Ensuring Advancement in Sandwich Construction Through Innovation and Exploitation

TEST REPORT

No.: D3.2 – part 5

Tests on load application details of axially loaded sandwich panels

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Task: 3.4

Object: Load bearing capacity of load application details of axially loaded sandwich panels

This report includes 16 pages and 7 Annexes (276 pages).

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1 Preliminary remark

Traditionally sandwich panels are used as covering elements of buildings. In this application the panels only transfer transverse loads (wind, snow) to the substructure by bending. In the panels only the stress resultants of bending moment and transverse force are effective. A recent tendency, especially in the area of smaller buildings – such as cooling chambers, climatic chambers and clean rooms – is to apply the panels without substructure. In this application the wall panels have to transfer normal forces in addition to the stress resultants arising from transverse loads. This results in the question for the load-bearing capacity of the panels in the areas of load application, i.e. at the lower ends of the panels and at the connection between wall and ceiling (Fig. 1), where the superimposed loads from the ceiling are applied as normal force into the inner face of the wall panels.

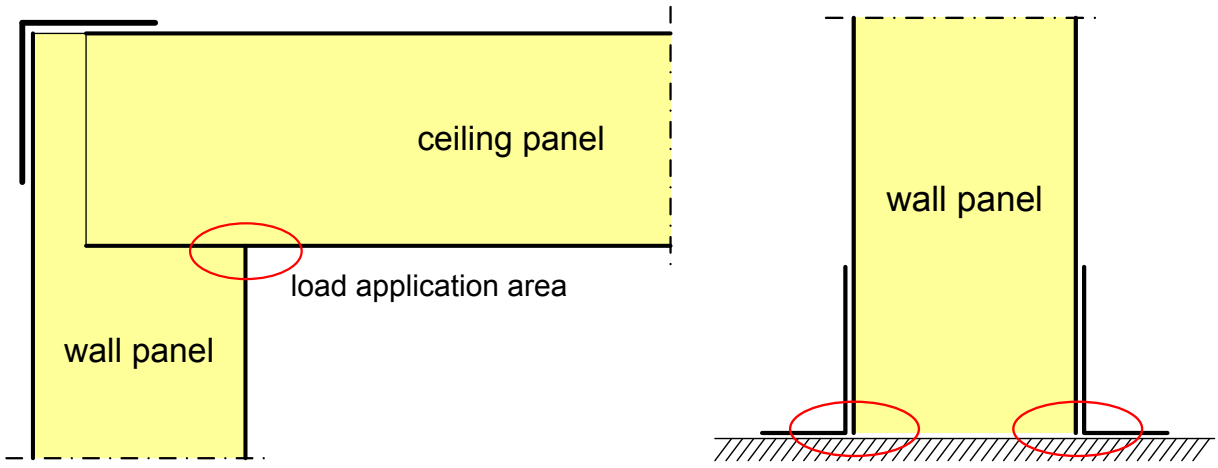


Fig. 1: Typical connection between wall and ceiling and lower end

A design concept for axially loaded sandwich panels was developed within the framework of the EASIE project. The design concept also includes the determination of the local load bearing capacity of the load application area. In deliverable D3.2 – part 5, the results of the experimental tests on load application details are presented. The evaluation of the results can be found in deliverable D3.3. Deliverable D3.3 is also dealing with the numerical calculations and the derivation of a design concept.

2 Tested types of sandwich panels

Investigations on different types of sandwich panels were performed. The tested types of panels are summarized in Tab. 1.

No.	core material	core thickness	face material	face thickness	profiling of faces
A	PU	100	steel	0,50	lightly profiled
B *)	PU	100	steel	0,75	lightly profiled
C	EPS	100	steel	0,60	flat
D	EPS	100	GFRP	1,8	flat
E	MW	100	steel	0,50	lightly profiled

*) discontinuous produced panel

Tab. 1: Tested types of sandwich panels

The geometry of the panels with lightly profiled faces (type A, B, E) was measured. The results are shown in the following figures.

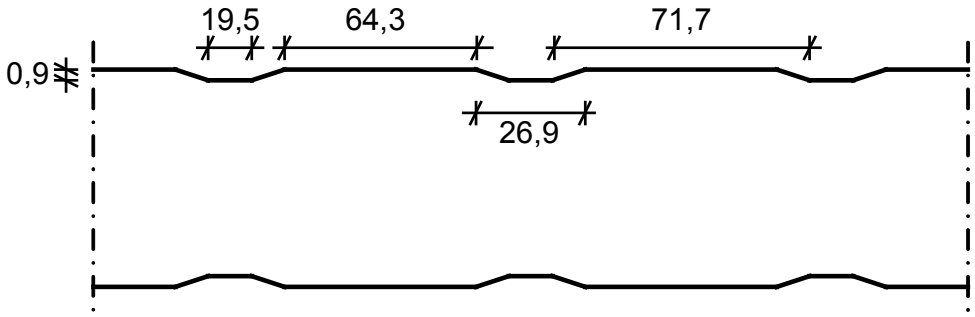


Fig. 2: Geometry of panel type A

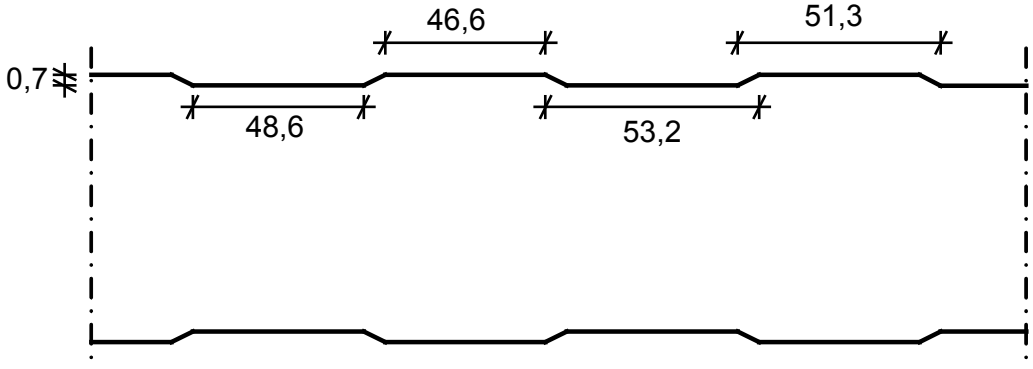


Fig. 3: Geometry of panel type B

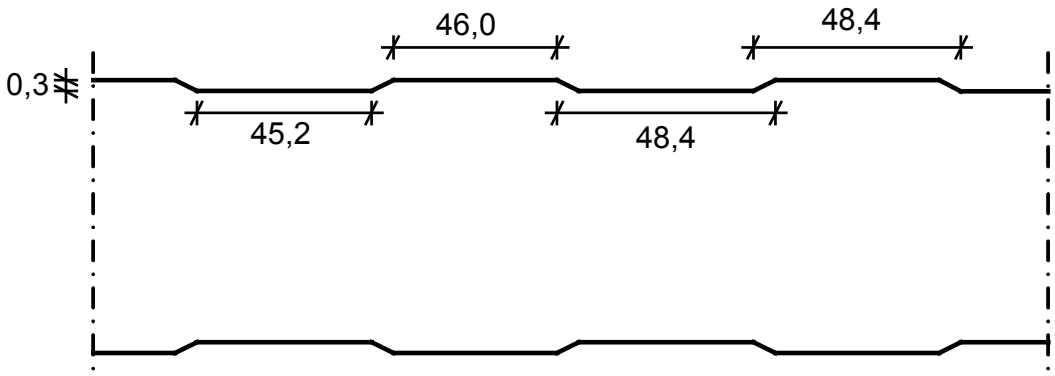


Fig. 4: Geometry of panel type E

3 Test performance and results of the tests

3.1 Preliminary remarks

To examine the load bearing capacity of the load application area, where the loads are introduced from the ceiling into the wall panel, different tests were performed. For all tests specimens with the width 400 mm have been used. At the load application area local failure occurs (crippling of the cut edge or local buckling, Fig. 5), so short sections of panels (ca. 300-400 mm) have been used.

Fig. 5: Local failure at load application area

At the lower end of the specimens aluminium angles were glued on the faces of the panel und additionally they were screwed to the panel by self drilling screws. The angles were screwed to a wooden board, so the lower end of the tested panel can be regarded as clamped.

Fig. 6: Lower end of the tested specimens

3.2 Test series I: Introduction of loads by contact

Test to determine the load bearing capacity of the free cut edge of the panel were performed. The load was introduced by contact. The test set up is shown in Fig. 7 und Fig. 8. For introducing the load into the face of the panel a plate of steel has been used. For comparison instead of a plate of steel a section of a sandwich panel was used for introducing the load in some tests (Fig. 9).

Annex I shows the results of the tests. For each test, a table listing all relevant parameters is given, followed by the graphs of the measured values. In addition significant pictures are shown for each test.

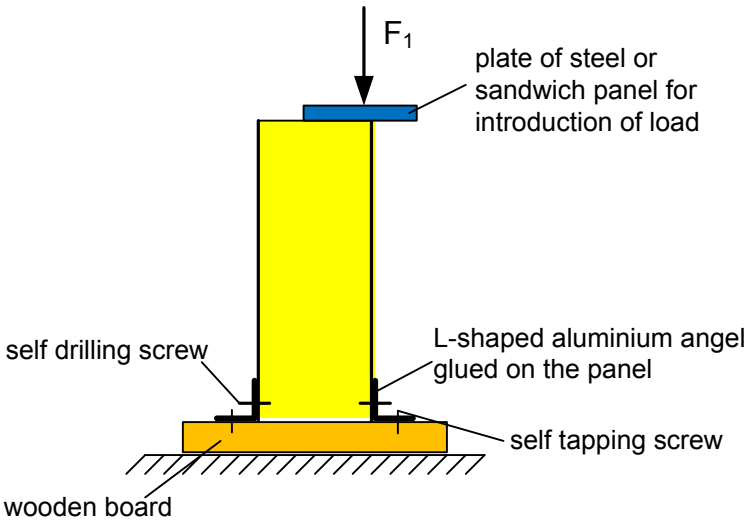


Fig. 7: Test set-up of test series I

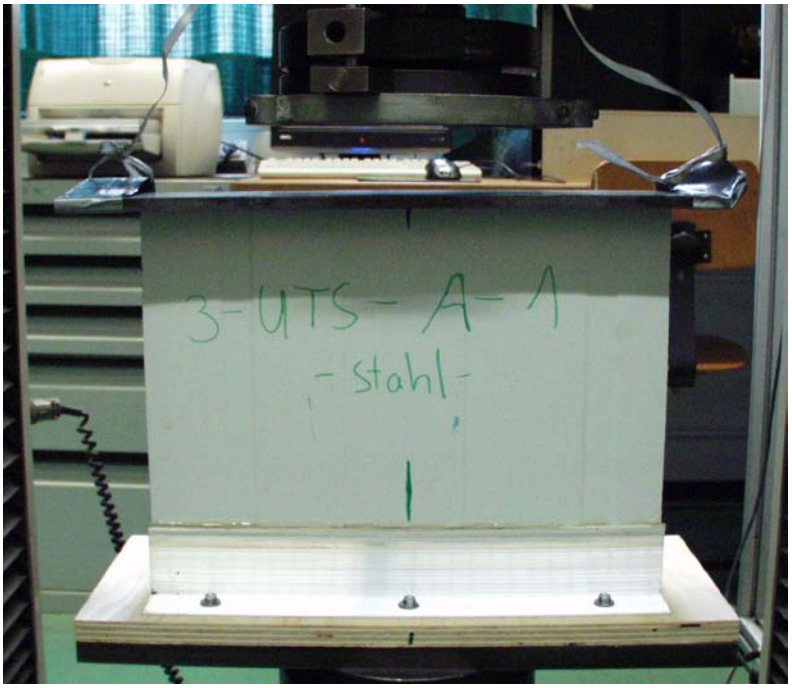


Fig. 8: Test set-up of test series I

Fig. 9: Introduction of load by plate of steel and by sandwich panel

3.3 Test series II: Tests on corner details

Test on typical corner details for the connection between wall and ceiling were performed. The test set up is shown in Fig. 10 and Fig. 11. For panels with thicknesses used in the tests failure does usually not occur at the free cut edge of the wall panel, but shear failure of the ceiling panel occurs. Therefore the load was not introduced by a sandwich panel, but by a plate of steel. An aluminium hollow section was placed on the plate of steel and on an additional hinged support. The load was introduced in the hollow section.

Because of the deflection of the ceiling panel a rotation occurs at the line of load application. This results in an additional horizontal load. To consider this additional load in the tests the angle α, the hollow section was placed on the wall panel, was varied. Additional to the applied

load F_1 the reaction force F_2 at the hinged support was measured. The load introduced in the cut edge can be calculated by subtracting F_2 from F_1.

Annex II shows the results of the tests. For each test, a table listing all relevant parameters is given, followed by the graphs of the measured values. In addition significant pictures are shown for each test.

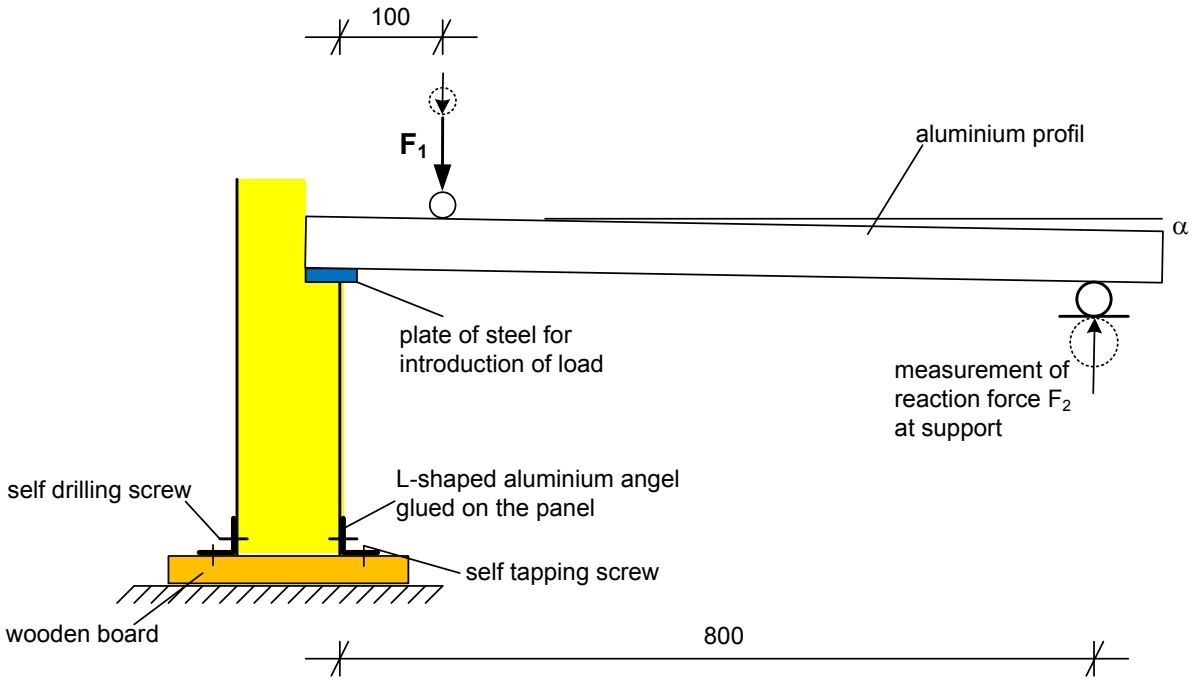


Fig. 10: Test set-up of test series II

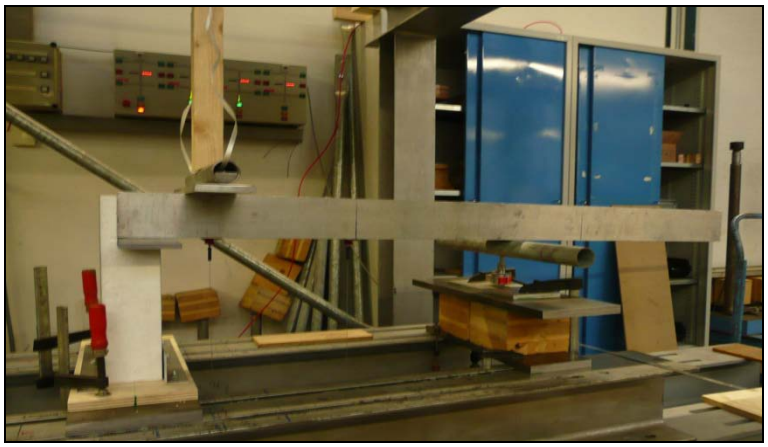


Fig. 11: Test set-up of test series II

3.4 Test series III: Tests on corner details with glued core

Especially for cooling chambers it is common practice to glue the cores of ceiling and wall panels. Therefore tests on glued corner details were performed. A wall panel and a ceiling panel of the same type were glued with glue „OTTOCOLL® P84“ (polyurethane glue). The

ceiling panel was loaded as single span beam (test series IIIa) and as lever arm (test series IIIb).

The test set up of test series IIIa (single span) is shown in Fig. 12 and Fig. 13. The ceiling panel was supported by an additional hinged support and loaded by four line loads. During the test the reaction force F_2 at the support and the deflection in mid-span at the lower face of the panel were measured.

Annex IIIa shows the results of the tests.

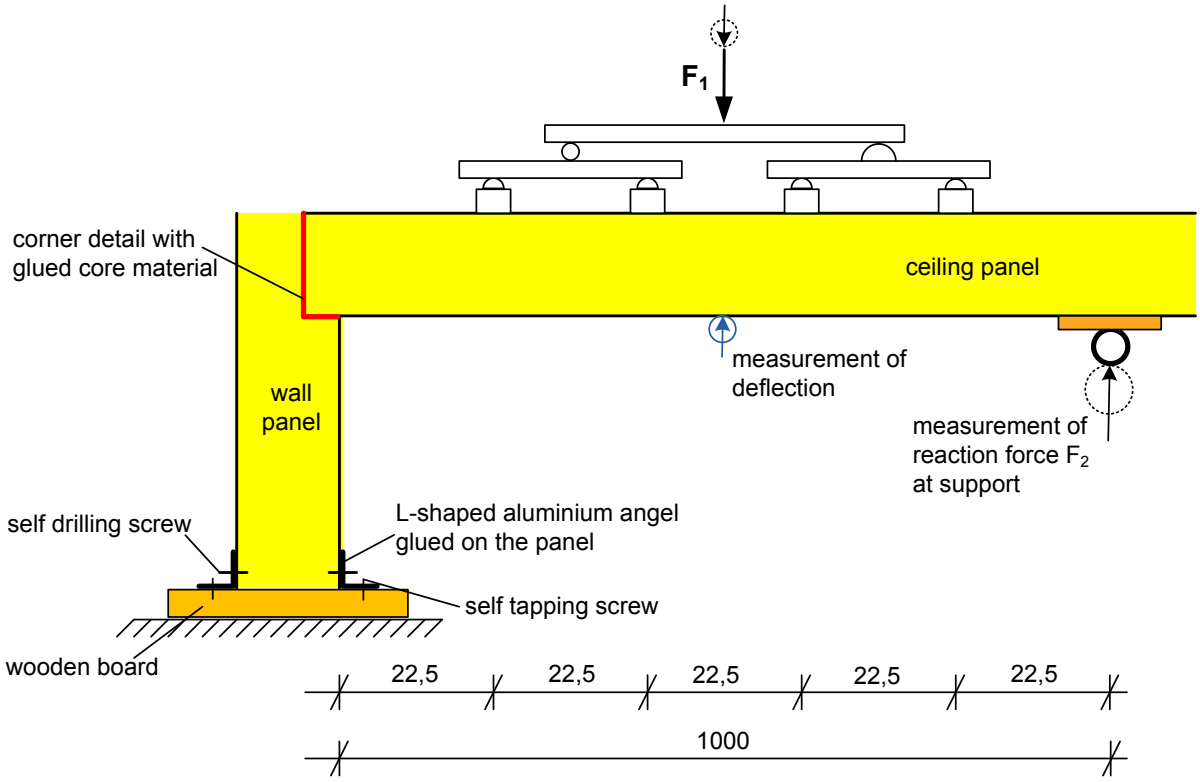


Fig. 12: Test set-up of test series IIIa

Fig. 13: Test set-up of test series IIIa

Fig. 14 and Fig. 15 show the test set up of test series IIIb (lever arm). The ceiling panel was loaded by a line load. The distance a between the inner face of the wall panel and the applied load was varied. The deflection of the ceiling panel was measured at the lower face.
Annex IIIb shows the results of the tests.

