TEST REPORT

REPORT NUMBER: 160830005SHF-BP-3

ORIGINAL ISSUE DATE: 2016-09-29

EVALUATION CENTER

Intertek Testing Services Ltd., Shanghai

Plant 7, No. 6958 Daye Road, Fengxian District, Shanghai, China

RENDERED TO

Grinwood WPC Material Co., Ltd

Longquanwu Eco-Industrial Zone, Miaoxi, Huzhou, Zhejiang, China

PRODUCT EVALUATED

WPC Hollow Decking

EVALUATION PROPERTY

As requested by the applicant, for details refer to attached pages(s).

Test Report

Report Number: 160830005SHF-BP-3

Report Date: 2016-09-29

Applicant:	**Grinwood WPC Material Co., Ltd**
Applicant Address:	**Longquanwu Eco-Industrial Zone, Miaoxi, Huzhou, Zhejiang, China**
Attn:	**Liu Jianjian**

Sample information:

Product:	WPC Hollow Decking
Model:	GW007A
Specification:	135 mm× 25 mm
Sample Quantity:	36 pieces
Sample ID:	S160830005SHF.001~036
Date Received:	2016/08/29
Date Test Conducetd:	2016/08/29 to 2016/09/28

Conclusion:

For details refer to attached page(s).

The conclusions of this test report may not be used as part of the requirements for Intertek product certification. Authority to Mark must be issued for a product to become certified.

Test Report

Report Number: 160830005SHF-BP-3

Report Date: 2016-09-29

Test Items, Method and Results:

Test item: Creep behaviour (Known span in use)

Condition: Condition to constant mass at temperature of 23 ± 2 °C and relative humidity of 50 ± 5 %

Test condition: 23 ± 2 °C and relative humidity of 50 ± 5 %

Test specimen: 400 mm(length) × 135 mm(width) × 25 mm(thickness)

Test span: 300 mm offered by applicant

Test load: 1000 N

Test duration: 504 hours

Test Items	Test Method	Test Results		Test requirements	Verdict
Creep behaviour	EN 15534-4:2014 Section 4.5.3 EN 15534-1:2014 Section 7.4.1	Span:	300 mm	Known span in use	Pass
		Mean ΔS:	1.34 mm	Mean ΔS≤ 10 mm	
		Max. ΔS:	1.68 mm	Max. ΔS≤ 13 mm	
		Mean ΔSr:	1.02 mm	Mean ΔSr≤ 5 mm	

Note:

1. Requirement is cited from EN 15534-4:2014 Table 4.

Test Report

Report Number: 160830005SHF-BP-3

Report Date: 2016-09-29

Test Items, Method and Results:

Test item: Swelling and water absorption

Condition: Condition to constant mass at temperature of 23 ± 2 °C and relative humidity of 50 ± 5 %

Immersion in water at 20 ± 2°C for 28 days

Test specimen: 100 mm(length) × 135 mm(width) × 25 mm(thickness)

Test Items	Test Method	Test Results	Test requirements	Verdict
Swelling and water absorption (28 days immersion)	EN 15534-1:2014 Section 8.3.1 EN 317:1993	Mean Swelling: 1.74 % in thickness 0.15 % in width 0.13 % in length Max. Swelling: 1.89 % in thickness 0.18 % in width 0.15 % in length Water absorption: Mean: 2.42 % Max.: 2.52 %	Mean swelling: ≤ 4 % in thickness ≤ 0.8 % in width ≤ 0.4 % in length Max. swelling: ≤ 5 % in thickness ≤ 1.2 % in width ≤ 0.6 % in length Water absorption: Mean≤ 7 % Max.≤ 9 %	Pass

Note:

1. Requirement is cited from EN 15534-4:2014 Table 7.

Test Report

Report Number: 160830005SHF-BP-3

Report Date:2016-09-29

Appendix A: Sample received photo

Approved by:

Name: Sun Sun	Name: Sally Xie	Name: Daniel Zhang
Title: Approver	Title: Reviewer	Title: Project Engineer

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The End of Report

TEST REPORT

Report Number: 160830005SHF-BP-5

Report Date: 2016-10-26

EVALUATION CENTER

Intertek Testing Services Ltd., Shanghai

Plant 7, No. 6958 Daye Road, Fengxian District, Shanghai, China

RENDERED TO

Grinwood WPC Material Co., Ltd

Longquanwu Eco-Industrial Zone, Miaoxi, Huzhou, Zhejiang, China

PRODUCT EVALUATED

WPC Hollow Decking

EVALUATION PROPERTY

As requested by the applicant, for details refer to attached pages(s).

