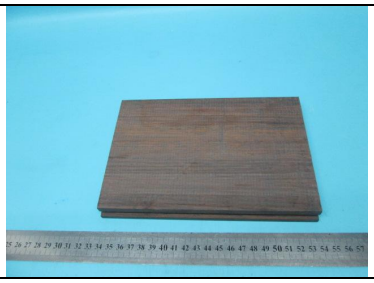
Technical Report No. 64.165.17.01660.01
Rev. 00
Dated 2017-05-05

Client:	Hunan Taohuajiang Bamboo Technology Co., LTD Taojiang County, Yiyang, Hunan Province, China
Test Subject:	The submitted sample was identified and described by client as: Strand woven bamboo
Test Requested:	**(1) UV exposure ISO 4892-3:2016** **(2) Formaldehyde Release EN 717-1:2004** **(3) Swelling in thickness after immersion in water EN 317:1993** **(4) EN 13501-1:2007+a1:2009 Fire classification of construction products and building elements-Part1: Classification using data from reaction to fire tests** **(5) Determination of resistance to indentation EN 1534-2010** **(6) Slip resistance - Pendulum test DD CEN/TS 15676-2007** **(7) Flexural Test EN ISO 178:2010/Amd.1:2013 Method A**
Test Result:	Please refer to next page(s)
Remarks:	(1) The results relate only to the items tested. (2) Samples are tested as received.

1 Description of the test subject

Sample No.	Color and description	Photograph
001	Brown bamboo	

2 Order

2.1 Date of Purchase Order

2017-04-06

2.2 Receipt of Test Sample, Location

2017-04-13, Guangzhou

2.3 Date of Testing

2017-04-13 to 2017-05-05

2.4 Location of Testing

The test was performed in an accredited laboratory and the test results were reviewed at TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch.

3 Test Results

3.1 UV exposure

Environment condition	:	Temperature: 23±2℃, Humidity: 50±5%RH
Equipment name	:	Number Polymer-004, Model QUV/SPARY/240
Test method	:	ISO 4892-3:2016
Test condition	:	Exposure cycle: ISO 4892-3:2016 cycle 1 Lamp type: UVA-340 8h UV at (60±3)℃ BST, 0.76W/(m^2•nm) @ 340nm 4h condensation at (50±3)℃ BST Exposure duration: 300h

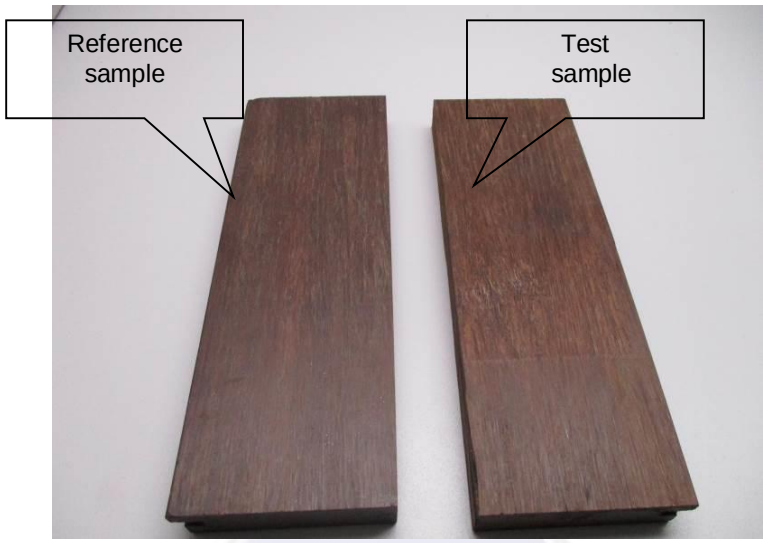
Test result:

Evaluation item	Result
Grey scale	Grade 4
ΔE^*_{ab}	1.69

Note:

1. According to ISO 105-A02:1993/Cor.2:2005, the grey scale was determined under the D65 standard light, with scale 5 as the best and scale 1 as the worst.
2. According to ASTM D2244-16, ΔE^*_{ab} was measured b sphere spectrophotometer. Use D65 standard light source with 10° observer. The results included specular reflection condition.

Test photo:



After test

3.2 Formaldehyde Release

Tested requested: Determine the Formaldehyde release of the submitted sample(s) according to EN standard.

Test Item	Tested Method	Unit	Tested Limit	Test Result
Formaldehyde Release	EN 717-1:2004	mg/m³	0.001	0.001

3.3 Swelling in thickness after immersion in water

Tested requested: Swelling in thickness after immersion in water of the submitted sample(s) according to EN standard.