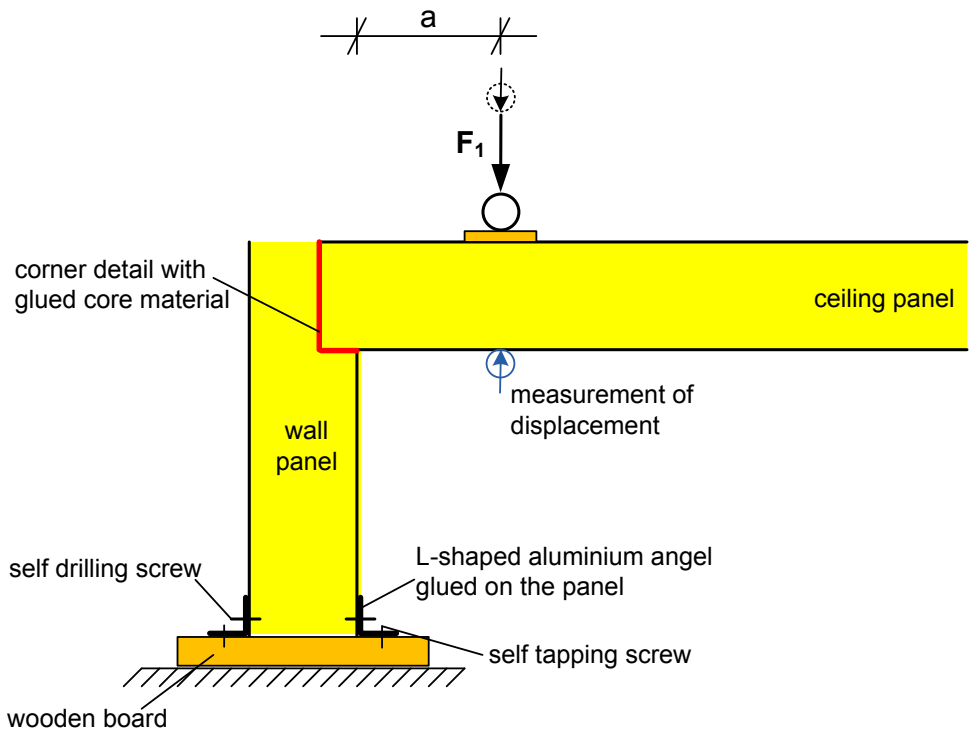


Fig. 14: Test set-up of test series IIIb

Fig. 15: Test set-up of test series IIIb

3.5 Test series IV: Tests on improved corner details

Tests on improved corner details were performed. The load application area was improved by a glued angle (Fig. 16) or by three dowels (Fig. 17) screwed in the core material of the wall panel. Dowels FID 50 of Würth and W-ID 95 of Fischer were used (Fig. 18).

Fig. 16: Wall panel with glued angle for improvement of the load application area

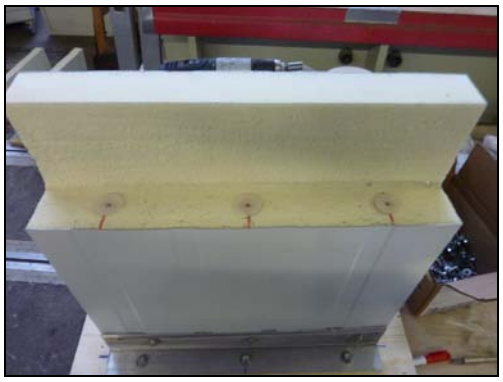
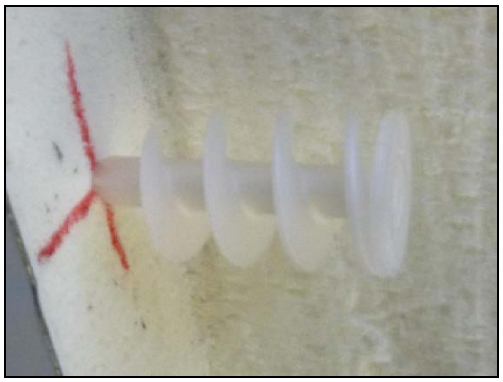


Fig. 17: Application of dowels in the core material



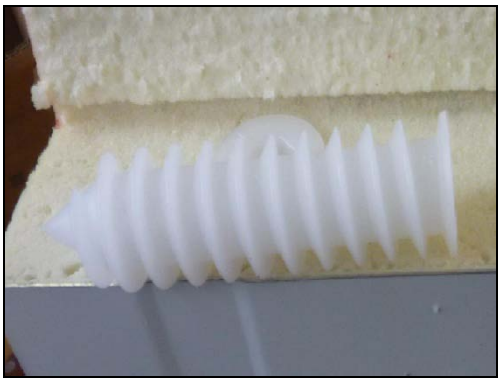


Fig. 18: Dowel FID 50 and W-ID 95

The improved corner details were tested with the test set up of test series I (chapter 3.2) and test series II (chapter 3.3).
Annex IVa shows the results of the tests on corner details improved by glued angles. Annex IVb shows the results of the tests on corner details improved by dowels.

4 Determination of the material properties

4.1 Mechanical properties of the metallic surface layers

For each tested type of panel, specimens for tensile tests according to EN 10002-1 were worked out and tensile tests for determining the mechanical properties of surface layers were done. For the determination of the yield strength $R_{eH}/R_{p0,2}$ and the tensile strength $R_{m,}$ the core thicknesses t_k determined on the specimens were used. The mean values of the results are listed in Tab. 2.

type of panel		t_K	$R_{eH}/R_{p0,2}$	R_m
		[mm]	[N/mm²]	[N/mm²]
A	top side of production	0,474	358	405
	bottom side of production	0,472	358	403
B	top side of production	0,765	399	403
	bottom side of production	0,759	406	402
C	face 1	0,538	412	456
	face 2	0,541	406	453
D	GFRP			
E	face 1	0,474	461	468
	face 2	0,476	472	479

Tab. 2: Mechanical properties of the metallic surface layers

4.2 Mechanical properties of the core layer

The mechanical properties of the core layer were determined according to EN 14509. The determination of the compression strength f_{Cc}, the tensile strength f_{Ct}, the shear strength f_{Cv}, as well as the appropriate shear, compression and tensile module values G_C, E_{Cc} and E_{Ct} was realized on at least three specimens. The analysis of the modulus of elasticity E_C was realised as mean value from the compression and tensile module of a specimen pair. The mean values of the results are listed in Tab. 3 and Tab. 4. Some pictures of the specimens after tensile test are shown in Annex V.

No.	f_{Cv}	f_{Cc}	f_{Ct}
	[N/mm²]	[N/mm²]	[N/mm²]
A	0,09	0,10	0,14
B	0,11	0,19	0,21
C	0,10	0,15	0,16
D	0,11	0,14	0,23
E	0,08	0,09	0,12

Tab. 3: Mechanical properties of the core layer – strength

No.	G_C	E_{Cc}	E_{Ct}	E_C
	[N/mm²]	[N/mm²]	[N/mm²]	[N/mm²]
A	2,93	2,95	3,24	3,10
B	3,56	3,83	6,32	5,08
C	4,18	6,38	10,56	8,47
D	6,10	6,39	10,18	8,29
E	9,82	9,33	12,08	10,71

Tab. 4: Mechanical properties of the core layer – module

4.3 Wrinkling stress of the faces

Single-span bending tests were performed with every type of sandwich panel. The sandwich panels with a length of 6000 mm were loaded until failure in a vacuum chamber under uniform surface load. For the calculation of the wrinkling stress the measured thickness of the steel faces and the measured thickness of the panels were used. The results of the single-span bending tests are listed in Tab. 5.

type of panel		thick-ness of panel (mean value)	width of panel	span	core sheet thickness of com-pressed face	failure load incl. dead weight	wrin-kling stress
		[mm]	[mm]	[mm]	[mm]	[kN/m]	[N/mm²]
		D	B	l_a	t_K	p	σ_w
A	top side of production	99,4	1176	5700	0,474	2,69	198
	bottom side of production	99,3	1178	5700	0,472	2,75	203
B	top side of production	98,9	1194	5700	0,765	4,41	200
	bottom side of production	89,9	1195	5700	0,759	4,43	202
C	face 1	100,3	1196	5700	0,538	2,79	174
	face 2	100,2	1196	5700	0,541	2,76	177
D	face 1 *)	101,6	1194	5700	1,8	1,01	19
	face 2	101,8	1194	5700	1,8	1,45	28
E	face 1	99,4	999	5800	0,475	1,17	105
	face 2	99,5	999	5800	0,475	1,51	136
		99,4	1000	5800	0,475	1,69	151
*) reduced wrinkling stress caused by cut of core material in mid-span							

Tab. 5: Wrinkling stress of the faces

5 Summary

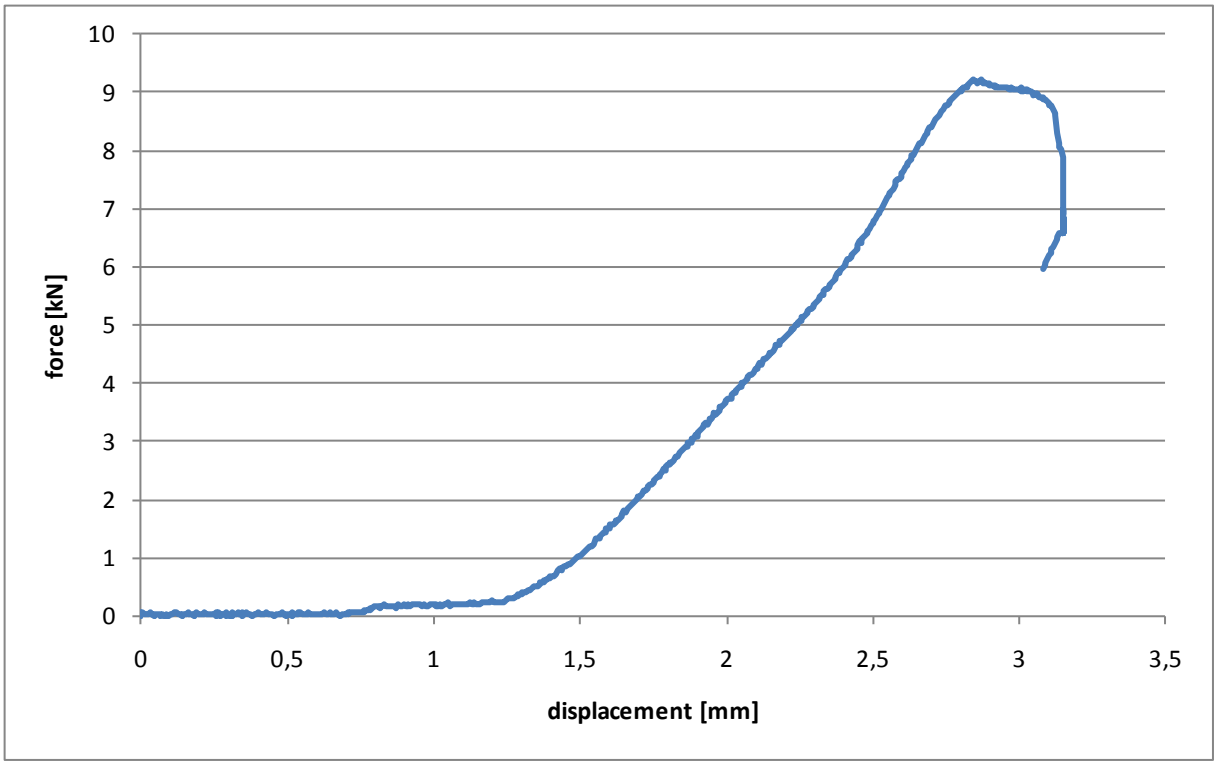
WP 3, task 3.4 of the EASIE project deals with sandwich panels used for buildings without substructure. In this application the wall panels have to transfer normal forces in addition to transverse loads. In deliverable 3.2 – part 5 the results of the experimental tests on load application details of axially loaded sandwich panels are presented.

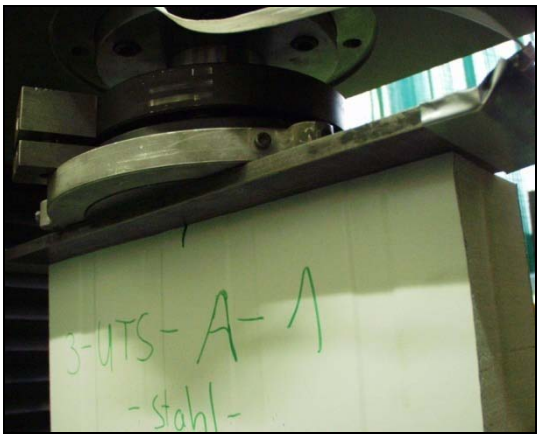
Test No.		**I-A-1**
type of test	introduction of load by contact	
load introduction	steel sheet	
type of panel	A	
faces	0,50 mm steel	
core	100 mm PU	
stressed face	top side of production	

Measured dimensions:		
width b	396	mm
height l	303	mm
thickness d	94	mm

ultimate load	9,22	kN
ultimate stress	49,1	N/mm^2
ultimate stress based on failed width	73,7	N/mm^2

Failure mode	crippling of the stressed face
Remarks	failed width 2/3b



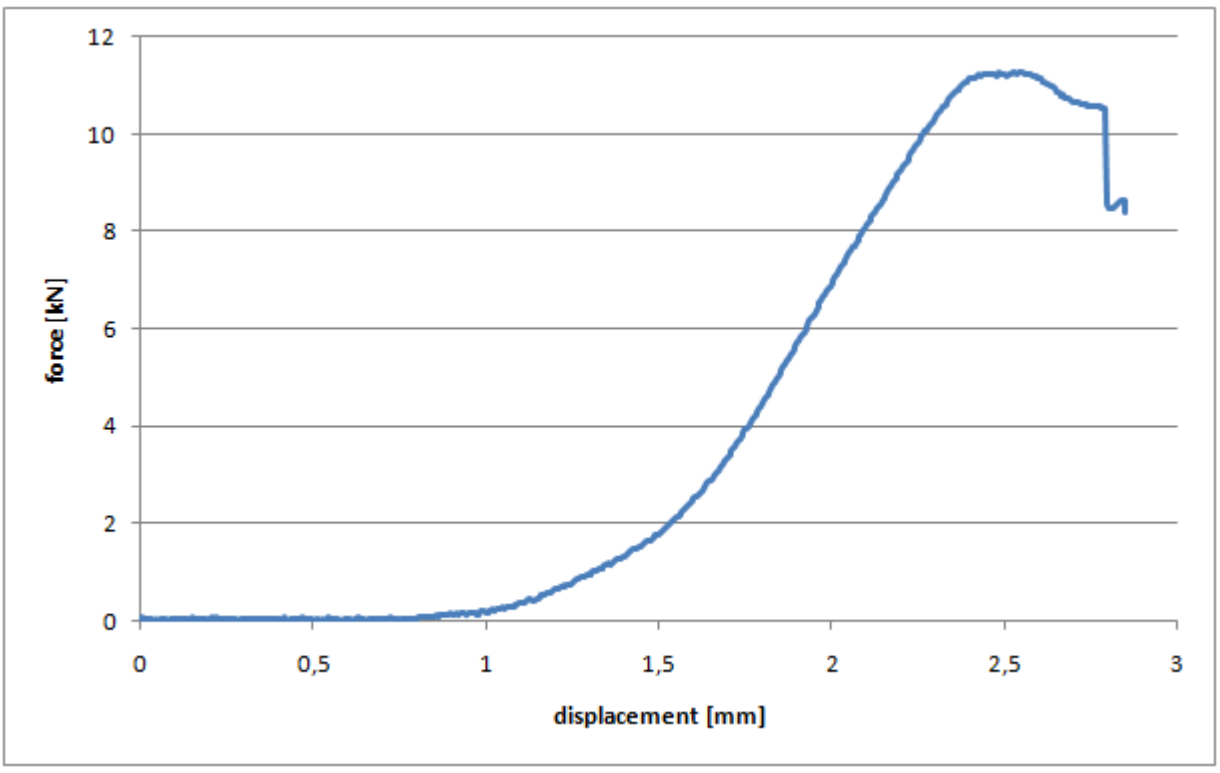
Test No.	**I-A-1**
	
Crippling of the stressed face	

Test No.		**I-A-2**
type of test	introduction of load by contact	
load introduction	steel sheet	
type of panel	A	
faces	0,50 mm steel	
core	100 mm PU	
stressed face	top side of production	

Measured dimensions:		
width b	399	mm
height l	299	mm
thickness d	94	mm

ultimate load	11,26	kN
ultimate stress	59,5	N/mm^2
ultimate stress based on failed width	71,4	N/mm^2

Failure mode	crippling of the stressed face
Remarks	failed width 5/6b



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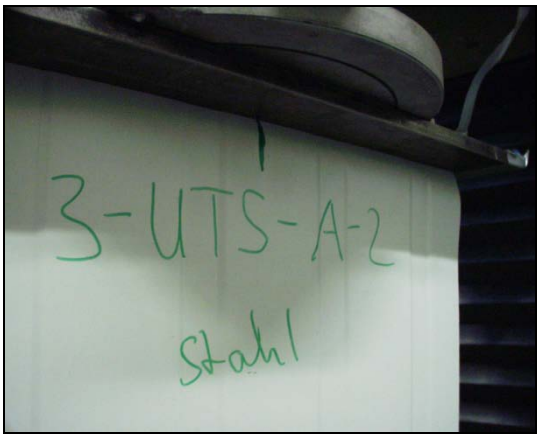
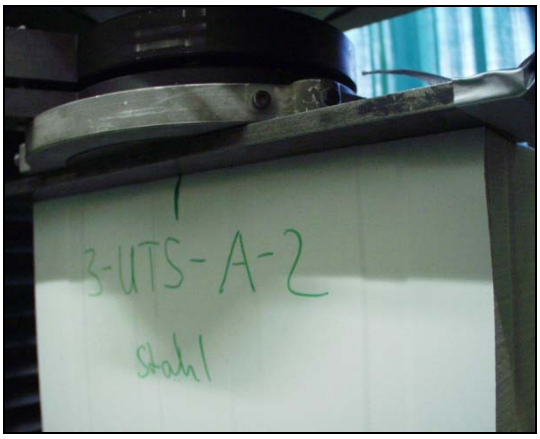
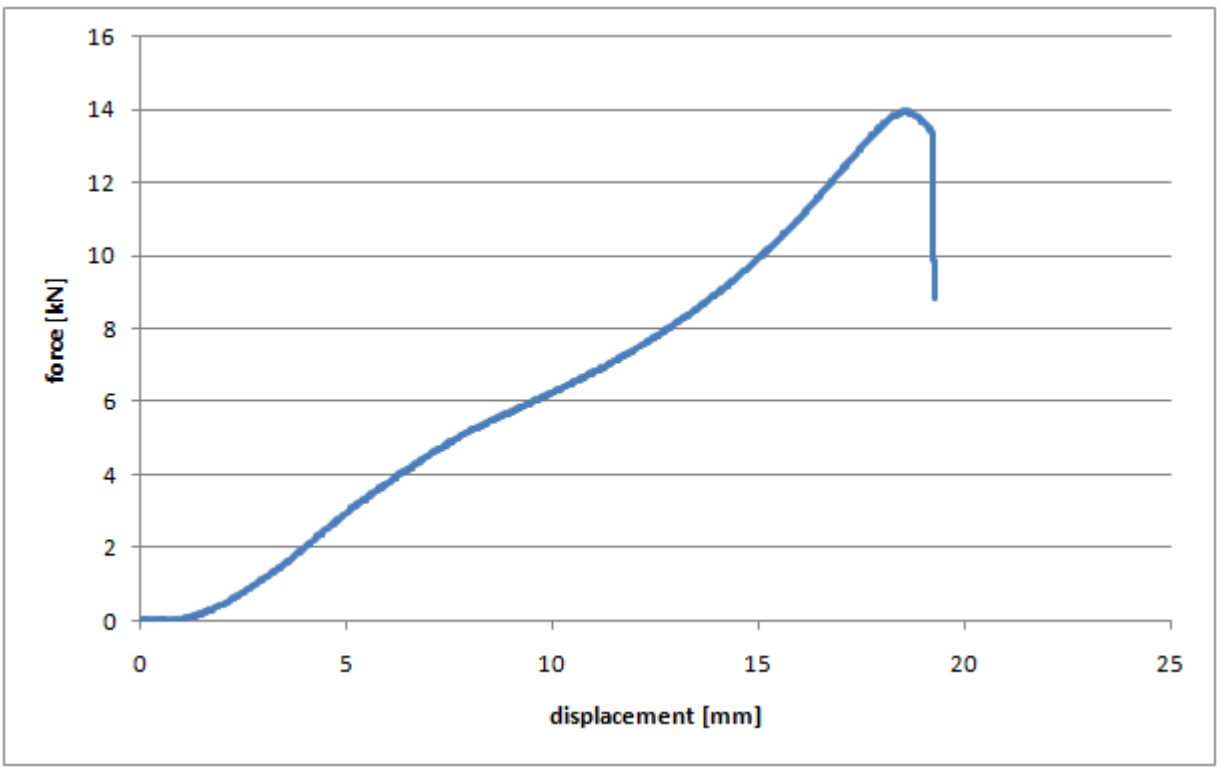
	
