

**BURNBLOCK®**

NATURAL & NON-TOXIC FIRE RETARDANT



# ADVANCED FIT FOR OUTSIDE USE

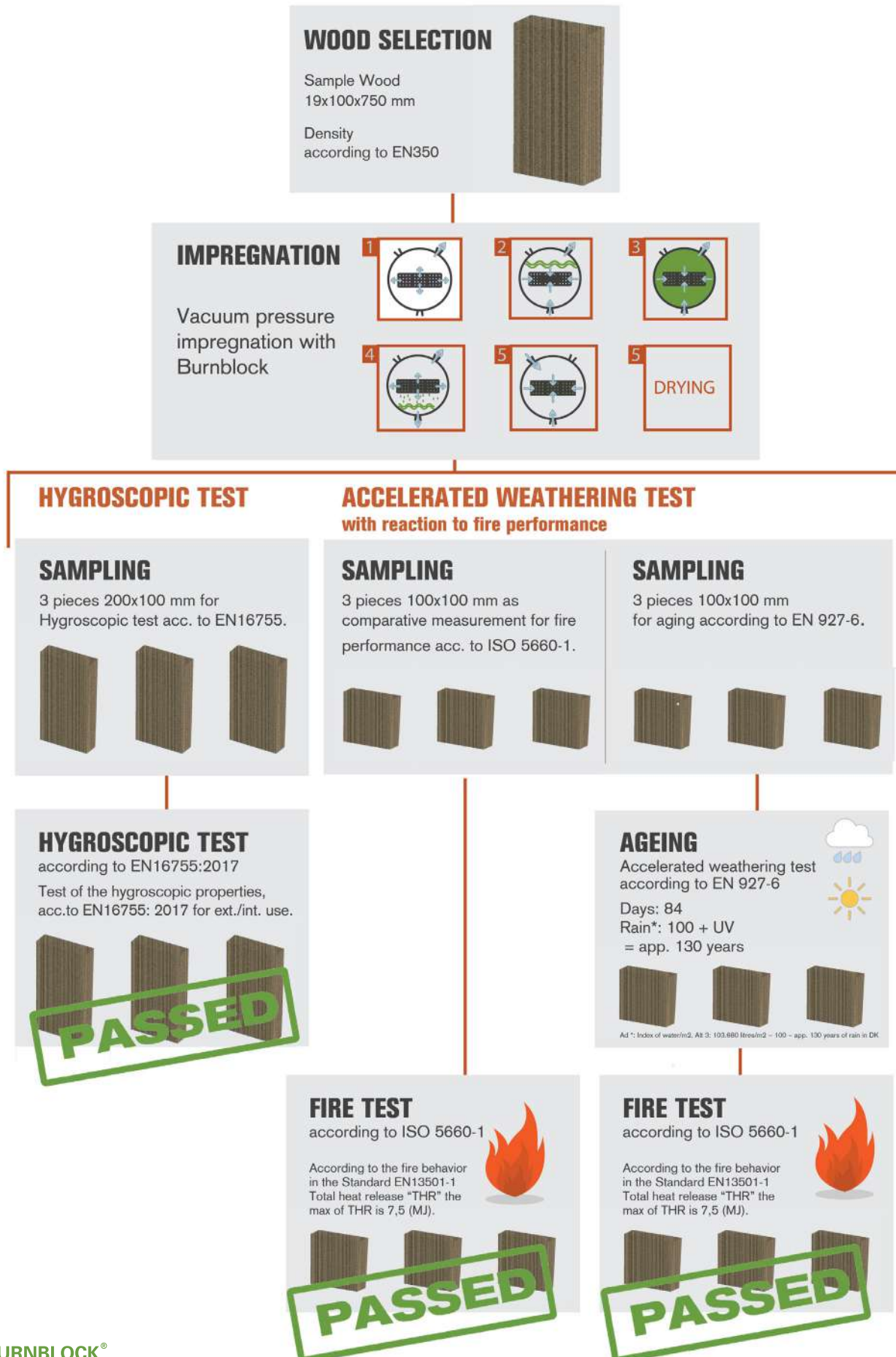
**BURNBLOCK PASSED HYGROSCOPIC TESTS ACCORDING TO EN 16755:2017 FIR DRF CLASSES INT2 AND EXT.**

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Burnblock has previously documented that Western Red Cedar and Thermo Pine impregnated with Burnblock maintain their fire (ISO5660-1) both before and after accelerated aging test according to test method EN927-6 according to EN16755: 2017, and that they comply with the hygroscopic requirements according to EN16755: 2017.

