

Kaindl Flooring GmbH
Herrn Christian Mayer
Kaindlstrasse 2
5071 WALS, SALZBURG
ÖSTERREICH



Deutsche
Akkreditierungsstelle
D-PL-11054-01-00



Dresden, 15/08/2024
MPET/USOK

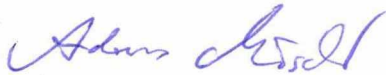
Test Report Order No. 2117129/2024/12

Client: Kaindl Flooring GmbH
Kaindlstrasse 2
5071 Wals, Salzburg
Österreich

Order: Determination of the water resistance
according to NALFA-method

Contractor: EPH - Laboratory Unit Surface Testing

Engineer in charge: Dipl.-Ing. (FH) M. Peter



Dipl.-Ing. Andreas Möschner
Head of Laboratory Unit Surface Testing

The test report contains 10 pages. Any duplication of extracts requires the written permission of EPH. The test results refer exclusively to the material tested.

1 Task

The accredited Entwicklungs- und Prüflabor Holztechnologie GmbH (EPH) was instructed by M. Kaindl GmbH in Wals, Salzburg, Österreich to determine the water resistance according to NALFA-method on floor coverings.

NOTE: All numerical values within this document are given with a comma as decimal.

2 Material

The following samples and information were selected for testing and submitted to the contractor by the client:

Variant	Classes	Assembly group*	Product name	Dimensions in mm
L6	32	47	Laminate floor covering	1290 x 193 x 8
L21	33	70	Laminate floor covering	1290 x 193 x 12
L22	33	71	Laminate floor covering	1383 x 193 x 12
L23	31	61	Laminate floor covering	1290 x 193 x 10
L24	33	23	Laminate floor covering	1383 x 193 x 7

* according to Kaindl floor matrix 2024

Date of sample receipt: 22/04/2024 and 27/06/2024

3 Determination of the water resistance according to NALFA-method

NALFA Laminate Surface Swell Test - Assembled Joint;

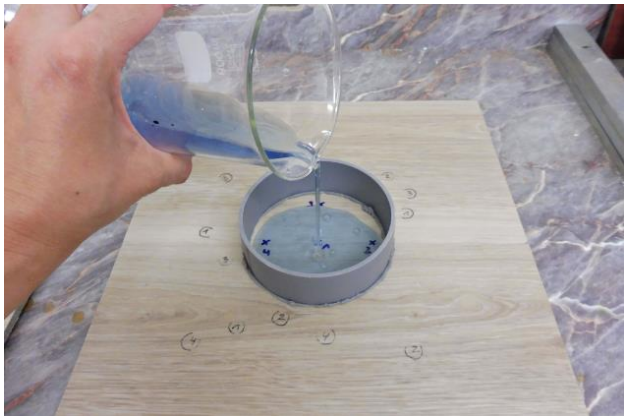
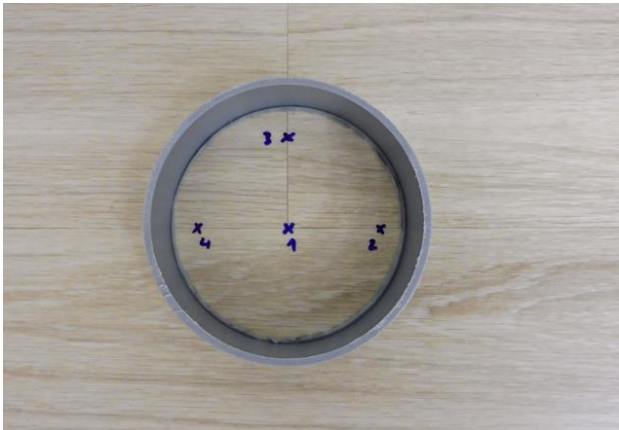
Purpose: To evaluate surface swell of finished Laminate flooring products when exposed to water utilizing an assembled joint

The determination of the water resistance (cf. figures next page) was carried out according to the following NALFA standard:

“NALFA Laminate Surface Swell Test - Assembled Joint; Purpose: To evaluate surface swell of finished Laminate flooring products when exposed to water utilizing an assembled joint.”

