



BUREAU VERITAS ESTONIA

Attestation N^o 150/09/TAL

About connection strengths of the insulation fibreboards SB.H *Tuuletökkeplaat*
(windprotectionboard) to the building wooden frame

11.09.2009

The present attestation confirms that insulation fibreboards SB.H *Tuuletökkeplaat* connection strengths by building wooden frames, listed in table 1 produced by VIISNURK Ltd. Building Materials Division are correct and the data can be used for calculating in different frameworks if the connection is performed according to the recommendation and guides of fibreboard manufacturer.

Table 1

Nominal thickness of the board mm	Connection type	Declared load bearing of the connection N
12	Insulation fibreboard connection with building wood by stapled connection	448
25		468
12	Insulation fibreboard connection with building wood by nailed connection	432
25		336

Above mentioned data based on the results of experimentally performed test. Experimental tests were performed using the test method approved by Department of Structural Design of Tallinn University of Technology and by certification body Bureau Veritas.

Annex. Test report N^o 12/09 from 8 September 2009. 7 pages.

Tiit Hindreus
Country Manager

Test report N₀ 12/09
 From 8 September 2009

page 1(7)

1. Customer Certification body Bureau Veritas
 Tartu mnt 24/24B, 10115 Tallinn Estonia.
2. Order Agreement from 31 August 2009.
3. Task Determination connection of stapled and nailed strengths of the insulation fibreboards SB.H *Tuuletõkkeplaat (windprotectionboard)* to the building wooden frame.
4. Description of the test connection Above mentioned fibreboards with different thicknesses and connections by clipper and nail (see figures 1 and 2). For test were defined 4 jointing versions and each presents 6 test peaces.
5. Sampling All the samples are prepared and delivered by producer of the softboards AS VIISNURK EMD. The test pieces are marked by laboratory and according to the following code:
 TTP25R45KL - insulation fibreboard connection with building wood by stapled connection;
 TTP12R45KL - insulation fibreboard connection with building wood by stapled connection;
 TTP25R27N - insulation fibreboard connection with building wood by nailed connection;
 TTP12R27N - insulation fibreboard connection with building wood by nailed connection.
- 6 Symbols used in marking and in referencing measuring units
 TTPxxRyyKL/N - TTP- insulation fibreboard,
 xx- with nominal thickness mm,
 R- wooden frame with nominal thickness mm,
 KL/N- connection type where KL -clipper and
 N - nail;
 F_u - load- carrying per fastener;
 F_{ul} - load- carrying capacity per shear plane per fastener;
 F_k - 5 % value of load- carrying capacity per shear plane per fastener;
 F_{kesk} - mean value.
- 7 Testing
- 7.1 Testing time From 01 September to 4 September 2009.
- 7.2 Test method According to the agreement the principals of test methods and procedures are used such as a analog performed by VTT of Finland.
- 7.3 Test equipments Dynamometer scale interval 2 kgf and caliper scale interval 0,01 mm.

