

# Test Report

Report Number:  
262505-3-WL



**DANISH  
TECHNOLOGICAL  
INSTITUTE**

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Init.: JOSCFBAU  
Order no.: 262505  
Encl.: 3

**Assignor:** MONTANA WOOD TECHNOLOGIES, LLC, 135 Hutton Ranch Rd., Suite 103, Kalispell, MT 59901, USA

**Item:** Swelling of SYP180°C and RedOak170°C. See enclosure B for detailed sample description.

**Sampling:** The product was selected by Danish Technological Institute and received at Danish Technological Institute on 17 June 2024.

**Period:** The test took place from 28 July 2024 to 13 August 2024.

**Method:** The test methods used are listed in enclosure A.

**Test results:** The detailed results are shown in enclosure C.

**Remarks:** In the longitudinal direction, some values appear to be negative, which is to explain with the very small change in dimension and the accuracy of the measuring device.

**Terms:** This test was conducted accredited in accordance with international requirements (ISO/IEC 17025:2017) and in accordance with the General Terms and Conditions of Danish Technological Institute. The test results solely apply to the tested item. This test report may be quoted in extract only if Danish Technological Institute has granted its written consent.

**Place:** Danish Technological Institute, Taastrup, Building and Construction

**Signature:** This document is only valid with a digital signature from Danish Technological Institute. The date of issue appears from the digital signature.

Joanna Schalnat  
Consultant



DIGITALLY SIGNED DOCUMENT

16 August 2024

DANISH TECHNOLOGICAL INSTITUTE



**DANAK**

TEST Reg.no. 2



## Methods

The following standard methods are used in this test report:

EN 317:1993 Particleboards and fibreboards - Determination of swelling in thickness after immersion in water

EN 325:2012 Wood-based panels - Determination of dimensions of test pieces

EN 326-1:1994 Wood-based panels - Sampling, cutting and inspection - Part 1: Sampling and cutting of test pieces and expression of test results

EN 326-2 + A1:2014 Wood-based panels - Sampling, cutting and inspection - Part 2: Initial type testing and factory production control





## Test of Swelling of SYP180°C and RedOak170°C

### Sample description

Sample mark: SYP180°C\_Radial

Grade: SOLID Nominal thickness: 22 mm

Additional info: Thermally treated wood. The same samples were used to measure the swelling in all directions. The direction of measurement is shown in the photo.



### Summary

Tested property		Mean	Std.dev.	COV	Char.value	Requirements
Swelling, 24 h	%:	0.8	0.3	39.6	1.0	-



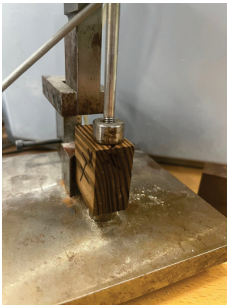
## Test of Swelling of SYP180°C and RedOak170°C

### Sample description

Sample mark: SYP180°C\_Tangential

Grade: SOLID Nominal thickness: 40 mm

Additional info: Thermally treated wood. The same samples were used to measure the swelling in all directions. The direction of measurement is shown in the photo.



### Summary

Tested property		Mean	Std.dev.	COV	Char.value	Requirements
Swelling, 24 h	%:	1.5	0.4	25.0	1.7	-



## Test of Swelling of SYP180°C and RedOak170°C

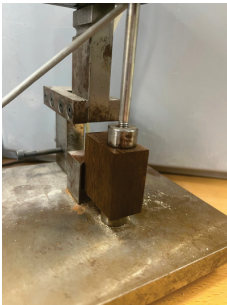
### Sample description

Sample mark: RedOak170°C\_Longitudinal

Grade: SOLID

Nominal thickness: 40 mm

Additional info: Thermally treated wood. The same samples were used to measure the swelling in all directions. The direction of measurement is shown in the photo.



### Summary

Tested property		Mean	Std.dev.	COV	Char.value	Requirements
Swelling, 24 h	%:	0.1	0.1	138.0	0.1	-



## Test of Swelling of SYP180°C and RedOak170°C

### Sample description

Sample mark: RedOak170°C\_Radial

Grade: SOLID Nominal thickness: 22 mm

Additional info: Thermally treated wood. The same samples were used to measure the swelling in all directions. The direction of measurement is shown in the photo.



### Summary

Tested property		Mean	Std.dev.	COV	Char.value	Requirements
Swelling, 24 h	%:	0.3	0.1	53.6	0.4	-



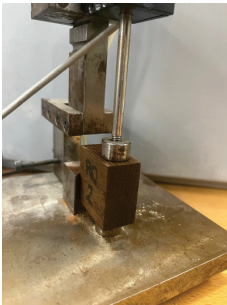
## Test of Swelling of SYP180°C and RedOak170°C

### Sample description

Sample mark: RedOak170°C\_Tangential

Grade: SOLID Nominal thickness: 40 mm

Additional info: Thermally treated wood. The same samples were used to measure the swelling in all directions. The direction of measurement is shown in the photo.



