

Durability testing of a Cattail-based insulation material against termite attack

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General Aspect

- . The use of insulation materials
- . Natural products in constructions
- . Cattail is a natural product

But is the product be suitable for use in tropical countries?

Materials and methods



ion mate



Cattail (*Typha spec.*)

The product, which was tested

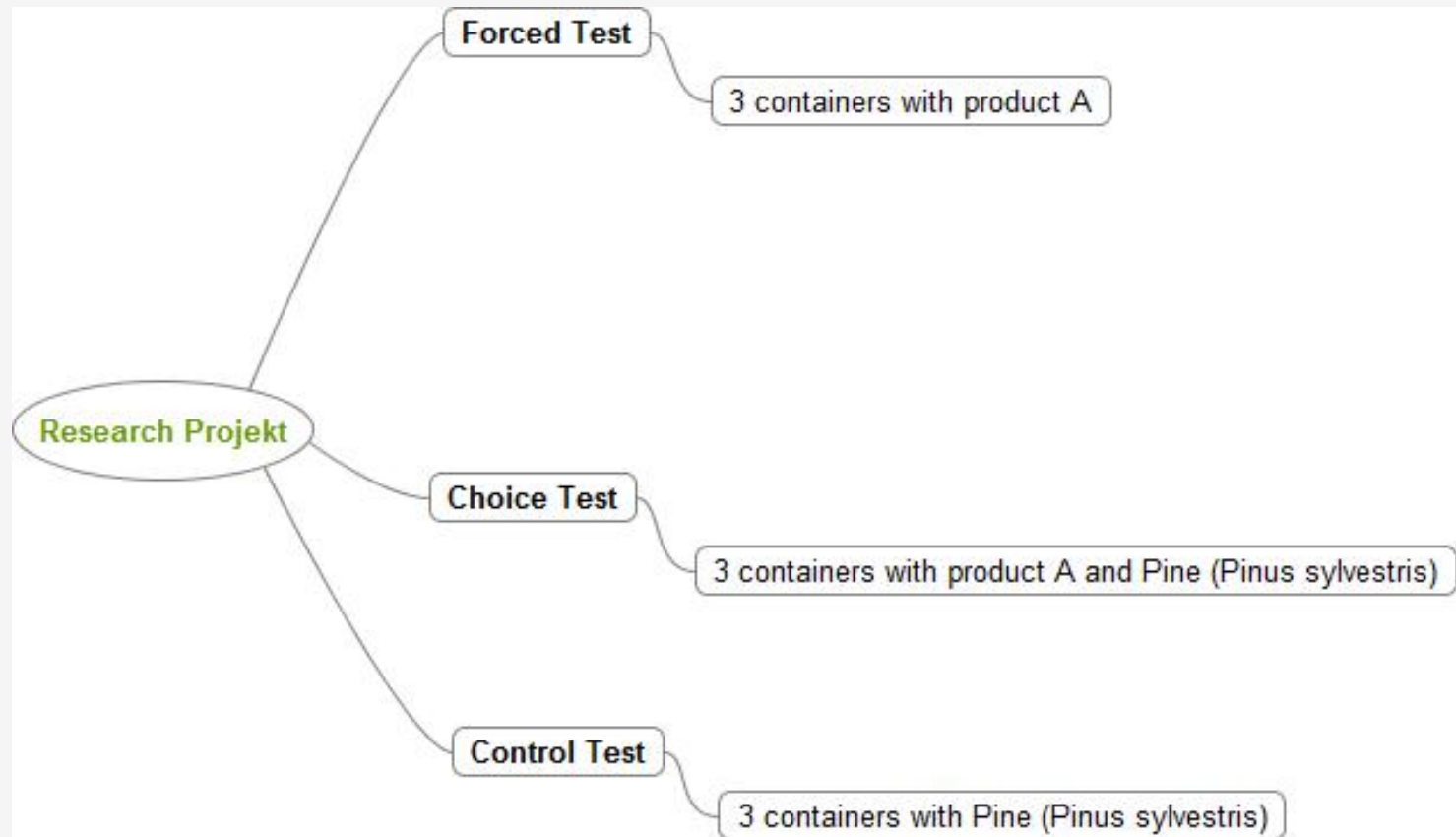
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Materials and methods