Test Item	Tested Method	Unit	Tested Limit	Test Result
Swelling in thickness after immersion in water	EN317:1993	%	---	0.2

3.4 EN 13501-1:2007+A1:2009 Fire classification of construction products and building elements-Part1: Classification using data from reaction to fire tests

Tested Method:

1. EN ISO 9239-1:2010 Reaction to fire tests for floorings - Part 1: Determination of the burning behavior using a radiant heat source.
2. EN ISO 11925-2:2010 Reaction to fire tests – Ignitability of building products subjected to direct impingement of flame – Part2: Single -flame source test

Mounting and fixing (For EN ISO 9239-1):

Fiber cement board, with its density about 1800kg/m³, thickness about 8mm, is as the substrate.
The speciments were fixed mechanically to the substrate.

Test method	Parameter	Number of tests	Results
EN ISO 9239-1:2010	The mean value for the critical heat flux (CHF and/or HF-30) from the same orientation	3	≥11Kw/m²
	Smoking measurement Integrated smoke value		47.2% X min
	Comments and Observation		Charring
EN ISO 11925-2:2010 Exposure=15s	*F*s≤150mm with 20s	6	Yes

Remark:
1). Specimens that do not ignite or which spread flame less than 110 mm have a critical heat flux ≥11Kw/m²
2). Test specimens with flame-spread distances longer than 910 mm have a critical heat flux≤1.1Kw/m²
3). Specimens which are extinguished by the operator at 30 min do not have a CHF value, but only a HF-30 value
4). For test durations longer than 30 min, record the time of flame extinguishment and the most distant point of flame spread and convert this to CHF
5). Calculate the mead value for the critical flux (CHF and/or HF-30) from the three same orientation specimens

Classification and direct filed of application
This classification has been carried out in accordance with EN 13501-1:2007+A1:2009

Classification:

Fire behaviour		Smoke production	
B_{fl}	---	S	1

Reaction to fire classification: B_{ft}-s1

Remark:
The classes with their corresponding fire performance are given in Table 2.
Reaction to fire classification is based on the 7-step scale of $A1_{fl}$ to F_{fl}, where $A1_{fl}$ is good and F_{fl} is bad.

Statement:
The test results relate to the behavior of the test specimens of a product under the particular conditions of the test'; they are not intended to be the sole criterion for assessing the potential fire hazard of the product in use.

Warning:
This classification report does not represent type approval or certification of the product.
The test laboratory has, therefore, play no part in sampling the product for the test, although it holds appropriate references to the manufacturer's factory production control that is aimed to be relevant to the samples tested and that will provide for their traceability.

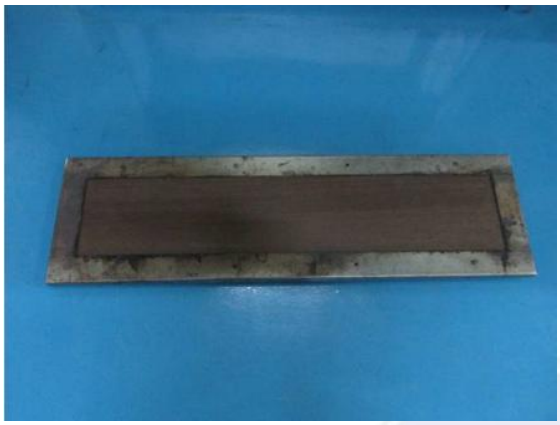
Table 2-Classes of reaction to fire performance for floorings

Class	Test method(s)	Classification criteria	Additional classification
$A1_{fl}$	EN ISO 1182 [a] and	$\Delta T \leq 30°C$; and $\Delta m \leq 50\%$; and $t_f = 0$(i.e. no sustained flaming)	-
	EN ISO 1716	*PCS*≤2,0 MJ/kg [a] and *PCS*≤2,0 MJ/kg [b] and *PCS*≤1,4 MJ/m² [c] and *PCS*≤2,0 MJ/kg [d]	-
$A2_{fl}$	EN ISO 1182 [a] or	$\Delta T \leq 50°C$; and $\Delta m \leq 50\%$; and $T_f \leq 20s$	-
	EN ISO 1716 and	*PCS* ≤3,0 MJ/kg [a] and *PCS* ≤4,0 MJ/m² [b] and *PCS* ≤4,0 MJ/m² [c] and *PCS* ≤3,0 MJ/kg [d]	-
	EN ISO 9239-1 [e]	Critical flux [f]≥8,0 kW/m²	Smoke production [g]
B_{fl}	EN ISO 9239-1 [e] and	Critical flux [f]≥8,0 kW/m²	Smoke production [g]
	EN ISO 11925-2 [h]: Exposure-15s	*F*s≤150mm within 20s	-
C_{fl}	EN ISO 9239-1 [e] and	Critical flux [f]≥4,5 kW/m²	Smoke production [g]
	EN ISO 11925-2 [h]: Exposure-15s	*F*s≤150mm within 20s	
D_{fl}	EN ISO 9239-1 [e] and	Critical flux [f]≥3,0 kW/m²	Smoke production [g]
	EN ISO 11925-2 [h]: Exposure-15s	*F*s≤150mm within 20s	
E_{fl}	EN ISO 11925-2 [h]: Exposure-15s	*F*s≤150mm within 20s	
F_{fl}	No performance determined		

