

SINTEF Technical Approval

TG 2030

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SINTEF confirms that

Sterling OSB/3 Zero 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

West Fraser Europe Limited
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2. Product description

Sterling OSB/3 Zero are oriented strand board panels made of wood strands from Scots pine. The strands are cross oriented in three layers and bonded together under high temperature and pressure with PMDI glue. The face layer strands are mainly oriented with the wood fibers parallel to the length of the panels. The core layer strands are mainly parallel to the width of the panel.

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

Standard floor panel thicknesses are 18 mm and 22 mm, and the roof panel thicknesses are 15 mm, 18 mm, and 22 mm. The boards are normally delivered with unsanded surface.

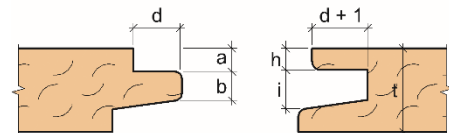
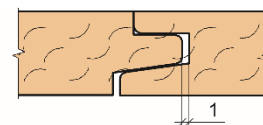
Standard sizes in the Norwegian market are 600 mm x 2 400 mm and 1 200 mm x 2 400 mm, with tongue and groove edges at the long sides (fig. 1). All boards can be delivered with tongue and grooves at all four sides.

Declared tolerances on dimension are as follows, measured according to EN 324-1 and EN 324-2:

- Tolerance on thickness (unsanded) $\pm 0,8$ mm
- Length and width tolerance $\pm 3,0$ mm
- Edge straightness tolerance $\pm 1,5$ mm/m
- Squareness tolerance $\pm 2,0$ mm/m

Sterling OSB/3 Zero have density approximately 600 kg/m^3 ($\pm 15\%$).

Formaldehyde emission class according to EN 13986 is E1.



t	a	b	d	h	i
15	3,95	4,4	8	3,95	4,5
18	5,45	4,4	8	5,45	4,5
22	7,45	4,4	8	7,45	4,5

Fig. 1
 Sterling Zero OSB. Tongue and groove profiles (mm).

3. Fields of application

Sterling OSB/3 Zero may be used as subfloor on floor joists in residential and other buildings with similar floor loads, and as loadbearing roof sheathing in timber roof structures.

Sterling OSB/3 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 a complete analytic fire design must be performed.

In general, it is recommended that OSB/3 boards be used only in permanent constructions where they are directly protected from rain, corresponding to climate classes 1 and 2 according to EN 1995-1-1 and EN 335.

The use of OSB/3 in climate class 2 must be considered separately in each individual project due to the increased risk of condensation and mold formation.

SINTEF is the Norwegian member of European Organisation for Technical Assessment, EOTA, and European Union of Agrément, UEAtc

4. Properties

4.1 Strength and stiffness

Table 1 shows the characteristic strength and stiffness required for OSB/3 boards manufactured according to EN 300. Structural design properties for calculating main load-bearing structures are given in EN 12369-1.

Table 1
Minimum characteristic strength and stiffness for Sterling OSB/3 Zero floor and roof sheathing¹⁾

Property	Test method	Value in N/mm ²	
		Nom. board thickness, mm	
		15	18-25
Bending strength			
Parallel to board length	EN 310	20,0	18,0
Parallel to board width		10,0	9
E-modulus in bending			
Parallel to board length	EN 310	3500	
Parallel to board width		1400	
Internal bond			
Internal bond	EN 319	0.32	0.30

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

4.2 Properties related to fire

Sterling OSB/3 Zero has reaction to fire classification D-s2,d0 according to EN 13501-1 for use as ceiling board and underlaying floor.

Sterling OSB/3 Zero has reaction to fire classification D_{fl}-s1 according to EN 13501-1 for use as visible floorboard. See chap. 6.3 regarding special conditions for use and installation.

See chap. 6 regarding special conditions for use and installation.

4.3 Thermal insulation

Design thermal conductivity is $\lambda_d = 0,13 \text{ W/(mK)}$ according to EN 13986.

4.4 Properties related to moisture

Moisture movement in the plane of the panels when the moisture content change from equilibrium at 35 % RH to equilibrium at 85 % RH is considered to be 2 mm/m, and increase in thickness of approx. 5 %, determined according to EN 318.

Thickness swelling after 24 hours water immersion is $\leq 15 \%$ measured in accordance with EN 317.

The water vapour resistance coefficient is $\mu = 50$ for dry conditions and $\mu = 30$ for wet conditions according to EN 13986. This is equivalent to $s_d = 0,90 \text{ m}$ and $0,54 \text{ m}$ for 18 mm thick boards, and $s_d = 1,10 \text{ m}$ and $0,66 \text{ m}$ for 22 mm thick boards (equivalent air thickness value).

