

CLASSIFICATION REPORT OF FIRE RESISTANCE

IN ACCORDANCE WITH ÖNORM EN 13501-2:2016

30.04.2021
MAI/FÜI

Customer: Stora Enso Wood Products GmbH
Brand 44
AT-3531 Brand

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Subject: Load-bearing floor and roof components
of cross laminated timber
„Stora Enso CLT \geq 150 mm“ planked and unplanked
Fire resistance REI 90/ REI 120

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Enclosures: ---

1. Introduction

This classification report on fire resistance defines the classification of load-bearing floor and roof components of cross laminated timber "Stora Enso CLT ≥ 150 mm" planked and unplanked, in compliance with the process according to the standard ÖNORM EN 13501-2:2016.

2. Details on the classified product

2.1. General

The load-bearing floor and roof components of cross laminated timber "Stora Enso CLT ≥ 150 mm " planked and unplanked belong to the product type of load-bearing, insulating solid timber constructions.

2.2. Description

Table 1: components to be classified

planking mm room side	suspension/ installation area mm	cross laminated timber dimensions (layers) mm
---	---	CLT 160 L5s 160 mm (5s - 40 20 40 20 40) according ETA-14/0349 AbZ: Z-9.1-559
$\geq 12,5$ GKF*)	---	CLT 160 L5s 160 mm (5s - 40 20 40 20 40) according ETA-14/0349 AbZ: Z-9.1-559
$\geq 12,5$ GKF*)	40 MW**)	CLT 160 L5s 160 mm (5s - 40 20 40 20 40) according ETA-14/0349 AbZ: Z-9.1-559
---	---	CLT 200 L5s 200 mm (7s - 40 40 40 40 40) according ETA-14/0349 AbZ: Z-9.1-559
---	---	CLT 220 L7s 220 mm (7s - 40 20 40 20 40 20 40) according ETA-14/0349 AbZ: Z-9.1-559

*) according to ÖNORM B 3410; DIN 18180; type DF according to ÖNORM EN 520; density ≥ 800 kg/m³ or gypsum fibre board according to ÖNORM EN 15283-2; density ≥ 1000 kg/m³

***) MW - mineralwool according to ÖNORM EN 13162; density ≥ 11 kg/m³

3. Test reports/reports on the extended area of application and test result for verification of the classification

3.1. Description of the underlying tested components

Table 2: tested cross laminated timber components

short name	planking mm exposed side to fire	suspension/ installation area mm	cross laminated timber dimensions mm (layers)
---	---	---	CLT 160 (40 20 40 20 40)
MD 2.1	12,5 GKF*)	---	CLT 150 (42 19 28 19 42)
MD 3.1	12,5 GKF*)	40 MW**)	CLT 150 (42 19 28 19 42)
---	---	---	CLT 200 (40 40 40 40 40)
---	---	---	CLT 220 (40 20 40 20 40 20 40)

*) according to ÖNORM B 3410; DIN 18180; type DF according to ÖNORM EN 520; density $\geq 800 \text{ kg/m}^3$

***) MW-mineralwool according to ÖNORM EN 13162; density $\geq 11 \text{ kg/m}^3$

3.2. Test reports

Table 3: underlying test reports

test laboratory	name of the customer	test report n°	standard and issue date	type of product/ test specimen
IBS ¹⁾	Stora Enso Wood Products GmbH 3531 Brand	IBS 321031504- 1	ÖNORM EN 1365-2:2014-12 ÖNORM EN 1363-1:2020-04	load -bearing floor component of cross laminated timber with 5 layers CLT 160 L5s
IBS ¹⁾	Holzfor- schung Austria	IBS 10032908	ÖNORM EN 1365-2:2000-06 ÖNORM EN 1363-1:2000-01	load -bearing floor component of cross laminated timber with 5 layers CLT-5s 150 mm with 12,5 mm gypsum board plank- ing

test laboratory	name of the costumer	test report n°	standard and issue date	type of product/ test specimen
IBS ¹⁾	Holzforchung Austria	IBS 10032909	ÖNORM EN 1365-2:2000-06 ÖNORM EN 1363-1:2000-01	load -bearing floor component of cross laminated timber with 5 layers CLT-5s 150 mm with a spring rail and 12,5 mm gypsum board planking
CSI ²⁾	Stora Enso Wood Products GmbH 3531 Brand	No 0092/DC/RFM/19_4	EN 1365-2:2014 EN 1363-1:2012	classification report "loadbearing floor consisting of wood panel in cross laminated timber"
CSI ²⁾	Lian Ho Lee Construction (Private) Linmit 367991 Singapore	No 0043/DC/RFM/19_2	EN 1365-2:2014 EN 1363-1:2012	classification report "loadbearing floor consisting of wood panel in cross laminated timber"

1) IBS – IBS – Institut für Brandschutztechnik und Sicherheitsforschung GesmbH, Akkreditierte Prüf-, Inspektions- und Zertifizierungsstelle, 4020 Linz

2) CSI – ANIMQ GROUP COMPANY, Italy 20021 Bollate

The test reports listed under point 3.2. according to ÖNORM EN 1365-2 and 1363-1 were partly carried out according to older standards (see table 3).

The current standards, ÖNORM EN 1365-2: 2014 and ÖNORM EN 1363-1:2020, essentially contain changes in terminology, new definitions and concretisations compared to the older versions.