Crippling of the stressed face	

Test No.		**I-A-3**
type of test	introduction of load by contact	
load introduction	sandwich panel	
type of panel	A	
faces	0,50 mm steel	
core	100 mm PU	
stressed face	top side of production	

Measured dimensions:		
width b	396	mm
height l	299	mm
thickness d	96	mm

ultimate load	13,98	kN
ultimate stress	74,5	N/mm^2
ultimate stress based on failed width	74,5	N/mm^2

Failure mode	crippling of the stressed face
Remarks	failed width b



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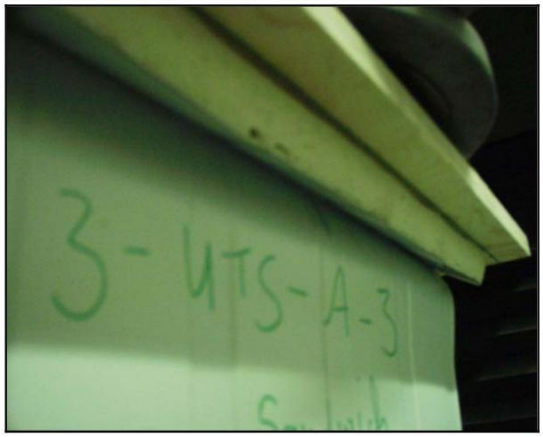
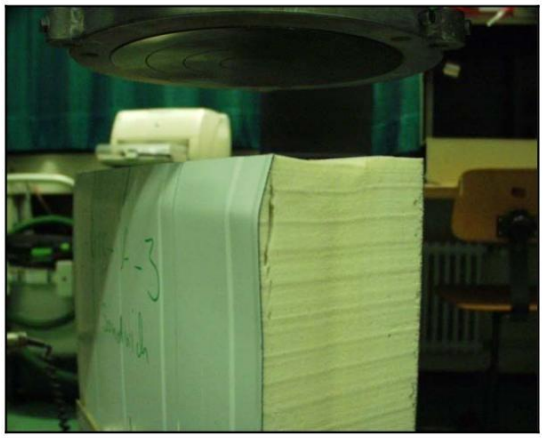
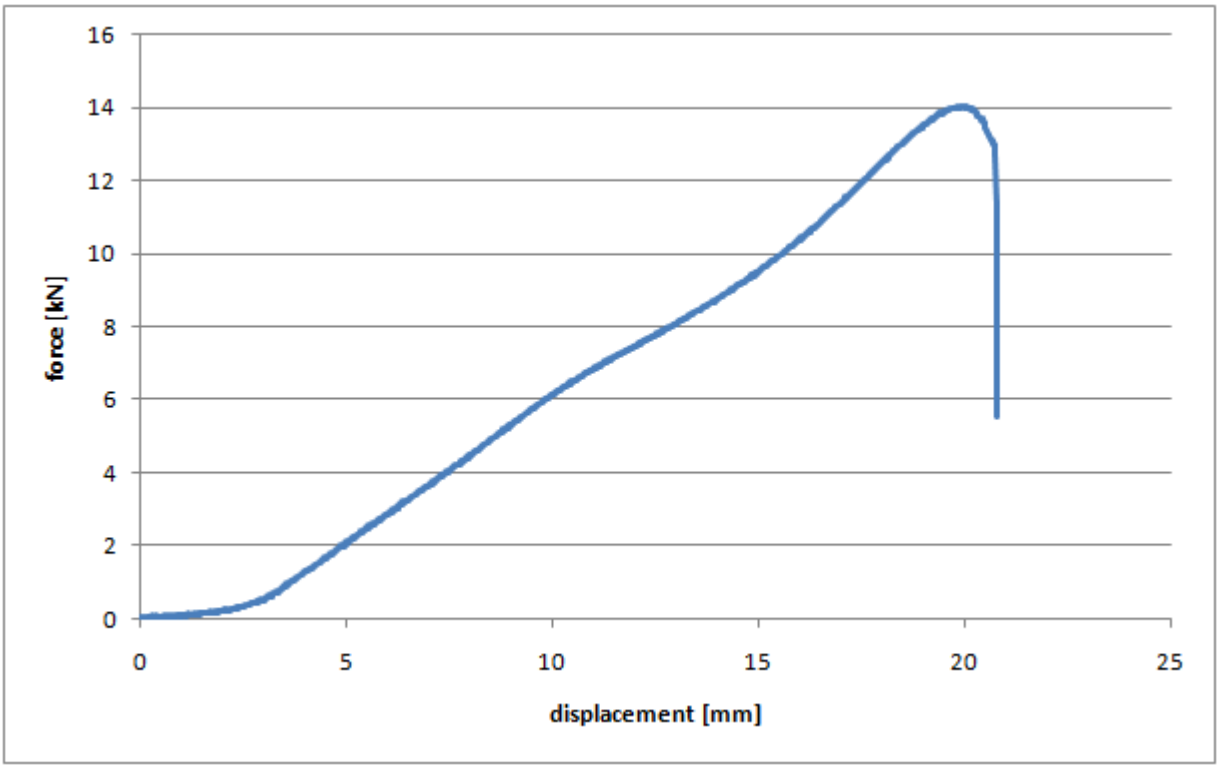
	
Failure of the stressed face	
	
Failure of the stressed face	

Test No.		**I-A-4**
type of test	introduction of load by contact	
load introduction	sandwich panel	
type of panel	A	
faces	0,50 mm steel	
core	100 mm PU	
stressed face	top side of production	
Measured dimensions:		
width b	397 mm	
height l	298 mm	
thickness d	97 mm	
ultimate load	14,03 kN	
ultimate stress	74,6 N/mm^2	
ultimate stress based on failed width	74,6 N/mm^2	
Failure mode	crippling o the stressed face, failure of core material	
Remarks	failed width b	



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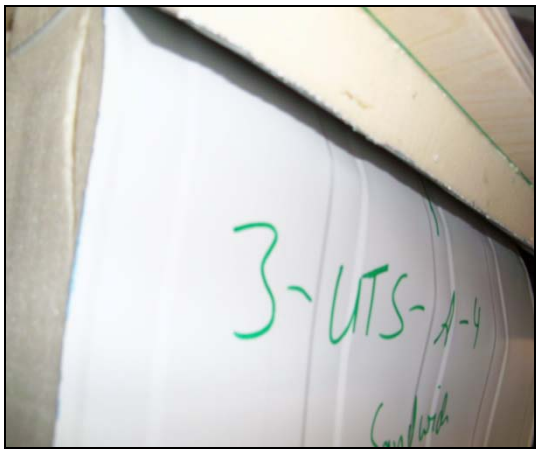
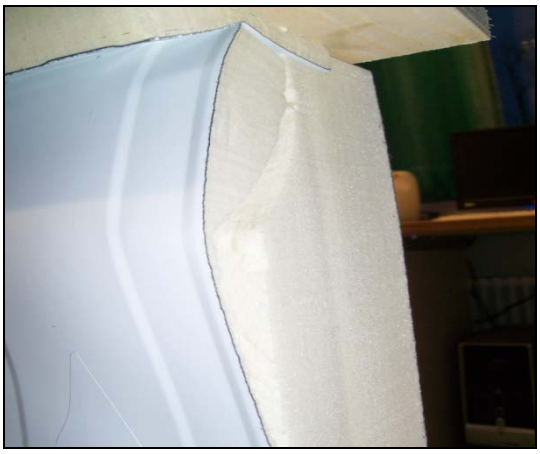
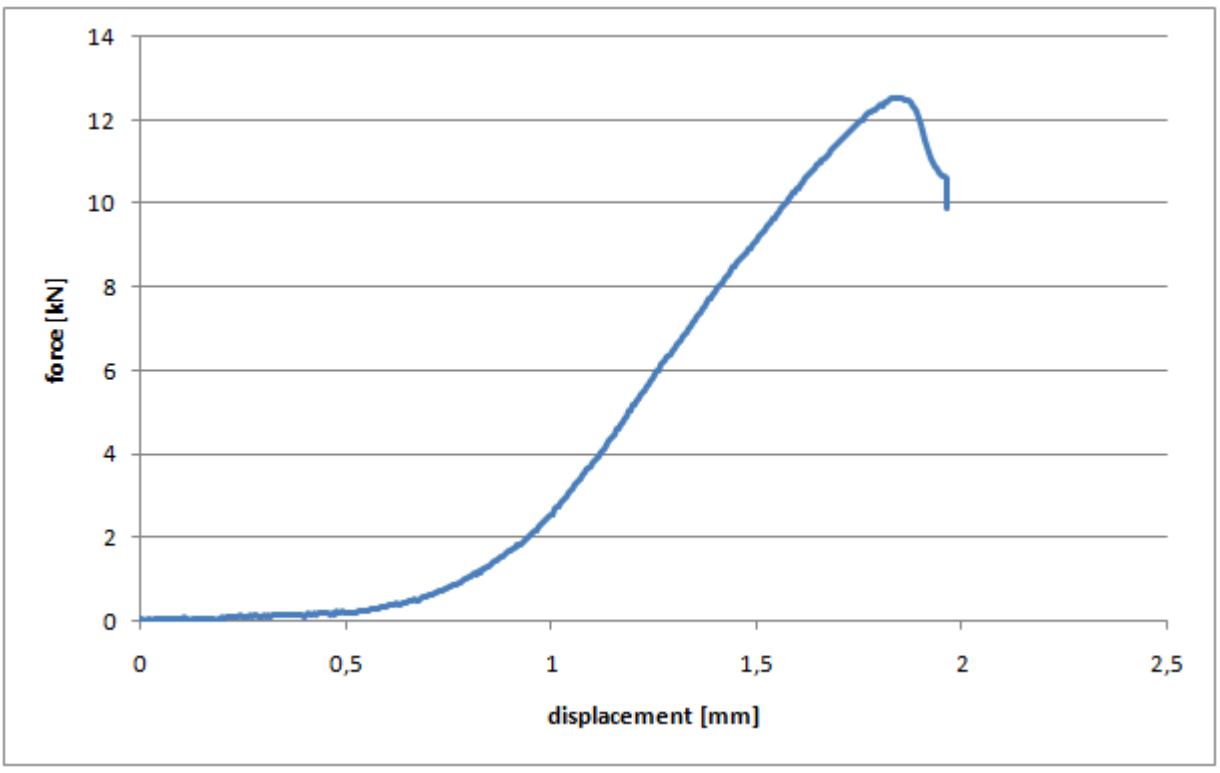
 Failure of the stressed face	

Test No.		**I-A-5**
type of test	introduction of load by contact	
load introduction	steel sheet	
type of panel	A	
faces	0,50 mm steel	
core	100 mm PU	
stressed face	bottom side of production	

Measured dimensions:		
width b	399	mm
height l	299	mm
thickness d	94	mm

ultimate load	12,53	kN
ultimate stress	66,5	N/mm^2
ultimate stress based on failed width	76,0	N/mm^2

Failure mode	crippling of the stressed face
Remarks	failed width 7/8b



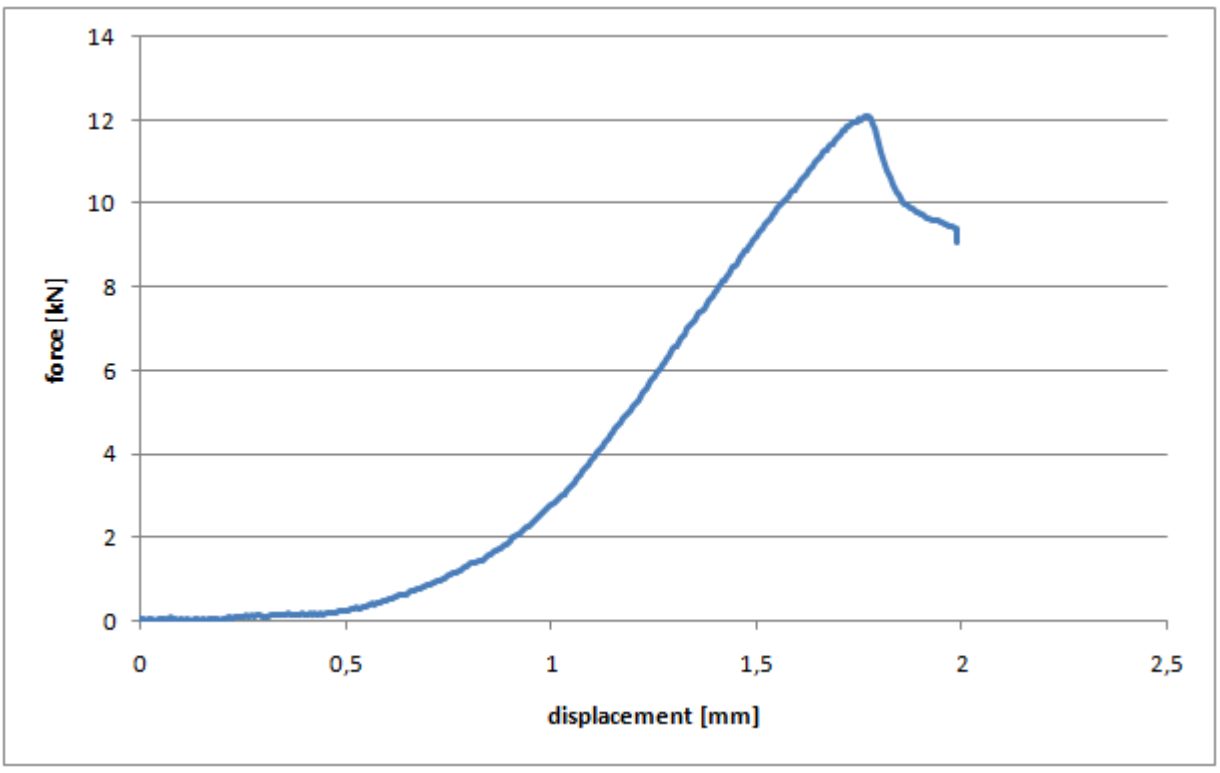
Test No.	**I-A-5**
	
Failure of the stressed face	

Test No.		**I-A-6**
type of test	introduction of load by contact	
load introduction	steel sheet	
type of panel	A	
faces	0,50 mm steel	
core	100 mm PU	
stressed face	bottom side of production	

Measured dimensions:		
width b	396	mm
height l	299	mm
thickness d	96	mm

ultimate load	12,11	kN
ultimate stress	64,8	N/mm^2
ultimate stress based on failed width	64,8	N/mm^2

Failure mode	crippling of the stressed face
Remarks	failed width 5/6b



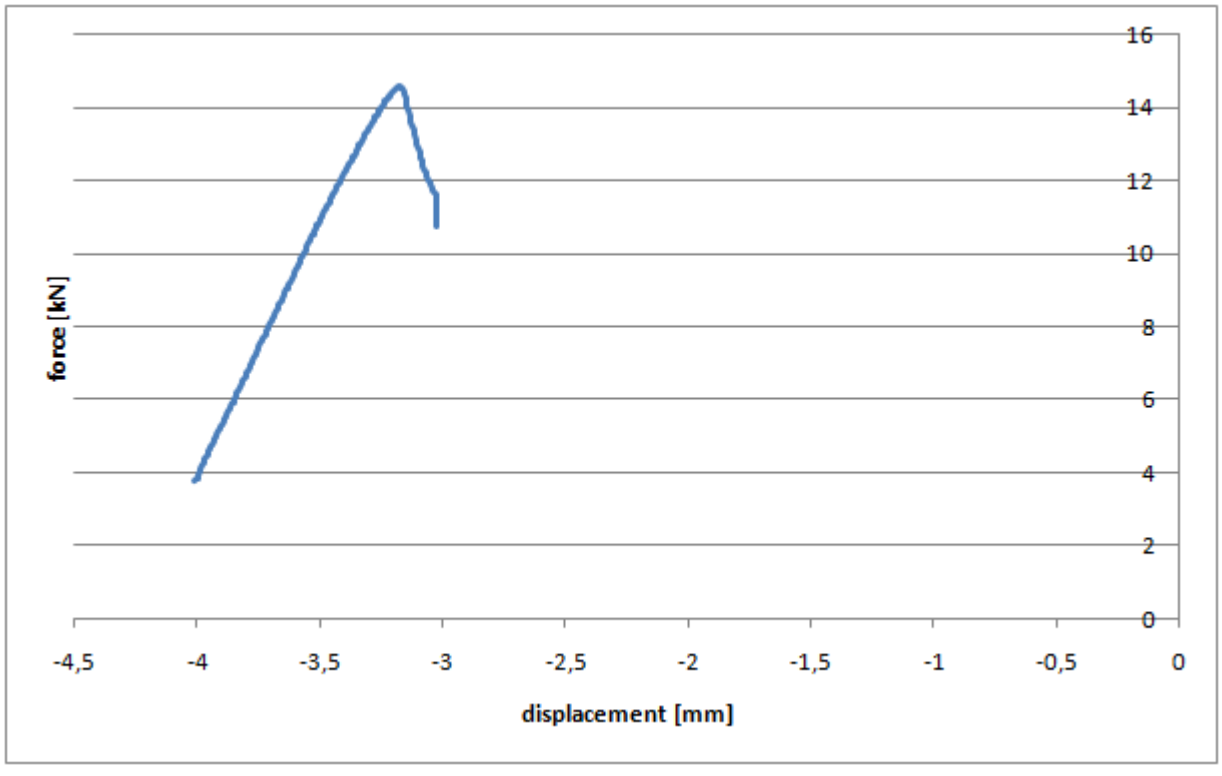
Test No.	**I-A-6**
	
crippling of the stressed face	

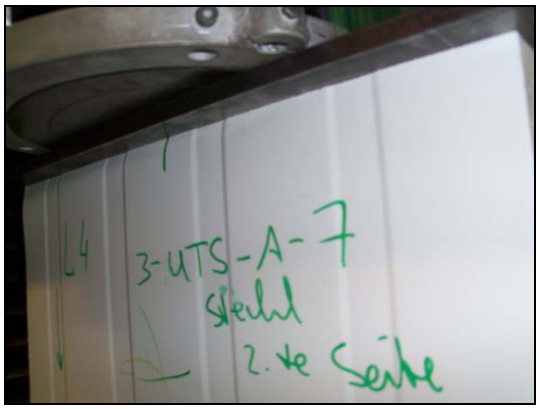
Test No.		**I-A-7**
type of test	introduction of load by contact	
load introduction	steel sheet	
type of panel	A	
faces	0,50 mm steel	
core	100 mm PU	
stressed face	bottom side of production	

Measured dimensions:		
width b	396	mm
height l	303	mm
thickness d	94	mm

ultimate load	14,58	kN
ultimate stress	78	N/mm^2
ultimate stress based on failed width	78	N/mm^2