- . Test standard EN 117
- . Test duration of 56 days
- . 250 workers and 7 nymphs
- . Test specimens 50 x 25 x 15 mm

***Reticulitermes santonensis* de Feytaud**

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Overview of the experiment

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Visual rating of the test specimens according
EN 117 in number **0, 1, 2, 3 or 4**

Classification into durability classes according
EN 350-01

After

Visual

Class of Durability	Description	Average Rating
D	Durable	0-1
M	Moderately durable	2
S	Susceptible	3-4

Assessment of the durability of a product

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Test results

A: Results of the Force Test

Sample number	Mass loss in [%]	Surviving termites		Mortality in [%]	Assessment of the damage	
		A	N		EN 117	EN 118
A1	14,05	0	6	97,6	4	4
A2	16,05	17	5	91,2	4	4
A3	15,40	2	4	97,6	4	4

All test specimens – A1 to A3 - Cattail-based - used in the Forced Tests, were heavily attacked by termites.

A 1



A 2



A 3



A 3



Specimens of the Force Test after 56 days

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Test results

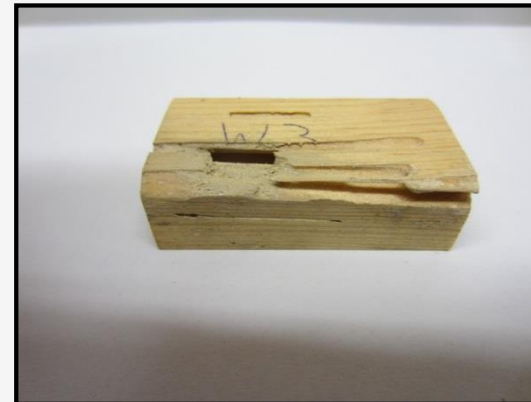
B: Results of the Choice Test

A:

Sample number	Mass loss in [%]	Surviving termites		Mortality in [%]	Assessment of the damage	
		A	N		EN 117	EN 118
B4	0,26	160	7	33,2	4	4
WB4	11,68				4	4
B5	2,48	179	7	25,6	4	4
WB5	9,47				4	4
B6	0,80	184	4	24,8	4	4
WB6	8,87				4	4

The test specimens – B4 to B6 - Cattail Q- Plex PLA - in the Choice Test were less affected than in the Force Test. The termites have focused more on the choice specimens – WB4 to WB6.

A: Result



Test specimen - B6 - Cattail Q- Plex PLA - and the control specimen – WB6 - Scotch pine - after 56 days within the Choice Test.

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Test results

B: Results of the Control Test

A: Results

Sample number	Mass loss in [%]	Surviving termites			Assessment of the damage	
		A	N	Mortality in [%]	EN 117	EN 118
C1	10,92	167	7	30,4	4	4
C2	10,43	189	7	21,6	4	4
C3	10,13	182	7	24,4	4	4

The demands of the EN 117 and EN 118 were complied.

A:



Control specimens of Scotch pine in the Control Test after 56 days

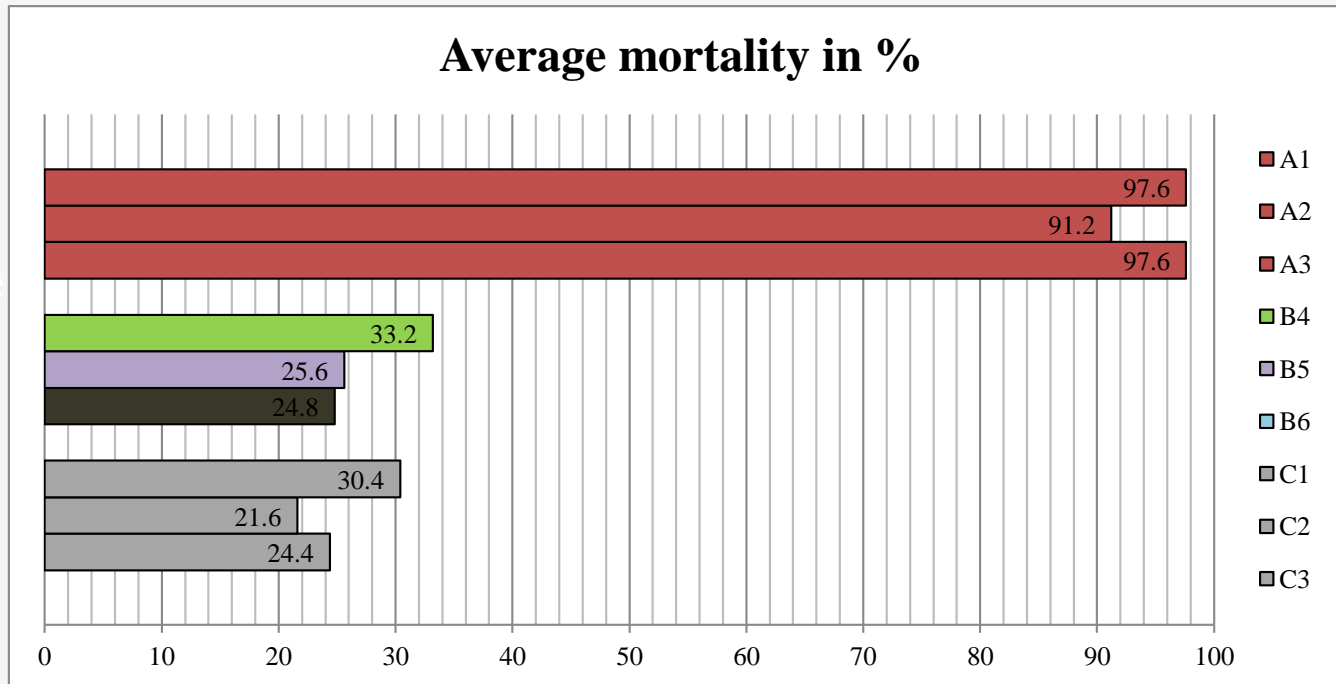
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The control specimens before and after 56 days in the test

