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EVALUATION CENTER

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RENDERED TO

Xuancheng FUMEIDA New Materials Co., Ltd.
No.6, Dongshan Road, North District Industrial Park, Xuancheng, Anhui

PRODUCT EVALUATED

Wood plastic composite decking

EVALUATION PROPERTY

Flexural strength, Tensile strength, Impact strength, Slip resistance, Fastener holding test, Coefficient of linear thermal expansion, Water absorption, Density, Surface hardness,

Report of Testing wood plastic composite board for compliance with the applicable requirements of the following criteria:

ASTM D6109-2010, ASTM D638-2010, ASTM D256-2010, ASTM D2394-2008, ASTM D1761-2006, ASTM D696-2008, ASTM D570-2005, ASTM D6111-2009, ASTM D1037-2006.

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2 Introduction

Intertek has conducted testing for Xuancheng FUMEIDA New Material Co., Ltd, on wood plastic composite decking in accordance with recognized ASTM standards. The coefficient of linear thermal expansion testing was conducted at the Intertek approved external facility. This evaluation began on March 16, 2011 and was completed on March 31, 2011.

3 Test Samples

3.1. SAMPLE SELECTION

Samples were submitted to Intertek directly from the client. Samples were not independently selected for testing. Samples were received at the Evaluation Center on March 16, 2011.

3.2. SAMPLE AND ASSEMBLY DESCRIPTION

The samples were identified as wood plastic composite board. Photographs of samples were presented in Appendix A. The nominal sizes were summarized in Table below.

Table Nominal Dimensions		
Sample ID	Size(Length × Width × Thickness) (mm)	Quantity (pieces)
S1103117.001- 022	395×145×19	22

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4 Testing and Evaluation Methods

The test specimens were conditioned for at least 48 hours at a temperature of $23 \pm 2^{\circ}\text{C}$ and relative humidity of $50 \pm 5\%$ unless otherwise specified.

4.1. FLEXURAL TEST

The flexural strength and stiffness were conducted in accordance with ASTM D6109-2010 Method A. The specimen rectangular cross section was tested in flexure as a beam in a flat mode. The beam rested on two supports and was loaded at two points, each an equal distance from the adjacent support point. The distance between the loading noses is one-third of the support span. The specimen was deflected until rupture occurred in the outer fibers.

4.2. TENSILE STRENGTH

The test was conducted in accordance with ASTM D638-2010. Five specimens were tested. The width and thickness of flat specimens at the center of each specimen were measured. The specimen was placed in the grips of the testing machine. The speed of testing was 5 mm/min. The tensile strength was calculated by dividing the maximum load by the average original cross-sectional area in the gage length segment of the specimen.

4.3. IMPACT RESISTANCE

The test was conducted in accordance with ASTM D256-2010. Ten individual determinations of impact resistance were tested under the conditions. The average Izod impact resistance of the group of specimens was calculated. Values obtained from specimens that did not break in the manner specified were not included in the average.

4.4. SLIP RESISTANCE

The test was conducted in accordance with ASTM D2394-2008. Wet and dry slip resistances were evaluated. Static coefficients of friction were determined by obtaining the force required to move the specimen from a stationary position. To accomplish this, the sliding unit was placed on the specimen and carefully lined up so the line of force coincides with a line through the center of gravity of the mass of the sliding unit. The chain was loaded at a rate of separation of the testing machine heads of 1.27 mm/min. The load required to move the sliding unit divided by the mass of the sliding unit was the static coefficient of friction. Sliding coefficients of friction were determined by measuring the average force required to maintain movement at a rate of separation of the heads of the testing machine of 51 mm/min.

4.5. FASTENER HOLDING TEST

The test was conducted in accordance with ASTM D1761-2006. The specimen was inserted with screw. The model of screw was standard 1-in No. 10-gage flathead low-carbon-steel wood screws. The specimens and screws were conditioned for at least 48 hours at a temperature of $20 \pm 3^{\circ}\text{C}$ and relative humidity of $65 \pm 3\%$. The screws were withdrawn at a uniform rate of speed by means of a testing machine and maximum load was recorded. Five specimens were tested.