Performance of tests: 11/06/2024 - 15/08/2024

Example figures of the test execution



4 Results - Water resistance according to NALFA-method

Variant L6/ Assembly group 47 - Specimen 1

Quantitative Results - measured values in mm					
Position	Initial Height	Time water added 24 hours			
		Wet Height	Wet Swell	Re-dry Height	Re-dry Swell
1	-0,71	-0,58	0,13	-0,64	0,07
2	-0,52	-0,46	0,06	-0,57	0,05
3	0,02	0,22	0,20	0,13	0,11
4	-0,59	-0,56	0,03	-0,58	0,01
Average (Pos. 2-4)			0,10		0,06

Qualitative Results in Grade

Wet Swell	2	Re-dry Swell	1
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Variant L6/ Assembly group 47 - Specimen 2

Quantitative Results - measured values in mm					
Position	Initial Height	Time water added 24 hours			
		Wet Height	Wet Swell	Re-dry Height	Re-dry Swell
1	-0,24	0,00	0,24	-0,09	0,15
2	0,19	-0,05	0,24	-0,13	0,32
3	-0,03	0,15	0,18	-0,07	0,04
4	-0,13	0,02	0,15	-0,06	0,07
Average (Pos. 2-4)			0,19		0,14

Qualitative Results in Grade

Wet Swell	2	Re-dry Swell	2
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Grade Description

- Grade 1 No change - Little to no noticeable change in edge swell or panel surface lift
- Grade 2 Slight swelling - Slight swelling small ridge along one or more joints very little if any panel surface lift
- Grade 3 Moderate - Noticeable edge swelling and some panel surface lift extending in away from joint
- Grade 4 Objectional - Severely raised edge and swelling extending noticeably under the panel surface
- Grade 5 Invalid Test - Water leaked out of the ring. Leaving no continuous film of water inside the ring (this grade is given even if there is no swell of the edge joint)

Variant L21/ Assembly group 70 - Specimen 1

Quantitative Results - measured values in mm					
Position	Initial Height	Time water added 24 hours			
		Wet Height	Wet Swell	Re-dry Height	Re-dry Swell
1	-0,27	-0,10	0,17	-0,19	0,08
2	-0,29	-0,25	0,04	-0,29	0,00
3	0,13	0,54	0,41	0,41	0,28
4	-0,31	-0,30	0,01	-0,27	0,04
Average (Pos. 2-4)			0,15		0,11

Qualitative Results in Grade

Wet Swell	2	Re-dry Swell	2
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Variant L21/ Assembly group 70 - Specimen 2

Quantitative Results - measured values in mm					
Position	Initial Height	Time water added 24 hours			
		Wet Height	Wet Swell	Re-dry Height	Re-dry Swell
1	-0,14	-0,03	0,11	-0,10	0,04
2	-0,24	-0,14	0,10	-0,23	0,01
3	0,02	0,21	0,19	0,11	0,09
4	-0,11	-0,05	0,06	-0,11	0,00
Average (Pos. 2-4)			0,12		0,03

Qualitative Results in Grade

Wet Swell	2	Re-dry Swell	1
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Grade Description

- Grade 1 No change - Little to no noticeable change in edge swell or panel surface lift
- Grade 2 Slight swelling - Slight swelling small ridge along one or more joints very little if any panel surface lift
- Grade 3 Moderate - Noticeable edge swelling and some panel surface lift extending in away from joint
- Grade 4 Objectional - Severely raised edge and swelling extending noticeably under the panel surface
- Grade 5 Invalid Test - Water leaked out of the ring. Leaving no continuous film of water inside the ring (this grade is given even if there is no swell of the edge joint)

Variant L22/ Assembly group 71 - Specimen 1

Quantitative Results - measured values in mm					
Position	Initial Height	Time water added 24 hours			
		Wet Height	Wet Swell	Re-dry Height	Re-dry Swell
1	-0,08	0,47	0,55	0,24	0,32
2	-0,15	0,10	0,25	-0,08	0,07
3	0,07	0,48	0,41	0,27	0,20
4	0,01	0,06	0,05	0,04	0,03
Average (Pos. 2-4)			0,24		0,10

Qualitative Results in Grade

Wet Swell	3	Re-dry Swell	2
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Variant L22/ Assembly group 71 - Specimen 2