# TEST PROCESS

The graphic below shows the test process of durability of reaction to fire performance.



# DOCUMENTATION OF DURABILITY OF REACTION TO FIRE

Western Red Cedar og Thermofyr



Univerza v Ljubljani  
*Biotehniška* fakulteta

Burnblock ApS  
Wilders Pl. 8A, 1401  
København, Denmark

Ljubljana, 2. 4. 2019

Reference: MH01032019A2

*Documentation of durability of reaction to fire for Burnblock impregnated Western Red Cedar and Thermally Modified Pine (Thermo Pine) (without surface treatment)*

It is to support the independent studies performed by Dr. Dennis Jones (DJ190126BB4BREV and DJ190126-BB4AREV) that the durability of reaction to fire for Burnblock impregnated Western Red Cedar and Thermally Modified Pine (Thermo Pine) (without any surface coating). This work forms part of ongoing performance criteria being undertaken by Burnblock towards future accreditation of products. Within this work, the results were described:

Fire test (according to ISO 5660-1) before and after ageing (according to EN 927-6)  
Testing from these studies resulted in the following classifications, with detailed data available from Burnblock.

Results before ageing:	Fire class B
Results after ageing:	Fire class B
Evaluation:	<u>Thermo Pine passes the fire tests.</u>

Results before ageing:	Fire class B
Results after ageing:	Fire class B
Evaluation:	<u>Western Red Cedar passes the fire tests.</u>

Evaluation of data before and after ageing suggest that the effect of the fire retardant diminished at a rate equivalent to the degradative ageing and leaching of the wood itself. This meant that the effective level of fire retardant per unit of wood remained unchanged, thus Burnblock maintains its fire class B for Western Red Cedar and Thermo Pine.

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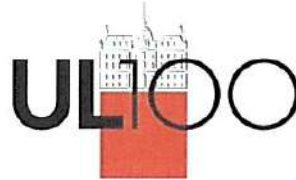


# HYGROSCOPIC TEST (S.1 af 2)

Thermofyr

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Biotehniška fakulteta

Jamnikarjeva 101  
SI 1000 Ljubljana  
Slovenia



Burnblock ApS  
Wilders Pl. 15C, 1403  
København, Denmark

Doc. No.: MH201911b  
Date: 2.7.2019

**Hygroscopic performance certification of Thermo-D Pine wood treated with Burnblock (retention 51,7 kg/m<sup>3</sup>) according to EN 16755:2017; Durability of reaction to fire performance. Classes of fire-retardant treated wood products in interior and exterior end use applications.**

Date of the samples delivery: 4<sup>th</sup> April 2018  
Contact person: Paw Fællø  
Samples description: Planks of dimensions 100 × 700 × 20 mm<sup>3</sup>  
Date of analysis: 15<sup>th</sup> April 2019 – 20<sup>th</sup> June 2019  
Method: Hygroscopic test according to EN 16755:2017

## Methods

Treated planks were cut to produce three replicate specimens of the following dimension: 100 × 200 × 20 mm<sup>3</sup>. In addition control specimens of the same size made of Scots pine sapwood (*Pinus sylvestris*) were provided. Samples were exposed in the climate chamber to reach equilibrium state as prescribed by standard EN 16755:2017. Conditioning in the climate RH 50%, T 23°C took four weeks, same as conditioning at the target climate RH 90 %, 27°C. Samples were exposed in climate chamber I-1000 CH Kambič (Semič, Slovenia). Incubation chamber enables control of the RH and temperature.

Table 1: Description of tested material and respective retentions

Material	Wood species	Retention of Burnblock
TF-10	Thermo-D Pine	51,7 kg/m <sup>3</sup>

# HYGROSCOPIC TEST (S.2 af 2)

Thermofyr

## Results

Raw data was provided to customer in xls file.

Table 2: Moisture content of treated wood at respective climate conditions

Sample No	Material	RH 50%, T 23°C	Moisture content		
			RH 90 %, 27°C		
4	TF-10	4,7%		10,7%	
5	TF-10	4,7%	4,6%	10,8%	10,6%
6	TF-10	4,5%		10,4%	
13	control	9,1%		20,2%	
14	control	9,0%	9,0%	20,3%	20,3%
15	control	9,0%		20,3%	

## Comments

There were staining fungi developed on the surface of scots pine sapwood (Figure 1), there were no sapstain fungi observed on the tested material.

