JAPAN TESTING CENTER FOR CONSTRUCTION MATERIALS

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NOTE: This is an English version report translated from the original test report.

TEST REPORT

No. 08A3910

Client

Address : Kagurazaka First Bldg 2F, 27 Nakazato-cho, Shinjuku-ku, Tokyo, 162-0804, Japan

Firm Name : Tokyo Koei Co., Ltd.

Trade Name : Thermo Ash Deck

Designation of Test

Performance test on wood deck materials

This is to certify that the entitled test result is true and correct as written in this test report.

JAPAN TESTING CENTER FOR
CONSTRUCTION MATERIALS
CENTRAL LABORATORY

Katsuichi Kuroki
Director

Issue No.: 08A3910

[Designation of Test]

Performance test on wood deck materials

［Contents］

1. Description of test

   The wood deck materials submitted by Tokyo Koei were tested for the following properties:

   (1) Scratching hardness (2) Water absorption

   (3) Accelerated weathering (4) Rot resistance

2. Test specimen

   The test samples are outlined in Table 1.

Table 1 Test specimens

General name	Wood deck materials		
Product or item name	Black Deck	Shorea spp. Deck	Red Cedar Deck
Type	Ash (high temperature drying)	Shorea spp.	Red cedar
Dimensions	Cross-section dimensions: 24 mm x 42 mm Length: 2 m	Cross-section dimensions: 30 mm x 20 mm Length: 2 m	Cross-section dimensions: 40 mm x 40 mm Length: 2 m
Quantity	4	4	4
Remarks	—	For comparison	

3. Test method

Specimens were taken from the test samples and then tested as follows:

(1) Scratching hardness

Pursuant to JIS K 5600-5-4 [Section 4: Scratching Hardness (Pencil Hardness Method); in Part 5: Mechanical Properties of Coatings; General Testing Methods for Paints], the hardness of the hardest pencil that does not make scratches on the specimen surface was identified.

The lead powder from the pencil was removed with a plastic eraser before visually check for scratches. The load was 750 g and the pencils used for the test was Uni brand pencils made by Mitsubishi Pencil Co., Ltd.

(2) Water absorption

The method pursuant to “6.8 Water absorption” in JIS A 5905 (Fiber board) was used.

(3) Accelerated weathering

The specimens were first subjected to 500-hour exposure pursuant to “6.3 Exposure test method WS-A using open-frame carbon-arc lamps” in JIS A 1415 (Methods of exposure to laboratory light sources for polymeric material of building) and then measured to check the following:

(i) Appearance: The surface color and roughness of the specimens after the test were observed visually.

(ii) Abrasion resistance: After abrasion resistance tests were performed 500 times pursuant to JIS K 7205 (Testing method for abrasion resistance of plastics by abrasives), the abrasion mass was measured and the surface roughness was observed.

(4) Resistance to rotting

Tests were conducted pursuant to “17 Rot resistance testing” in JIS Z 2101 (Methods of test for woods).

Note that the tests were conducted on the Black Deck, Shorea spp. Deck and untreated cryptomeria (control material).

4. Test results

(1) The results of the tests are summarized in Table 2.

(2) The results of the scratching hardness test are summarized in Table 3.

(3) The results of the water absorption test are summarized in Table 4.

(4) The results of the accelerated weathering test are summarized in Table 5.

(5) The results of the rot resistance test are summarized in Table 6 to Table 9.

Table 2 Summary of the test results

Test item			Black Deck	Shorea spp. Deck	Red Cedar Deck
Scratching hardness		Pencil hardness	H, H, H	4H, 4H, 4H	3B, 3B, 3B
Water absorption (%)			7.3	5.7	32.9
Accelerated weathering resistance	Appearance		Although whitening occurred, no surface roughness was observed.	Although whitening occurred, no surface roughness was observed.	Although whitening occurred, no surface roughness was observed.
	Abrasion resistance	Appearance	No surface roughness was observed.	No surface roughness was observed.	No surface roughness was observed.
		Abrasion mass (g)	0.47	0.86	1.68
Resistance to rotting	Decrease in mass (%)	Tyromyces palustris	1.74	2.11	–
		Trametes versicolor	0.66	1.26	–

Table 3 Results of the scratching hardness test

Test specimen name	Specimen No.	Pencil hardness
Black Deck	1	H
	2	H
	3	H
Shorea spp. Deck	1	4H
	2	4H
	3	4H
Red Cedar Deck	1	3B
	2	3B
	3	3B