Test Report

Report Number: 160830005SHF-BP-5

Report Date: 2016-10-26

Applicant:	**Grinwood WPC Material Co., Ltd**
Applicant Address:	**Longquanwu Eco-Industrial Zone, Miaoxi, Huzhou, Zhejiang, China**
Attn:	**Liu Jianjian**

Sample information:

Product:	WPC Hollow Decking
Model:	GW007A
Specification:	135 mm× 25 mm
Sample Quantity:	36 pieces
Sample ID:	S160830005SHF.001~036
Date Received:	2016/08/29
Date Test Conducetd:	2016/08/29 to 2016/10/25

Conclusion:

For details refer to attached page(s).

The conclusions of this test report may not be used as part of the requirements for Intertek product certification. Authority to Mark must be issued for a product to become certified.

Test Report

Report Number: 160830005SHF-BP-5

Report Date: 2016-10-26

Test Items, Method and Results:

Test item: Moisture resistance under cyclic test conditions

Condition: 96 hours at a temperature of 23 ± 2 °C and relative humidity of 50 ± 5 %.

Test condition: Test specimens should be subjected to the following cyclic treatment before flexural testing.

Cycle 1

1) Immersion in water at 20±1°C for 28 days;

2) Freezing at -20±2°C for 24 hours;

3) Drying at 70±2°C for 72 hours

Cycle 2 and cycle 3

1) Immersion in water at 20±1°C for 72 hours;

2) Freezing at -20±2°C for 24 hours;

3) Drying at 70±2°C for 72 hours

Condition after cycle 3: 72 hours at a temperature of 23 ± 2 °C and relative humidity of 50 ± 5 %

Test specimen: 400 mm(length) × 135 mm(width) × 25 mm(thickness)

Test speed: 6.67 mm/minute

Test span: 300 mm offered by applicant

Test Items	Test Method	Test Results			Test requirements	Verdict
Moisture resistance under cyclic test conditions	EN 15534-1:2014 Section 8.3.2 EN 321:2001	Bending strength:			Decrease of bending strength, Mean≤ 20 % Max.≤ 30 %	Pass
		Original value:	31.30	MPa		
		After exposure				
		Mean value:	31.1	MPa		
		Decrease:	0.60	%		
		Minimum value:	30.2	MPa		
		Decrease:	3.50	%		

Note:

1. Requirement is cited from EN 15534-4:2014 Table 7.

Test Report

Report Number: 160830005SHF-BP-5

Report Date: 2016-10-26

Appendix A: Sample received photo

Approved by:

Name: Sun Sun

Title: Approver

Name: Sally Xie

Title: Reviewer

Name: Daniel Zhang

Title: Project Engineer

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The End of Report

TEST REPORT

REPORT NUMBER:160830005SHF-BP-1

ORIGINAL ISSUE DATE:2016-09-08

EVALUATION CENTER

Intertek Testing Services Ltd., Shanghai

Plant 7, No. 6958 Daye Road, Fengxian District, Shanghai, China

RENDERED TO

Grinwood WPC Material Co., Ltd

Longquanwu Eco-Industrial Zone, Miaoxi, Huzhou, Zhejiang, China

PRODUCT EVALUATED

WPC Hollow Decking

EVALUATION PROPERTY

As requested by the applicant, for details refer to attached pages(s).