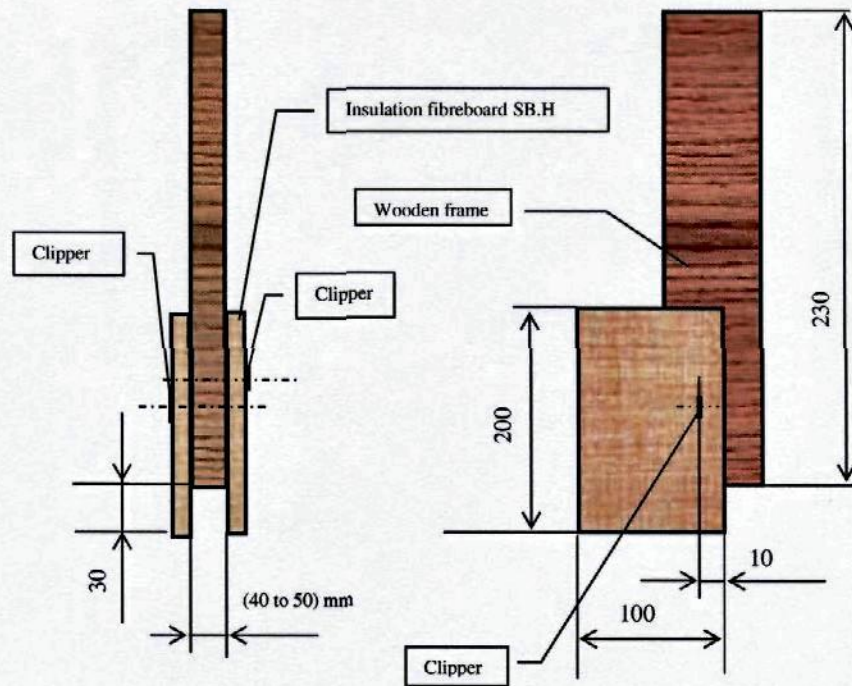


Figure 1. Board and wood connection by stapled connection.

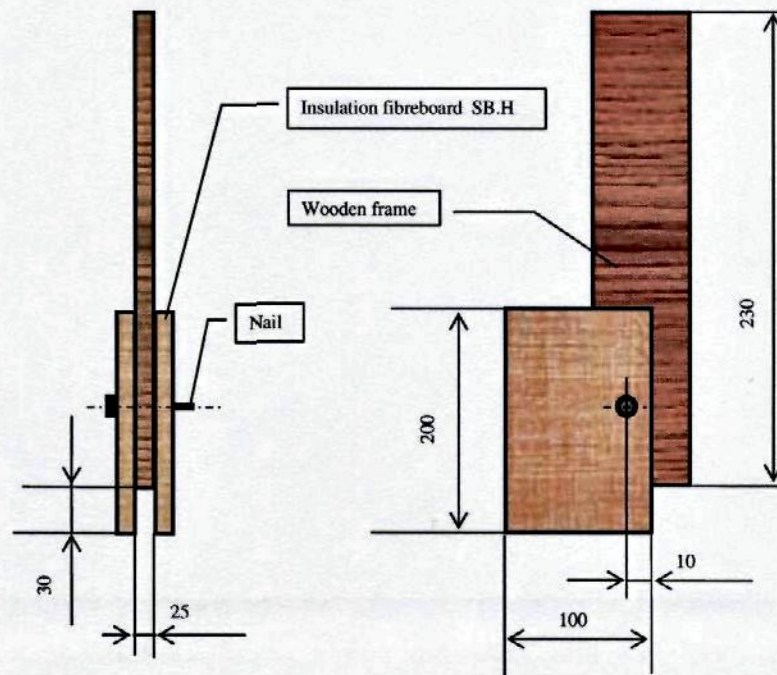


Figure 2. Board and wood connection by nailed connection.

The test report may be copied as whole. For copyright in parts must be the permission of laboratory.

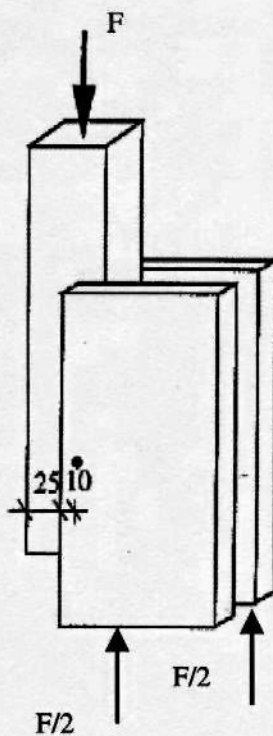
Test report N₀ 12/09

page 3(7)

8 Test results

(The test results valid only for tested samples).