Failure mode	crippling of the stressed face
Remarks	failed width b



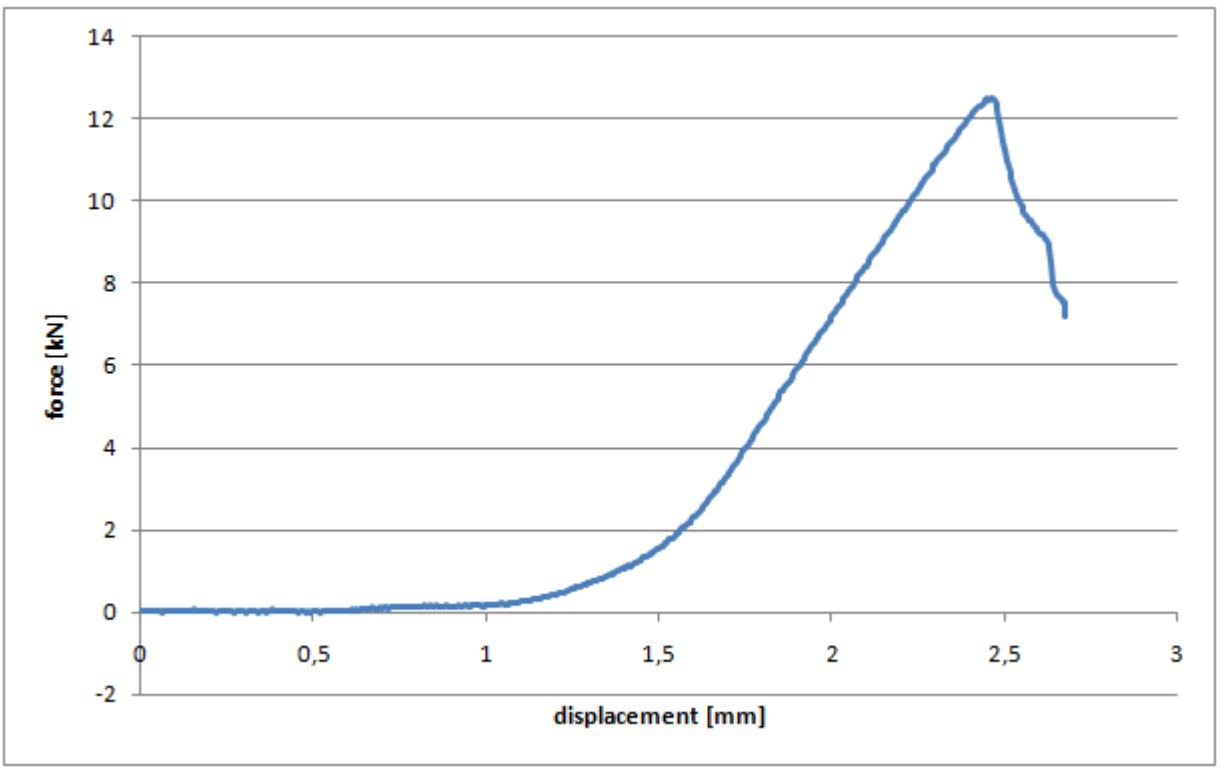
Test No.	**I-A-7**
	
crippling of the stressed face	

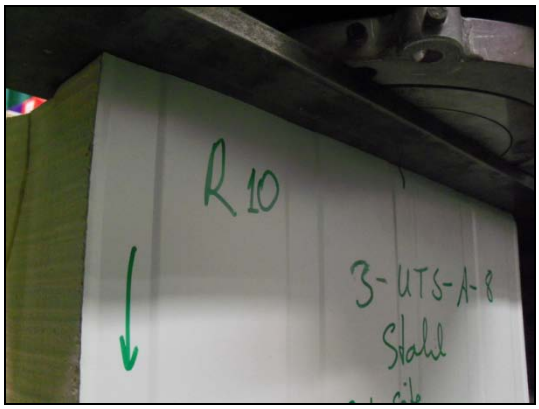
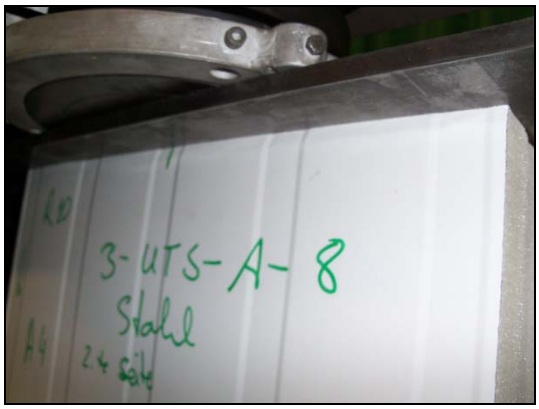
Test No.		**I-A-8**
type of test	introduction of load by contact	
load introduction	steel sheet	
type of panel	A	
faces	0,50 mm steel	
core	100 mm PU	
stressed face	bottom side of production	

Measured dimensions:		
width b	397	mm
height l	298	mm
thickness d	97	mm

ultimate load	12,5	kN
ultimate stress	66,7	N/mm^2
ultimate stress based on failed width	77,8	N/mm^2

Failure mode	crippling of the stressed face
Remarks	failed width 6/7b



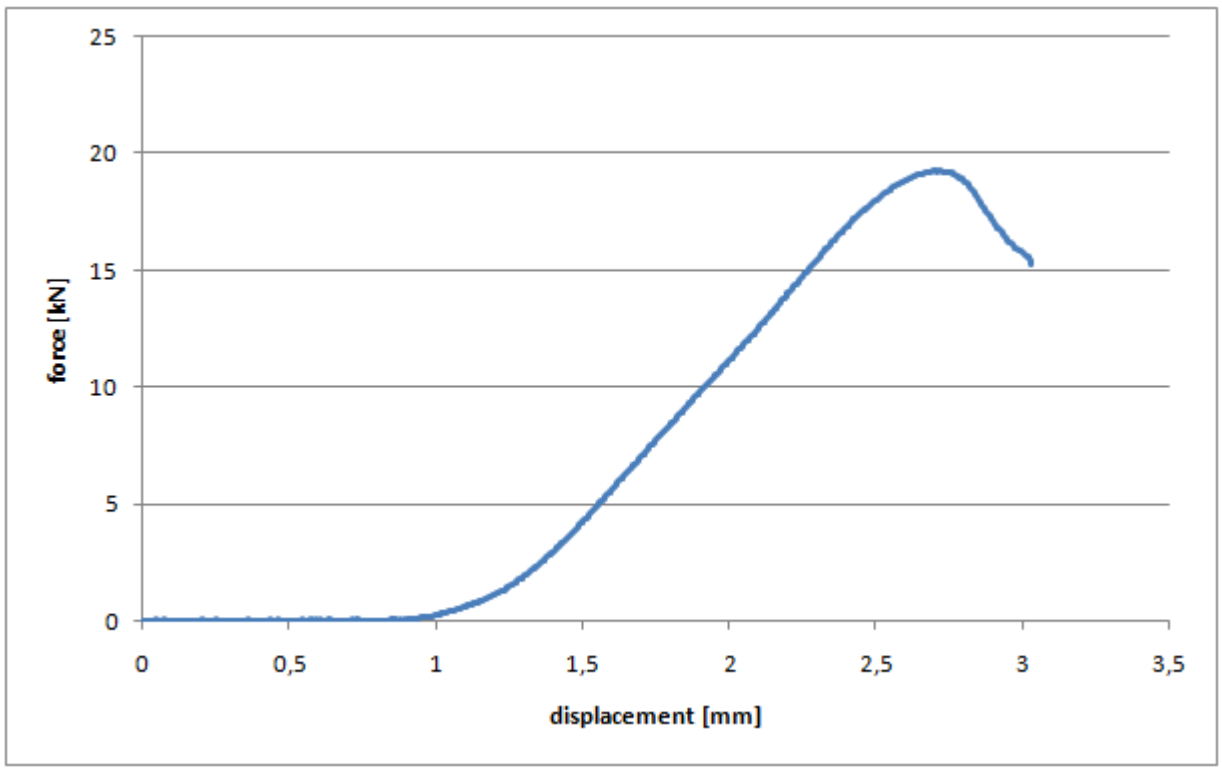
Test No.	**I-A-8**
	
crippling of the stressed face	

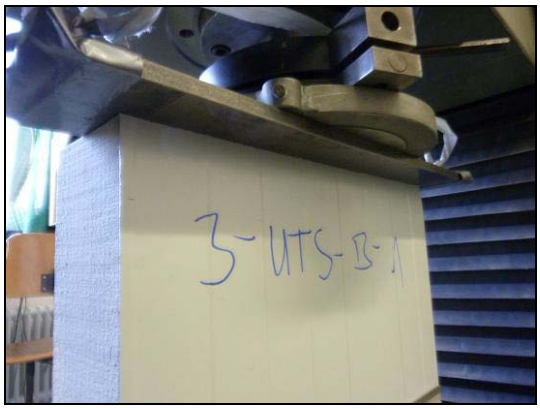
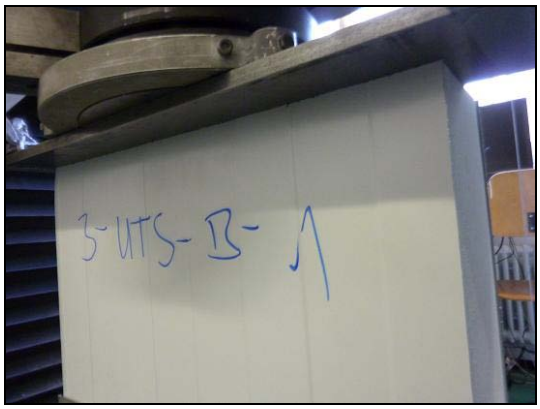
Test No.		**I-B-1**
type of test	introduction of load by contact	
load introduction	steel sheet	
type of panel	B	
faces	0,75 mm steel	
core	100 mm PU	
stressed face	-	

Measured dimensions:		
width b	400	mm
height l	302	mm
thickness d	100	mm

ultimate load	19,24	kN
ultimate stress	63,1	N/mm^2
ultimate stress based on failed width	63,1	N/mm^2

Failure mode	crippling of the stressed face
Remarks	failed width b



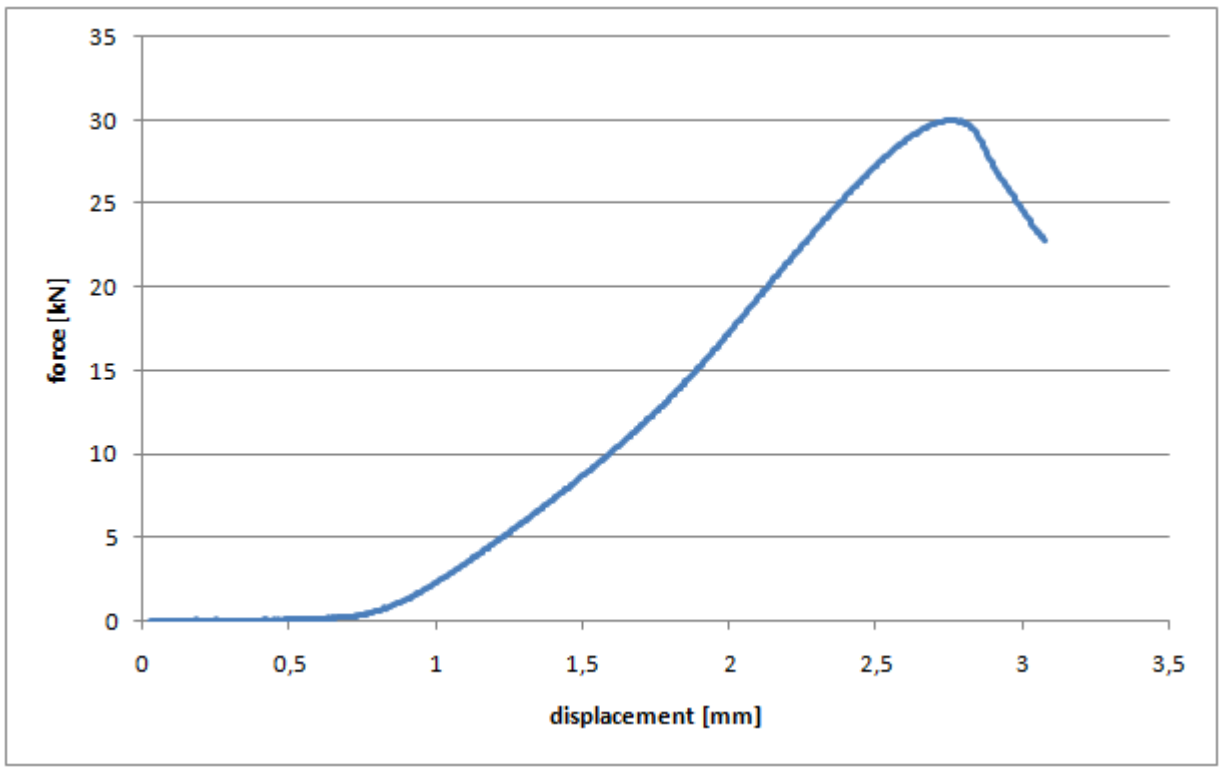
Test No.	**I-B-1**
 Failure of the stressed face	
 Compound between core and face	

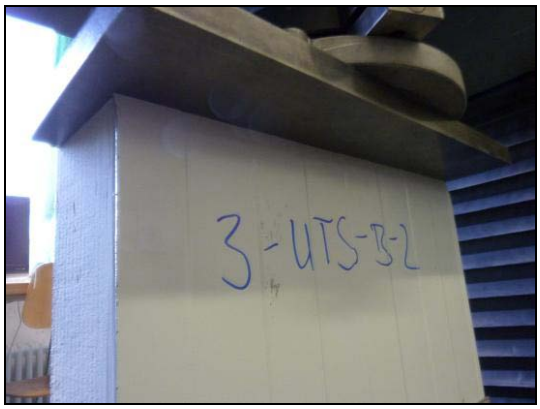
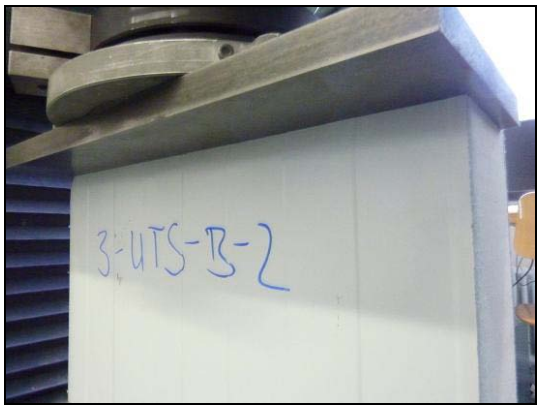
Test No.		**I-B-2**
type of test	introduction of load by contact	
load introduction	steel sheet	
type of panel	B	
faces	0,75 mm steel	
core	100 mm PU	
stressed face	-	

Measured dimensions:		
width b	400	mm
height l	302	mm
thickness d	100	mm

ultimate load	29,95	kN
ultimate stress	98,3	N/mm^2
ultimate stress based on failed width	98,3	N/mm^2

Failure mode	crippling of the stressed face
Remarks	failed width b



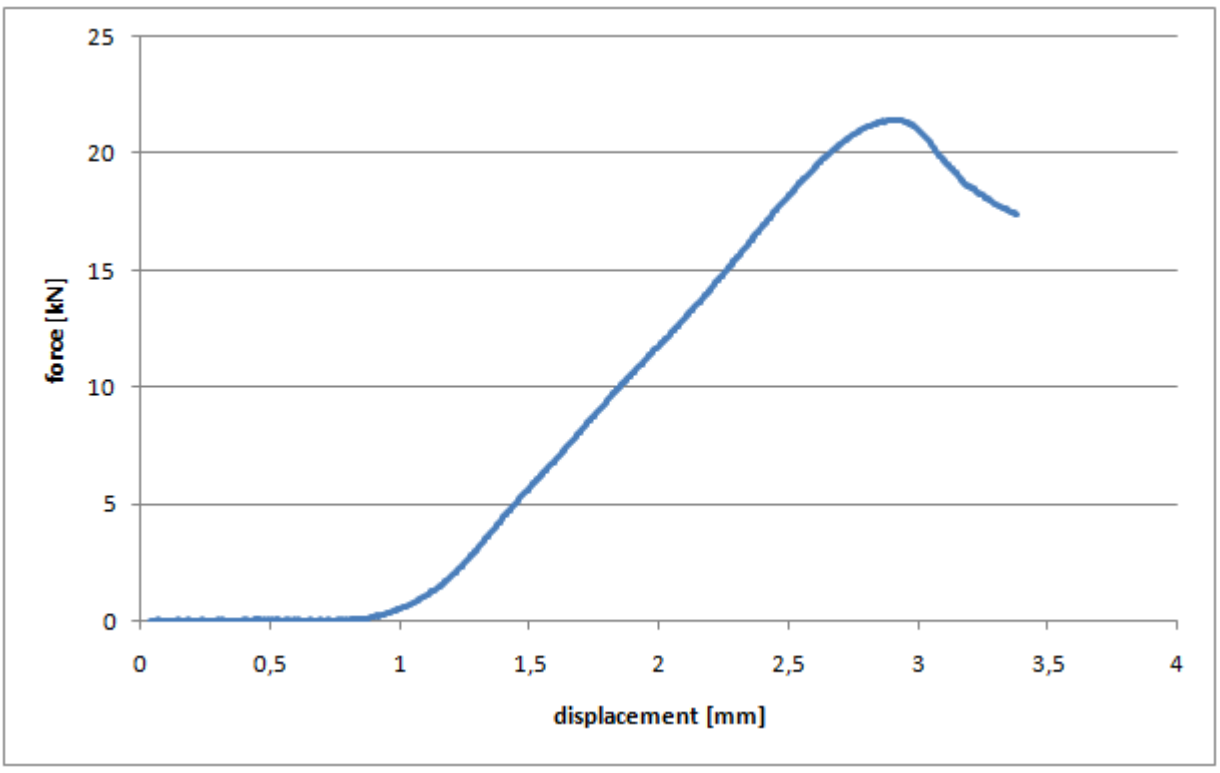
Test No.	**I-B-2**
 Failure of the stressed face	
 Compound between core and face	

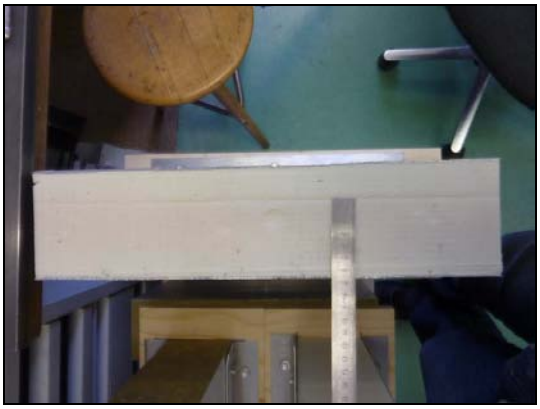
Test No.		**I-B-3**
type of test	introduction of load by contact	
load introduction	steel sheet	
type of panel	B	
faces	0,75 mm steel	
core	100 mm PU	
stressed face	-	

Measured dimensions:		
width b	399	mm
height l	297	mm
thickness d	100	mm

ultimate load	21,42	kN
ultimate stress	70,5	N/mm^2
ultimate stress based on failed width	70,5	N/mm^2

Failure mode	crippling of the stressed face
Remarks	failed width b



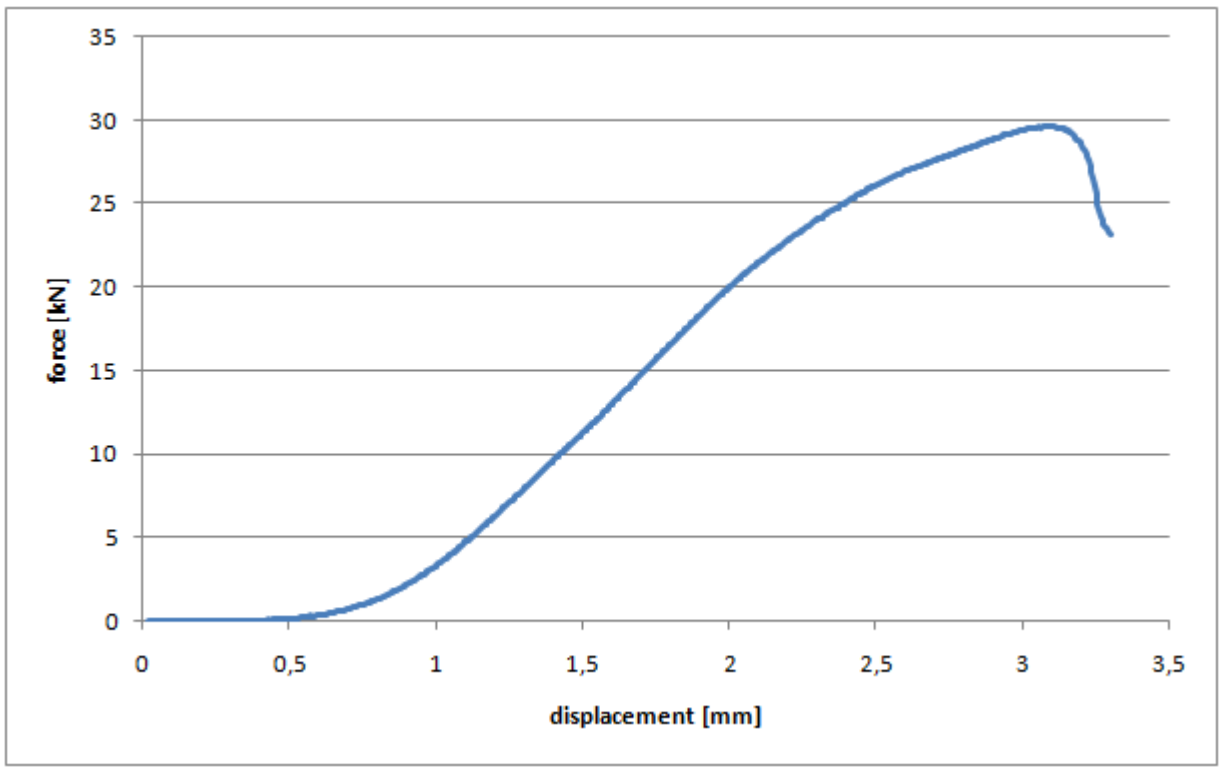
Test No.	**I-B-3**
	
Failure of the stressed face	
	
Compound between core and face	

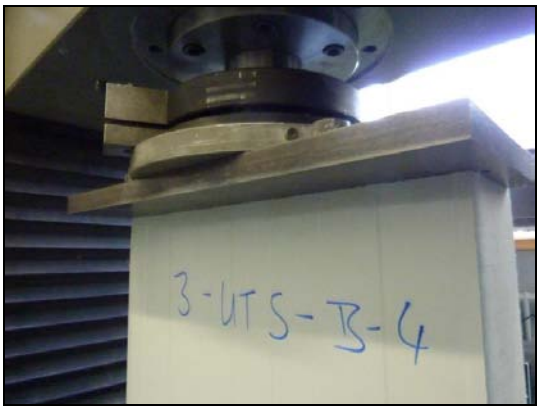
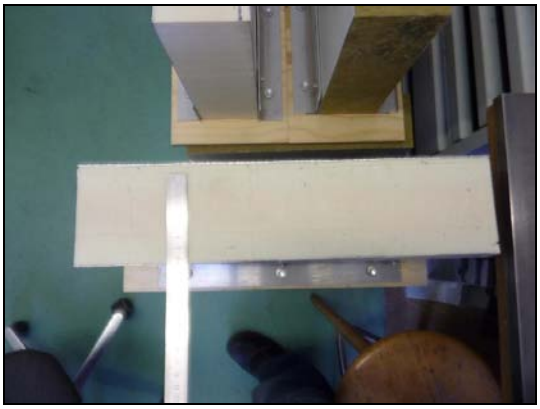
Test No.		**I-B-4**
type of test	introduction of load by contact	
load introduction	steel sheet	
type of panel	B	
faces	0,75 mm steel	
core	100 mm PU	
stressed face	-	