Test Report

Report Number:160830005SHF-BP-1

Report Date:2016-09-08

Applicant:	**Grinwood WPC Material Co., Ltd**
Applicant Address:	**Longquanwu Eco-Industrial Zone, Miaoxi, Huzhou, Zhejiang, China**
Attn:	**Liu Jianjian**

Sample information:

Product:	WPC Hollow Decking
Model:	GW007A
Specification:	135 mm× 25 mm
Sample Quantity:	36 pieces
Sample ID:	S160830005SHF.001~036
Date Received:	2016/08/29
Date Test Conducetd:	2016/08/29 to 2016/09/07

Conclusion:

For details refer to attached page(s).

The conclusions of this test report may not be used as part of the requirements for Intertek product certification. Authority to Mark must be issued for a product to become certified.

Test Report

Report Number: 160830005SHF-BP-1

Report Date: 2016-09-08

Test Items, Method and Results:

Test item: Slipperiness (Pendulum test)

Condition: 96 hours at a temperature of 23 ± 2 °C and relative humidity of 50 ± 5 %

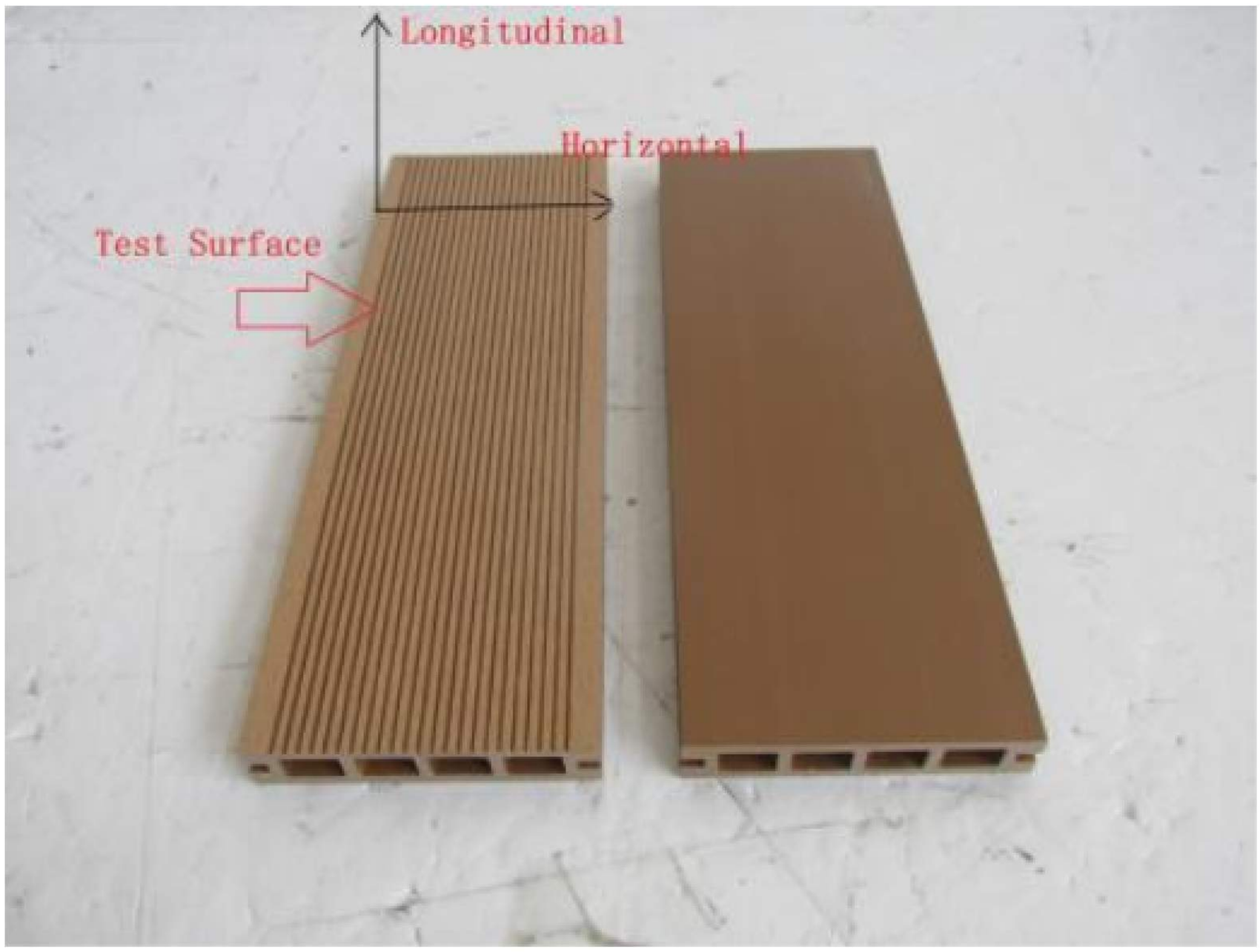
Test specimen: 400 mm(length) × 135 mm(width) × 25 mm(thickness)

