

Approval body for construction products
and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and
Laender Governments



European Technical Assessment

ETA-13/0784
of 18 May 2017

English translation prepared by DIBt - Original version in German language

General Part

Technical Assessment Body issuing the
European Technical Assessment:

Deutsches Institut für Bautechnik

Trade name of the construction product

SWISS KRONO Magnum - Board

Product family
to which the construction product belongs

Walls, roofs and ceilings made of OSB-panels which are
glued together on their surfaces

Manufacturer

SWISS KRONO GmbH
Wittstocker Chaussee 1
16909 Heiligengrabe
DEUTSCHLAND

Manufacturing plant

Werk1 bis Werk 6

This European Technical Assessment
contains

13 pages including 3 annexes which form an integral part
of this assessment

This European Technical Assessment is
issued in accordance with Regulation (EU)
No 305/2011, on the basis of

European Assessment Document (EAD)
140015-00-0304

This version replaces

ETA-13/0784 issued on 26 June 2013

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Specific part

1 Technical description of the product

"SWISS KRONO Magnum Board" are plane elements for wall, floor and roof constructions with a thickness between 75 mm and 250 mm. They consist of at least three and up to 10 OSB slabs which are glued together parallel to their direction of construction. The slabs have to correspond to the data deposited at Deutsches Institut für Bautechnik. The components and the system setup of the product are given in Annex 1.

They have a width of up to 2.8 m and a length of up to 20 m.

Wall elements according to Annex 1, which are compression loaded in plane of the element parallel to the direction of the grain, can have a height of $H \leq 6.5$ m.

Wall elements according to Annex 1, which are compression loaded in plane of the element perpendicular to the direction of the grain, can have a height of $H \leq 2.8$ m.

Wall elements according to Annex 1, which are compression loaded in plane of the element perpendicular to the direction of the grain, may have horizontal joints with a relative offset, which are to be arranged within a distance of a $\leq 0.3 \cdot H$ from the top or bottom edge. More horizontal joints are not allowed. The height of the element does not exceed $H = 3.8$ m.

The single OSB slabs are glued together parallel to their direction of the grain of the surface layers when manufacturing the element.

In the surface layers of the wall, floor and roof elements there are no butt joints over the elements length and height.

The inner layers, up to 2/5 of the thickness can include butt joints, if not stated other hereafter. In the area of butt joints there has to be an overlap of at least 300 mm.

For the plane bonding between the OSB slabs a PU adhesive, fulfilling the requirements Type I according to EN 15425, must be used under observation of the processing instructions given by the manufacturer of the adhesive. The use of another glue as deposited at Deutsches Institut für Bautechnik is only allowed after former approval by Deutsches Institut für Bautechnik. Only sanded OSB slabs may be used.

2 Specification of the intended use in accordance with the applicable European Assessment Document

The performances given in Section 3 are only valid if the "SWISS KRONO Magnum Board" is used in compliance with the specifications and conditions given in Annexes 1 to 3.

The verifications and assessment methods on which this European Technical Assessment is based lead to the assumption of a working life of the "SWISS KRONO Magnum Board" of at least 50 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

3 Performance of the product and references to the methods used for its assessment

3.1 Mechanical resistance and stability (BWR 1)

Essential characteristic	Performance
Bending strength ¹⁾	See Annex 3
Shear strength ²⁾	See Annex 3
Compression strength ^{1) 2)}	See Annex 3
Tensile strength ²⁾	See Annex 3
Embedding strength	See Annex 3
Withdrawal strength	See Annex 3
Pull through parameter	See Annex 3
Durability	See Annex 3
¹⁾ Load bearing capacity and stiffness regarding mechanical actions perpendicular to the elements	
²⁾ Load bearing capacity and stiffness regarding mechanical actions in plane of the elements	

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	See Annex 3

3.3 Hygiene, health and the environment (BWR 3)

Essential characteristic	Performance
Content, emission and/or release of dangerous substances	
Substance(s) classified as EU-cat. Carc. 1A/1B in accordance with Regulation (EC) No 1272/2008.	The product does not contain these dangerous substances actively used. ^{a)}
Substance(s) classified as EU-cat. Muta. 1A/1B in accordance with Regulation (EC) No 1272/2008.	
Substance(s) classified as EU-cat. Acute Tox. 1, 2 and/or 3; substance(s) classified as EU-cat. Repr. 1A/1B; substance(s) classified as EU-cat. STOT SE 1 and/or STOT RE 1, in accordance with Regulation (EC) No 1272/2008.	
Formaldehyde emission	E1 in accordance with EN 13986
VOC and SVOC Release scenarios regarding BWR 3: IA1, IA2, S/W3 (in accordance with EOTA TR 034)	NPA
^{a)} Assessment based on a detailed manufacturer's product declaration.	