Measured dimensions:		
width b	399	mm
height l	297	mm
thickness d	100	mm

ultimate load	29,61	kN
ultimate stress	97,4	N/mm^2
ultimate stress based on failed width	97,4	N/mm^2

Failure mode	crippling of the stressed face
Remarks	failed width b



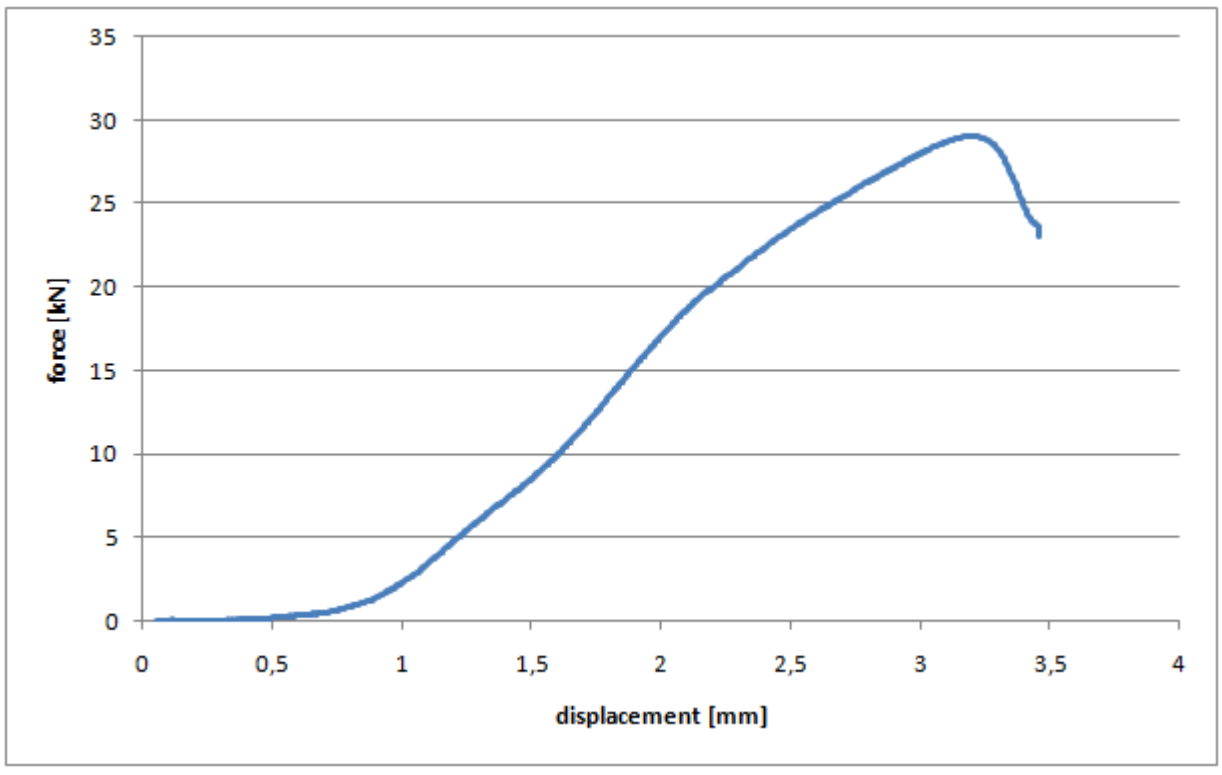
Test No.	**I-B-4**
	
Failure of the stressed face	
	
Compound between core and face	

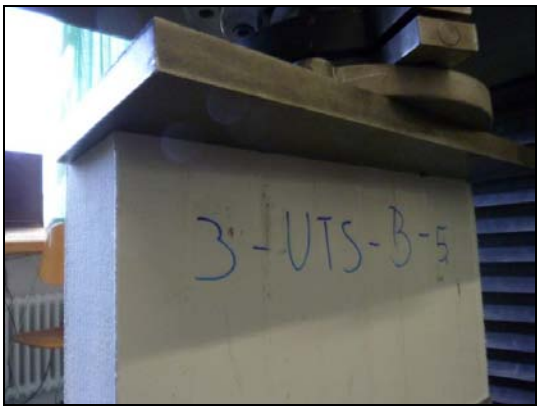
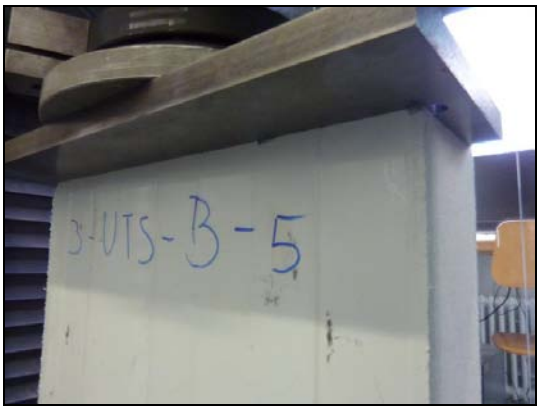
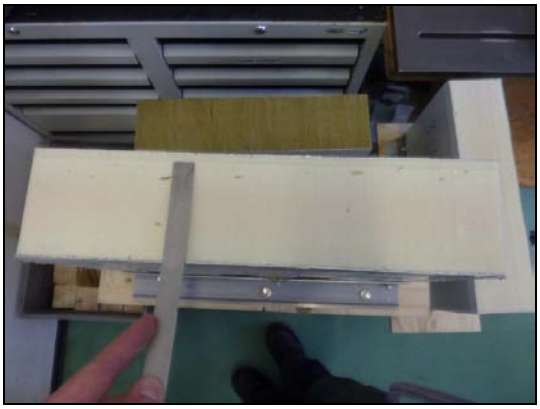
Test No.		**I-B-5**
type of test	introduction of load by contact	
load introduction	steel sheet	
type of panel	B	
faces	0,75 mm steel	
core	100 mm PU	
stressed face	-	

Measured dimensions:		
width b	400	mm
height l	295	mm
thickness d	99,5	mm

ultimate load	29,02	kN
ultimate stress	95,2	N/mm^2
ultimate stress based on failed width	95,2	N/mm^2

Failure mode	crippling of stressed face
Remarks	failed width b



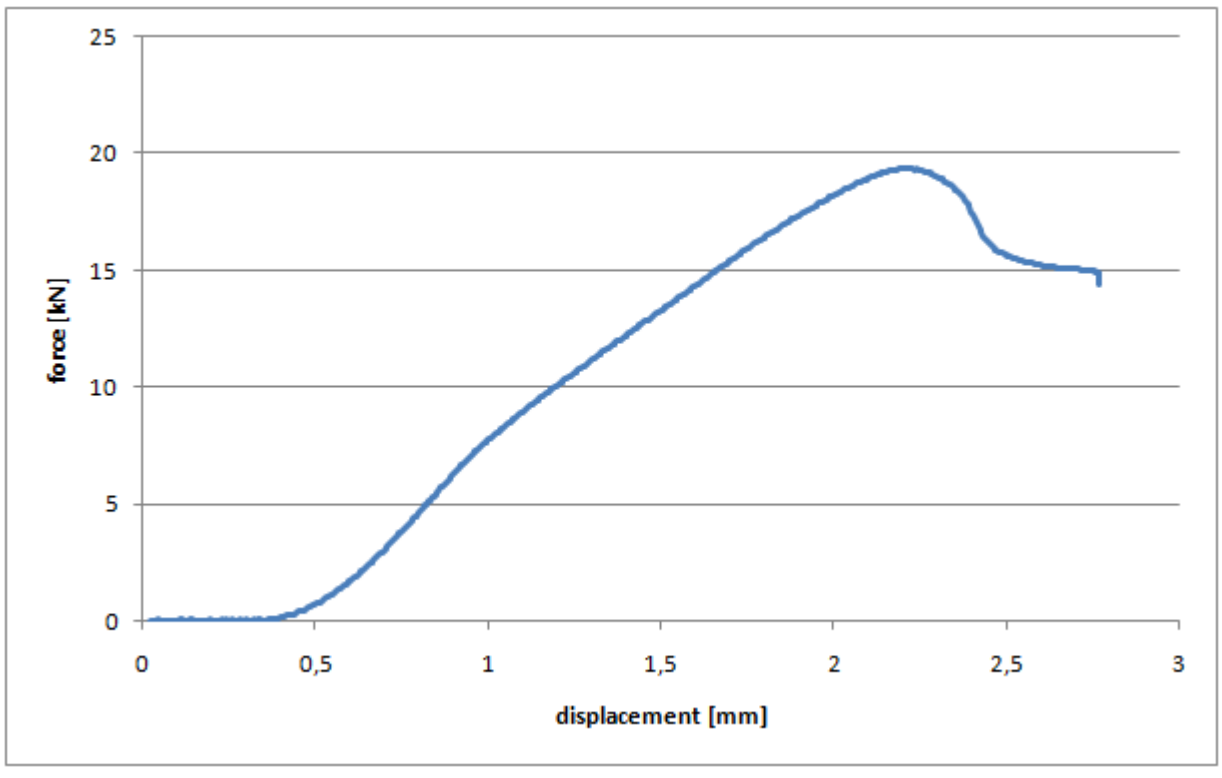
Test No.	**I-B-5**
 Failure of the stressed face	
 Compound between core and face	

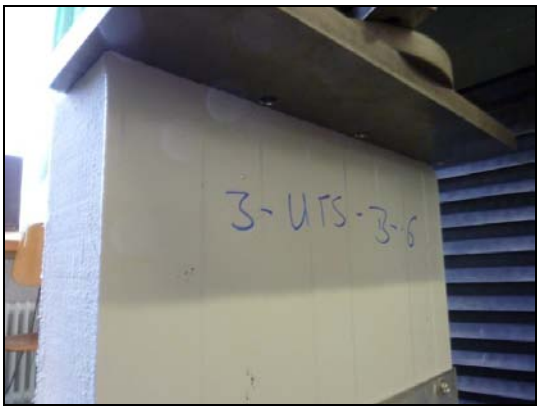
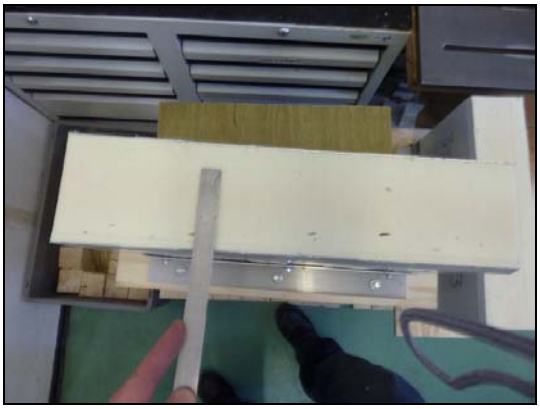
Test No.		**I-B-6**
type of test	introduction of load by contact	
load introduction	steel sheet	
type of panel	B	
faces	0,75 mm steel	
core	100 mm PU	
stressed face	-	

Measured dimensions:		
width b	400	mm
height l	295	mm
thickness d	99,5	mm

ultimate load	19,40	kN
ultimate stress	63,7	N/mm^2
ultimate stress based on failed width	63,7	N/mm^2

Failure mode	crippling of stressed face
Remarks	failed width b



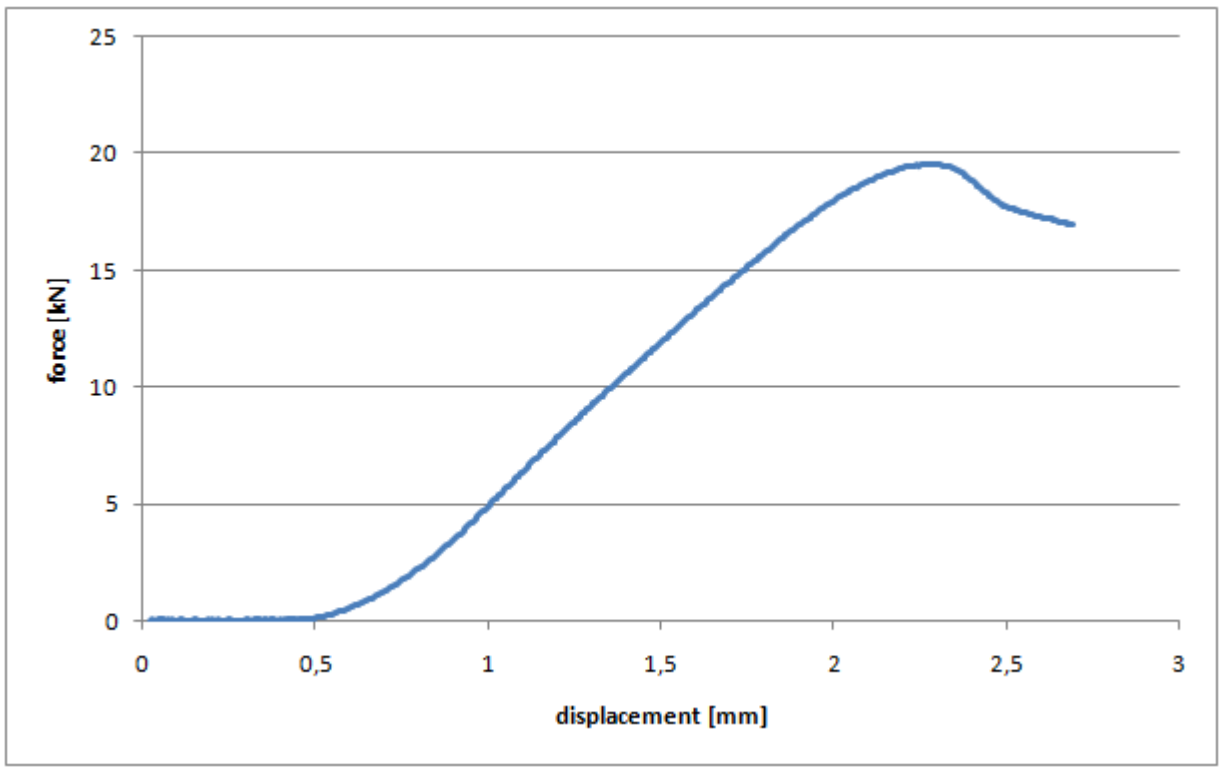
Test No.	**I-B-6**
 Failure of the stressed face	
 Compound between core and face	

Test No.		**I-B-7**
type of test	introduction of load by contact	
load introduction	steel sheet	
type of panel	B	
faces	0,75 mm steel	
core	100 mm PU	
stressed face	-	

Measured dimensions:		
width b	399	mm
height l	301	mm
thickness d	99,5	mm

ultimate load	19,54	kN
ultimate stress	64,3	N/mm^2
ultimate stress based on failed width	64,3	N/mm^2

Failure mode	crippling of the stressed face
Remarks	failed width b



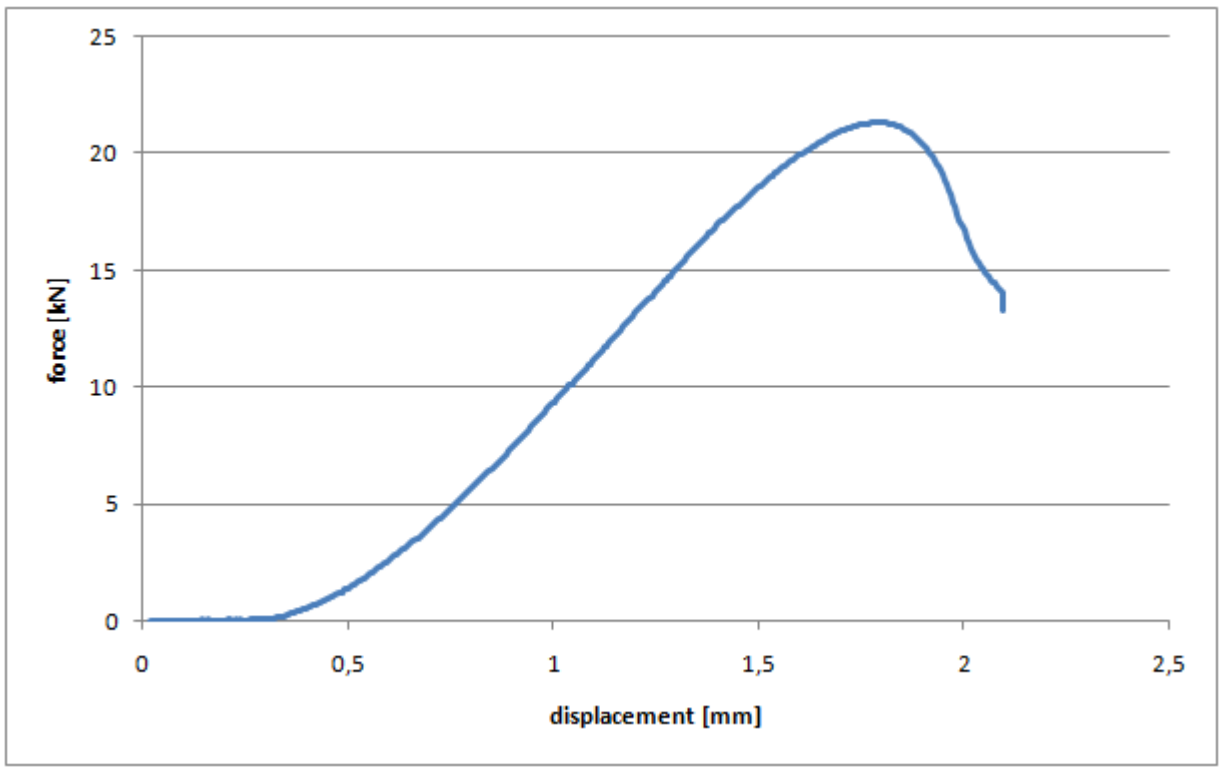
Test No.	**I-B-7**
 Failure of the stressed face	
 Compound between core and face	

Test No.		**I-B-8**
type of test	introduction of load by contact	
load introduction	steel sheet	
type of panel	B	
faces	0,75 mm steel	
core	100 mm PU	
stressed face	-	

Measured dimensions:		
width b	399	mm
height l	301	mm
thickness d	99,5	mm

ultimate load	21,33	kN
ultimate stress	70,2	N/mm^2
ultimate stress based on failed width	70,2	N/mm^2

