

MFPA Leipzig GmbH

Testing, inspection and certification body for
building materials, building products and building systems

Division III - Structural Fire Protection

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Classification report no. KB 3.2/19-464-1

from 11 May 2020

1st copy

Classification of fire resistance acc. to
DIN EN 13501-2:2016-12

Subject matter:

Classification of a load-bearing, space-enclosing and thermally-insulating solid wood wall construction (plywood board) with asymmetric lining/panelling on both sides in accordance with DIN EN 13501-2:2016-12 with a one-sided exposure to fire of wall side A for classification in the fire resistance class REI 90 - M.

Applicant:

Massiv-Holz-Mauer Entwicklungs GmbH
Auf der Geigerhalde 41
D-87459 Pfronten-Weißbach

Person in charge:

P. Lux, B. Eng.

This classification report is valid for an unlimited period.

This document consists of 6 pages.

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Testing laboratory accredited by DAkkS GmbH in accordance with DIN EN ISO/IEC 17025. The accreditation only applies to the test procedures listed in the certificate (marked with * in this document). The certificate can be viewed at www.mfpa-leipzig.de.

Gesellschaft für Materialforschung und Prüfungsanstalt für das Bauwesen Leipzig mbH (MFPA Leipzig GmbH)

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1 Introduction

This classification report defines the classifications assigned to the load-bearing, space-enclosing and thermally-insulating solid wood wall construction (plywood board) with asymmetrical panelling/sheathing on both sides in accordance with the procedures set out in DIN EN 13501-2:2016-12.

2 Details of the classified product


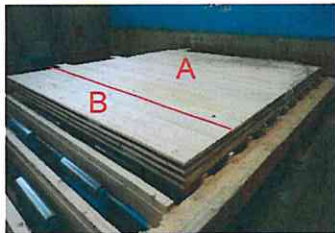

2.1 Type of function

The solid wood wall construction with asymmetrical lining/panelling on both sides, which is to be classified, is defined as a load-bearing, space-enclosing and thermally-insulating wall construction. It is classified as a load-bearing wall construction in accordance with DIN EN 1365-1:2013-08 in conjunction with DIN EN 13501-2:2016-12, section 7.3.2. Their function is to resist fire according to the characteristic reaction to fire as per section 5.2.1 to 5.2.3 of DIN EN 13501-2:2016-12.

2.2 Description of the construction

The tested solid wood wall construction consists of a plywood board element with lining/panelling on both sides which is an unsymmetrically designed wall construction according to table 1.

Table 1: List of structural details of the tested wall construction

Overall dimensions of the tested construction: Width: w = 3000 mm; height: h = 3000 mm; thickness: t = 202.3 mm		
Item	Material/ dimensions	Comments
Supporting structure:   	Plywood board wall elements, view of the wall side A: MHM – Wall element with 7 layers acc. to ETA ¹⁾ -15/0760 Dimensions wooden boards: l x w x h = ≤ 3500 mm x ≤ 180 mm x 22.4 mm Board grooves: l x w x h = ≤ 3500 mm x 7 mm x ≤ 2.4 mm 4 aluminium threaded nails in the intersection Dimensions fasteners: T x l = Ø 2.5 mm x 50 mm Element A Geometric dimensions: l x w x h = 3000 mm x 2500 mm x 156.8 mm Joint: butt-jointed, Joint width ≤ 1 mm Element B Geometric dimensions: l x w x h = 3000 mm x 500 mm x 156.8 mm Joint: butt-jointed, Joint width ≤ 1 mm	<u>Fasteners at the element joint:</u> The butt board was fastened with wood screws Fastening 1 at the butt board from the side facing the fire. Type: Spax – dia. 8.0 x 200 mm acc. to ETA ¹⁾ -12/0114 Edge distance: ≤ 20 mm Screw spacing: ≤ 400 mm Screw-in angle to the element surface: 45° Fastening 2 at the butt board from the side facing the fire Type: Spax – dia. 8.0 x 160 mm acc. to ETA ¹⁾ -12/0114 Edge distance: ≤ 50 mm Screw spacing: ≤ 400 mm Screw-in angle to the element surface: 90° Element joints: No additional sealants at the element joint

¹⁾ ETA – European Technical Assessment

Table 1 continued on next page.