### Summary

Tested property		Mean	Std.dev.	COV	Char.value	Requirements
Swelling, 24 h	%:	0.7	0.1	20.5	0.8	-





## Detailed results

### *Test of Swelling of SYP180°C and RedOak170°C*

Sample: SYP180°C\_Longitudinal

Particleboards and fibreboards - Determination of swelling in thickness after immersion in water

Standard: EN 317:1993

Equipment: HBM length transducer, IID 7867

	Initial thickness [mm]	Thickness 24h [mm]	Swelling 24h [%]
	39.99	39.95	-0.1
	40.05	40.02	-0.1
	39.96	39.97	0.0
	40.09	40.13	0.1
	40.04	40.09	0.1
	40.11	40.13	0.0
	40.09	40.09	0.0
	40.09	40.12	0.1
Number			8
Mean			0.0
Std.Dev.			0.1
CoV			667.6
Char. value *			0.1

\* Characteristic value calculated according to EN 326-2:2014 - 6.4 Factory Production Control



## Test of Swelling of SYP180°C and RedOak170°C

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Sample: SYP180°C\_Radial

Particleboards and fibreboards - Determination of swelling in thickness after immersion in water

Standard: EN 317:1993

Equipment: HBM length transducer, IID 7867

	Initial thickness [mm]	Thickness 24h [mm]	Swelling 24h [%]
	21.80	21.96	0.7
	21.69	21.93	1.1
	21.41	21.65	1.1
	21.77	21.93	0.7
	21.64	21.68	0.2
	21.67	21.81	0.6
	21.73	21.95	1.0
	21.78	21.93	0.7
Number			8
Mean			0.8
Std.Dev.			0.3
CoV			39.6
Char. value *			1.0

\* Characteristic value calculated according to EN 326-2:2014 - 6.4 Factory Production Control

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## Test of Swelling of SYP180°C and RedOak170°C

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Sample: SYP180°C\_Tangential

Particleboards and fibreboards - Determination of swelling in thickness after immersion in water

Standard: EN 317:1993

Equipment: HBM length transducer, IID 7867

	Initial thickness [mm]	Thickness 24h [mm]	Swelling 24h [%]
	40.11	40.76	1.6
	40.05	40.74	1.7
	39.97	40.60	1.6
	40.18	40.74	1.4
	39.96	40.50	1.4
	40.11	40.39	0.7
	39.98	40.78	2.0
	39.96	40.56	1.5
Number			8
Mean			1.5
Std.Dev.			0.4
CoV			25.0
Char. value *			1.7

\* Characteristic value calculated according to EN 326-2:2014 - 6.4 Factory Production Control

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## Test of Swelling of SYP180°C and RedOak170°C

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Sample: RedOak170°C\_Longitudinal

Particleboards and fibreboards - Determination of swelling in thickness after immersion in water

Standard: EN 317:1993

Equipment: HBM length transducer, IID 7867

	Initial thickness [mm]	Thickness 24h [mm]	Swelling 24h [%]
	39.89	39.91	0.1
	40.01	39.98	-0.1
	39.94	39.97	0.1
	39.91	39.97	0.2
	40.02	40.00	0.0
	39.95	39.94	0.0
	39.86	39.88	0.1
	39.88	39.97	0.2
Number			8
Mean			0.1
Std.Dev.			0.1
CoV			138.0
Char. value *			0.1

\* Characteristic value calculated according to EN 326-2:2014 - 6.4 Factory Production Control

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## Test of Swelling of SYP180°C and RedOak170°C

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Sample: RedOak170°C\_Radial

Particleboards and fibreboards - Determination of swelling in thickness after immersion in water

Standard: EN 317:1993

Equipment: HBM length transducer, IID 7867

	Initial thickness [mm]	Thickness 24h [mm]	Swelling 24h [%]
	21.73	21.81	0.4
	21.49	21.54	0.2
	21.53	21.61	0.4
	21.67	21.75	0.4
	21.59	21.65	0.3
	21.63	21.64	0.0
	21.52	21.56	0.2
	21.37	21.41	0.2
Number			8
Mean			0.3
Std.Dev.			0.1
CoV			53.6
Char. value *			0.4

\* Characteristic value calculated according to EN 326-2:2014 - 6.4 Factory Production Control

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## Test of Swelling of SYP180°C and RedOak170°C

---

Sample: RedOak170°C\_Tangential

Particleboards and fibreboards - Determination of swelling in thickness after immersion in water

Standard: EN 317:1993

Equipment: HBM length transducer, IID 7867

	Initial thickness [mm]	Thickness 24h [mm]	Swelling 24h [%]
	39.94	40.25	0.8
	39.93	40.27	0.9
	40.01	40.22	0.5
	39.92	40.14	0.6
	39.96	40.24	0.7
	39.92	40.16	0.6
	39.82	40.11	0.7
	39.74	40.09	0.9
Number			8
Mean			0.7
Std.Dev.			0.1
CoV			20.5
Char. value *			0.8

\* Characteristic value calculated according to EN 326-2:2014 - 6.4 Factory Production Control

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