Failure mode	crippling of the stressed face
Remarks	failed width b



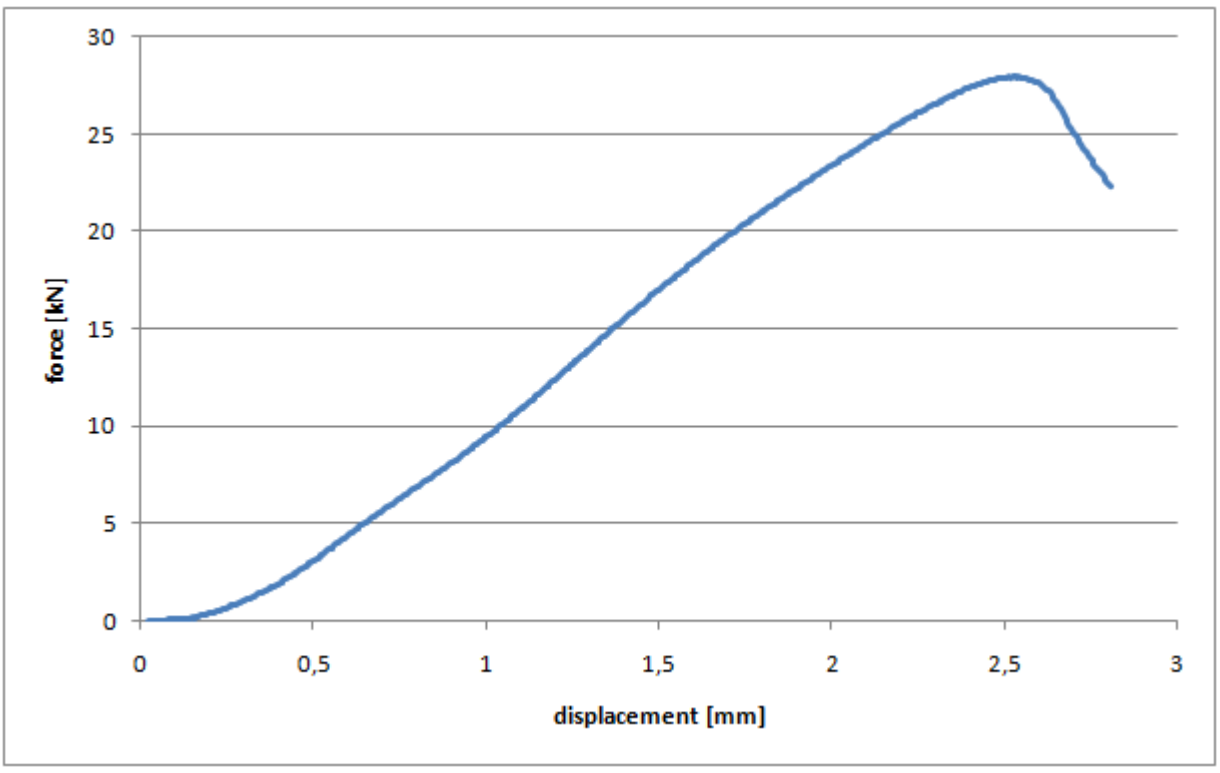
Test No.	**I-B-8**
 Compound between core and face	

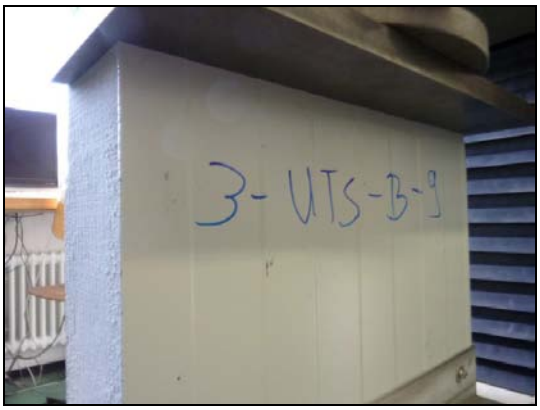
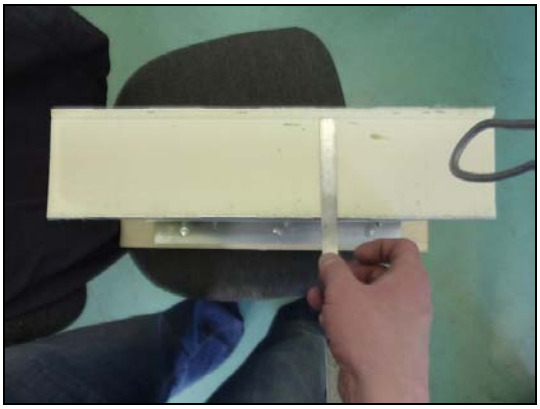
Test No.		**I-B-9**
type of test	introduction of load by contact	
load introduction	steel sheet	
type of panel	B	
faces	0,75 mm steel	
core	100 mm PU	
stressed face	-	

Measured dimensions:		
width b	399	mm
height l	299	mm
thickness d	100	mm

ultimate load	28,01	kN
ultimate stress	92,1	N/mm^2
ultimate stress based on failed width	92,1	N/mm^2

Failure mode	crippling of the stressed face
Remarks	failed width b



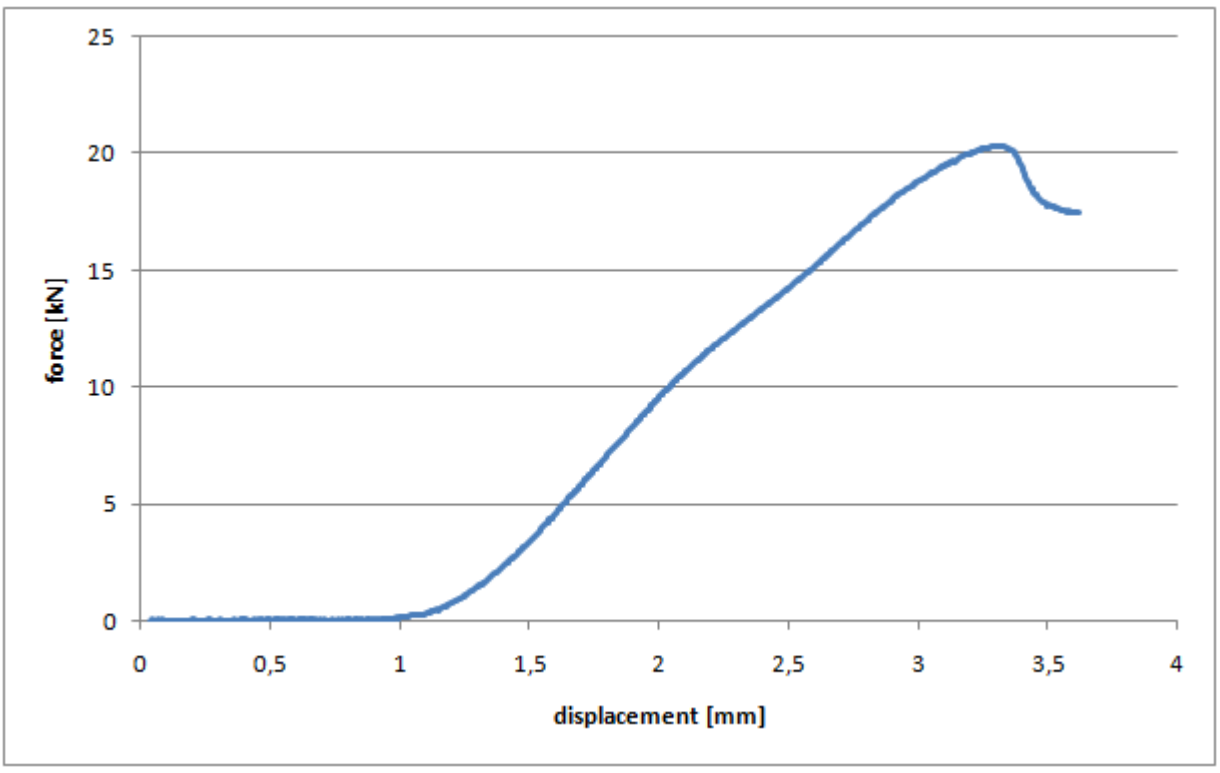
Test No.	**I-B-9**
 Failure of the stressed face	
 Compound between core and face	

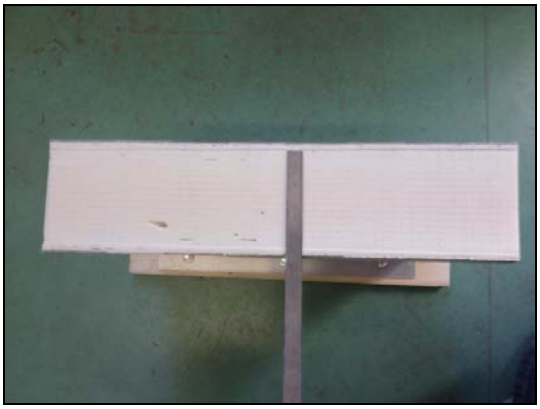
Test No.		**I-B-10**
type of test	introduction of load by contact	
load introduction	steel sheet	
type of panel	B	
faces	0,75 mm steel	
core	100 mm PU	
stressed face	-	

Measured dimensions:		
width b	399	mm
height l	299	mm
thickness d	100	mm

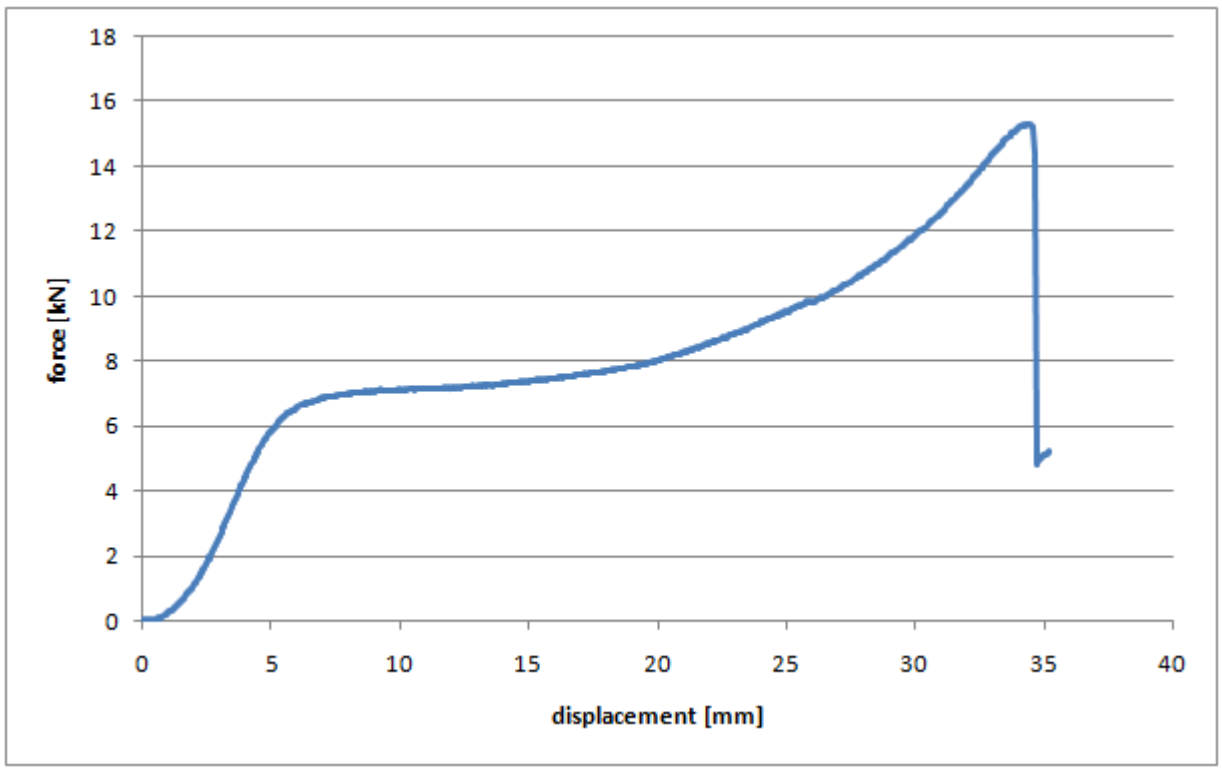
ultimate load	20,33	kN
ultimate stress	66,9	N/mm^2
ultimate stress based on failed width	66,9	N/mm^2

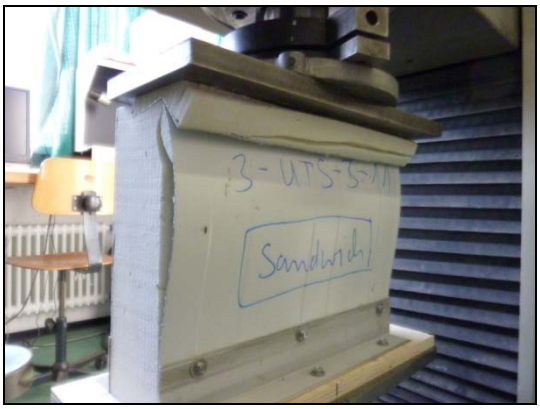
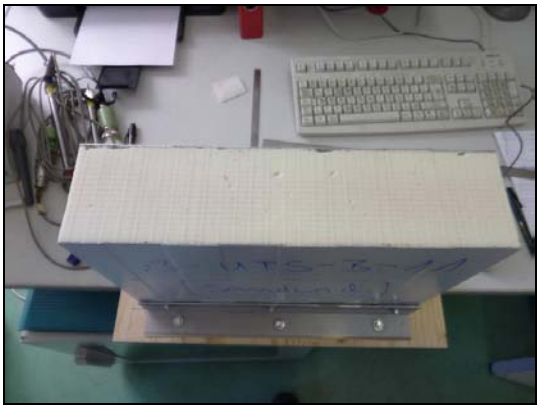
Failure mode	crippling of the stressed face
Remarks	failed width b



Test No.	**I-B-10**
 Failure of the stressed face	
 Compound between core and face	

Test No.		**I-B-11**
type of test	introduction of load by contact	
load introduction	sandwich panel	
type of panel	B	
faces	0,75 mm steel	
core	100 mm PU	
stressed face	-	
Measured dimensions:		
width b	399 mm	
height l	299 mm	
thickness d	99 mm	
ultimate load	15,30 kN	
ultimate stress	50,3 N/mm^2	
ultimate stress based on failed width	50,3 N/mm^2	
Failure mode	long wave buckling of the stressed face	
Remarks	failed width b	



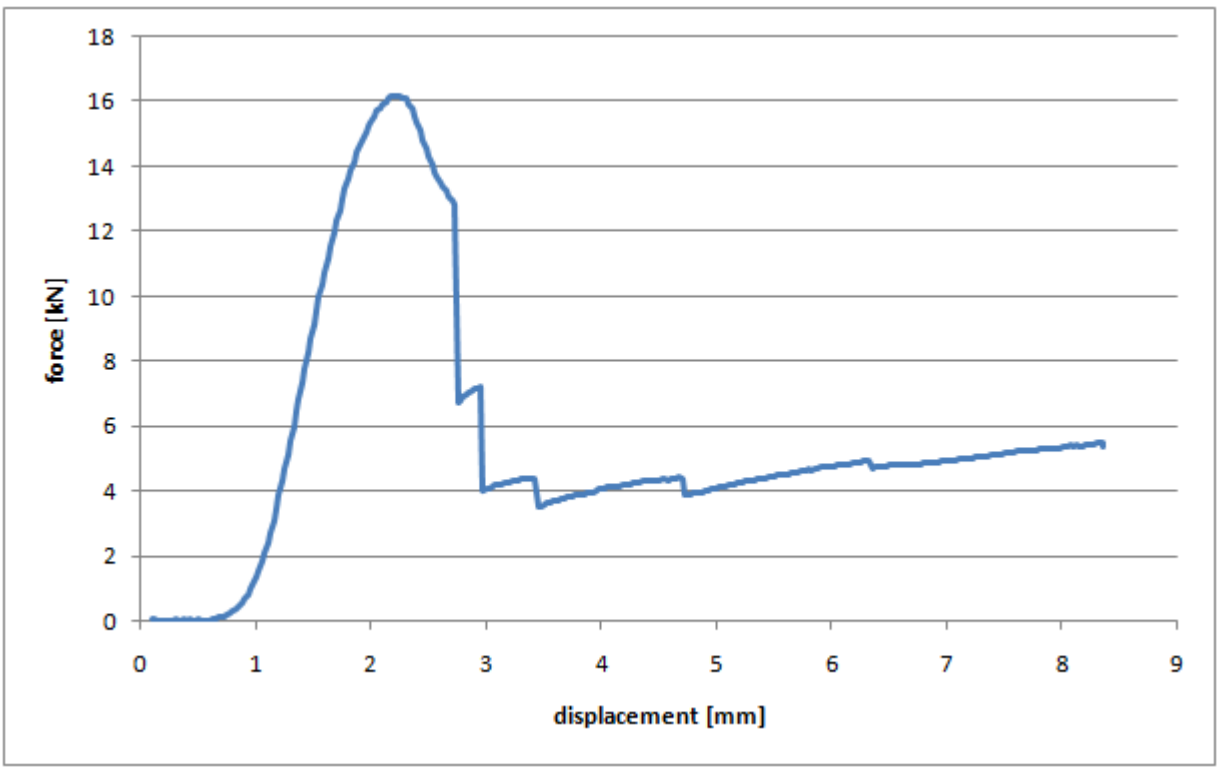
Test No.	**I-B-11**
 Failure of the stressed face	
 Compound between core and face	

Test No.		**I-B-12**
type of test	introduction of load by contact	
load introduction	steel sheet	
type of panel	B	
faces	0,75 mm steel	
core	100 mm PU	
stressed face	-	

Measured dimensions:		
width b	399	mm
height l	299	mm
thickness d	99	mm

ultimate load	16,16	kN
ultimate stress	53,2	N/mm^2
ultimate stress based on failed width	53,2	N/mm^2

Failure mode	long wave buckling of the stressed face
Remarks	failed width b



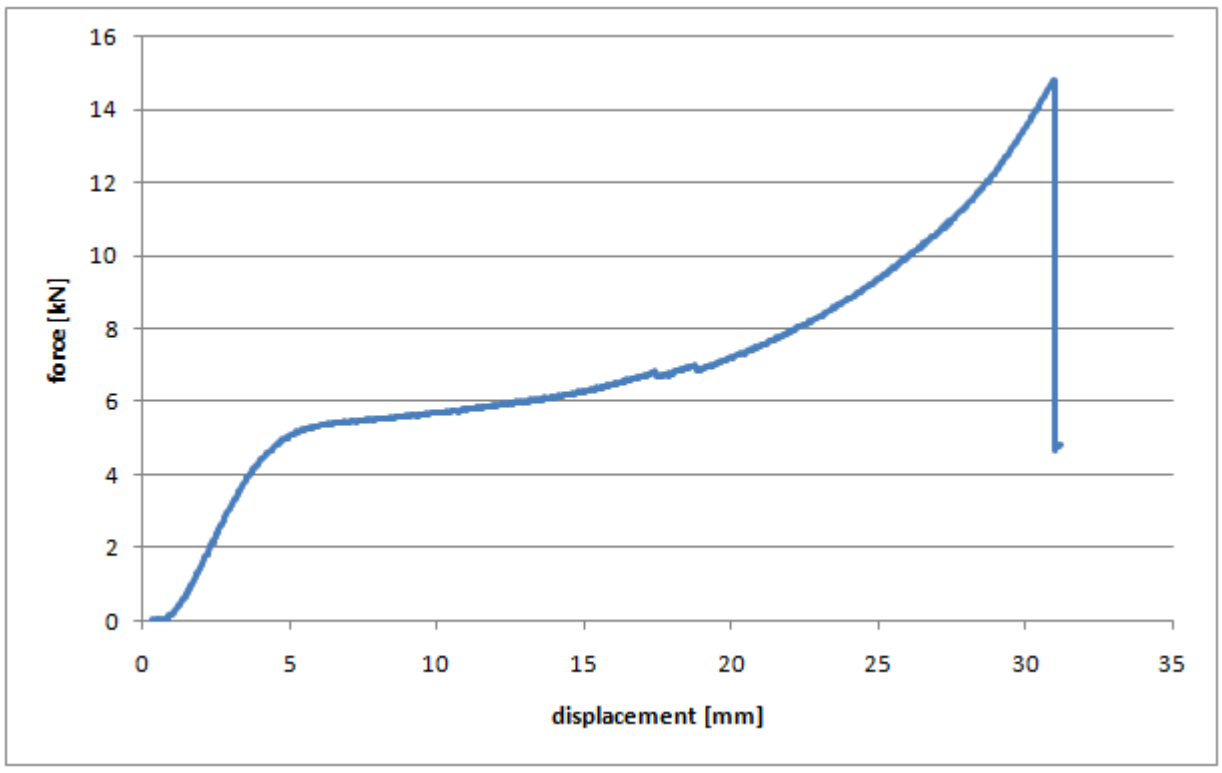
Test No.	**I-B-12**
	
Failure of the stressed face	
	
Compound between core and face	

Test No.		**I-B-13**
type of test	introduction of load by contact	
load introduction	sandwich panel	
type of panel	B	
faces	0,75 mm steel	
core	100 mm PU	
stressed face	-	