Table 1, continued: List of structural details of the tested wall construction


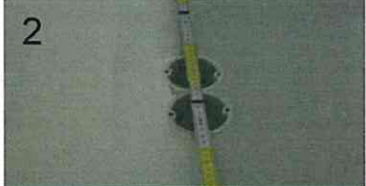
Item	Material/ dimensions	Comments
<p>Butt board:</p> 	<p>TeboPin III - veneer plywood acc. to DIN EN 13986:2004+A1:2015 maximum geom. dimensions: l x w x h = 2500 mm x 200 mm x 40 mm Joints: butt-jointed, Joint width ≤ 1 mm Joint offset ≤ 4 mm</p>	<p>Dimension of the opening at the element segments: l x w x h = 3000 mm x 200 mm x 44 mm No additional sealant between butt board and sample</p>
<p>Sheathing/panelling Wall side A facing the fire:</p> 	<p>Inner sheathing / panelling layer Knauf fire protection board GKF acc. to DIN EN 520: 2004 + A1:2009 Maximum board size: l x w x t = ≤ 3000 mm x ≤ 1250 mm x 18 mm Joints: butt-jointed, Joint width ≤ 1 mm Joint filler: Knauf Uniflott type 4B acc. to DIN EN 13963: 2005-05 evenly distributed on the board junctions. Fastener rows additionally grouted.</p>	<p>Connection devices: Clamps KMR KG 45 VZ HZ acc. to ETA¹⁾-18/0708 Geometric dimensions: l x w x t = 45 mm x 11.10 mm x 1.44 mm Clamp spacing: ≤ 150 mm Row spacing: ≤ 625 mm Edge distance: ≤ 30 mm Connection: Board in CLT</p>
	<p>Outer sheathing/panelling layer Knauf fire protection board GKF acc. to DIN EN 520: 2004 + A1:2009 Maximum board size: l x w x t = ≤ 3000 mm x ≤ 1250 mm x 18 mm Joints: butt-jointed, Joint width ≤ 1 mm Joint filler: Knauf Uniflott type 4B acc. to DIN EN 13963: 2005-05 evenly distributed on the board junctions. Fastener rows additionally grouted.</p>	<p>Connection devices: Clamps KMR KG 65 VZ HZ acc. to ETA¹⁾-18/0708 Geometric dimensions: l x w x t = 65 mm x 11.10 mm x 1.44 mm Clamp spacing: ≤ 75 mm Row spacing: ≤ 625 mm Edge distance: ≤ 30 mm Connection: Board in CLT</p>
<p>Sheathing/panelling wall side B facing away from the fire:</p> 	<p>sheathing/panelling layer Knauf board GB acc. to DIN EN 520: 2004 + A1:2009 Maximum board size: l x w x t = ≤ 3000 mm x ≤ 1250 mm x 9.5 mm Joints: butt-jointed, Joint width ≤ 1 mm Joint filler: Knauf Uniflott type 4B acc. to DIN EN 13963: 2005-05 evenly distributed on the board junctions. Fastener rows additionally grouted.</p>	<p>Connection devices: Clamps KMR KG 45 VZ HZ acc. to ETA¹⁾-18/0708 Geometric dimensions: l x w x t = 45 mm x 11.10 mm x 1.44 mm Clamp spacing: ≤ 150 mm Row spacing: ≤ 625 mm Edge distance: ≤ 30 mm Connection: Board in CLT</p>

¹⁾ ETA – European Technical Assessment

Table 1 continued on next page.



Table 1, continued: List of structural details of the tested wall construction

Item	Material/ dimensions	Comments
Electrical installations Wall side A facing the fire:  	Electrical installation 1 Junction boxes Countersunk hole CLT: dia. 100 mm Countersunk hole sheathing: dia. 68 mm Countersunk hole depth CLT: 70 mm Cut channel to box: w x d = 30 mm x 20 mm Electrical installation 2 Kaiser "Wall boxes HWD 90" Countersunk hole CLT: dia. 74 mm Countersunk hole sheathing: dia. 74 mm Countersunk hole depth CLT: 70 mm Cut channel to box: w x d = 30 mm x 20 mm	Electrical installation 1 Connection devices: Device screws Fire protection reinforcement: Knauf Uniflott type 4B acc. to DIN EN 13963: 2005-05 evenly distributed in the milled groove and at the transition to the cable duct by pressing in. Electrical installation 2 Connection devices: Device screws

