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Dresden, 22/04/2014

Test Report

Order no. 2213076

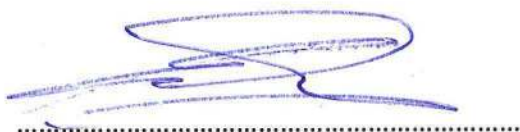
Client: Northland Forest Products, Inc.
Postfach PO Box 369, Kingston NH 03848-0

Date of order: 31/10/2013

Order: Durability test of thermally modified ash against basidiomycetes fungi

Contractor: Entwicklungs- und Prüflabor Holztechnologie GmbH

Person in charge: Dipl.-Biol. Katharina Plaschkies



Dr. Wolfram Scheiding

Head of Laboratory Biological Testing

Surveillance Body FPC/EUTR

The test report contains 3 pages and 1 annex with 4 pages. Any duplication, even in part, requires written permission of EPH. These test results are exclusively related to the tested material.

1 Task

Durability test of thermally modified ash (TMT ash) against basidiomycetes fungi

2 Test material

Kind of test material: 10 boards thermally modified ash from 3 batches,
(500 × 200 × 30) mm³
Test specimens were cut by the contractor.

Tab. 1: Oven-dry density of the boards

no. batch	1			2			3		
no. board	1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2	3.3
Oven-dry density									
TMT ash (kg/m ³)	584	574	556	657	569	546	563	567	572

Supplier: Niehoff Sitzmöbel GmbH, Postfach 200263, 48220 Warendorf
Sample delivery: 05/11/2014
Reference wood species: European beech (*Fagus sylvatica* L.),
provided by the contractor
Raw density after kiln drying: 658 kg/m³

3 Test performance

Test procedure: according to CEN/TS 15083-1:2005
Test fungi: *Coniophora puteana* (Schumacher ex Fries), Karsten, Stamm BAM
Ebw. 15 = DSM 3085
Coriolus versicolor (Linnaeus) Quélet, Stamm CTB 863A (syn.
Trametes versicolor)
Replicates: 36 specimens for each test fungus, 4 specimens from each board
Specimens: (50 × 25 × 15) mm³
Leaching procedure: according to DIN EN 84:1997-05
19/11/2013 – 03/12/2013
Sterilisation: water damp
Duration of the test: 16 weeks
Inoculation date: 06/12/2013
Emplacement date: 19/12/2013
Removal date: 10/04/2014

4 Validity of the test

Tab. 2: Virulence (mass loss of the test fungi on the reference wood beech)

test fungus	mean mass loss (n=10, see tables A1-A2)	in the standard demanded mass loss
<i>Coniophora puteana</i>	31.4 %	30.0 %
<i>Coriolus versicolor</i>	36.2 %	20.0 %

The test was valid, because the demanded values of the average mass losses were exceeded by all test fungi.

5 Results for the test material

Tab. 3: Results of the durability test against wood destroying basidiomycetes according to CEN/TS 15083-1
Median mass loss (n=36, single values see tables A3-A4)

	mass loss
<i>Coniophora puteana</i> DSM 3085	2.2 %
<i>Coriolus versicolor</i> CTB 863A	1.5 %
durability class*	1 (very durable)

) preliminary allocation according the proposal of CEN/TS 15083-1:2005:

durability class	1	2	3	4	5
description	very durable	durable	moderately durable	slightly durable	not durable
median mass loss	≤ 5 %	> 5 % ≤ 10 %	> 10 % ≤ 15 %	> 15 % ≤ 30 %	> 30 %

The basis for the classification is the result of that fungus, which caused the highest mass loss.

6 Summary

An assortment of thermally modified ash was tested according to CEN/TS 15083-1:2005 after leaching according to EN 84:199. The results allow the preliminary allocation to the durability class 1 (very durable) against wood destroying basidiomycetes.

Dresden, 22/04/2014



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Dipl.-Biol. Katharina Plaschkies
Person in charge

Annex: tables with single values

Tab. A1: Virulence of *Coniophora puteana* DSM 3085 on beech, test CEN/TS 15083-1

no specimen	oven-dry mass before fungus test	oven-dry density	oven-dry mass after fungus test	wood moisture after fungus test	mass loss
	g	kg/m ³	g	%	%
V1	11.67	622.40	7.61	66.62	34.79
V2	12.93	689.60	9.09	49.83	29.70
V3	11.46	611.20	7.30	63.15	36.30
V4	12.47	665.07	9.50	51.16	23.82
V5	12.53	668.27	8.84	51.81	29.45
V6	12.24	652.80	8.67	48.44	29.17
V7	13.25	706.67	8.98	57.02	32.23
V8	12.51	667.20	9.30	52.37	25.66
V9	12.52	667.73	9.37	50.05	25.16
V10	11.64	620.80	6.05	58.18	48.02
average	12.32	657.17	8.47	54.86	31.43

