IRG/WP/DDB 14-00050

THE INTERNATIONAL RESEARCH GROUP ON WOOD PROTECTION

Section 2 Testing Methodology and Assessment

Scots pine

Natural durable timber – Field test results
IRG/WP Durability Database

Alfredsen, G.; Flæte, P.O.

IRG SECRETARIAT
Box 5609
SE-114 86 Stockholm
Sweden
www.irg-wp.org

AIMS AND SCOPE OF THE IRG-WP DURABILITY DATABASE

The overall aim of the IRG-WP durability data base is the allocation of wood durability test results for comparative studies and re-analyses. The data base shall serve as pool for service life prediction and modelling and shall contribute to an enhanced understanding of wood durability. It is an open web-based platform for scientific exchange in the field of wood durability and wood protection.

It is NOT the aim of the data base to promote or denigrate any product or material. The data base will contain raw data only; no statistical evaluation will be included. Thus it will be the exclusive responsibility of the user to interpret the test results published in the data base.

For each data set, the full range of information about the test method, the test material, and other relevant parameters, is required to guarantee reliability of the data. For this reason every data set submitted is reviewed and checked for completeness of all relevant data.

The database allows submission of assessment data from all kinds of standardized and non-standardized wood durability tests.

Records of the IRG/WP Durability data base shall be cited as in the following example:

Brischke C., Meyer L. (2013) Douglas fir. Natural durable timber - Field test results. IRG/WP Durability Database. Stockholm: The International Research Group on Wood Protection, IRG/WP/DDB 13-00001.

INFORMATION

Submission Date	09.04.2014

AUTHORS

Corresponding author	Gry Alfredsen
Email	alg@skogoglandskap.no
Institution	Norwegian Forest and Landscape Institute
Street/PO Box	Box 115
City	Ås
Zip Code	1431
Country	Norway

Author 2	Per Otto Flæte
Email	Per.otto.flaete@treteknisk.no
Institution	Norsk Treteknisk Institutt
Street/PO Box	Box 113 Blindern
City	Oslo
Zip Code	031
Country	Norway

TESTED TIMBER

Trade name	Scots pine
Botanical name	*Pinus sylvestris* L.
Origin	Norway
Number of replicates	20
Sampling (optional)	Heartwood
Timber quality (optional)	Slow grown, narrow annual rings

REFERENCE TIMBER

Trade name	Scots pine sapwood
Botanical name	*Pinus sylvestris* L.
Origin	Norway
Number of replicates	22
Sampling (optional)	
Timber quality (optional)	

TEST METHODS

Non-standard method	Horizontal double layer (Rapp and Augusta 2004)
Reference	Rapp A.O., Augusta U. (2004) The full guideline for the "double layer test method" – A field test method for determining the durability of wood out of ground. Stockholm: The International Research Group on Wood Protection, IRG/WP/04-20190.
Specimen dimension and shape	25 x 50 x 500 mm^3
Rating scheme	0 (sound), 1 (slight decay), 2 (moderate decay), 3 (severe decay), 4 (failure) after EN 252 (1989)
Address of test site	Roof of Norwegian Institute of Wood Technology's 8 floor building, Forskningsveien 3B, NO-0373 Oslo-Blindern
Geographic coordinates (optional)	59°94'48,97''N 10°71'15,77''E
Start of test	October 20 2003
Last evaluation	October 20 2013
Status of test	Still running

RESULTS

Assessment

Material	***Pinus sylvestris* L.**					
Date	**20.10.2005**	**20.10.2007**	**20.10.2008**	**20.10.2009**	**20.10.2010**	**20.10.2011**
Assessment	1	2	3	4	5	6
Replicate ID	[0-4]	[0-4]	[0-4]	[0-4]	[0-4]	[0-4]
1	0	0	0	0	1	1
2	0	0	0	1	1	1
3	0	0	0	0	1	1
4	0	0	0	1	1	1
5	0	0	0	1	1	1
6	0	0	0	0	1	1
7	0	0	0	0	1	1
8	0	0	0	1	1	1
9	0	0	0	0	0	0
10	0	0	0	0	0	1
11	0	0	0	1	1	1
12	0	0	0	1	1	1
13	0	0	0	1	1	1
14	0	0	0	1	1	1
15	0	0	0	1	1	1
16	0	0	0	1	1	1
17	0	0	0	1	1	1
18	0	0	0	1	1	2
19	0	0	0	1	1	1
20	0	0	0	1	1	1

Material	***Pinus sylvestris* L.**					
Date	**20.10.2012**	**20.10.2013**				
Assessment	7	8	9	10	11	12
Replicate ID	[0-4]	[0-4]	[0-4]	[0-4]	[0-4]	[0-4]
1	1	1				
2	1	1				
3	1	1				
4	1	1				
5	1	1				
6	1	1				
7	1	1				
8	1	1				
9	0	1				
10	1	1				
11	1	1				
12	1	1				
13	1	1				
14	2	2				
15	1	1				
16	1	1				
17	1	1				
18	2	2				
19	1	1				
20	1	1				