Test Items	Test Method	Test Results		Test requirements	Verdict
Slipperiness (Pendulum test)	EN 15534-1:2014 Section 6.4.2 CEN/TS 15676:2007	Longitudinal direction:		Pendulum value≥36	Pass
		Mean:	57		
		Min.:	56		
		Horizontal direction:			
		Mean:	65		
		Min.:	64		

Note:

1. Requirement is cited from EN 15534-4:2014 Table 1.

2. Test surface and direction please refer to below picture.



Test Report

Report Number: 160830005SHF-BP-1

Report Date: 2016-09-08

Test Items, Method and Results:

Test item: Falling mass impact resistance

Condition: 96 hours at a temperature of 23 ± 2 °C and relative humidity of 50 ± 5 %

Test specimen: 300 mm(length) × 135 mm(width) × 25 mm(thickness)

Test span: 200 mm

Striker head: hemispherical surface of 25 mm radius

Striker mass: 1000 g

Drop height: 700 mm

Test Items	Test Method	Test Results	Test requirements	Verdict
Falling mass impact resistance	EN 15534-1:2014 Section 7.1.2.1	Hollow profile Max. Crack length (mm): No crack appeared Max. Residual Indentation (mm): 0.12 mm	None of 10 test specimens shall show a failure with a crack length≥ 10 mm or a depth of residual indentation≥ 0.5 mm	Pass

Note:

1. Requirement is cited from EN 15534-4:2014 Table 2.

Test Report

Report Number: 160830005SHF-BP-1

Report Date: 2016-09-08

Test Items, Method and Results:

Test item: Flexural properties

Condition: 96 hours at a temperature of 23 ± 2 °C and relative humidity of 50 ± 5 %

Test specimen: 400 mm(length) × 135 mm(width) × 25 mm(thickness)

Test speed: 8.14 mm/minute

Test span: 300 mm offered by applicant

Test Items	Test Method	Test Results	Test requirements	Verdict
Flexural properties	EN 15534-1:2014 Annex A	Bending Strength: 31.3 MPa Modulus of elasitcity: 3.10 GPa Maximum load: Mean: 6080 N Min.: 5844 N Deflection at 500N: Mean: 0.70 mm Max.: 0.78 mm	Flexural properties -F'max: Mean≥ 3300 N Min.≥ 3000 N -Deflection under a load of 500 N Mean≤ 2.0 mm Max.≤ 2.5 mm	Pass

Note:

1. Requirement is cited from EN 15534-4:2014 Table 3.

Test Report

Report Number: 160830005SHF-BP-1

Report Date: 2016-09-08

Test Items, Method and Results:

Test item: Boiling test

Condition: 96 hours at a temperature of 23 ± 2 °C and relative humidity of 50 ± 5 %. Immersed in boiling water during 5 hours ± 10 minutes. After 5 hours storage in boiling water, immediately immersed in cold water at 20 ± 2°C during 15 minutes. Tested at a temperature of 23 ± 2°C and a relative humidity of 50±5% within 120 min after the removal of the test specimens from water.