According to information from the testing body, these changes have no effect on the results in the test reports listed and can therefore still be used for the classification of fire resistance.

3.3. Results

Table 4: results

testing process: ÖNORM EN 1365-2: 2014-12 ÖNORM EN 1363-1: 2020-04	parameters	results
test report n° IBS 321031504-1	<i>load applied supporting structure</i>	153,9 kN total load 15,25 kN/m ²
	<i>load-bearing capacity</i>	93 min
	<i>integrity</i>	93 min
	<i>thermal insulation</i>	93 min

testing process: ÖNORM EN 1365-2: 2000-06 ÖNORM EN 1363-1: 2000-01	parameters	results
test report n° IBS 10032908	<i>load applied</i> <i>supporting structure</i> <i>load-bearing capacity</i> <i>integrity</i> <i>thermal insulation</i>	87,5 kN total load 7 kN/m ² 100 min 100 min 100 min
test report n° IBS 10032909	<i>load applied</i> <i>supporting structure</i> <i>load-bearing capacity</i> <i>integrity</i> <i>thermal insulation</i>	75 kN total load 6 kN/m ² 98 min 100 min 100 min
testing process: EN 1365-2: 2014 EN 1363-1: 2012	parameters	results
test report n° CSI 0092/DC/RFM/19_4	<i>load applied</i> <i>supporting structure</i> <i>load-bearing capacity</i> <i>integrity</i> <i>thermal insulation</i>	137,7 kN total load 32,28 kN/m ² 106 min 106 min 106 min
test report n° CSI 0045/DC/RFM/19_2	<i>load applied</i> <i>supporting structure</i> <i>load-bearing capacity</i> <i>integrity</i> <i>thermal insulation</i>	101,7 kN total load 29,18 kN/m ² 145 min 145 min 145 min

4. Classification and area of application

4.1. Classification reference

This classification was carried out in compliance with ÖNORM EN 13501-2:2016-11, clause 7.3.3..

4.2. Classification

The load-bearing floor and roof components of cross laminated timber are classified according to the following combinations of performance parameters and classes.

Table 5: classification

planking mm room side exposed- side to fire	suspension/ installation area mm	cross laminated timber (CLT)	applied load					test labora- tory	report n°	classification b → a (down → above, internal → exter- nal)
			span	CLT width	E _{d,fi}	max. moment	shear force			
			[m]	[m]	[kN/m ²]	[kNm/m]	[kN/m]			
---	---	CLT 160 L5s 160 mm (5s - 40 20 40 20 40) according ETA-14/0349 AbZ: Z-9.1-559	4,70	2,85	15,25	42,1	27	IBS	IBS 321031504-1	REI 90
≥ 12,5 GKF*)	5,00		3,00	7,00	21,9	14,58	IBS 10032908			
≥ 12,5 GKF*)	40 MW**)		5,00	3,00	6,00	18,8	12,5		IBS 10032909	
---	---	CLT 200 L5s 200 mm (7s - 40 40 40 40 40) according ETA-14/0349 AbZ: Z-9.1-559	4,13	2,00	32,28	68,8	50	CSI	No 0092/DC/RFM/19_4	REI 90
---	---	CLT 220 L7s 220 mm (7s - 40 20 40 20 40 20 40) according ETA-14/0349 AbZ: Z-9.1-559	4,13	2,25	29,18	62	45,2	CSI	No 0043/DC/RFM/19_2	REI 120

*) according to ÖNORM B 3410; DIN 18180; type DF according to ÖNORM EN 520; density ≥ 800 kg/m³ or gypsum fibre board according to ÖNORM EN 15283-2; density ≥ 1000 kg/m³

***) MW - mineralwool according to ÖNORM EN 13162; density ≥ 11 kg/m³

4.3. Area of application

This classification is valid for the following practical applications:

The results of the fire tests can be applied directly to similar structures on which one or several of the changes described below are carried out and on which the design continues to fulfil the requirements of the respective design standard with a view to their stiffness and strength:

- The maximum moments and shear forces, which when calculated on the same basis as the test load, shall not exceed the ones tested.
- Regarding to sub-ceiling systems: The size of the panels of the suspended ceiling planking must not be changed. The total area occupied by installation parts must not be increased in relation to the area of the suspended ceiling panelling. The dimensions of the largest tested opening in the suspended ceiling panelling must not be increased.
- Regarding the cavity: The height of the cavity shall be at least equal to the tested height. No additional flammable materials or insulation may be installed in the cavity unless the same amount of flammable materials or insulation (fire load) was installed when the test specimen was tested.
- Regarding to the inclination of roof structures:
 - For roofs with one or more purlins, the results apply to a practical application for pitches from 0° to 80°.
 - For gable roofs or monopitch roofs, the results apply to a practical application for pitches from 0° to 15°.

5. Limitations

5.1. General

If one of the fundamental test and evaluation criteria changes or the customer makes prohibited technical changes to the product, this classification report shall cease to be valid.

5.2. Warning notice

This classification document does not constitute a type approval or certification of the product.

HOLZFORSCHUNG AUSTRIA


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Authorised signatory and technical consultant Head of Unit

This report was approved electronically in accordance with an internal HFA process by the designated authorized signatory, traceable and documented.

Accreditation is given for the following procedures.
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accreditation mark	type of accreditation	process
	inspection	<ul style="list-style-type: none"> • ÖNORM EN 13501-2

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