Quantitative Results - measured values in mm					
Position	Initial Height	Time water added 24 hours			
		Wet Height	Wet Swell	Re-dry Height	Re-dry Swell
1	-0,12	0,30	0,42	0,07	0,19
2	-0,09	-0,02	0,07	-0,09	0,00
3	0,01	0,46	0,45	0,24	0,23
4	-0,09	-0,03	0,06	-0,09	0,00
Average (Pos. 2-4)			0,19		0,08

Qualitative Results in Grade

Wet Swell	2	Re-dry Swell	1
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Grade Description

- Grade 1 No change - Little to no noticeable change in edge swell or panel surface lift
- Grade 2 Slight swelling - Slight swelling small ridge along one or more joints very little if any panel surface lift
- Grade 3 Moderate - Noticeable edge swelling and some panel surface lift extending in away from joint
- Grade 4 Objectional - Severely raised edge and swelling extending noticeably under the panel surface
- Grade 5 Invalid Test - Water leaked out of the ring. Leaving no continuous film of water inside the ring (this grade is given even if there is no swell of the edge joint)

Variant L23/ Assembly group 61 - Specimen 1

Quantitative Results - measured values in mm					
Position	Initial Height	Time water added 24 hours			
		Wet Height	Wet Swell	Re-dry Height	Re-dry Swell
1	0,04	0,49	0,45	0,74	0,70
2	0,02	0,14	0,12	0,22	0,20
3	-0,09	0,27	0,36	0,17	0,26
4	-0,09	0,15	0,24	0,30	0,39
Average (Pos. 2-4)			0,24		0,28

Qualitative Results in Grade

Wet Swell	3	Re-dry Swell	3
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Variant L23/ Assembly group 61 - Specimen 2

Quantitative Results - measured values in mm					
Position	Initial Height	Time water added 24 hours			
		Wet Height	Wet Swell	Re-dry Height	Re-dry Swell
1	-0,09	0,08	0,17	-0,08	0,01
2	-0,10	0,01	0,11	-0,10	0,00
3	0,02	0,19	0,17	0,06	0,04
4	-0,17	-0,05	0,12	-0,20	0,03
Average (Pos. 2-4)			0,13		0,02

Qualitative Results in Grade

Wet Swell	2	Re-dry Swell	1
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Variant L23/ Assembly group 61 - Specimen 3

Quantitative Results - measured values in mm					
Position	Initial Height	Time water added 24 hours			
		Wet Height	Wet Swell	Re-dry Height	Re-dry Swell
1	-0,07	0,08	0,15	-0,05	0,02
2	-0,04	0,03	0,07	-0,04	0,00
3	-0,07	0,12	0,19	0,03	0,10
4	-0,08	-0,02	0,06	-0,08	0,00
Average (Pos. 2-4)			0,11		0,03

Qualitative Results in Grade

Wet Swell	2	Re-dry Swell	1
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Variant L24/ Assembly group 23 - Specimen 1

Quantitative Results - measured values in mm					
Position	Initial Height	Time water added 24 hours			
		Wet Height	Wet Swell	Re-dry Height	Re-dry Swell
1	-0,50	-0,28	0,22	-0,48	0,02
2	-0,39	0,24	0,63	-0,39	0,00
3	-0,03	0,12	0,15	-0,05	0,02
4	-0,48	-0,39	0,09	-0,50	0,02
Average (Pos. 2-4)			0,29		0,01

Qualitative Results in Grade

Wet Swell	3	Re-dry Swell	1
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Variant L24/ Assembly group 23 - Specimen 2

Quantitative Results - measured values in mm					
Position	Initial Height	Time water added 24 hours			
		Wet Height	Wet Swell	Re-dry Height	Re-dry Swell
1	-0,33	-0,10	0,23	-0,29	0,04
2	-0,36	-0,20	0,16	-0,35	0,01
3	0,05	0,19	0,14	0,03	0,02
4	-0,25	-0,05	0,20	-0,25	0,00
Average (Pos. 2-4)			0,17		0,01

Qualitative Results in Grade

Wet Swell	2	Re-dry Swell	1
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Grade Description