Test specimen: 100 mm(length) × 135 mm(width) × 25 mm(thickness)

Test Items	Test Method	Test Results	Test requirements	Verdict
Boiling test	EN 15534-1:2014 Section 8.3.3	Water absorption: Mean: 1.91 % Max.: 1.98 %	Water absorption: Mean≤ 7 % Max.≤ 9 %	Pass

Note:

1. Requirement is cited from EN 15534-4:2014 Table 7.

Test Report

Report Number: 160830005SHF-BP-1

Report Date: 2016-09-08

Test Items, Method and Results:

Test item: Linear thermal expansion

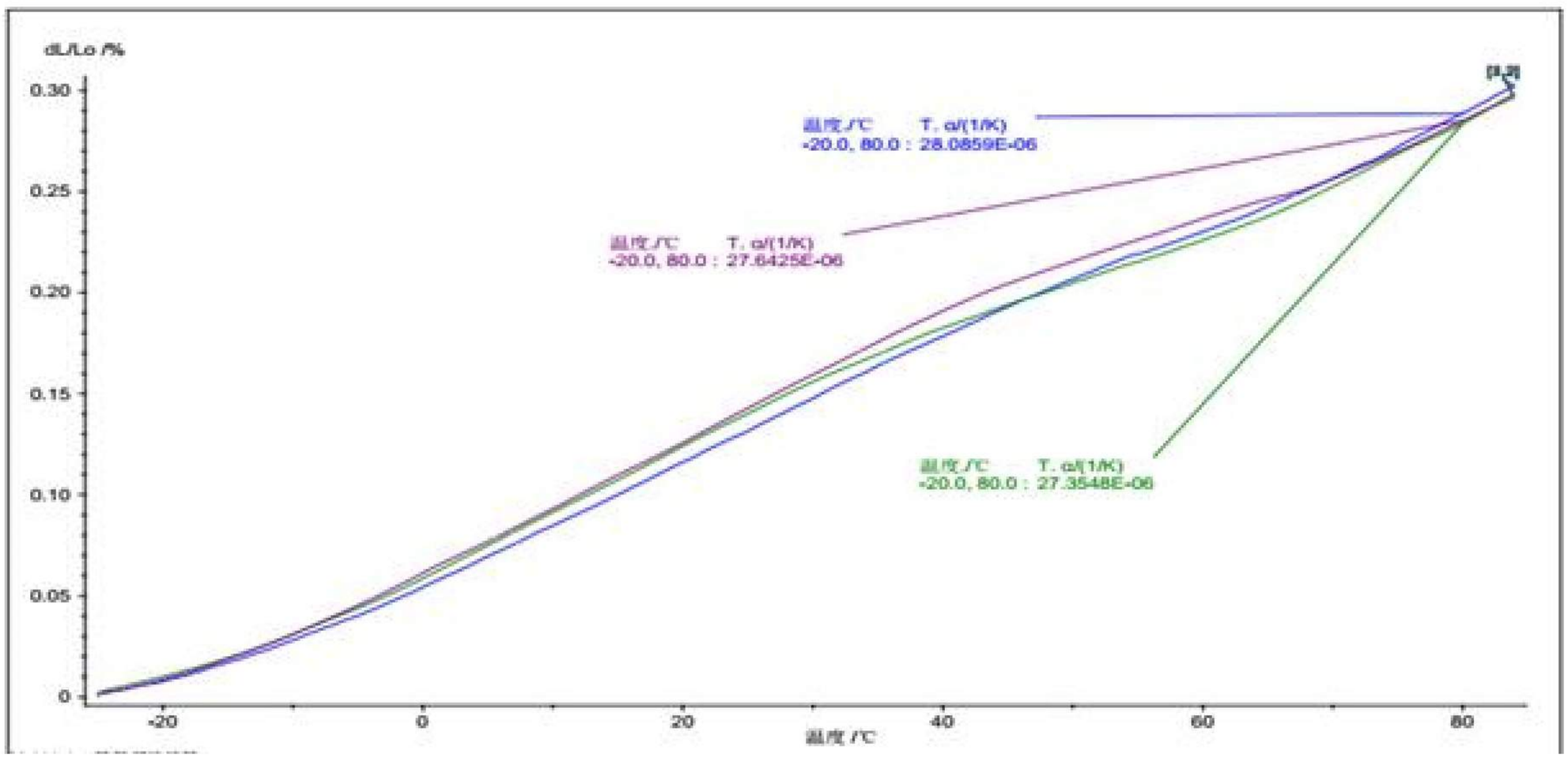
Temperature range: -20°C to 80°C

Test Items	Test Method	Test Results	Test requirements	Verdict
Linear thermal expansion coefficient	EN 15534-1:2014 Section 9.2 ISO 11359-2:1999	28.1 $\times 10^{-6}$ K^{-1} 27.6 $\times 10^{-6}$ K^{-1} 27.4 $\times 10^{-6}$ K^{-1} Mean: 27.7 $\times 10^{-6}$ K^{-1}	$\leq 50 \times 10^{-6} K^{-1}$	Pass