3.4 Safety and accessibility in use (BWR 4)

The essential characteristics of BWR 4 have been covered by BWR 1.

3.5 Energy economy and heat retention (BWR 6)

Essential characteristic	Performance
Thermal resistance	See Annex 3

English translation prepared by DIBt

4 Assessment and verification of constancy of performance (AVCP) system applied, with reference to its legal base

In accordance with EAD No. 140015-00-0304 the applicable European legal act is: [1997/176/EC(EU)].

The system to be applied is: 1

5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited with Deutsches Institut für Bautechnik.

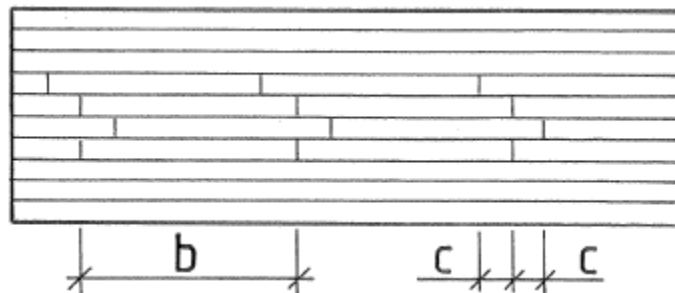
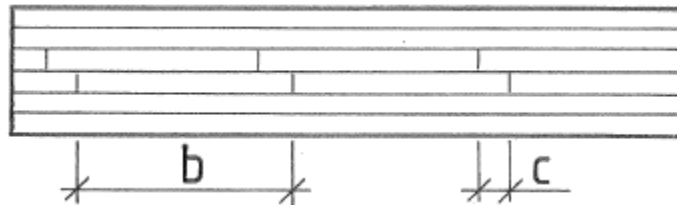
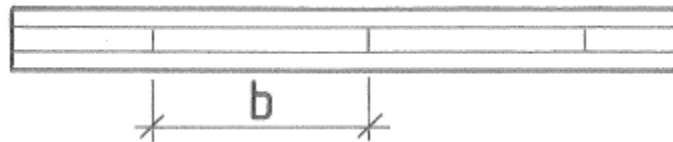
Issued in Berlin on 18 May 2017 by Deutsches Institut für Bautechnik

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Beglaubigt:
Baumann

SWISS KRONO Magnum Board

Elements with three or more layers



Butt joints in SWISS KRONO Magnum Board – elements (Examples)

$b \geq 1000$ mm

$c \geq 300$ mm

SWISS KRONO Magnum - Board

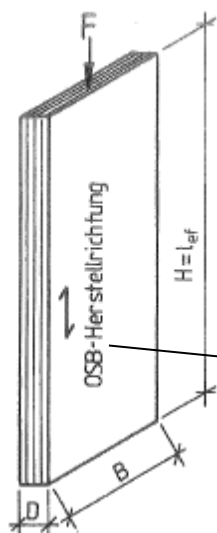
Technical description of the product

SWISS KRONO Magnum Board – examples of elements

Annex 1.1

SWISS KRONO Magnum Board

Vertically loaded elements

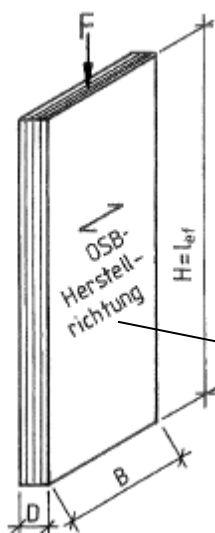


Compression load parallel to the direction of construction of the OSB slabs.

Height of wall $H \leq 6.5 \text{ m}$

Equivalent member length $l_{ef} \leq 6.5 \text{ m}$

Direction of construction



Compression load perpendicular to the direction of construction of the OSB slabs.

