SINTEF Technical Approval

TG 2459

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www.sintefcertification.no

SINTEF confirms that

Agepan® OSB 3 Ecoboard floor and roof sheathing

has been found to be fit for use in Norway and to meet the provisions regarding product documentation given in the regulation relating to the marketing of products for construction works (DOK) and regulations on technical requirements for building works (TEK), with the properties, fields of application and conditions for use as stated in this document

1. Holder of the approval

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2. Product description

Agepan® OSB 3 Ecoboards are wood-based oriented strand boards with strands mainly from pine and spruce, bonded together under high temperature and pressure with moisture resistant resin type PDMI (polymeric diphenylmethanediiso-cyanate). The wood strands are cross-oriented in three layers with the wood fibres in the face layers mainly oriented parallel to the length of the board.

The boards are produced as type OSB/3 in accordance with EN 13986 and EN 300.

Standard nominal thicknesses for floorboards are 18 mm and 22 mm, and 15, 18 and 22 mm for roof boards. Boards are normally delivered with unsanded surfaces.

Standard sizes, as installed, are 2440 mm x 1220 mm with tongue and groove edge profiles at long edges, and 2440 mm x 600 mm with tongue and groove on all four edges, see in fig. 1.

Dimensional tolerances according to EN 300, measured according to EN 324-1 and 324-2 are:

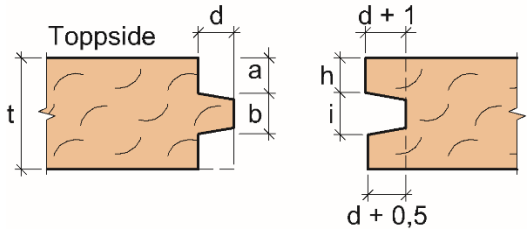
- Thickness, (unsanded) ± 0,8 mm
- Length and width ± 3 mm
- Edge straightness 1,5 mm/m
- Squareness 2,0 mm/m

Minimum density of boards is approx. 600 kg/m³ measured according to EN 323.

Formaldehyde emission class according to EN 13986 is E1.

3. Fields of application

Agepan® OSB 3 Ecoboards can be used in buildings in risk class 1-6 in fire class 1, 2 and 3. For use in fire rated constructions in fire class 3 complete analytical fire design must be performed.



t	a	b	d	h	i
15	4,35	6	7	4,35	6,30
18	5,85	6	7	5,85	6,30
22	6,85	8	7	6,85	8,30

Fig. 1
Agepan® OSB 3 Ecoboard floor and roof sheathing. Tongue and groove edge profiles

With conditions as specified in section 6, the boards may be used as subfloor on floor joists in residential buildings and other buildings with imposed floor load category A or B according to EN 1991-1-1., and as loadbearing roof sheathing in roof structures.

The boards can be used in service class 1 and 2 according to EN 1995-1-1, and as subfloor in platform constructions. In the final construction, the average humidity shall not exceed 85% RH for more than short period.

Special conditions for application are given in clause 6.

4. Properties

Strength and stiffness
Table 1 shows the characteristic strength and stiffness required for OSB/3 boards according to EN 300.

Structural design properties for calculating load-bearing structures are given in EN 12369-1.

Table 1
Minimum characteristic strength and stiffness for Agepan® OSB 3 Ecoboards

Property [1]	Value	Nom. board thickness, mm		Test method
		15	18 and 22	
Bending strength - Parallel to board length - Parallel to board width	N/mm²	16,4 8,2	14,8 7,4	EN 310
E-modulus in bending - Parallel to board length - Parallel to board width	N/mm²	4930 1980		EN 310
Internal bond	N/mm²	0,32	0,30	EN 319

[1] The values represent the 5 % fractile as specified in EN 300

Properties in relation to fire
Agepan® OSB 3 Ecoboards have reaction to fire classification D-s2,d0 according to EN 13501-1 for use as ceiling board and underlaying floor.

Agepan® OSB 3 Ecoboards have reaction to fire classification D_{fl}-s1 according to EN 13501-1 for use as visible floorboards.

See chap. 6.3 regarding special conditions for use and installation.