The resin used in the boards is moisture resistant, which allows the boards to be exposed to water for a limited time during the construction period. In permanent conditions the boards must not be exposed to a climate with more than 85 % RH except for a few weeks per year. The moisture content of the product shall not exceed 16% for any significant period, nor 20% at any time.

The declared moisture content of the boards is 2 % - 12 % weight after manufacture.

The boards are not specially treated against growth of mold or fungi.

5. Environmental aspects

5.1 Substances hazardous to health and environment

Sterling OSB/3 Zero 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.

5.2 Effect on indoor environment

The boards 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.

5.3 Waste treatment/recycling

The boards shall be sorted as wood on the demolition site. The product shall be delivered to an authorized waste treatment plant for energy recovery.

5.4 Environmental declaration

An environmental declaration (EPD) has been worked out according to EN 15804 for Sterling OSB Zero. For complete documentation see EPD no. S-P-01850, www.environdec.com.

6. Special conditions for use and installation

6.1 Design considerations for floor sheathing

18 mm and 22 mm Sterling OSB/3 Zero may be used as subfloor on floor joists spaced maximum c/c 600 mm, provided that the imposed load is maximum category B according to NS-EN 1991-1-1, i.e. maximum 3,0 kN/m² uniformly distributed load and 2,0 kN concentrated load.

The use of 18 mm boards on c/c 600 mm joist spacing requires a stiff flooring material like parquet, timber flooring or laminates. 22 mm boards are recommended for use under thin flooring materials like vinyl or linoleum.

Sterling OSB/3 Zero may be applied in platform constructions where the boards are exposed to direct precipitation for a limited period. The boards may also be used as a subfloor in the wet rooms in residential buildings and similar.

6.2 Design considerations for roof sheathing

Sterling OSB/3 Zero 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 guards.

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 is applied, and have a ventilated space underneath the boards.

Table 2
Minimum board thickness for Sterling OSB/3 Zero loadbearing roof sheathing

Span (rafter spacing) mm	Snowload ¹⁾ kN/m ²	Minimum board thickness ²⁾ mm
Roof covered with ordinary roofing (membrane shingles etc.) ³⁾		
600	$s_k \leq 5,5$	15
	$5,5 < s_k \leq 7,5$	18
	$7,5 < s_k \leq 9,0$	22
900	$3,5 < s_k \leq 4,5$	22
	Roof covered with turf roofing	
600	$s_k \leq 2,5$	18
	$2,5 < s_k \leq 6,0$	22

¹⁾ Characteristic snow-load on ground, s_k , according to EN 1991-1-3 (based upon the fundamental value for the municipality, with possible addition for height above the municipality centre)

²⁾ For roof smaller than 1:20 it is recommended to increase the boards thicknesses by 3 mm

³⁾ The dead load of roofing and roof underlay is assumed to be 0,25 kN/m²

6.3 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 or class D-s2,d2 with density not less than 400 kg/m³.

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 class D-s2,d2 and density not less than 400 kg/m³. If mounted with an open cavity behind, the fibre boards must have a thickness of minimum 18 mm.

6.4 Installation

In floors and roofs, Sterling OSB/3 Zero 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.

Straight edge boards without tongue and groove edges must be supported at all four sides.

All tongue and groove joints in floors shall be glued with two adhesive strings as shown in fig. 2.

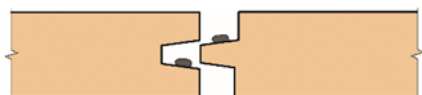


Fig. 2
Tongue and groove joints shall be glued with two adhesive strings. One is applied in the groove and one on the tongue.

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.

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 Sterling OSB/3 Zero floor sheathing, including fastening by nails or screws, shall otherwise be in conformity with the recommendations in SINTEF Building Research Design Sheet no. 522.861.

Sterling OSB/3 Zero roof sheathing shall otherwise be used and installed in conformity with the recommendations in SINTEF Building Research Design Sheet no. 525.861.

6.5 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.

6.6 Underlay for ceramic tiles

When used as an underlay for ceramic tiles the boards with minimum thickness 22 mm shall be used and 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.*

6.8 Transport and storage

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

7. Factory production control

Sterling OSB/3 Zero is produced by West Fraser Europe Limited, Inverness, Scotland, UK.

The holder of the approval is responsible for the factory production control in order to ensure that Sterling OSB/3 Zero is produced in accordance with the preconditions applying to this approval.

The manufacturing of Sterling OSB/3 Zero is subject to continuous surveillance of the factory production control in accordance with the contract regarding SINTEF Technical Approval.

West Fraser Europe Limited has a quality system certified in accordance with EN ISO 9001.

8. Basis for the approval

The evaluation of Sterling OSB/3 Zero is based on reports owned by the holder of the approval.

9. Marking

Sterling OSB/3 Zero 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 2030 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



Hans Boye Skogstad
Approval Manager