Table 4 Results of the water absorption test

Test specimen name	Specimen No.	Mass before water immersion (g)	Mass after water immersion (g)	Water absorption (%)
Black Deck	1	29.399	31.411	6.8
	2	29.474	31.543	7.0
	3	29.106	31.463	8.1
	Average	—	—	7.3
Shorea spp. Deck	1	40.564	42.938	5.9
	2	40.847	43.122	5.6
	3	40.519	42.771	5.6
	Average	—	—	5.7
Red Cedar Deck	1	13.618	18.128	33.1
	2	13.552	18.035	33.1
	3	13.492	17.876	32.5
	Average	—	—	32.9

Table 5 Results of the accelerated weathering test

Test specimen name	Specimen No.	Appearance after weathering	Abrasion after weathering			
			Mass before abrasion (g)	Mass after abrasion (g)	Abrasion mass (g)	Appearance (surface roughness)
Black Deck	1	Although whitening occurred to all the three specimens, no surface roughness was observed.	120.78	120.27	0.51	No surface roughness was observed on any of the three specimens.
	2		116.56	116.12	0.44	
	3		122.60	122.13	0.47	
	Average	—	—	—	0.47	—
Shorea spp. Deck	1	Although whitening occurred to all the three specimens, no surface roughness was observed.	154.80	153.79	1.01	No surface roughness was observed on any of the three specimens.
	2		153.03	152.18	0.85	
	3		148.34	147.62	0.72	
	Average	—	—	—	0.86	—
Red Cedar Deck	1	Although whitening occurred to all the three specimens, no surface roughness was observed.	101.79	100.18	1.61	No surface roughness was observed on any of the three specimens.
	2		103.23	101.41	1.82	
	3		95.87	94.27	1.60	
	Average	—	—	—	1.68	—

Table 6 Results of the rot resistance test (change in mass by Tyromyces palustris)

Fungus type	Specimen type	Test operation type	Decrease in mass (%)									Average decrease in mass (%)	Average decrease in mass after correction (%)
			1	2	3	4	5	6	7	8	9		
Tyromyces palustris	Black Deck	Rotting	1.61	1.99	1.59	1.81	1.81	1.44	1.59	1.81	1.98	1.74	1.74
		Correction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Shorea spp. Deck	Rotting	2.16	2.83	2.80	1.64	1.92	1.48	2.18	1.93	2.04	2.11	2.11
		Correction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Untreated cryptomeria	Rotting	29.57	33.33	32.26	30.42	28.00	31.03	30.21	33.07	32.61	31.17	31.17
		Correction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Table 7 Results of the rot resistance test (change in mass by Trametes versicolor)

Fungus type	Specimen type	Test operation type	Decrease in mass (%)									Average decrease in mass (%)	Average decrease in mass after correction (%)
			1	2	3	4	5	6	7	8	9		
Trametes versicolor	Black Deck	Rotting	0.91	0.89	0.70	0.54	0.54	0.54	0.71	0.91	0.18	0.66	0.66
		Correction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Shorea spp. Deck	Rotting	1.66	1.63	0.96	2.83	0.41	0.55	1.38	0.96	0.93	1.26	1.26
		Correction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Untreated cryptomeria	Rotting	15.90	17.65	14.23	16.61	17.10	16.82	17.47	17.15	16.34	16.59	16.59
		Correction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Table 8 Results of the rot resistance test (Appearance observation with Tyromyces palustris)

Fungus type	Specimen type	Test operation type	Appearance								
			1	2	3	4	5	6	7	8	9
Tyromyces palustris	Black Deck	Rotting	+++	+++	+++	+++	+++	+++	+++	+++	+++
	Shorea spp. Deck	Rotting	+++	+++	+++	+++	+++	+++	+++	+++	+++
	Untreated cryptomeria	Rotting	+++	+++	+++	+++	+++	+++	+++	+++	+++

(Note) The “+++” sign denotes that hyphal growth was observed on the entire surface of the test specimen.

Table 9 Results of the rot resistance test (Appearance observation with Tyromyces versicolor)

Fungus type	Specimen type	Test operation type	Appearance								
			1	2	3	4	5	6	7	8	9
Tyromyces versicolor	Black Deck	Rotting	+++	+++	+++	+++	+++	+++	+++	+++	+++
	Shorea spp. Deck	Rotting	+++	+++	+++	+++	+++	+++	+++	+++	+++
	Untreated cryptomeria	Rotting	+++	+++	+++	+++	+++	+++	+++	+++	+++

(Note) The “+++” sign denotes that hyphal growth was observed on the entire surface of the test specimen.

5. Test date, personnel and place

Test date: From March 3, 2009 to June 23, 2009

Test personnel:

From the Materials Group

Test supervisor:	Takatsugu Mano
Test manager:	Akira Oshima
Tester:	Akira Oshima

Test place: Central Test Laboratory, Japan Testing Center for Construction Materials