Note:

1. This test was conducted at the external approved facility, located at Shanghai

Test graph

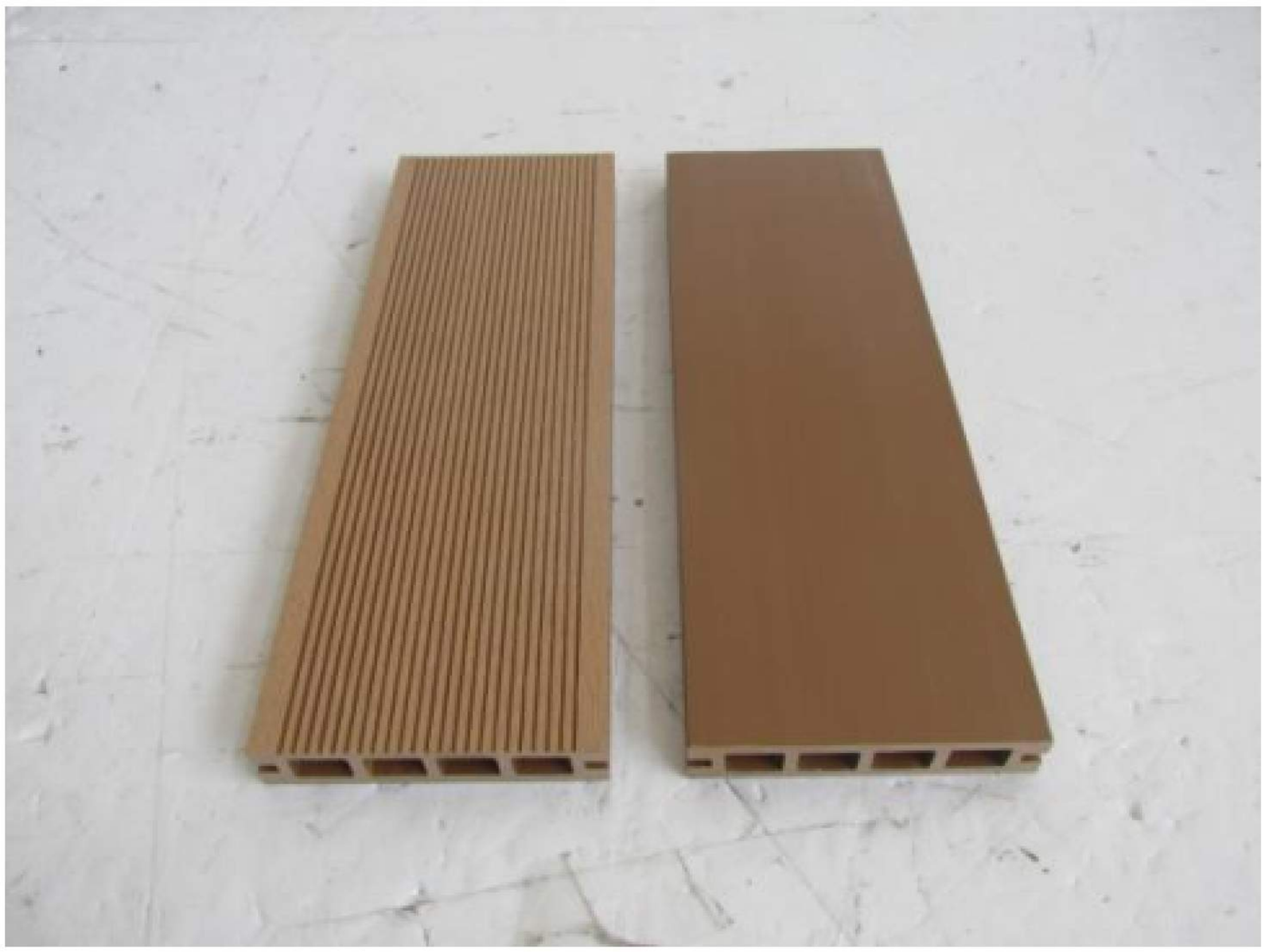


Test Report

Report Number:160830005SHF-BP-1

Report Date:2016-09-12

Appendix A: Sample received photo



Approved by:

