14,95	20,17	26,07
0,40	1,14	2,27	3,95	7,76	11,42	15,41	19,92
0,45	0,79	1,57	2,75	5,42	9,00	12,15	15,71
0,50	0,56	1,13	1,99	3,93	6,84	9,82	12,70
0,55	0,41	0,83	1,47	2,93	5,11	8,09	10,47
0,60		0,63	1,12	2,24	3,91	6,78	8,77
0,625		0,55	0,98	1,97	3,45	6,24	8,07
0,65		0,48	0,86	1,74	3,05	5,64	7,45
0,70		0,37	0,68	1,37	2,42	4,49	6,40
0,75			0,54	1,10	1,95	3,62	5,36
0,80			0,43	0,89	1,59	2,96	4,39
0,833			0,37	0,78	1,39	2,61	3,87
0,85			0,35	0,73	1,31	2,45	3,64
0,90				0,60	1,08	2,04	3,04
0,95				0,50	0,90	1,72	2,56
1,00				0,41	0,76	1,45	2,18
1,05		‹ 50 kg/m²		0,34	0,64	1,24	1,86
1,10					0,54	1,06	1,60
1,15					0,46	0,91	1,38
1,20						0,79	1,20

The following table specifies the required board thickness with the application of vertical loads only (e.g. shelf boards) without a plate effect, as double-span girders. In this case the deflection is limited to l/300.

Double-span girder, double-sided load / allowable vertical load (kN/m²)

Open spane (m)	Board thickness d (mm)						
	8	10	12	15	18	22	25
0,35	2,46	3,86	5,07	7,94	11,46	15,46	19,99
0,40	1,87	2,94	3,86	6,06	8,75	11,81	15,27
0,45	1,38	2,31	3,04	4,77	6,89	9,30	12,03
0,50	0,99	1,86	2,45	3,85	5,56	7,51	9,72
0,55	0,73	1,46	2,01	3,16	4,58	6,18	8,00
0,60	0,55	1,11	1,68	2,64	3,83	5,17	6,70
0,625		0,98	1,54	2,43	3,52	4,76	6,16
0,65		0,86	1,42	2,24	3,25	4,39	5,69
0,70		0,68	1,21	1,92	2,78	3,77	4,88
0,75		0,54	0,97	1,66	2,41	3,26	4,24
0,80			0,78	1,45	2,11	2,85	3,70
0,833			0,69	1,33	1,93	2,62	3,40
0,85			0,64	1,27	1,85	2,51	3,26
0,90			0,53	1,08	1,64	2,23	2,90
0,95				0,91	1,46	1,98	2,58
1,00				0,77	1,31	1,78	2,32
1,05		‹ 50 kg/m²		0,65	1,17	1,60	2,09
1,10				0,55	1,00	1,45	1,89
1,15					0,86	1,31	1,72
1,20					0,75	1,19	1,56

EGGER OSB 4 TOP – PRE-DIMENSIONING OF HORIZONTAL SHEATHING AS DOUBLE-SPAN GIRDER FOR VERTICAL LOADS

The following table specifies the required board thickness with the application of vertical loads only (e.g. shelf boards) without a plate effect, as double-span girders. In this case the deflection is limited to l/300.

Double-span girder, one-sided load / allowable vertical load (kN/m²)

Open spane (m)	Board thickness d (mm)								
	8	10	12	15	18	22	25	30	40
0,35	2,47	4,87	8,44	16,54	28,36	42,39	54,76	73,79	113,13
0,40	1,64	3,24	5,63	11,05	19,15	32,42	41,89	56,45	86,56
0,45	1,14	2,26	3,93	7,73	13,41	24,56	33,07	44,57	68,34
0,50	0,82	1,63	2,85	5,61	9,75	17,87	26,26	36,06	55,31
0,55	0,60	1,21	2,12	4,19	7,30	13,39	19,69	29,77	45,67
0,60		0,92	1,62	3,21	5,59	10,28	15,13	24,99	38,33
0,625		0,80	1,42	2,83	4,94	9,08	13,37	23,01	35,31
0,65		0,71	1,26	2,50	4,38	8,06	11,87	20,59	32,63
0,70		0,55	0,99	1,99	3,48	6,42	9,47	16,45	28,10
0,75			0,79	1,60	2,81	5,20	7,67	13,34	24,44
0,80			0,64	1,30	2,30	4,26	6,29	10,96	21,45
0,833			0,56	1,14	2,02	3,76	5,56	9,69	19,77
0,85			0,52	1,07	1,90	3,53	5,22	9,11	18,63
0,90				0,89	1,58	2,95	4,38	7,64	15,66
0,95				0,74	1,33	2,49	3,70	6,47	13,27
1,00				0,62	1,12	2,11	3,15	5,52	11,35
1,05				0,52	0,95	1,81	2,70	4,74	9,77
1,10					0,81	1,55	2,33	4,10	8,46
1,15		< 50 kg/m²			0,70	1,34	2,02	3,57	7,38
1,20					0,60	1,17	1,76	3,12	6,46

The following table specifies the required board thickness with the application of vertical loads only (e.g. shelf boards) without a plate effect, as double-span girders. In this case the deflection is limited to l/300.

Double-span girder, double-sided load / allowable vertical load (kN/m²)

Open spane (m)	Board thickness d (mm)								
	8	10	12	15	18	22	25	30	40
0,35	4,25	7,77	10,27	16,07	21,75	32,53	42,02	56,63	86,83
0,40	2,83	5,56	7,85	12,28	16,63	24,87	32,14	43,31	66,42
0,45	1,97	3,89	6,18	9,68	13,12	19,62	25,36	34,18	52,43
0,50	1,43	2,85	4,90	7,83	10,60	15,87	20,51	27,65	42,42
0,55	1,06	2,10	3,67	6,45	8,74	13,09	16,92	22,82	35,01
0,60	0,80	1,61	2,81	5,41	7,33	10,98	14,20	19,15	29,38
0,625	0,71	1,41	2,47	4,88	6,75	10,11	13,07	17,63	27,06
0,65	0,62	1,25	2,19	4,33	6,23	9,33	12,07	16,29	25,00
0,70		0,99	1,74	3,45	5,35	8,03	10,39	14,02	21,52
0,75		0,79	1,40	2,79	4,65	6,98	9,03	12,19	18,71
0,80		0,64	1,14	2,28	3,99	6,12	7,92	10,69	16,42
0,833		0,56	1,00	2,01	3,52	5,63	7,29	9,84	15,12
0,85		0,52	0,94	1,89	3,31	5,40	7,00	9,45	14,52
0,90			0,78	1,57	2,77	4,80	6,22	8,41	12,92
0,95			0,65	1,32	2,34	4,30	5,57	7,53	11,57
1,00			0,55	1,12	1,99	3,70	5,01	6,77	10,42
1,05				0,96	1,70	3,18	4,53	6,13	9,43
1,10				0,82	1,47	2,74	4,07	5,57	8,57
1,15		< 50 kg/m²		0,71	1,27	2,38	3,54	5,08	7,82
1,20				0,61	1,10	2,08	3,10	4,65	7,16

NOTES

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