Height of wall $H \leq 2.8 \text{ m}$

Equivalent member length $l_{ef} \leq 2.8 \text{ m}$

Direction of construction

Direction of construction = direction of the grain of the surface layers

SWISS KRONO Magnum - Board

Technical description of the product

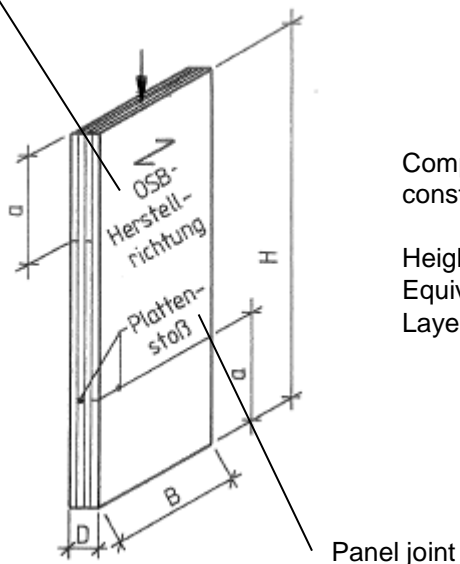
Vertically loaded elements without panel joint

Annex 1.2

SWISS KRONO Magnum Board

Vertically loaded elements
- with panel joint -

Direction of construction



Compression load parallel to the direction of construction of the OSB slabs.

Height of wall $H \leq 3.8 \text{ m}$
Equivalent member length $l_{ef} \leq 3.8 \text{ m}$
Layer with joint $a \leq 0.3 \cdot H$

SWISS KRONO Magnum - Board

Technical description of the product

Vertically loaded elements with panel joint

Annex 1.3

Specification of intended use and environmental conditions

A.2.1 Loading

- Static and quasi-static loads (not relevant to fatigue)
- Loads parallel and perpendicular to the elements plane
- Non-load-carrying or load-carrying wall, roof and floor construction elements

A.2.2 Durability

- Service classes 1 and 2 according to EN 1995-1-1
- in case of external use additional weather protection has to be ensured
- elements have to be protected from moisture

A.2.3 Design of the elements

The design of the solid wood slab elements can be performed according to EN 1995-1-1 taking into account annex 3, A.3.1 and A.3.2 of this European technical assessment.

Verification of stability of the buildings while using the solid wood slab elements is not subject of this European technical assessment.

Wall elements

Wall elements vertically and horizontally loaded can be designed according to EN 1995-1-1. The characteristic values given in Annex 3, A.3.1 shall be used.

In case of calculation of stability of wall elements under vertical load the following buckling values can be taken into account:

Equivalent member length	Slenderness ratio (maximum)	Reduction factor for buckling k_c
$l_{ef} \leq 6.0$ m	$\lambda \leq 210$	1.0
$l_{ef} > 6.0$ m and $l_{ef} \leq 6.5$ m	$\lambda \leq 130$	0.7

As mechanical key values to determine the relative slenderness ratio $\lambda_{rel,c}$ the values for $f_{c,0,k}$ or $f_{c,90,k}$ and $E_{m,0,k}$ or $E_{m,90,k}$ have to be taken into account.

The anchorage of wall elements has to be proved.

Roof and floor elements

Roof and floor elements vertically and horizontally loaded can be designed according to EN 1995-1-1. The characteristic values given in Annex 3, A.3.1 shall be used.

Fasteners

The following fasteners can be used:

- Nails according to EN 14592 with $d_n = 3,1$ mm or 3,8 mm and $l_n > 50$ mm,
- Screws "HECO-TOPIX" according to ETA 11/0284. The diameter d is $d = 10$ mm.
- Screws "Würth ASSY" according to ETA 11/0190, Type II following Annex 4 of the ETA. The diameter d is $d = 10$ mm.

SWISS KRONO Magnum - Board

Specification of intended use and environmental conditions

Loading, durability and design

Annex 2.1

The following principles shall be observed:

- For distance between nails and screws EN 1995-1-1 applies.
- Perpendicular to the length of the lateral side the distance to the unloaded edge has to be at least 30 mm.
- Distance to the unloaded edge in case of connections involving shear (transverse tension) may not be under the 70% of the elements thickness.

Connections with nails in the lateral side of the elements are not allowed.

Connections with screws perpendicular to the plane of the element have to be predrilled.

Characteristic values for the connections shall be taken from Annex 3, A.3.2.

A.2.4 Installation provisions

- Elements exposed to the weather have to be provided with weather protection during assembling and service.
- Roofs made of "SWISS KRONO Magnum Boards" must have an incline $\geq 5^\circ$.
- Elements for steep roofs must be insulated by an overlying insulation layer.
- The use of "SWISS KRONO Magnum Board for outside walls of basements, wet rooms or stables is not allowed.