Measured dimensions:		
width b	400	mm
height l	299	mm
thickness d	100	mm

ultimate load	14,82	kN
ultimate stress	48,6	N/mm^2
ultimate stress based on failed width	48,6	N/mm^2

Failure mode	long wave buckling of the stressed face
Remarks	failed width b



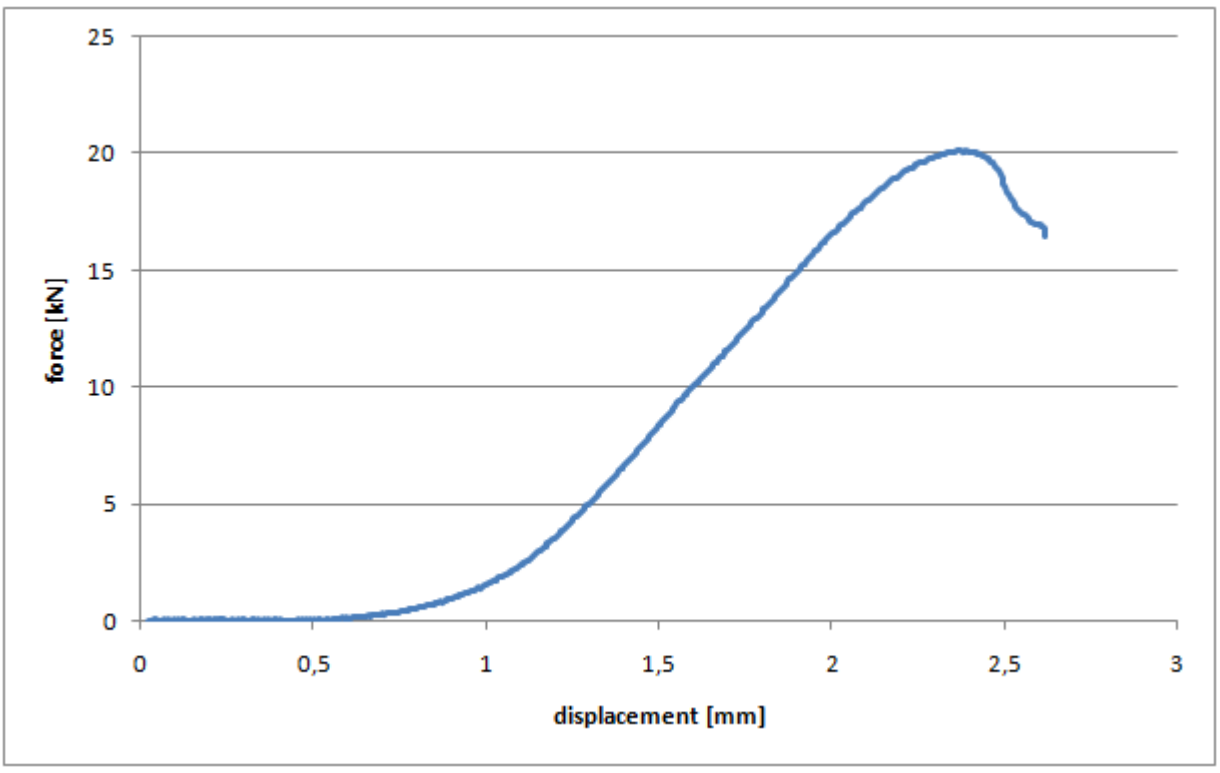
Test No.	**I-B-13**
	
Failure of the stressed face	
	
Compound between core and face	

Test No.		**I-B-14**
type of test	introduction of load by contact	
load introduction	steel sheet	
type of panel	B	
faces	0,75 mm steel	
core	100 mm PU	
stressed face	-	

Measured dimensions:		
width b	400	mm
height l	299	mm
thickness d	100	mm

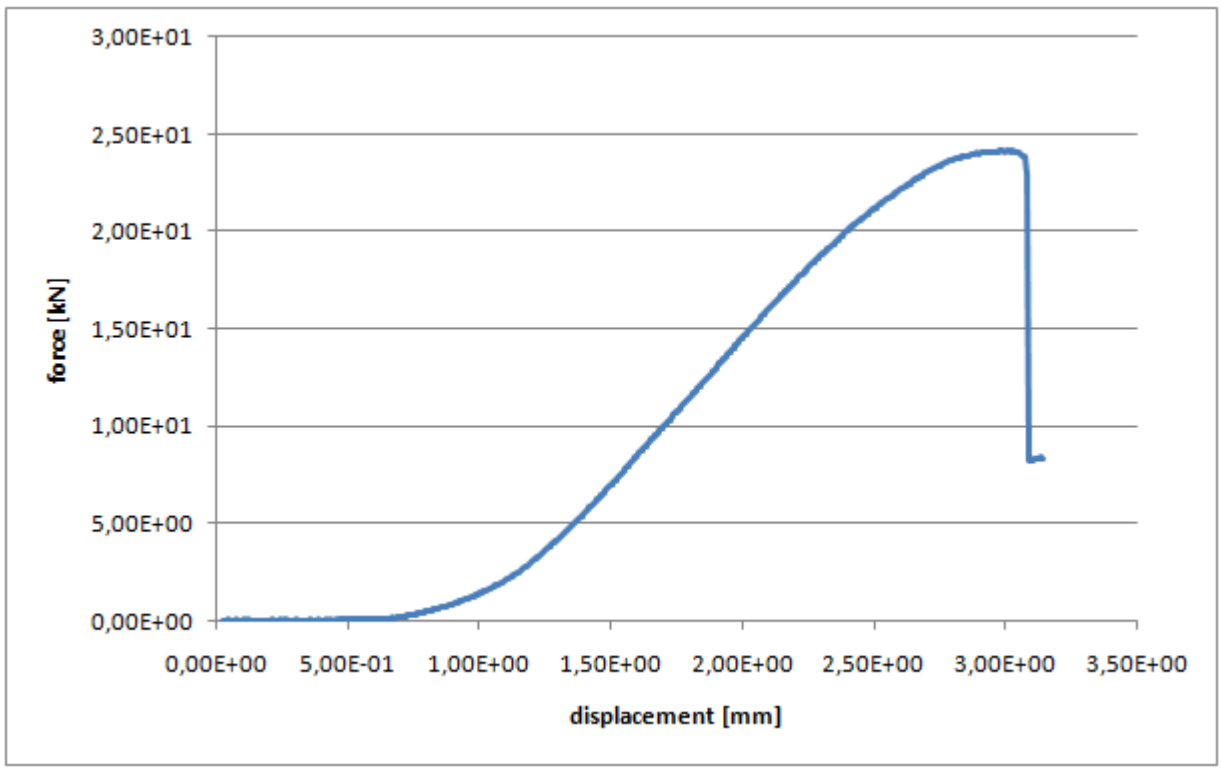
ultimate load	20,16	kN
ultimate stress	66,1	N/mm^2
ultimate stress based on failed width	66,1	N/mm^2

Failure mode	crippling of the stressed face
Remarks	failed width b



Test No.	**I-B-14**
	
Failure of the stressed face	
	
Compound between core and face	

Test No.		**I-B-15**
type of test	introduction of load by contact	
load introduction	steel sheet	
type of panel	B	
faces	0,75 mm steel	
core	100 mm PU	
stressed face	-	
Measured dimensions:		
width b	400 mm	
height l	299 mm	
thickness d	100 mm	
ultimate load	24,13	kN
ultimate stress	79,2	N/mm^2
ultimate stress based on failed width	79,2	N/mm^2
Failure mode	long wave buckling of the stressed face	
Remarks	failed width b	



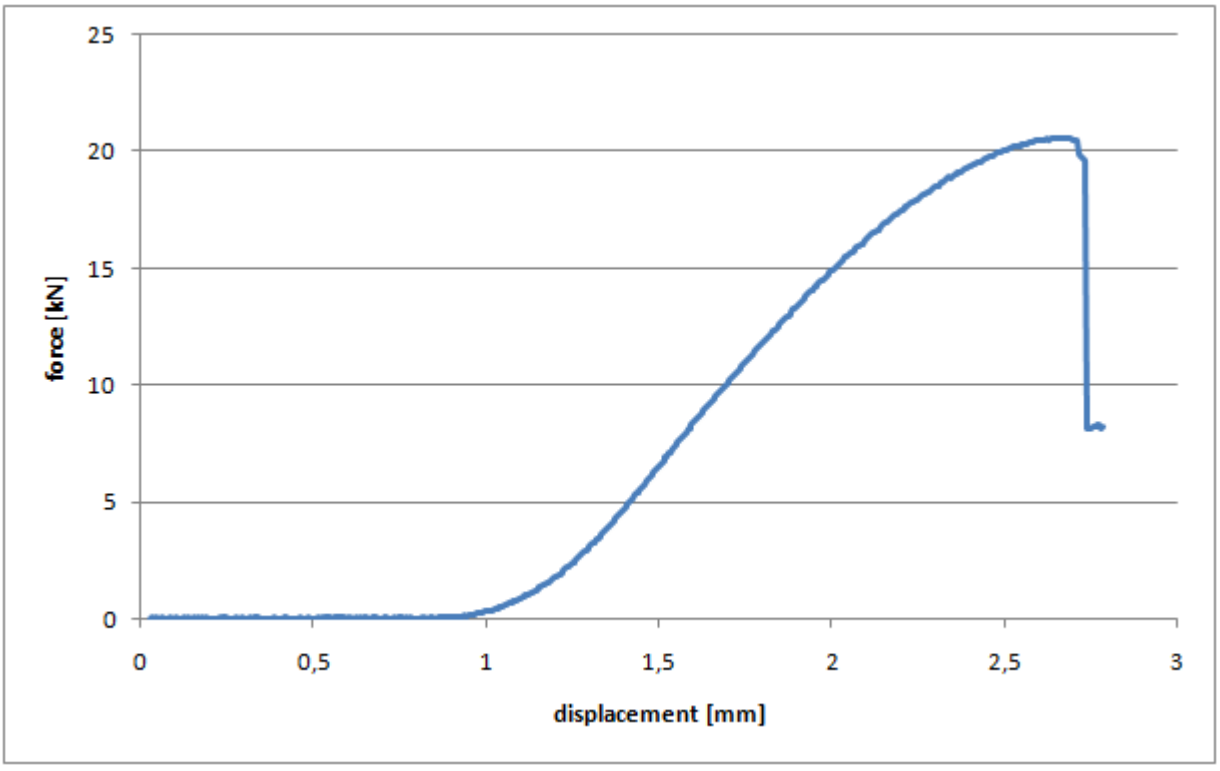
Test No.	**I-B-15**
	
Failure of the stressed face	
	
Compound between core and face	

Test No.		**I-B-16**
type of test	introduction of load by contact	
load introduction	steel sheet	
type of panel	B	
faces	0,75 mm steel	
core	100 mm PU	
stressed face	-	

Measured dimensions:		
width b	400	mm
height l	299	mm
thickness d	100	mm

ultimate load	20,60	kN
ultimate stress	67,6	N/mm^2
ultimate stress based on failed width	67,6	N/mm^2

Failure mode	long wave buckling of the stressed face
Remarks	failed width b



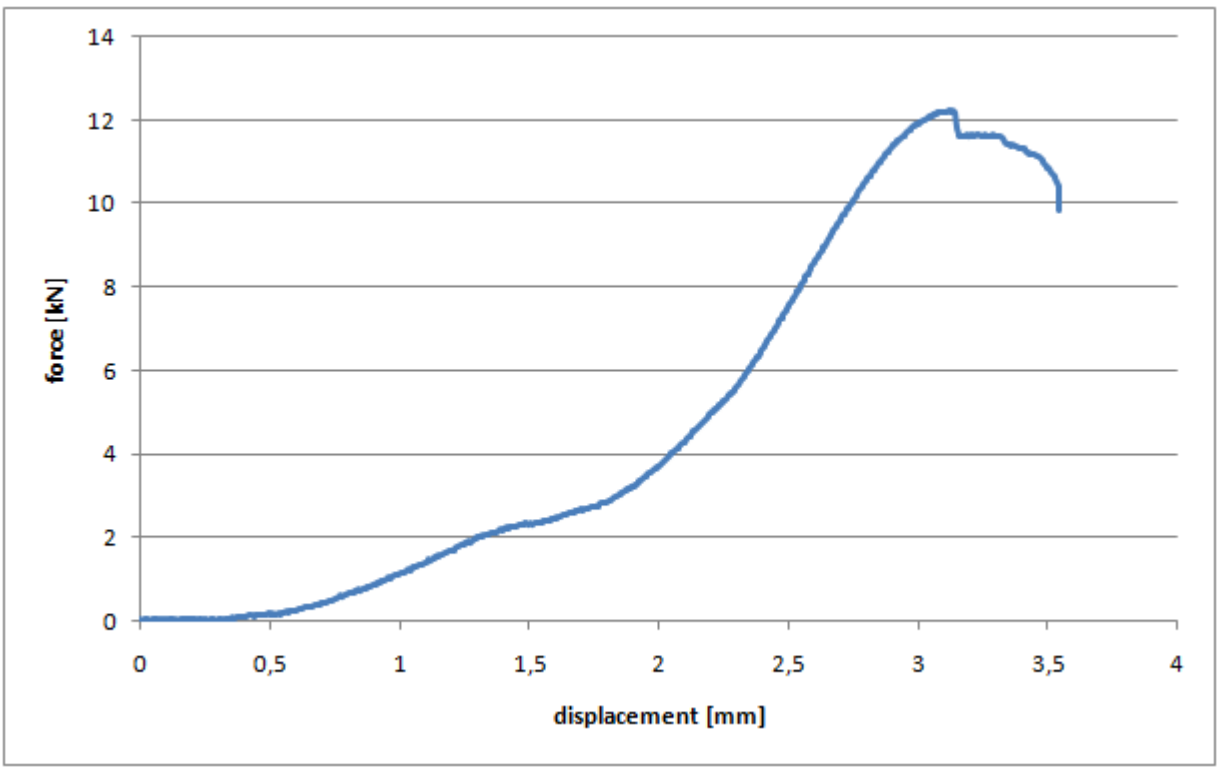
Test No.	**I-B-16**
	
Failure of the stressed face	
	
Compound between core and face	

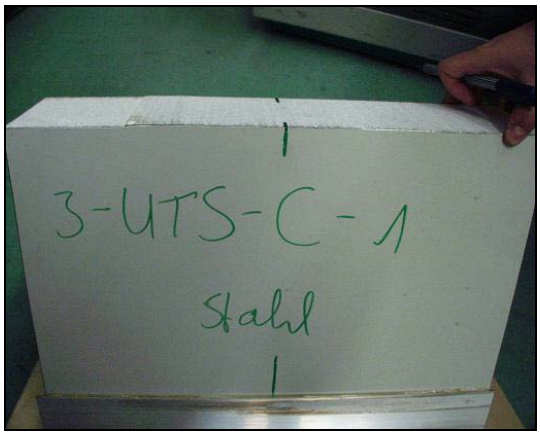
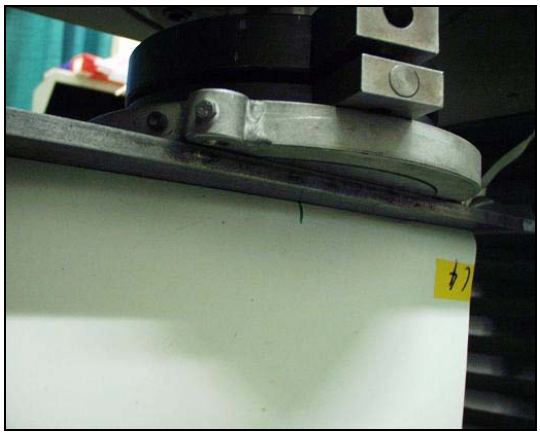
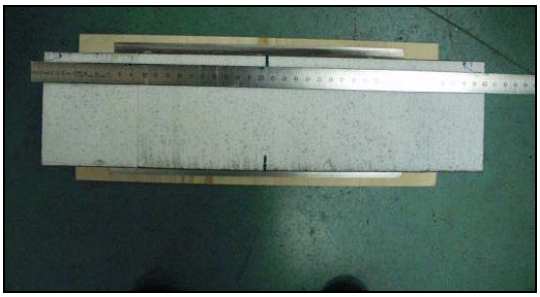
Test No.		**I-C-1**
type of test	introduction of load by contact	
load introduction	steel sheet	
type of panel	C	
faces	0,60 mm steel	
core	100 mm EPS	
stressed face	-	

Measured dimensions:		
width b	390	mm
height l	293	mm
thickness d	99	mm

ultimate load	12,26	kN
ultimate stress	58,32	N/mm^2
ultimate stress based on failed width	58,32	N/mm^2

Failure mode	crippling of the stressed face
Remarks	failed width b



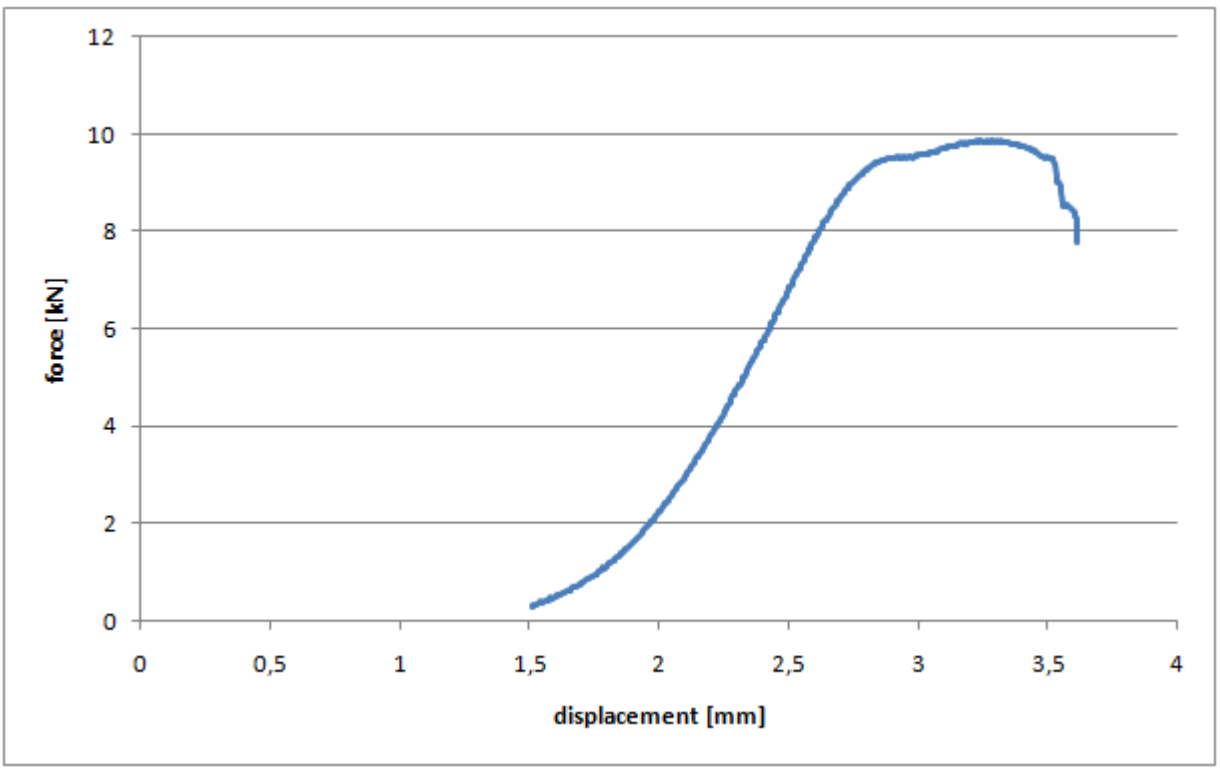
Test No.	**I-C-1**
	
Uneven cutting of load application line	Failure of the stressed face
	
Cracks in the core material caused by cutting	

Test No.		**I-C-2**
type of test	introduction of load by contact	
load introduction	steel sheet	
type of panel	C	
faces	0,60 mm steel	
core	100 mm EPS	
stressed face	-	