- Grade 1 No change - Little to no noticeable change in edge swell or panel surface lift
- Grade 2 Slight swelling - Slight swelling small ridge along one or more joints very little if any panel surface lift
- Grade 3 Moderate - Noticeable edge swelling and some panel surface lift extending in away from joint
- Grade 4 Objectional - Severely raised edge and swelling extending noticeably under the panel surface
- Grade 5 Invalid Test - Water leaked out of the ring. Leaving no continuous film of water inside the ring (this grade is given even if there is no swell of the edge joint)

5 Evaluation

Variant L6/Assembly group 47 - Overall evaluation of Specimen 1 and 2

Evaluation*		Wet Swell	Re-dry Swell
FinalAvg Thickness Swell in mm	Pos. 1	0,19	0,11
	Pos. 2-4	0,15	0,10
Qualitative Rating Specimen 1		2	1
Qualitative Rating Specimen 2		2	2

* Statements on conformity assessment/classification were made on the basis of the measurement results obtained. Measurement uncertainties were not included in the assessment (ILAC G8 03/2009 "Guidelines on the Reporting of Compliance with Specification" Section 2.7).

Water passage through the joint connection was not detected.

Variant L21/Assembly group 70 - Overall evaluation of Specimen 1 and 2

Evaluation*		Wet Swell	Re-dry Swell
FinalAvg Thickness Swell in mm	Pos. 1	0,14	0,06
	Pos. 2-4	0,14	0,07
Qualitative Rating Specimen 1		2	2
Qualitative Rating Specimen 2		2	1

* Statements on conformity assessment/classification were made on the basis of the measurement results obtained. Measurement uncertainties were not included in the assessment (ILAC G8 03/2009 "Guidelines on the Reporting of Compliance with Specification" Section 2.7).

Water passage through the joint connection was not detected.

Variant L22/Assembly group 71 - Overall evaluation of Specimen 1 and 2

Evaluation*		Wet Swell	Re-dry Swell
FinalAvg Thickness Swell in mm	Pos. 1	0,49	0,26
	Pos. 2-4	0,22	0,09
Qualitative Rating Specimen 1		3	2
Qualitative Rating Specimen 2		2	1

* Statements on conformity assessment/classification were made on the basis of the measurement results obtained. Measurement uncertainties were not included in the assessment (ILAC G8 03/2009 "Guidelines on the Reporting of Compliance with Specification" Section 2.7).

Water passage through the joint connection was not detected.

Variant L23/Assembly group 61 - Overall evaluation of Specimen 2 and 3

Evaluation*		Wet Swell	Re-dry Swell
FinalAvg Thickness Swell in mm (Specimen 2 and 3)	Pos. 1	0,16	0,02
	Pos. 2-4	0,12	0,03
Qualitative Rating Specimen 2		2	1
Qualitative Rating Specimen 3		2	1

* Statements on conformity assessment/classification were made on the basis of the measurement results obtained. Measurement uncertainties were not included in the assessment (ILAC G8 03/2009 "Guidelines on the Reporting of Compliance with Specification" Section 2.7).

Water passage through the joint connection was not detected.

Variant L24/Assembly group 23 - Overall evaluation of Specimen 1 and 2

Evaluation*		Wet Swell	Re-dry Swell
FinalAvg Thickness Swell in mm	Pos. 1	0,23	0,03
	Pos. 2-4	0,23	0,01
Qualitative Rating Specimen 1		3	1
Qualitative Rating Specimen 2		2	1

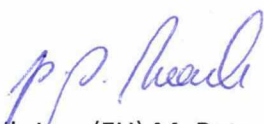
* Statements on conformity assessment/classification were made on the basis of the measurement results obtained. Measurement uncertainties were not included in the assessment (ILAC G8 03/2009 "Guidelines on the Reporting of Compliance with Specification" Section 2.7).

Water passage through the joint connection was not detected.

Requirements by NALFA after 24 hours water load:

Recovered Qualitative Rating (Re-Dry Swell) of two Specimen, each: < 2
 Calculated Recovered FinalAvg Thickness Swell Pos. 2-4 (Re-dry Swell): ≤ 0,3 mm

The requirements were fulfilled by all tested variants.



Dipl.-Ing. (FH) M. Peter
 Engineer in charge