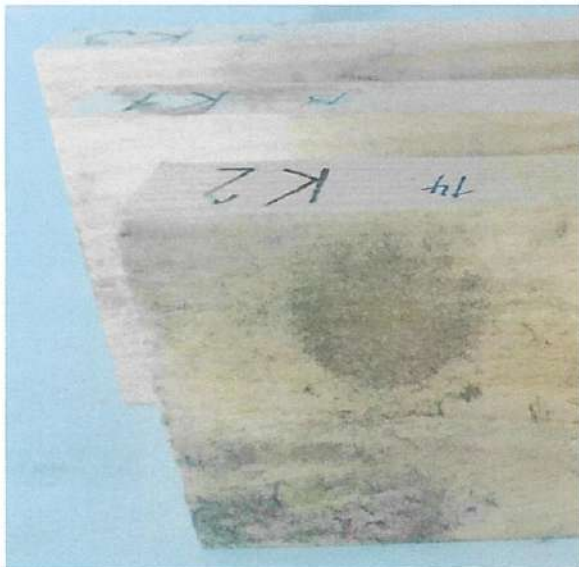


Figure 1: Sapstain fungi on the surface of control specimens.

## Conclusions

Thermo-D Pine wood treated with Burnblock (retention 51,7 kg/m<sup>3</sup>) fulfill the requirements of the hygroscopic requirements of the standard EN 16755:2017, and passed the tests.

## Literature:

EN 16755:2017, Durability of reaction to fire performance. Classes of fire-retardant treated wood products in interior and exterior end use applications

# QUANTITY OF RAINFALL CONVERTED TO NUMBERS OF YEARS IN DENMARK

	AMOUNT OF WATER/ RAINFALL	UNIT	SOURCE
THE AGEING TEST IS A CYCLE OF 12 WEEKS, IN WHICH THE WOOD HAS BEEN EXPOSED TO THE FOLLOWING AMOUNT OF WATER:	103.680	L / M <sup>2</sup>	DS/EN 927-6:2018 PKT 7.3.
THE AVERAGE OF THE ANNUAL RAINFALL IN DENMARK IN THE PERIOD 2006-2015: 792 MM. IT CORRESPONDS TO:	792	L / M <sup>2</sup> / ÅR	DMI
AMOUNT OF WATER OF THE AGEING TEST BASED ON THE ANNUAL AVERAGE OF RAINFALL IN DENMARK.	131	ÅR	

## NOTE

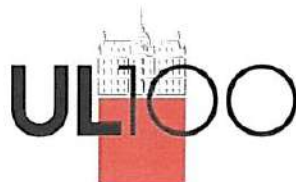
The calculation above was made by Burnblock and is based on information from the standard of ageing test and DMI. Without responsibility.

# HYGROSCOPIC TEST (S.1 af 2)

## Western Red Cedar

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Biotehniška fakulteta

Jamnikarjeva 101  
SI 1000 Ljubljana  
Slovenia



Burnblock ApS  
Wilders Pl. 15C, 1403  
København, Denmark

Doc. No.: MH201911d  
Date: 2.7.2019

**Hygroscopic performance certification of Western Red Cedar (*Thuja plicata*) wood treated with Burnblock (retention 56,3 kg/m<sup>3</sup>) according to EN 16755:2017; Durability of reaction to fire performance. Classes of fire-retardant treated wood products in interior and exterior end use applications.**

Date of the samples delivery: 4<sup>th</sup> April 2018  
Contact person: Paw Fællø  
Samples description: Planks of dimensions 100 × 700 × 20 mm<sup>3</sup>  
Date of analysis: 15<sup>th</sup> April 2019 – 20<sup>th</sup> June 2019  
Method: Hygroscopic test according to EN 16755:2017

### Methods

Treated planks were cut to produce three replicate specimens of the following dimension: 100 × 200 × 20 mm<sup>3</sup>. In addition control specimens of the same size made of Scots pine sapwood (*Pinus sylvestris*) were provided. Samples were exposed in the climate chamber to reach equilibrium state as prescribed by standard EN 16755:2017. Conditioning in the climate RH 50%, T 23°C took four weeks, same as conditioning at the target climate RH 90 %, 27°C. Samples were exposed in climate chamber I-1000 CH Kambič (Semič, Slovenia). Incubation chamber enables control of the RH and temperature.