Tab. A2: Virulence of *Coriolus versicolor* CTB 863A on beech, test CEN/TS 15083-1

no specimen	oven-dry mass before fungus test	oven-dry density	oven-dry mass after fungus test	wood moisture after fungus test	mass loss
	g	kg/m ³	g	%	%
V1	12.63	673.60	7.65	49.28	39.43
V2	11.94	636.80	7.77	42.60	34.92
V3	12.33	657.60	8.03	43.96	34.87
V4	12.44	663.47	8.13	43.79	34.65
V5	11.69	623.47	7.88	38.20	32.59
V6	12.76	680.53	7.47	46.18	41.46
V7	12.50	666.67	8.30	44.82	33.60
V8	12.39	660.80	8.09	42.89	34.71
V9	12.63	673.60	7.71	46.56	38.95
V10	12.23	652.27	7.76	54.12	36.55
average	12.35	658.88	7.88	45.24	36.17

Tab. A3: Durability of TMT Ash against *Coniophora puteana* DSM3085, CEN/TS 15083-1

no. specimen	no. board	oven-dry mass before fungus test g	oven-dry density kg/m ³	oven-dry mass after fungus test g	wood moisture after fungus test %	mass loss g
1	1.1	10.60	565.33	10.07	27.71	5.00
2	1.1	10.63	566.93	9.85	28.32	7.34
3	1.1	10.76	573.87	10.24	34.18	4.83
4	1.1	10.74	572.80	10.36	30.12	3.54
5	1.2	10.48	558.93	9.94	30.68	5.15
6	1.2	11.01	587.20	10.45	26.41	5.09
7	1.2	10.91	581.87	10.25	29.95	6.05
8	1.2	10.90	581.33	10.27	28.63	5.78
9	1.3	10.46	557.87	10.19	30.23	2.58
10	1.3	10.31	549.87	10.09	30.92	2.13
11	1.3	10.47	558.40	10.09	21.11	3.63
12	1.3	10.27	547.73	10.03	20.74	2.34
13	2.1	12.80	682.67	12.67	54.62	1.02
14	2.1	12.37	659.73	12.19	22.31	1.46
15	2.1	12.20	650.67	11.78	22.58	3.44
16	2.1	12.45	664.00	12.32	21.43	1.04
17	2.2	10.33	550.93	9.87	33.43	4.45
18	2.2	10.52	561.07	9.83	31.43	6.56
19	2.2	10.54	562.13	10.08	33.53	4.36
20	2.2	10.72	571.73	10.25	30.15	4.38
21	2.3	10.13	540.27	9.96	28.61	1.68
22	2.3	10.24	546.13	9.98	24.85	2.54
23	2.3	10.31	549.87	9.94	28.67	3.59
24	2.3	10.17	542.40	9.96	26.20	2.06
25	3.1	10.30	549.33	10.27	28.33	0.29
26	3.1	10.43	556.27	10.39	24.83	0.38
27	3.1	10.71	571.20	10.69	23.67	0.19
28	3.1	10.71	571.20	10.69	15.90	0.19
29	3.2	10.36	552.53	10.33	22.94	0.29
30	3.2	11.03	588.27	11.02	41.11	0.09
31	3.2	10.49	559.47	10.46	23.42	0.29
32	3.2	10.59	564.80	10.56	17.61	0.28
33	3.3	11.08	590.93	11.06	26.31	0.18
34	3.3	10.72	571.73	10.68	23.60	0.37
35	3.3	11.08	590.93	11.04	27.36	0.36
36	3.3	10.57	563.73	10.53	21.27	0.38
median:						2.24

Tab. A3: Durability of TMT Ash against *Coriolus versicolor* CTB 863A, CEN/TS 15083-1