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Discussion

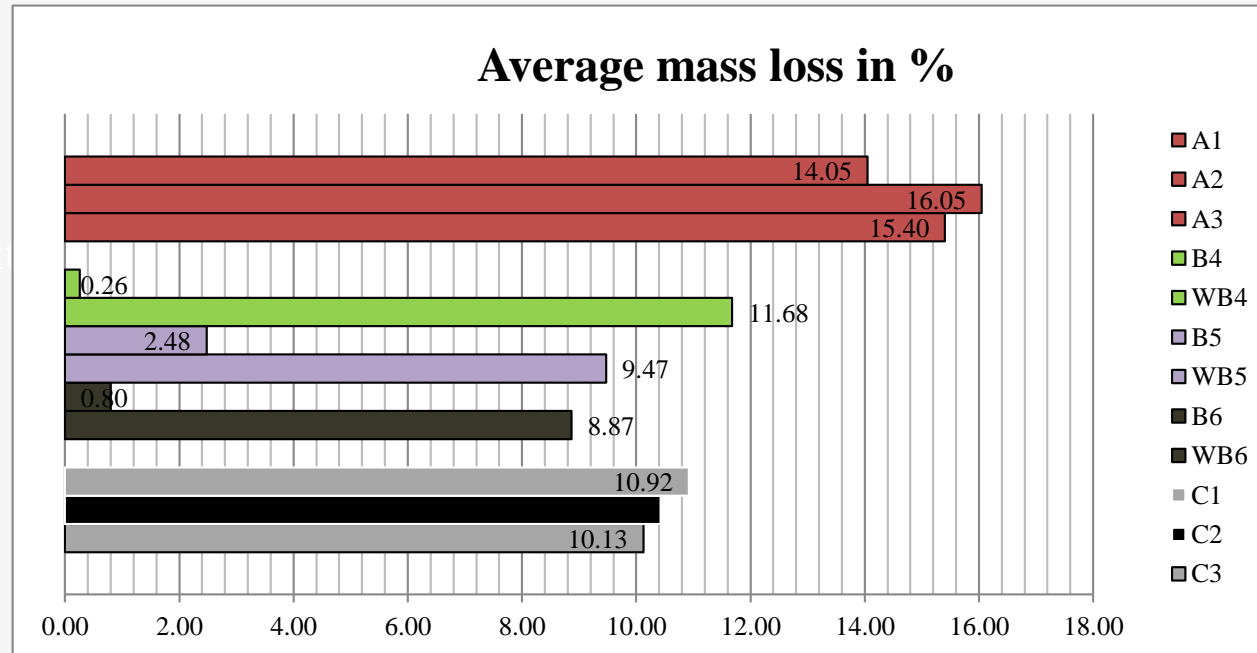


A: Re

A1 to A3 Force Test; B4 to B6 Choice test; C1 to C3 Control Test

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Discussion

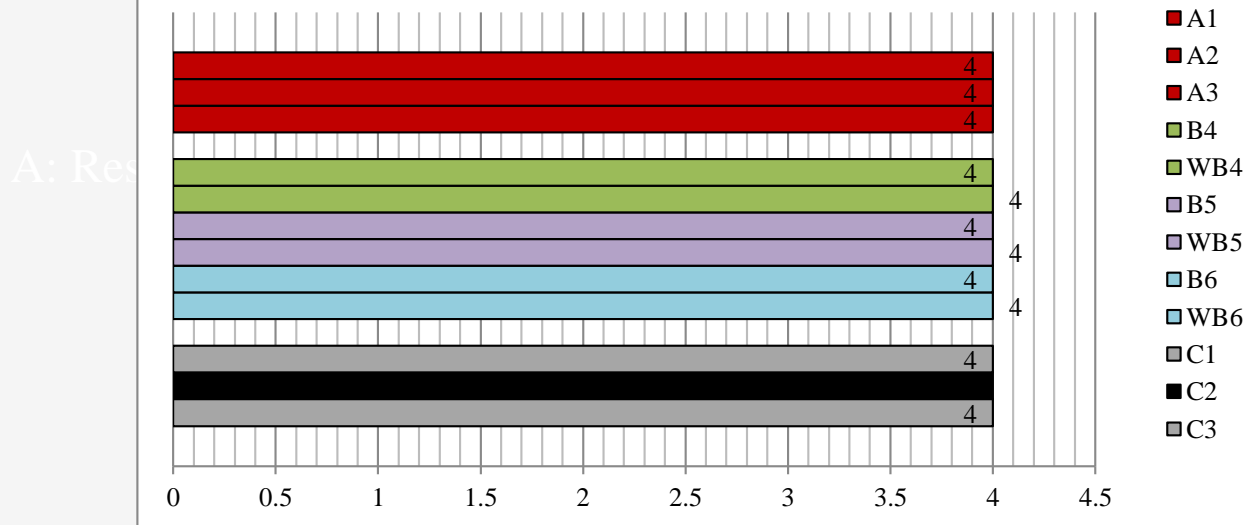


A1 to A3 Force Test; B4 to B6 Choice test; WB4 to WB6 Choice Test with choice specimen; C1 to C3 Control Test

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Discussion

Average assessment of the damage (0 to 4)
EN117



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Conclusion

Wood species	Kind of Test	Class of Durability	Description
Insulation Material	Forced	S	Susceptible
	Choice with <i>Pinus sylvestris</i> L.	S	Susceptible

The material - Cattail Q- Plex PLA - is SUSCEPTIBLE - against termite attacks.

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Outlook

A: R



For the export in tropical countries it will be necessary to add biocides, for instance special termiticides or Boric acid to the material.

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