Table 1: Description of tested material and respective retentions

Material	Wood species	Retention of Burnblock
C5	Western red cedar	56,3 kg/m <sup>3</sup>

# HYGROSCOPIC TEST (S.2 af 2)

## Western Red Cedar

### Results

Raw data was provided to customer in xls file.

Table 2: Moisture content of treated wood at respective climate conditions

Sample No	Material	RH 50%, T 23°C	Moisture content		
			RH 90 %, 27°C		
10	C5	8,7%		24,1%	
11	C5	9,0%	8,8%	27,1%	25,6%
12	C5	8,8%		25,5%	
13	control	9,1%		20,2%	
14	control	9,0%	9,0%	20,3%	20,3%
15	control	9,0%		20,3%	

### Comments

There were staining fungi developed on the surface of scots pine sapwood (Figure 1), there were no sapstain fungi observed on the tested material.

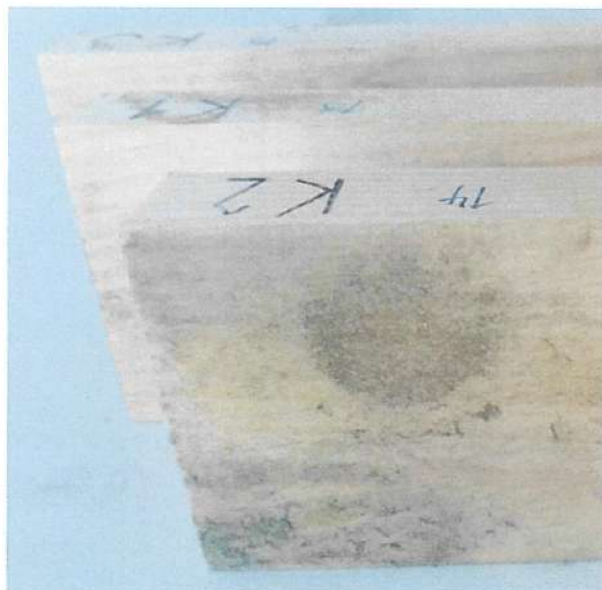


Figure 1: Sapstain fungi on the surface of control specimens.

### Conclusions

Western Red Cedar (*Thuja plicata*) wood treated with Burnblock (retention 56,3 kg/m<sup>3</sup>) fulfill the hygroscopic requirements of the standard EN 16755:2017, and passed the tests.

### Literature:

EN 16755:2017, Durability of reaction to fire performance. Classes of fire-retardant treated wood products in interior and exterior end use applications



## MAINTENANCE GUIDE FOR BURNBLOCK TREATED TIMBER AND WOOD PANELS

Burnblock FR treatment of timber is in principle a maintenance free treatment that protects the wood against spread of fire. The wood is treated with a high-pressure treatment that delivers the natural and non-toxic fire retardant to the cellular structure of the wood. For most wood species the treatment is a through and through treatment, and no after treatment is required for where the wood has been cut, drilled, planed or profiled.

**Test EN927-6** Burnblock treated timber has been tested for accelerated ageing/leaching according to EN927-6 (one of three test options in the new EN16755 standard) that uses both UV and an amount of water equivalent to more than 120 years of rainfall in a Scandinavian capital. The test shows the timber is maintaining Euro class B both before and after the ageing test, documented via ISO5660 tests. The results indicate that the effect of Burnblock diminishes at a rate equivalent to the degradative ageing and leaching of the wood itself. Documentation available upon request.

**Durability Extension** Burnblock fire retardant is a PH neutral treatment that is compatible with most surface treatments; oil, paint, stain etc. Please note that any surface treatment can change the fire classification and must therefore be tested on Burnblock treated wood before fully approved for EN13501:2007 Class B.

**Natural Ability** Durability is one of the key performance factors used to assess the suitability of a timber species for a specific application. The durability rating of a species is based on the natural ability of the heartwood of that species to resist decay and insect pests (including termites).

### EXPECTED SERVICE LIFE FOR TIMBER ACCORDING TO EN350 - TREATED AND UNTREATED WITH BURNBLOCK

	CLASS 1	CLASS 2	CLASS 3	CLASS 4
Fully exposed	25 years	15-25 years	8-15 years	< 5 years
Partly exposed	50 years	30 years	15 years	8 years
Shielded from the elements	Over 50 years			

The durability class mentioned above is only valid for heartwood.  
Sapwood is in general considered durability class 5 (not durable) according to EN 350.

Source: EN 350

Issued 03.05.2019

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