Properties related to moisture
- Declared moisture movement in the plane of the boards, measured according to EN 318, is 3 mm/m and thickness swelling 5 % when the moisture content changes from equilibrium at 35 % RH to equilibrium at 85 % RH.
- Thickness swelling after 24 hours water immersion is ≤ 15°% measured in accordance with EN 317.
- The water vapour resistance coefficient is μ = 200 for dry conditions and μ = 150 according to EN 12524. This corresponds to s_d = 3,6 m and s_d = 2,7 m for 18 mm thick boards (equivalent air thickness value). For other board thicknesses the equivalent air thickness value s_d can be calculated by formula $s_d = \mu \cdot d$, where d is board thickness in meters.
- The resin used in the boards is moisture resistant, which allows the boards to be exposed to free water for a limited time during the construction period. In permanent service the relative humidity shall not be more than 85 % apart for short periods.
- The boards are delivered from the factory with a moisture content of 5 - 12 % weight, measured according to EN 322.
- The boards are not treated against growth of mould or fungi.

Thermal insulation
Designed thermal conductivity is λ = 0,13 W/mK according to EN 13986.

5. Environmental aspects

Substances hazardous to health and environment
Agepan® OSB 3 Ecoboards contain no hazardous substances with priority in quantities that pose any increased risk for human health and environment. Chemicals with priority include CMR, PBT or vPvB substances.

Effect on indoor environment
Agepan® OSB 3 Ecoboards are evaluated according to SINTEF Technical Approval – Health and Environmental Requirements version 09.05.2022. The product is not regarded as emitting any particles, gases or radiation that have a perceptible impact on the indoor climate, or to have any significant impact on health. The product meets the requirements in BREEAM-NOR v6.0, Emissions from building products according to Hea 02 Indoor air quality.

Waste treatment/recycling
The boards shall be sorted as wood. The product shall be delivered to an authorized waste treatment plant for energy recycling.

Environmental declaration
An environmental declaration (EPD) has been worked out according to EN 15804 for AGEPAN® OSB 3 ECOBOARD. For complete documentation see EPD no. EPD-SON-20220209-ICC1-EN, www.ibu-epd.com

6. Special conditions for use and installation

Design considerations for floor sheathing
18 mm and 22 mm Agepan® OSB 3 Ecoboards may be used as subfloor on floor joists spaced maximum c/c 600 mm, provided that the imposed load is maximum 3,0 kN/m² uniformly distributed load and 2,0 kN concentrated load in accordance with EN 1991-1-1.

The use of 18 mm boards on c/c 600 mm joist spacing requires a stiff flooring material like parquet, timber flooring or laminates. Agepan® OSB 3 Ecoboards with minimum thickness 22 mm may be used under thin flooring materials like vinyl or linoleum.

Agepan® OSB 3 Ecoboards may be applied in platform constructions where the boards are exposed to direct precipitation for a limited period.

Design considerations for roof sheathing
Agepan® OSB 3 Ecoboards 15, 18 and 22 mm may be used as loadbearing roof sheathing with maximum spans as shown in Table 2. The table is valid for all roof slopes and for roofs with snow slide preventers.

Table 2
Minimum board thickness for Agepan® OSB 3 Ecoboards loadbearing roof sheathing

Rafter spacing mm	Snowload [1] kN/m²	Minimum board thickness mm [2]
Roof covered with roofing membranes and similar		
600	sk ≤ 5,5 5,5 < sk ≤ 7,5 7,5 < sk ≤ 9,0	15 18 22
Roof covered with turf roofing		
600	sk ≤ 2,5	18
	2,5 < sk ≤ 6,0	22

[1] Characteristic snowload on ground, sk, according to NS-EN 1991-1-3 (based upon the basic snow load value for the municipality, with possible addition for height above the municipality center)
[2] For roof with slopes smaller than 1:20 it is recommended to increase the board thickness by 3 mm

In order to prevent permanent deflections of roof sheathing leading to poor drainage of roofs with little slope over time, the thicknesses given in Table 2 should be increased by 3 mm if the slope of the roof surface is less than 1:20 and the design snow load on the ground at the same time is larger than 3.0 kN / m².

The boards shall always be covered by a watertight roofing membrane, also when discontinuous roofing on battens is applied, and have a ventilated space underneath the boards.

Safety in case of fire
Fire classification D-s2,d0 and D_{fl}-s1 supposes mounting directly on an underlay with class A1 or A2-s1,d0 with density not less than 10 kg/m³ (f.ex. mineral wool or gypsum boards) or minimum class D-s2,d2 with density not less than 400 kg/m³ (f.ex. timber or wood based boards).