no. specimen	no. board	oven-dry mass before fungus test g	oven-dry density kg/m ³	oven-dry mass after fungus test g	wood moisture after fungus test %	mass loss g
37	1.1	11.32	603.73	11.08	25.72	2.12
38	1.1	11.18	596.27	10.72	26.31	4.11
39	1.1	11.09	591.47	10.87	27.51	1.98
40	1.1	11.28	601.60	11.04	30.53	2.13
41	1.2	10.88	580.27	10.52	35.08	3.31
42	1.2	10.71	571.20	10.41	28.43	2.80
43	1.2	10.60	565.33	10.29	28.09	2.92
44	1.2	10.67	569.07	10.27	28.04	3.75
45	1.3	10.61	565.87	10.43	32.02	1.70
46	1.3	10.39	554.13	10.23	41.06	1.54
47	1.3	10.49	559.47	10.34	30.75	1.43
48	1.3	10.46	557.87	10.30	30.58	1.53
49	2.1	12.17	649.07	12.06	23.80	0.90
50	2.1	12.31	656.53	12.23	21.50	0.65
51	2.1	12.13	646.93	11.78	31.75	2.89
52	2.1	12.15	648.00	11.67	26.31	3.95
53	2.2	10.88	580.27	10.49	27.84	3.58
54	2.2	11.01	587.20	10.79	24.10	2.00
55	2.2	10.79	575.47	10.29	32.17	4.63
56	2.2	10.57	563.73	10.06	29.13	4.82
57	2.3	10.03	534.93	9.94	31.89	0.90
58	2.3	10.39	554.13	10.23	33.72	1.54
59	2.3	10.20	544.00	9.67	33.71	5.20
60	2.3	10.45	557.33	9.99	30.03	4.40
61	3.1	10.49	559.47	10.48	26.15	0.10
62	3.1	10.81	576.53	10.80	23.52	0.09
63	3.1	10.61	565.87	10.61	29.22	0.00
64	3.1	10.35	552.00	10.34	26.40	0.10
65	3.2	10.28	548.27	10.28	26.26	0.00
66	3.2	10.96	584.53	10.95	25.11	0.09
67	3.2	10.70	570.67	10.68	25.84	0.19
68	3.2	10.71	571.20	10.68	25.00	0.28
69	3.3	10.92	582.40	10.89	21.85	0.27
70	3.3	10.44	556.80	10.41	17.87	0.29
71	3.3	10.52	561.07	10.50	25.90	0.19
72	3.3	10.42	555.73	10.40	26.06	0.19
median:						1.54

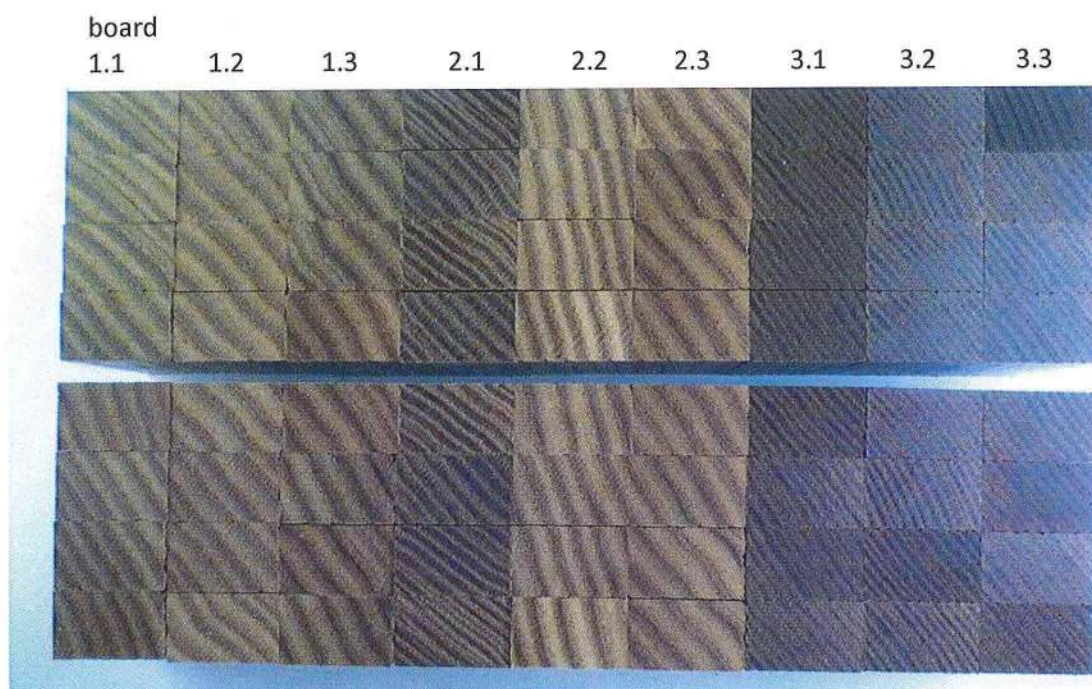


Fig. A1: specimens before the fungus test



Fig. A2: specimens after the fungus test (top: *Coniophora puteana*, bottom: *Coriolus versicolor*)