Jodie Zhou

Sally Xie

Daniel Zhang

Name: Jodie Zhou	Name: Sally Xie	Name: Daniel Zhang
Title: Approver	Title: Reviewer	Title: Project Engineer

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The End of Report

INSTITUTE FOR TESTING AND CERTIFICATION
třída Tomáše Bati 299, Louky, 763 02 Zlín, Czech Republic

TEST REPORT

No. : 78 35 02022 / 2016

Applicant :	**MAX DEVELOPING s.r.o.** **Samota 197** **783 01 Olomouc-Slavonín**
Product :	**GRINWOOD WPC hollow profile, type: GW**
Manufacturer :	GRINWOOD WPC Material Co. Ltd. Longquanwu, Eco-Industrial Zone, Miaoxi, Huzhou, Zhejiang, China
Conformity assessment carried by :	Milan Kovář
Date of issue :	2016-10-31
Validity until :	2019-10-31

AUTORIZOVANÁ OSOBA 224 ITC 3 INSTITUT PRO TESTOVÁNÍ A CERTIFIKACI, a. s.

RNDr. Radomír Čevelík
Representative of the Authorized Body

1. Product specification

Terrace four-chamber (rectangular air voids) boards with standard width of 150mm are made of wood-plastics (WPC) composite (HDPE/cellulose fibers) by extrusion and in several colours.
The product is marked as "GW001A-150x25", as well.
Terrace boards have fine antiskid grooves on one side and rough antiskid grooves on the other.
The declared wear side is the side with fine grooves.
Separate boards are laid on a floor grid (from WPC construction balks) and are fixed with assembly clips.
Reaction to fire according to ČSN EN 13501-1+A1 declared by the applicant (importer): F_{fl}.

Declared section modulus of the profile $W_x = 12352\ mm^3$
Declared span of supports $l_1 = 350$ mm

2. Conformity assessment with essential requirements persuant to Section 7, Paragraph 2, NV (Government Order) No.163/2002 Collection of Laws, as last amended by NV No. 312/2005 Collection of Laws and NV No. 215/2016 Collection of Laws.

2.1 *Essential requirements for the product and their specification in normative documents*

Conformity assessment was carried out according to the document:

"Construction Technical Approval STO-AO224-794/2016", elaborated by Institut pro testování a certifikaci a.s.-AO 224 Zlín.

2.2 *Indicators specifying essential requirements, test methods*

- Slipperiness, according to Table 1 of ČSN EN 15534-4 and Art. 6.4.2 (Pendulum test) of ČSN EN 15534-1
- Resistance to impact by falling mass (Falling mass impact resistance), according to Art. 4.5.1 of ČSN EN 15534-4 and Art. 7.1.2.1 of ČSN EN 15534-1
- Flexural properties (maximum loads and deflections under a load of 500 N), according to Art. 4.5.2 of ČSN EN 15534-4 and Annex A of ČSN EN 15534-1
- Moisture resistance under cyclic test conditions (change of bending strength after cyclic test conditions), according to Table 7 of ČSN EN 15534-4 and Art. 8.3.2 and 7.3.2 of ČSN EN 15534-1
- Swelling and water absorption, according to Table 7 of ČSN EN 15534-4 and Art. 8.3.1 of ČSN EN 15534-1
- Heat reversion, according to Table 10 of ČSN EN 15534-4 and Art. 9.3 of ČSN EN 15534-1

2.3 *Place and range of sampling*

The applicant, based on an appeal of a certification worker, delivered following test samples:

- GRINWOOD WPC hollow profile, type: GW in quantity of 25 pcs of boards (profiles) (board lengh: approx. 1 m)

Test samples were delivered and registered under No. 783502022/1 on 12/08/2016.

