

SINTEF confirms that

SWISS KRONO OSB/3 floor, roof and wall 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

SWISS KRONO TEX GmbH & Co. KG
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 Germany
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2. Product description

SWISS KRONO OSB/3 are oriented strand board panels made of wood strands from pine, bonded together under high temperature and pressure with synthetic resin.

The strands are cross oriented in three layers. The face layer strands are mainly oriented with the wood fibres parallel to the length of the panels. The core layer strands are mainly parallel to the width of the panel. The glue is PMDI (polymeric diphenylmethanediisocyanate).

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

Standard panel thicknesses are 15, 18 and 22 mm.

The surfaces are unsanded.

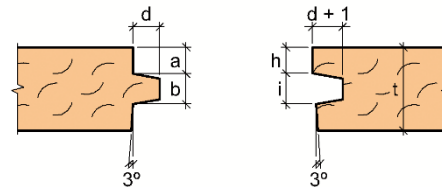
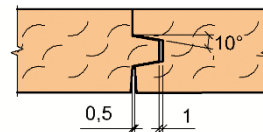
Standard sizes on the Norwegian market are 2400 mm x 1220 mm with tongue and groove edges at the long sides (fig. 1), and 2420 mm x 620 mm with tongue and groove at all four sides. The boards can also be delivered with straight edges in the sizes 2400 x 1200 or 2390 x 1197 mm and in the thicknesses 9, 10 or 11 mm.

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

- Tolerance on thickness ± 0.8 mm
- Tolerance on length and width ± 3.0 mm
- Edge straightness tolerance ± 1.5 mm/m
- Squareness tolerance ± 2.0 mm/m

Declared panel densities measured according to EN 323 varies from 580 to 630 kg/m³ depending upon panel thickness.

Formaldehyde emission class according to EN 13986 is E1.



t	a	b	d	h	i
15	4.5	6	7	4.25	6.5
18	6	6	7	5.75	6.5
22	7	8	7	6.75	8.5

Fig. 1
 SWISS KRONO OSB/3. Tongue and groove profiles

3. Fields of application

SWISS KRONO OSB/3 boards can be used as visible surface in buildings in risk class 1-6 in fire class 1, 2 and 3 with limitations as given in the guideline to TEK regarding surfaces, claddings and material use.

Covered in constructions without fire resistance the boards can be used in buildings in risk class 1-6 in fire class 1, 2 and 3. Covered in constructions with fire resistance the boards can be used in buildings in risk class 1-6 in fire class 1 and 2. For other areas of use, including loadbearing and/or fire rated constructions in fire class 3 and in shafts and cavities, the fire safety must be documented through analytical fire design in each building project. Also see SINTEF Building Research Guide 321.022 and 571.050.

In general, it is recommended that the OSB/3 is only used for where its directly protected against rain in permanent constructions as in climate class 1 and 2 according to EN 1995-1-1 and EN 335.

Use of OSB/3 boards in climate class 2 must be evaluated in every project because of an increased risk of condensation and growth of mold/fungi.

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 SWISS KRONO OSB/3¹⁾

Property	Test method	Value in N/mm ²		
		Nom. board thickness, mm		
		9-10	10-18	18-25
Bending strength				
Parallel to board length	EN 310	18,0	16,4	14,8
Parallel to board width		9,0	8,2	7,4
E-modulus in bending				
Parallel to board length	EN 310	4930		
Parallel to board width		1980		
Internal bond				
	EN 319	0.34	0.32	0.30

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

4.2 Properties related to fire

SWISS KRONO OSB/3 boards has reaction to fire classification D-s2,d0 according to EN 13501-1 for use as ceiling board, wall board and underlying floor.

SWISS KRONO OSB/3 boards has reaction to fire classification Dfl-s1 according to EN 13501-1 for use as visible floor board.

See chap. 6.4 regarding special conditions for use and installation.