Fire classification D-s2,d0 is also valid for mounting with an open or closed cavity ≤ 22 mm behind the board, where the opposite side of the cavity must consist of a product with minimum class A2-s1,d0 and density not less than 10 kg/m^3.

Fire classification D-s2,d0 and D_{fl}-s1 is also valid for mounting with a cavity behind the board, where the opposite side of the cavity must consist of a product with minimum class D-s2,d2 and density not less than 400 kg/m^3. If mounted with an open cavity behind, the fibre boards must have a thickness of minimum 18 mm. If mounted with a closed cavity behind, the fibre boards must have a thickness of minimum 15 mm.

Ceiling boards and underlaying floor can be mounted on an underlay of cellulose insulation with minimum fire classification E.

Installation
The boards shall be installed staggered, with the long side perpendicular to the floor joists, rafters or roof trusses. The boards shall normally span continuously over at least two spans. Free edges at walls and openings shall always be continuously supported.

All tongue and groove joints in floors shall be glued with two adhesive strings as shown in fig. 4. Floor sheathing shall also be glued to the floor joists with two continuous adhesives strings on top of the joists. A type of adhesive designed for subfloor installation and suitable for the relevant climate conditions during installation must be applied.

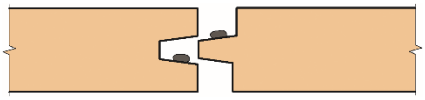


Fig. 4
Tongue and groove joints shall be glued with two adhesive strings. One is applied in the groove and one on the tongue.

The boards shall be fixed to the joists with either floor panel screws or nails. The length of screws should be 2,5 times the thickness of the board or at least 50 mm with a minimum screwhead diameter of 4 mm, and the length of nails should be 2,5 times the thickness of the board or at least 65 mm.
The spacing between fasteners shall be 150 mm at the ends of the boards, and 300 mm at intermediate supports. Screw heads shall be countersunk 2-3 mm.

It must be taken into account that some swelling in the plane of the boards will take place after installation.

The use and installation of Agepan® OSB 3 Ecoboards shall otherwise be in conformity with the recommendations in SINTEF Building Research Design Guide No. *522.861 Subfloor on timber joists and SINTEF Building Research Design Guide no. 525.861 Roof sheeting made of wood-based panels.*

Surface treatment
The boards shall be cleaned and have a moisture content of maximum 10 % before floor coverings are installed. Surface damages must be repaired with a filler compound before installation of thin floor coverings, and edge toppings must be sanded. Countersunk screw heads shall not be filled with filler compound.

Underlay for ceramic tiles
When used as an underlay for ceramic tiles the joist spacing should be maximum c/c 300 mm. Alternatively the boards may be installed on joists spaced c/c 600 mm, provided a double layer of boards is used or by applying of a screed material. See also SINTEF Building Research Design Guide no. *541.411. Ceramic tiles on indoor floors.*

Transport and storage
The boards are to be transported and stored in dry conditions on a stable and level substrate.

7. Factory production control

Agepan® OSB 3 Ecoboards are produced in Germany by Sonae Arauco Deutschland GmbH.

The holder of the approval is responsible for the factory production control in order to ensure that Agepan® OSB 3 Ecoboards are produced in accordance with the preconditions applying to this approval.

The manufacturing of the products and the manufacturer's system for factory production control (FPC) is subject to continuous surveillance in accordance with the contract regarding SINTEF Technical Approval.

Manufacturer has a quality system certified in accordance with EN ISO 9001 and environmental management system certified in accordance with EN ISO 14001.

8. Basis for the approval

The evaluation of Agepan® OSB 3 Ecoboards is based on reports owned by the holder of the approval.

9. Marking

Agepan® OSB 3 Ecoboards shall be CE-marked according to the provisions of EN 13986, incl. name of product and manufacturer, formaldehyde class, and a production number or date of production. The approval mark for SINTEF Technical Approval TG 2459 may also be used.

10. Liability

The holder/manufacturer has sole product responsibility according to existing law. Claims resulting from the use of the product cannot be brought against SINTEF beyond the provisions of Norwegian Standard NS 8402.

for SINTEF

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Approval Manager