2.4 *Place and date of testing*

The tests were carried out in these institutions:

- Institut pro testování a certifikaci, a. s. – testing laboratory Zlín (August - October 2016)

2.5 *Test results*

Test results are shown in Table 1.

Table 1 – Test results

Technical characteristic	Unit of measure	Values	
		Required (declared) value	Determined value (average value)
Heat reversion (at100°C, 60 min, longitudinal direction)	%	Max. 0,5	0,07
Resistance to impact by falling mass (Falling mass impact resistance)	%	0 of damaged test specimens shall show a failure with a crack length ≥ 10 mm or a depth of residual indentation ≥ 0.5	0 of damaged test specimens shall show a failure with a crack length ≥ 10 mm or a depth of residual indentation ≥ 0.5
Slipperiness - dry (dryness) (lengthwise/transverse) -wet (lengthwise/transverse)	-	Min. 36+)	51/67 39/45
Swelling and water absorption - Change in dimensions	%	Change in thickness: Max. 5 (individual values) Max. 4 (mean value) Change in width: Max. 1,2 (individual values) Max. 0,8 (mean value) Change in length: Max. 0,6 (individual values) Max. 0,4 (mean value)	0,81/0,63/0,93/0,84/0,88 0,82 0,09/0,07/0,09/0,08/0,08 0,08 0,10/0,08/0,10/0,06/0,12 0,09
- Change in swelling	% in weight	Max. 9 (individual values) Max. 7 (mean value)	1,52/1,46/1,48/1,44/1,41 1,46

Table 1 – continue

Technical characteristic	Unit of measure	Values	
		Required (declared) value	Determined value (average value)
Flexural properties - Maximum load (F_{max})	N	Min. 3000 (individual values)	6061/5887/6027/6117/5993/5819 / 6051/6021
		Min. 3300 (arithmetic mean value)	5997
- Deflection under a load of 500 N	mm	Max. 2,5 (individual values)	1,2/1,2/0,9/1,0/1,1/1,3/1,0
		Max. 2,0 (arithmetic mean value)	1,1
Moisture resistance under cyclic test conditions - Bending strength before cyclic test conditions (individual values, arithmetic mean value)	MPa		42,9/41,7/42,6/43,3/42,4/41,2/ 42,9/42,6
			42,5
- Bending strength after cyclic test conditions (individual values, arithmetic mean value)	MPa		38,8/38,4/32,9/33,2/38,9/33,8/ 39,2/38,2
			36,6
- Decrease of bending strength after cyclic test conditions	%	Max. 30 (individual values)	10,3/7,9/22,8/23,3/8,3/18,0/ 8,6/10,3
		Max. 20 (arithmetic mean value)	13,9

Note[*)] - requirement for the standard value of the pendulum value for floors of all housing and public rooms (premises) (including private terrace) is min. 30 and min. 40 for surfaces of walkable areas of parts of constructions used by the public, according to Art. 4.17 of ČSN 74 4505 standard referenced by Czech Regulation MMR No. 268/2009 Coll.

2.6 *Conformity assessment of the product*

The Assessed product meets requirements of the document: Construction Technical Approval STO-AO224-794/2016" in all properties.

3. Conclusion

The Assessed product meets requirements of the document: Construction Technical Approval STO-AO224-794/2016" in all properties.

4. List of documents used for elaboration of Test Report

- Application for construction product conformity assessment No. 783502022
- Government Decree (Order) No. 163 from 06/03/2002,as amended by NV (Government Degree) No. 312/2005 Coll. And NV (Government Degree) No. 215/2016 Coll., that lays down technical requirements for specified construction products
- Construction technical approval: STO-AO224-794/2016, elaborated by ITC,a.s.-AO224 Zlín
- Decision No. 2/2014 on the authorization of activities during the conformity assessment of specified construction products according to NV 163/2002 Coll., as amended by NV No.312/2005 Coll.
- Test report No. 783502022/01, elaborated by ITC a.s. – testing laboratory Zlín on 25/10/2016