Decay types

Material	***Pinus sylvestris* L.**					
Date	**20.10.2005**	**20.10.2007**	**20.10.2008**	**20.10.2009**	**20.10.2010**	**20.10.2011**
Assessment	1	2	3	4	5	6
Replicate ID						
1					S	S
2				S	S	S
3					S	S
4				S	S	S
5				S	S	S
6					S	S
7					S	S
8					S	S
9						
10						S
11				S	S	S
12				S	S	S
13				S	S	S
14				S	S	S
15				S	S	S
16				S	S	S
17				S	S	S
18				S	S	S
19				S	S	S
20				S	S	S

Material	***Pinus sylvestris* L.**					
Date	**20.10.2012**	**20.10.2013**				
Assessment	7	8	9	10	11	12
Replicate ID						
1	S	S				
2	S	S				
3	S	S				
4	S	S				
5	S	S				
6	S	S				
7	S	S				
8	S	S				
9		S				
10	S	S				
11	S	S				
12	S	S				
13	S	S				
14	S	S				
15	S	S				
16	S	S				
17	S	S				
18	S	S				
19	S	S				
20	S	S				

W = White rot, B = Brown rot, S = Soft rot

Assessment Reference

Material	***Pinus sylvestris* L. sapwood**					
Date	**20.10.2005**	**20.10.2007**	**20.10.2008**	**20.10.2009**	**20.10.2010**	**20.10.2011**
Assessment	1	2	3	4	5	6
Replicate ID	[0-4]	[0-4]	[0-4]	[0-4]	[0-4]	[0-4]
1	0	2	2	2	3	3
2	0	0	1	2	3	3
3	0	1	2	3	4	4
4	0	2	1	2	3	3
5	0	1	2	3	3	3
6	0	2	3	4	4	4
7	0	0	3	3	3	4
8	0	3	3	4	4	4
9	0	3	3	3	4	4
10	0	3	3	3	4	4
11	0	2	2	3	3	3
12	0	0	3	3	4	4
13	0	1	1	2	3	3
14	0	0	1	3	4	4
15	0	0	1	3	4	4
16	0	1	1	3	4	4
17	0	2	1	3	3	4
18	0	3	3	3	4	4
19	2	3	3	3	4	4
20	1	3	3	3	3	4
21	0	2	3	3	3	4
22	0	3	3	3	4	4

Material	***Pinus sylvestris* L. sapwood**					
Date	**20.10.2012**	**20.10.2013**				
Assessment	7	8	9	10	11	12
Replicate ID	[0-4]	[0-4]	[0-4]	[0-4]	[0-4]	[0-4]
1	4	4				
2	4	4				
3	4	4				
4	4	4				
5	4	4				
6	4	4				
7	4	4				
8	4	4				
9	4	4				
10	4	4				
11	4	4				
12	4	4				
13	4	4				
14	4	4				
15	4	4				
16	4	4				
17	4	4				
18	4	4				
19	4	4				
20	4	4				
21	4	4				
22	4	4				

Decay types reference

Material	***Pinus sylvestris* L. sapwood**					
Date	**20.10.2005**	**20.10.2007**	**20.10.2008**	**20.10.2009**	**20.10.2010**	**20.10.2011**
Assessment	1	2	3	4	5	6
Replicate ID						
1		S	S	S	S, W	S, W
2			S	S	S, W	S, W
3		S	S	S, W	S, W	S, W
4		S	S	S, W	S, W	S, W
5		S	S	S, W	S, W	S, W
6		S	S	S, W	S, W	S, W
7			S	S, W	S, W	S, W
8		S	S	S, W	S, W	S, W
9		S	S	S, W	S, W	S, W
10		S	S	S, W	S, W	S, W
11		S	S	S, W	S, W	S, W
12			S	S, B	S, W, B	S, W, B
13		S	S	S, W	S, W	S, W
14			S	S, W	S, W	S, W
15			S	S, W	S, W	S, W
16		S	S	S, W	S, W	S, W
17		S	S	S, W	S, W	S, W
18		S	S	S, W	S, W	S, W
19	S	S	S	S, W	S, W	S, W
20	S	S	S	S, W	S, W	S, W
21		S	S	S, W	S, W	S, W
22		S	S	S, W	S, W	S, W

Material	***Pinus sylvestris* L. sapwood**					
Date	**20.10.2012**	**20.10.2013**				
Assessment	7	8	9	10	11	12
Replicate ID						
1	S, W, B	S, W, B				
2	S, W, B	S, W, B				
3	S, W	S, W				
4	S, W, B	S, W, B				
5	S, W, B	S, W, B				
6	S, W	S, W				
7	S, W	S, W				
8	S, W	S, W				
9	S, W	S, W				
10	S, W	S, W				
11	S, W, B	S, W, B				
12	S, W	S, W				
13	S, W, B	S, W, B				
14	S, W	S, W				
15	S, W	S, W				
16	S, W	S, W				
17	S, W	S, W				
18	S, W	S, W				
19	S, W	S, W				
20	S, W	S, W				
21	S, W	S, W				
22	S, W	S, W				

W = White rot, B = Brown rot, S = Soft rot

REFERENCES

Evans F., Alfredsen G., Flæte P.O. (2011) Natural durability of wood in Norway – results after eight years above ground exposure. Proceedings of the 7th Meeting of the Nordic Baltic Network on Wood Material Science and Engineering, Oslo, Norway. Report from Norwegian Forest and Landscape Institute 15/2011: 1-6.