8.1 Testing scheme



8.2 Load bearing of the connection and of one cutting of connection are showed in table 1.

Table 1. Test results

Affixing code	Description of affixing	Test pice		F_u kN	F_{ul} N	Test time s
		Thickness mm	nr			
TTP12R45KL	Insulation fibreboard SB.H Wooden frame	12	1	1,00	500	203
		45	2	1,00	500	221
	3		1,10	550	214	
	4		0,98	490	208	
	5		1,00	500	190	
	6		1,20	600	222	
	Clipper 1,7 x 25 x 58			F_{kesk} 1,05	523	
		Standarddeviation s		0,09	43	
TTP25R45KL	Insulation fibreboard SB.H Wooden frame	25	1	1,17	585	196
		45	2	1,04	520	220
	3		1,20	600	194	
	4		1,28	640	206	
	5		1,14	570	184	
	6		0,96	480	197	
	Clipper 1,7 x 25 x 58			F_{kesk} 1,13	566	
		Standarddeviation s		0,11	57	
TTP25R27N	Insulation fibreboard SB.H Wooden frame	25	1	1,02	510	191
		27	2	1,05	525	197
	3		1,00	500	216	
	4		0,98	490	202	
	5		1,00	500	210	
	6		1,00	500	180	
	grooved nail 3,5x90			F_{kesk} 1,01	504	
		Standarddeviation s		0,02	12	
TTP12R45N	Insulation fibreboard SB.H Wooden frame	12	1	0,87	435	150
		27	2	0,70	350	100
	3		0,78	390	119	
	4		0,86	430	146	
	5		0,78	390	139	
	6		0,72	360	115	
	grooved nail 3,5x90			F_{kesk} 0,79	393	
		Standarddeviation s		0,07	35	

In annexes 1 and 2 of the current test report is showed the force and deformation diagrams of different test series.

Note. On the diagrams is showed deformation dependence from the force for each series of the test pieces (test pieces 1 to 6). For better review about functioning of a connection under load the single test results of test pieces is shifted 1 mm (test piece nr 2 shifted 1 mm, nr 3 shifted 2 mm, nr 4 shifted 3 mm, nr 5 shifted 4 mm and nr 6 shifted 5 mm).

The test report may be copied as whole. For copyright in parts must be the permission of laboratory.

Test report N₀ 12/09

page 5(7)

9. Summary

The load bearing 5 % value for one connection type and for a one shear surface was calculated on the bases of test results and according to the formula (follow the standard EVS-EN 14080:2005 annex A analogy):