SWISS KRONO Magnum - Board	Annex 2.2
Specification of intended use and environmental conditions	
Design and installation provisions	

Specification of essential characteristics

A.3.1 Characteristic values of strength and stiffness for "SWISS KRONO Magnum Board" with and without joints in the panels in N/mm²

Type of load	Characteristic values of strength and stiffness	
Bending perpendicular to the elements plane	$f_{m,0,k}$	17,6
	$f_{m,90,k}$	15,3
Shear in plane of the element	$f_{v,0,k}$	1,6
	$f_{v,90,k}$	
Compression perpendicular to the elements plane ¹	middle ² $f_{c,k}$	4,5
	edge ² $f_{c,k}$	4,0
Compression in plane of the element	$f_{c,0,k}$	16
	$f_{c,90,k}$	14
Modulus of elasticity perpendicular to the elements plane	$E_{m,0,mean}$ ³	5000
	$E_{m,90,mean}$ ³	3500
Modulus of shear in plane of the element	$G_{v,0,k}$	130
	$G_{v,90,k}$	
Modulus of compression in plane of the element	$E_{c,0,mean}$ ³	5000
	$E_{c,90,mean}$ ³	4500
¹ compression at 1% strain = limit value of the applicable compression load ² H = Height of the element loaded with compression vertically to its plane middle: edge distance > thickness of the element; edge: edge distance ≤ thickness of the element ³ $E_{m,c,k} = 0,85 \cdot E_{m,c,mean}$; $G_{v,k} = 0,85 \cdot G_{v,mean}$		

As values for k_{mod} and k_{def} the values for OSB/3 plates according to EN 1995-1-1 can be taken into account.

SWISS KRONO Magnum - Board

Specification of essential characteristics

Characteristic values of strength and stiffness

Annex 3.1

A.3.2 Characteristic values for connectors in SWISS KRONO Magnum board

Type of load	Characteristic values of strength		
nails			
Shear		$d_n = 3,1 \text{ mm}$	$d_n = 3,8 \text{ mm}$
Direction of load parallel to the plane of the element, axis of nail perpendicular	R_k	1550 N	1900 N
screws			
Shear		$d_1 = 10 \text{ mm}$	
Direction of load parallel to the plane of the elements, smooth shaft and thread perpendicular to the outer element	R_k	15000 N	
Direction of load parallel to the plane of the outer element, smooth shaft perpendicular to the outer element, thread in the lateral surface of the inner element	R_k	5500 N	
Direction of load perpendicular to the plane of the outer element, smooth shaft perpendicular to the outer element, thread in the lateral surface of the inner element being under transverse tension ¹	R_k	7500 N	
Withdrawal capacity		$d_1 = 10 \text{ mm}$	
Smooth shaft and thread perpendicular to the plane of the element	$f_{1,90,k}$	18 N/mm²	
Smooth shaft and thread parallel to the plane of the element (perpendicular to the lateral surface)	$f_{1,0,k}$	12 N/mm²	
Pull through resistance		$d_1 = 10 \text{ mm}$	
Smooth shaft and thread perpendicular to the plane of the element	$R_{2,90,k}$	15·d_k² N	
¹ the distance between the axis of the screw and the loaded edge has to be at least 70% of the elements thickness under transverse tension. d_k = diameter of the head of the screw in mm			

SWISS KRONO Magnum - Board

Specification of essential characteristics

Characteristic values for connectors in SWISS KRONO Magnum board

Annex 3.2

A.3.3 Reaction to fire

The solid wood slab elements for use as wall, roof and ceiling construction elements comply with Euro class D-s2, d0 according to EN 13501-1+A1¹. For the use as floor construction elements they comply with Euro class D_{fl}-s1 according to EN 13501-1+A1. Boundary conditions have to be attended for this classification.

A.3.4 Thermal conductivity

Design values for the timber elements can be taken from EN ISO 10456².

electronic copy of the eta by dibt: eta-13/0784

1	EN 13501-1:2007+A1:2009	Fire classification of construction products and building elements – Part 1: Classification using data from reaction
2	EN ISO 10456:2007 + AC:2009	Building materials and products – Hygrothermal properties – Tabulated design values and procedures for determining declared and design thermal values

SWISS KRONO Magnum - Board	Annex 3.3
Specification of essential characteristics	
Reaction to fire and thermal conductivity	