4.6. COEFFICIENT OF LINEAR THERMAL EXPANSION

The test was conducted in accordance with ASTM D696-2008. The thickness of the conditioned specimens was measured at room temperature. The specimen was mounted in a dilatometer which was then installed in the -30°C to -28°C environment until no further movement indicated by the measuring device over a period of 5 to 10 minutes. The other specimen was mounted in a dilatometer which was then installed in the $+20^{\circ}\text{C}$ to $+30^{\circ}\text{C}$ environment until no further movement indicated by the measuring device over a period of 5 to 10 minutes. Then the coefficient of linear thermal expansion over the temperature range was calculated in accordance with the requirements in ASTM D696 Section 11.

4.7. WATER ABSORPTION

The test was conducted in accordance with ASTM D570-2005. The conditioned specimens were weighed before immersion and then placed in a container of distilled water maintained at a temperature of $23 \pm 1^{\circ}\text{C}$, and were rest on edge and be entirely immersed. At the end of 24 hours, the specimens were removed from the water one at a time, all surface water wiped off with a dry cloth, and weighed immediately. After immersion, the specimens then reconditioned for the same time and temperature as used in the original drying period. They were cooled in a desiccator and immediately reweighed. The water-absorption value was taken as the sum of the increase in weight on immersion and of the weight of the water-soluble matter.

4.8. DENSITY

The test was conducted in accordance with ASTM D6111-2009. The weight of a specimen of the plastic lumber in air was determined. The specimen was then immersed in water, its weight upon immersion was determined, and its bulk specific gravity and bulk density calculated.

4.9. SURFACE HARDNESS

The test was conducted in accordance with ASTM D1037-2006a, Section 17. The modified Janka-ball test method was used with a "ball" 11.3 mm in diameter. Three specimens were tested. The load was recorded when the "ball" had penetrated to one-half its diameter into the panel, as determined by an electric circuit indicator or by the tightening of the collar against the specimen.

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5 Testing and Evaluation Results

5.1. RESULTS AND OBSERVATIONS

The test results are summarized in Table below.

Test Method	Character	Result		
ASTM D6109-2010	Flexural Strength ¹	38.0 MPa		
ASTM D638-2010	Tensile Strength	18.9 MPa		
ASTM D256-2010	Impact Strength	22.4 J/m Type of failure: complete break		
ASTM D2394-2008	Slip Resistance		Static coefficient of friction	Dynamic coefficient of friction
		Dry surface	0.31	0.23
		Wet surface	0.37	0.34
ASTM D1761-2006	Fastener Holding Test ²	1476 N		
ASTM D696-2008	Coefficient of Linear Thermal Expansion	4.17×10 ⁻⁵ 1/K		
ASTM D570-2005	Water Absorption	0.34 %		
ASTM D6111-2009	Density (23°C)	1.27 g/cm ³		
ASTM D1037-2006a	Surface Hardness ³	Front face:	12966 N	
		Back face	12830 N	

Note:

1. The specimens of flexural strength test were full size products submitted by the client.
2. The model of screw was standard 1-in No. 10-gage wood screws.
3. The thickness of the specimens was 38 mm.

5.1.1. Statement of Measurement Uncertainty

When determining the test result, measurement uncertainty has been considered.

6 Conclusion

The wood plastic composite board samples identified and evaluated in this report have been tested in accordance with ASTM D6109-2010, ASTM D638-2010, ASTM D256-2010, ASTM D2394-2008, ASTM D1761-2006, ASTM D696-2008, ASTM D570-2005, ASTM D6111-2009 and ASTM D1037-2006. The results were presented in Section 5 of this test report.

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.

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7 Appendix A: Sample Photographs



Fig.1 Front View



Fig.2 Back View



Fig.3 Cross Section

8 Revision Page

Revision No.	Date	Changes	Author	Reviewer
0	2011-03-31	First issue	Daniel Zhang	Jodie Zhou

END OF DOCUMENT

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