$$F_k = k_1 \cdot F_{k_{eskm}}$$

$$\text{where } k_1 = \exp(-2,645 + 1/\text{SQRT}(n)) \cdot v(x) + 0,15$$

Results of calculations are showed in table 2

Table 2. Calculation results


Test sample code	F_k N
TTP12R45KL	448
TTP25R45KL	468
TTP25R27N	432
TTP12R45N	336

Responsible persons

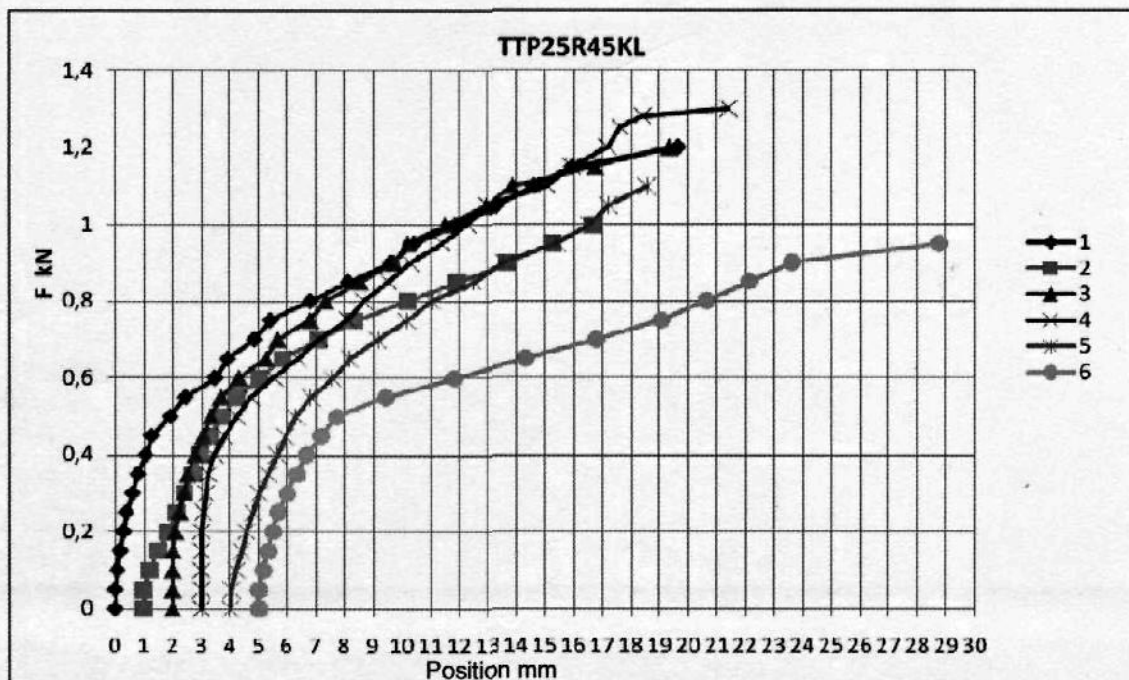
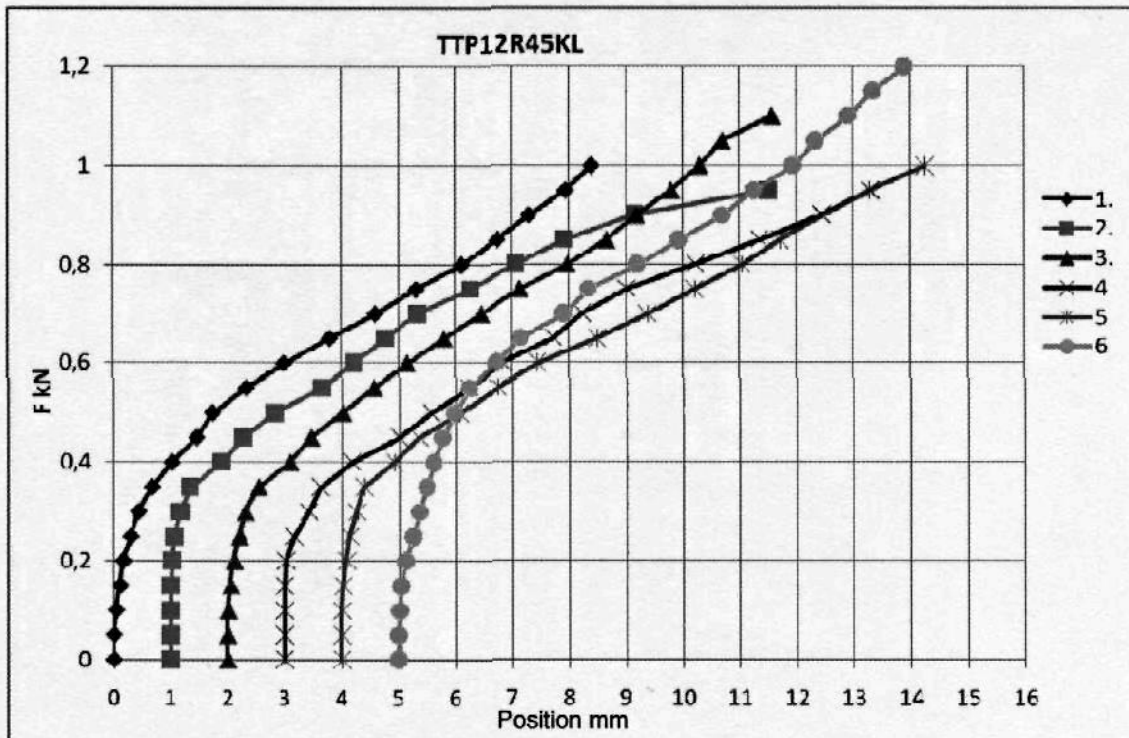
Elmar Just laboratory manager



Evald Kalda senior laboratory technician



Annex 1. Stapled connection



Annex 2. Nailed connection