4.3 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 2,5 mm/m determined according to EN 318.
- Equivalent air thickness value s_d is 1.0 m for 15mm boards, 1.2 m for 18mm boards and 1.5 m for 22mm boards.
- Thickness swelling after 24 hours water immersion is ≤ 15 % measured in accordance with EN 317.
- The boards are delivered from the factory with a declared moisture content of 9 ± 3 % weight, measured according to EN 322.
- 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 boards are not specially treated against growth of mold or fungi

4.4 Thermal insulation

Design thermal conductivity is $\lambda_d = 0.13$ W/(mK) according to EN 13986

5. Environmental aspects

5.1 Chemicals hazardous to health and environment

SWISS KRONO OSB/3 contains 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

SWISS KRONO OSB/3 is evaluated according to SINTEF Technical Approval – Health and Environmental Requirements version 09.05.22. 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. *SWISS KRONO OSB/3 satisfies the requirements of BREEAM-NOR v6.0, Emissions from construction products according to Hea 02 Indoor Air Quality.*

5.3 Waste treatment/recycling

SWISS KRONO OSB/3 shall be sorted as wood. SWISS KRONO OSB/3 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 Swiss Krono OSB-Platten. For complete documentation see EPD no. EPD-KRO-20200203-IBD1-EN, Swissskrono.com.

6. Special conditions for use and installation

6.1 Design considerations for floor sheathing

18 mm and 22 mm SWISS KRONO OSB/3 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 3491-1, 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 may be used under thin flooring materials like vinyl or linoleum.

SWISS KRONO OSB/3 may be applied in platform constructions where the boards are exposed to direct precipitation for a limited period.

6.2 Design considerations for roof sheathing

SWISS KRONO OSB/3 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.

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.

Table 2
Minimum board thickness for SWISS KRONO OSB/3 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	$sk \leq 5,5$	15
	$5,5 < sk \leq 7,5$	18
	$7,5 < sk \leq 9,0$	22
900	$sk \leq 2,5$	18
	$3,0 < sk \leq 5,0$	22
Roof covered with turf roofing		
600	$sk \leq 2,5$	18
	$2,5 < sk \leq 7,5$	22

¹⁾ Characteristic snowload on ground, sk , 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 Design considerations for wall sheathing and bracing

SWISS KRONO OSB/3 with thickness ≥ 9 mm with tongue and groove or straight edges can be used for wall sheathing and bracing.

6.4 Safety in case of fire

Fire classification D-s2,d0 and Dfl-s1 requires mounting directly on a substrate of class A1 or A2-s1,d0 with density not less than 10 kg/m³ (e.g. mineral wool or gypsum boards) or minimum class D-s2,d2 with density not less than 400 kg/m³ (e.g. timber or wood based boards).

Fire classification D-s2,d0 is also achieved when the boards are installed with a 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/m³.

Fire classification D-s2,d0 and Dfl-s1 is also achieved when installed 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/m³. 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. See SINTEF Building Research Guide 520.339 Use of combustible insulation in buildings regarding fields of application for combustible insulation.

6.4 Installation of SWISS KRONO OSB/3 boards

In floors and roofs, SWISS KRONO OSB/3 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.

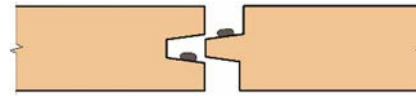


Fig. 2

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 SWISS KRONO OSB/3 boards 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 sheathing made of wood-based panels*.

SWISS KRONO OSB/3 boards used for wall sheathing and bracing, shall be installed with the long sides perpendicular to the studs with maximum c/c 600 mm joist spacing. Joints on boards with straight edges should have continuous support by joists. The installation of SWISS KRONO OSB/3 for wall sheathing and bracing shall otherwise be in conformity with manufacturer's installation manual.

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.

6.7 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

SWISS KRONO OSB/3 is produced by:

- *SWISS KRONO TEX GmbH & Co KG, Heiligengrabe, Germany*
- *SWISS KRONO sp. z o.o., ul. Serbska 56, 68-200 Żary, Poland*

The holder of the approval is responsible for the factory production control in order to ensure that *SWISS KRONO OSB/3 boards* are produced in accordance with the preconditions applying to this approval.

The manufacturing of the *SWISS KRONO OSB/3* and the manufacturer's system for factory production control (FPC) is subject to continuous surveillance in accordance with the contract regarding SINTEF Technical Approval.

8. Basis for the approval

The evaluation of *SWISS KRONO OSB/3* is based on reports owned by the holder of the approval.

9. Marking

SWISS KRONO OSB/3 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 2575 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



Susanne Skjervø
Approval Manager