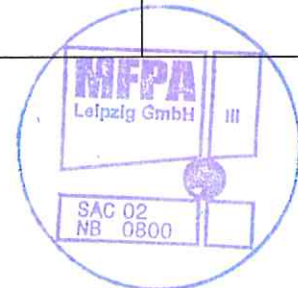
¹⁾ ETA – European Technical Assessment

Further structural details as well as the materials used and their building material characteristic values can be found in the test report PB 3.2/19-464-1, dated 17 March 2020, by the Gesellschaft für Materialforschung und Prüfungsanstalt für das Bauwesen Leipzig mbH (MFPA Leipzig GmbH).

3 Test report and test results supporting this classification

3.1 Test report

Organisation that performed the test	Applicant	Number of the test report
Gesellschaft für Materialforschung und Prüfungs- anstalt für das Bauwesen Leipzig mbH (MFPA Leipzig GmbH) Hans-Weigel-Straße 2b 04319 Leipzig Germany	Massiv-Holz-Mauer Entwicklungs GmbH Auf der Geigerhalde 41 D-87459 Pfronten-Weißbach	PB 3.2/19-464-1 from 17 March 2020



3.2 Fire protection capability

Table 2: Performance characteristics of the load-bearing, space-enclosing and thermally-insulating solid wood wall construction according to test report PB 3.2/19-464-1

Test method	Parameter	Test results Criterion exceeded acc. to:
DIN EN 1365-1:2013-08 in conjunction with DIN EN 1363-1:2012-10	Strength (R)	
	Applied load	100 kN/m (total load of 300 kN for a wall width of w = 3.00 m), solid wood with d = 156.8 mm
	Vertical compression C = h/100 [mm]	Limit not exceeded in the test time of 93 test minutes
	Speed of vertical compression dC/dt = 3 h/1000 [mm/min]	Limit not exceeded in the test time of 93 test minutes
	Integrity (E)	
	Combustion of the cotton ball	Test not necessary
	Appearance of gaps	Did not appear
	Appearance of flames on the opposite side	Did not appear
	Thermal insulation (I)	
	Rise in temperature above the initial temperature on the side facing away from the fire after the 90th minute of test	
	Mean value > 140 K	0 K
	max. single value > 180 K	3 K

4 Classification and direct field of application

4.1 Classification of wall side A

This classification has been carried out in compliance with section 7.3.2 of DIN EN 13501-2:2016-12.

The load-bearing, space-enclosing and thermally-insulating solid wood wall construction with asymmetrical panelling/sheathing on both sides according to section 2.2 on the basis of the fire resistance test performed on wall side A. The following combinations of performance parameters and classes are allowed. Other classifications are not allowed.

R	E	I	W	t	-	M	P	C	IncSlow	sn	ef	r
R	E	I	-	90		M	-	-	-	-	-	-

Fire resistance classification: REI 90 - M^{*)}

^{*)} The classification up to REI 90 - M (lower classification times included) applies to wall side A.



4.2 Direct field of application

This classification is valid for the following application conditions:

- The maximum permissible height of the wall construction is 3000 mm;
- The minimum wall thickness is $t \geq 202.3$ mm (asymmetric design);
- The width of the wall may be increased;
- The joints must be designed according to the tested type;
- The thickness of the material used may be increased;
- The fastening distances may be reduced;
- The applied load may be reduced;
- Fittings may be used (design in accordance with section 2.2).

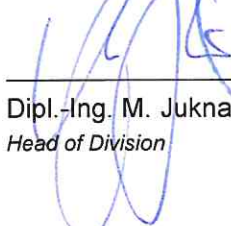
5 Restrictions


This classification report is not a type approval or certification of the product. It does not replace any appraisal certificate that may be necessary according to German building laws (state building code) and is only valid in conjunction with the corresponding test report.

It is the responsibility of the certification body to check whether the relevant test and classification standards are valid and/or that no significant changes have been made that may have an effect on the safety level.

The results of the tests refer exclusively to the test items described herein.

Leipzig, 11 May 2020


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Head of Division


P. Lux, B. Eng.
Test Engineer