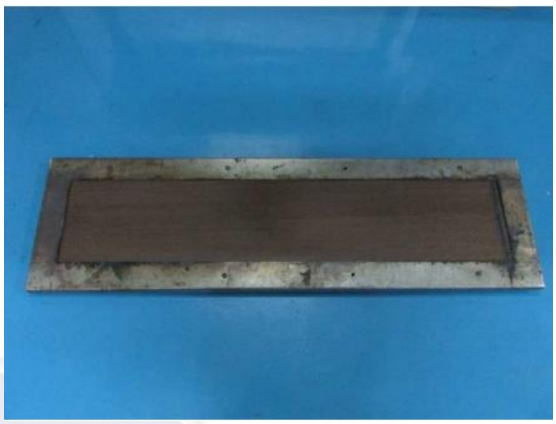
[a] For homogeneous products and substantial components of non-homogeneous products.
[b] For any external non-substantial component of non-homogeneous products.
[c] For any internal non-substantial component of non-homogeneous products.
[d] For the product as a whole.
[e] Test duration = 30min.
[f] Critical flux is defined as the radiant flux at which the flame extinguishes or the radiant flux after a test period of 30 min, whichever is the lower (i.e. the flux corresponding with the furthest extent of spread of flame).
[g] s1-Smoke≤750% minutes;
s2=not s1.
[h] Under conditions of surface flame attack and, if appropriate to the end use application of product, edge flame attack

SAMPLE INFORMATION AND PICTURES

Thickness: About 18.3mm
Mass per unit area: About 22.1kg/m²



Sample as received



After test for EN ISO 9239-1

3.5 Determination of resistance to indentation EN 1534-2010

Test Information: Sample description: See photo(s)

Test Item1: Determination of resistance to indentation

Test method: EN 1534-2010

Test condition:

Specimen: 10mm$_x$50mm$_x$1834mm
Diameter of steel ball: 10mm
Test speed: 3mm/min
Applied load: 1000N for 25s

Test result:

Hardness Brinell: 8.61N/mm^2

3.6 Slip resistance - Pendulum test DD CEN/TS 15676-2007

Test Item 2: Slip resistance - Pendulum test

Test method: DD CEN/TS 15676-2007

Test condition:

Specimen: 200mm$_X$140mm$_X$18.4mm

Test result:

No.	1	2	3	4	5	6	7	8	9	10	Ave.
Dry condition	64	64	64	64	68	64	68	68	66	66	66
Wet condition	38	38	38	34	36	38	36	38	36	38	37

3.7 Flexural Test EN ISO 178:2010/Amd.1:2013 Method A

Test Item 3: Flexural Test

Test method: EN ISO 178:2010/Amd.1:2013 Method A

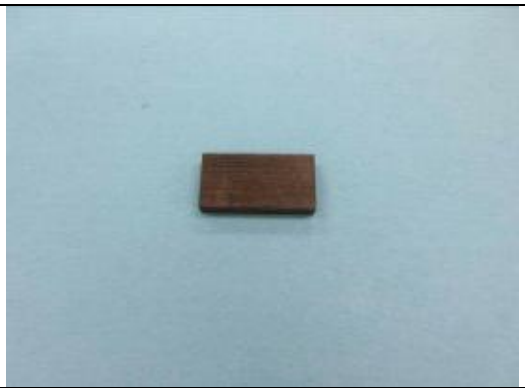
Test condition:

Specimen: 80mm$_X$12.15mm$_X$5.04mm
Test speed: 2mm/min
Span:75mm

Test result:

Test Item	Test Result
Flexural Modulus	12900MPa

Photo



Sample for test item 3.5

Sample for test item 3.6

Sample for test item 3.7

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
TÜV SÜD Group

Engineer: _____ **Technical Report checked:** _____

Lily Feng **Kevin Zhang**

- END OF TEST REPORT -