

Handled by, department
Lazaros Tsantaridis
Building Technology and Mechanics
+46 8 762 18 65, Lazaros.Tsantaridis@sp.se

HR-Invest Oy
Stenviksgatan 1B
02320 Esbo
Finland

Hygroscopic properties of fire retardant wood products according to NT Build 504

Summary

Hygroscopic testing was performed by commission of HR-Invest Oy, Finland. The hygroscopic tests included determining of moisture content according to NT Build 504 Hygroscopic properties of fire-retardant treated wood and wood-based products test.

The test results are given in Table 1-4.

Products

According to the client:

- Wood panel of pine untreated and surface treated with HR Prof fire retardant of 300 g/m² (with active fire retardant content of 30 %).
- Finnforest Kerto LVL (Laminated Veneer Lumber) untreated and surface treated with HR Prof fire retardant of 300 g/m² (with active fire retardant content of 30 %). Kerto is made of 3mm thick spruce veneers which are glued together with phenol adhesive.

The products were delivered to SP Trätekt between 18 August and 5 September 2006.

Manufacturer of fire retardant: Holz Prof Oü, Tallinn, Estonia.

Measured product data:

- Untreated pine: Thickness 23,0 mm. Density 420 kg/m³.
- Treated pine: Thickness 22,7 mm. Density 560 kg/m³.
- Untreated Kerto LVL: Thickness 31,1 mm. Density 525 kg/m³.
- Treated Kerto LVL: Thickness 31,5 mm. Density 515 kg/m³.

All specimens were conditioned to constant mass in a controlled climate chamber at 23 ± 2 °C and 50 ± 5 % RH at SP Trätekt before the testing.

The hygroscopic test was performed between 18 August and 25 September 2006.

SP Swedish National Testing and Research Institute

Postal address
SP
Box 5609
SE-114 86 Stockholm
SWEDEN

Office location
Drottning Kristinas
väg 67
Stockholm

Phone / Fax / E-mail
+46 8 762 18 00
+46 8 762 18 01
info@sp.se

This document may not be reproduced other than in full, except with the prior written approval of SP.

Hygroscopic test

The moisture content was determined by measuring the constant mass according to NT Build 504 at two different humidity conditions; 50 % RH at 23 °C and 90 % RH at 27 °C. Thereafter, the specimens were dried in an oven at 103 °C. The specimen size was 100 mm x 100 mm. Five specimens were tested for each product.

Test results

The test results from the hygroscopic test, NT Build 504, are given in Table 1-4.

Table 1. Test results for untreated pine.

Specimen	Moisture Content %, 50 % RH at 23 °C	Moisture Content %, 90 % RH at 27 °C	Observations
1	12,1	20,8	No salt at surface
2	12,0	20,6	- “ -
3	12,1	20,7	- “ -
4	12,3	21,0	- “ -
5	12,1	20,7	- “ -
Average±stdev	12,1 ± 0,13	20,7 ± 0,13	

Table 2. Test results for treated pine.

Specimen	Moisture Content %, 50 % RH at 23 °C	Moisture Content %, 90 % RH at 27 °C	Observations
1	13,5	24,5	No salt at surface
2	13,5	24,1	- “ -
3	14,5	29,6	- “ -
4	13,5	24,0	- “ -
5	15,1	30,8	- “ -
Average±stdev	14,0 ± 0,74	26,6 ± 3,32	

Table 3. Test results for untreated Kerto LVL.

Specimen	Moisture Content %, 50 % RH at 23 °C	Moisture Content %, 90 % RH at 27 °C	Observations
1	9,5	17,6	No salt at surface
2	9,5	17,5	- “ -
3	9,6	17,3	- “ -
4	9,6	17,3	- “ -
5	9,6	17,3	- “ -
Average±stdev	9,6 ± 0,05	17,4 ± 0,14	

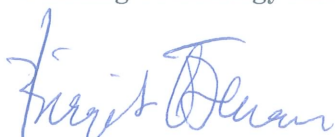
Table 4. Test results for treated Kerto LVL.

Specimen	Moisture Content %, 50 % RH at 23 °C	Moisture Content %, 90 % RH at 27 °C	Observations
1	9,8	17,9	No salt at surface
2	9,9	18,2	- “ -
3	9,9	18,3	- “ -
4	9,9	18,3	- “ -
5	9,9	18,0	- “ -
Average±stdev	9,9 ± 0,04	18,1 ± 0,17	

Statement

The test results relate to the behaviour of the test specimens of the products under the particular conditions of the test. The values of moisture content are related to the actual amount of fire retardants impregnated.

SP Swedish National Testing and Research Institute
Building Technology and Mechanics - Wood Technology



Birgit Östman
Research Leader



Lazaros Tsantaridis
Technical Officer