Measured dimensions:		
width b	391	mm
height l	291	mm
thickness d	99	mm

ultimate load	9,89	kN
ultimate stress	46,9	N/mm^2
ultimate stress based on failed width	62,8	N/mm^2

Failure mode	crippling of the stressed face
Remarks	failed width 3/4b



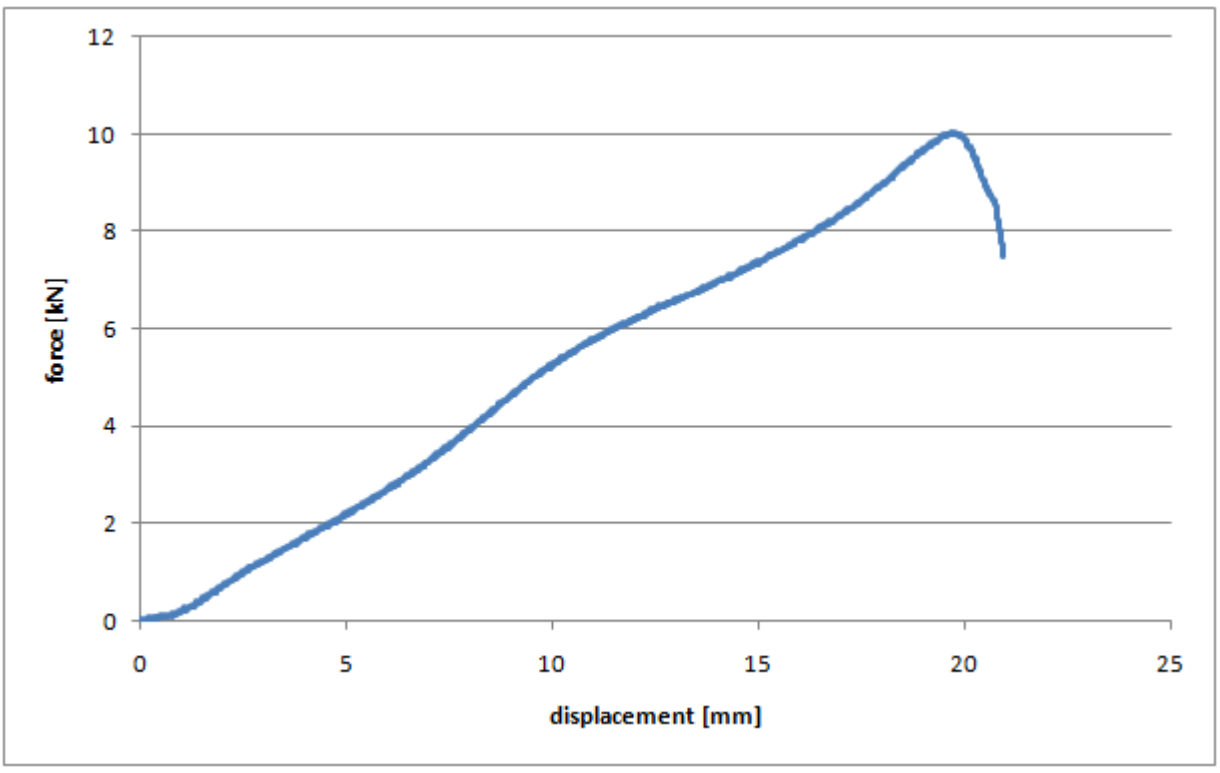
Test No.	**I-C-2**
	
Failure of the stressed face	

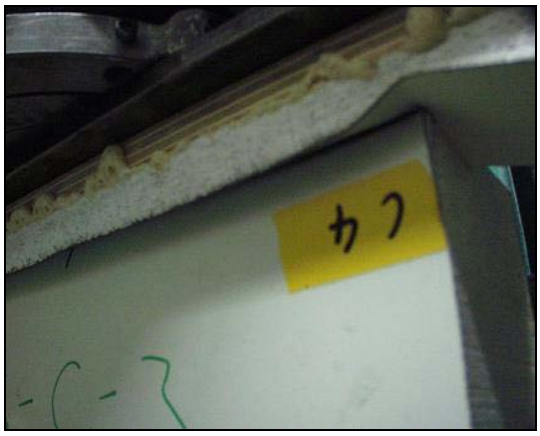
Test No.		**I-C-3**
type of test	introduction of load by contact	
load introduction	sandwich panel	
type of panel	C	
faces	0,60 mm steel	
core	100 mm EPS	
stressed face	-	

Measured dimensions:		
width b	390	mm
height l	291	mm
thickness d	99	mm

ultimate load	10,02	kN
ultimate stress	47,7	N/mm^2
ultimate stress based on failed width	47,7	N/mm^2

Failure mode	crippling of the stressed face
Remarks	failed width b



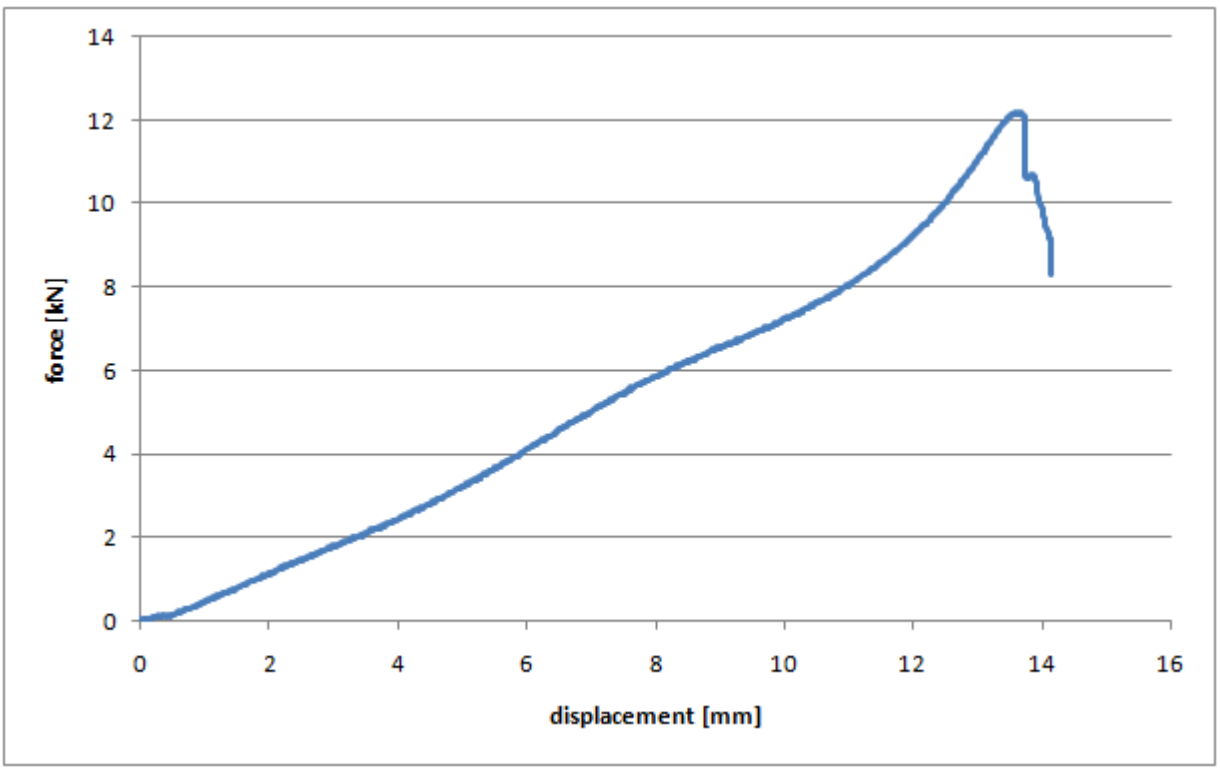
Test No.	**I-C-3**
	
Failure of the stressed face	
	
Sandwich panel used for introduction of load	

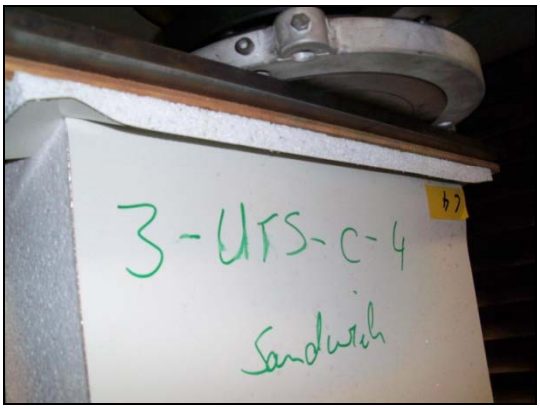
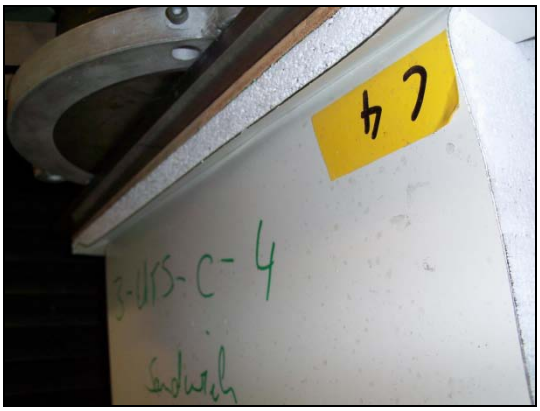
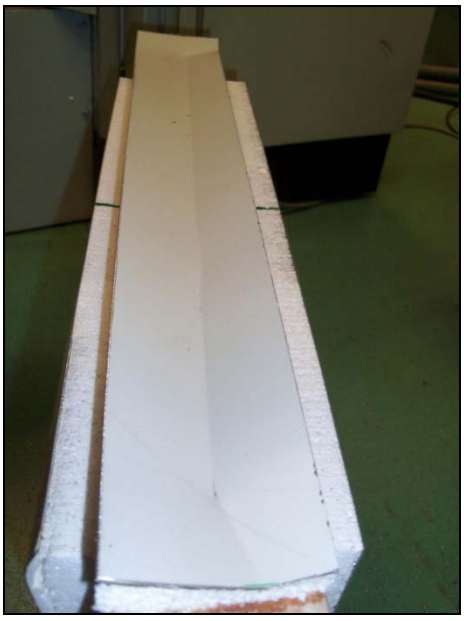
Test No.		**I-C-4**
type of test	introduction of load by contact	
load introduction	sandwich panel	
type of panel	C	
faces	0,60 mm steel	
core	100 mm EPS	
stressed face	-	

Measured dimensions:		
width b	390	mm
height l	292	mm
thickness d	100	mm

ultimate load	12,18	kN
ultimate stress	57,9	N/mm^2
ultimate stress based on failed width	57,9	N/mm^2

Failure mode	crippling of the stressed face
Remarks	failed width b



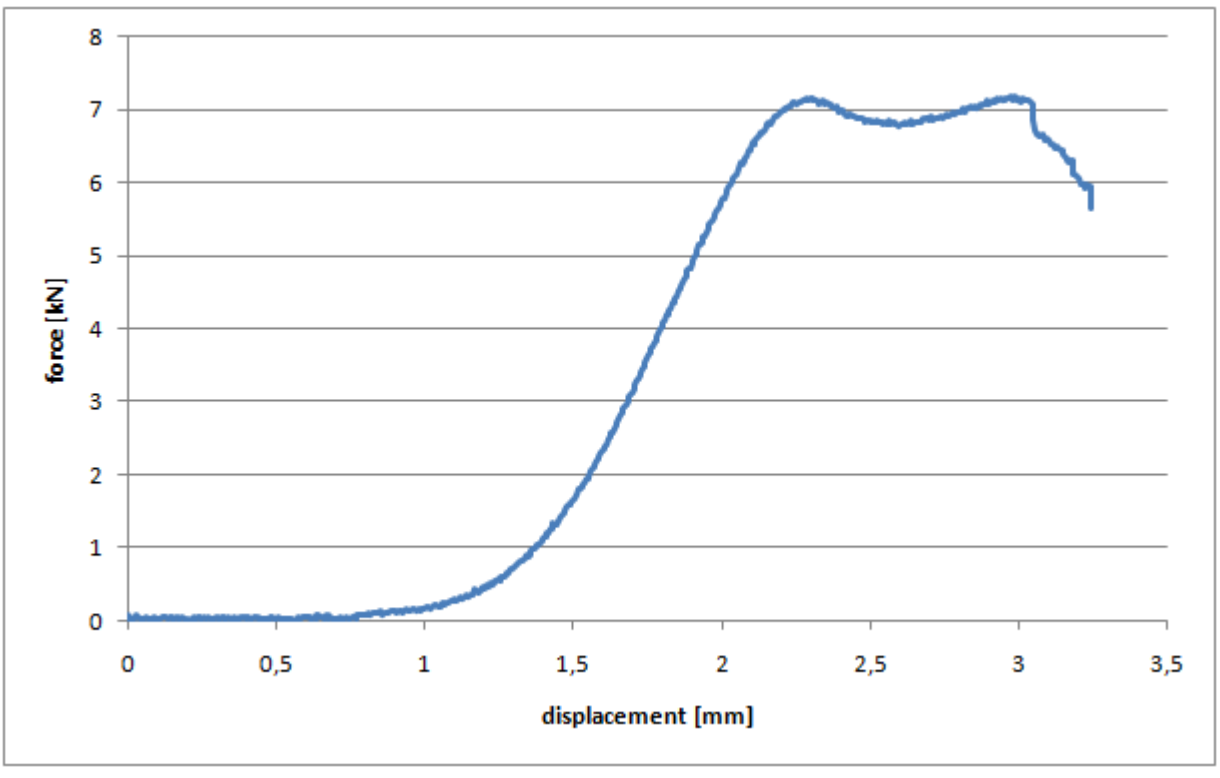
Test No.	**I-C-4**
	
Failure of the stressed face	
	
Sandwich panel used for introduction of load	

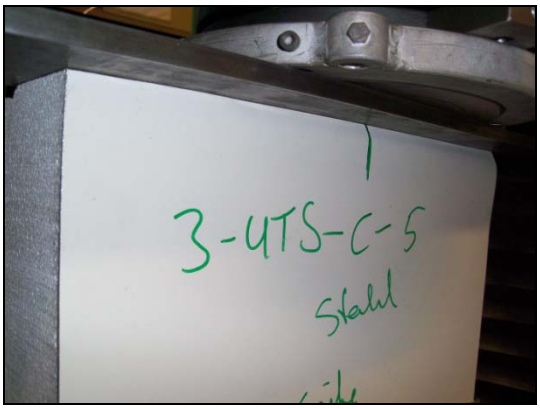
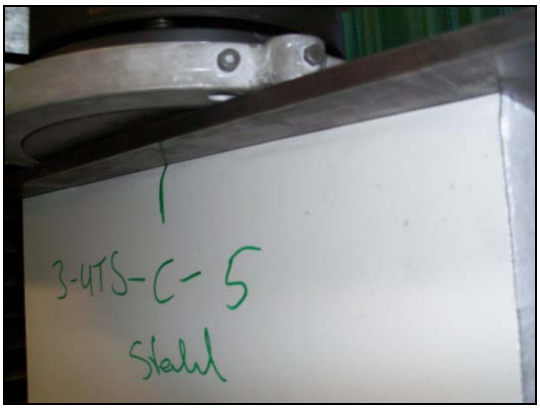
Test No.		**I-C-5**
type of test	introduction of load by contact	
load introduction	steel sheet	
type of panel	C	
faces	0,60 mm steel	
core	100 mm EPS	
stressed face	-	

Measured dimensions:		
width b	390	mm
height l	291	mm
thickness d	99	mm

ultimate load	7,18	kN
ultimate stress	34,2	N/mm^2
ultimate stress based on failed width	51,2	N/mm^2

Failure mode	crippling of the stressed face
Remarks	failed width 2/3b



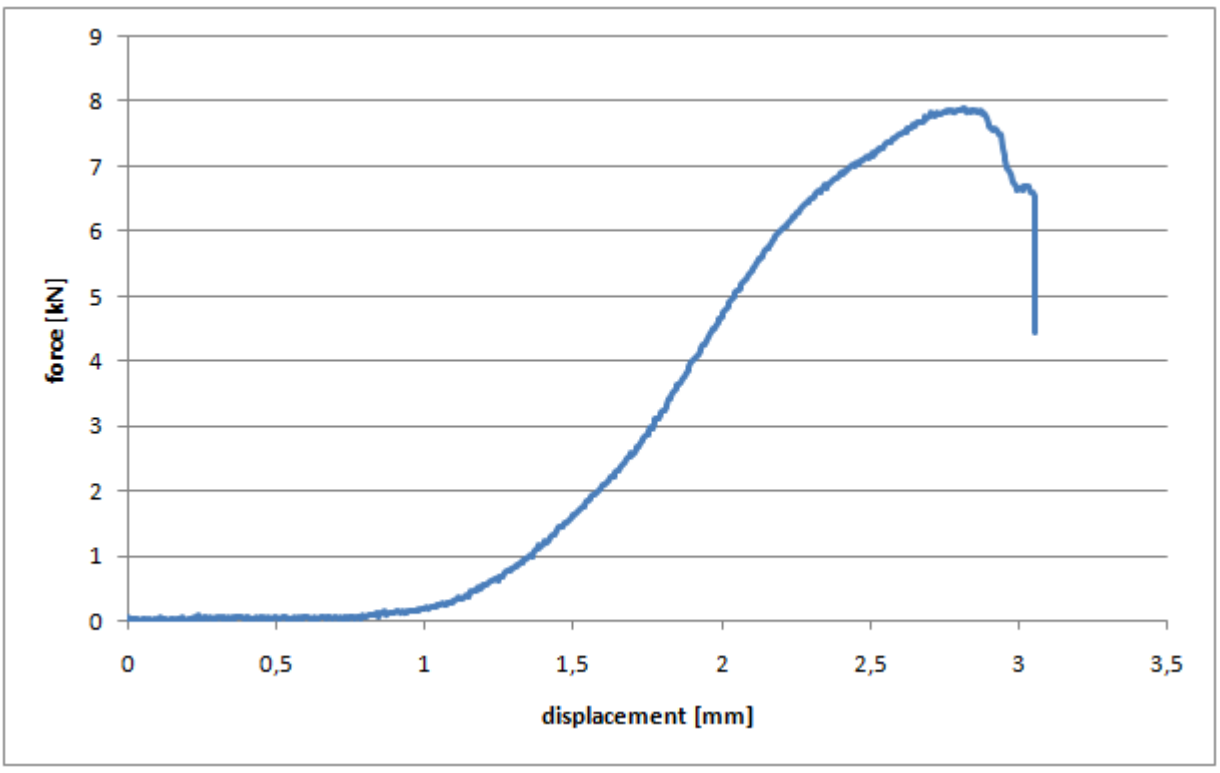
Test No.	**I-C-5**
	
Failure of the stressed face	

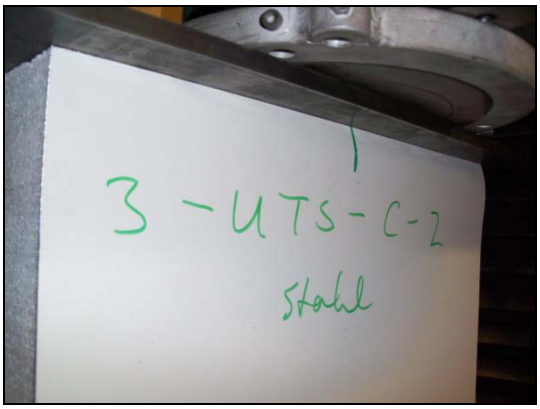
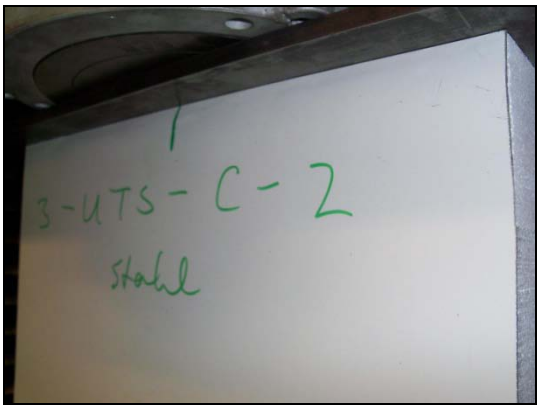
Test No.		**I-C-7**
type of test	introduction of load by contact	
load introduction	steel sheet	
type of panel	C	
faces	0,60 mm steel	
core	100 mm EPS	
stressed face	-	

Measured dimensions:		
width b	391	mm
height l	291	mm
thickness d	99	mm

ultimate load	7,89	kN
ultimate stress	37,4	N/mm^2
ultimate stress based on failed width	44,9	N/mm^2

Failure mode	crippling of the stressed face
Remarks	failed width 5/6b



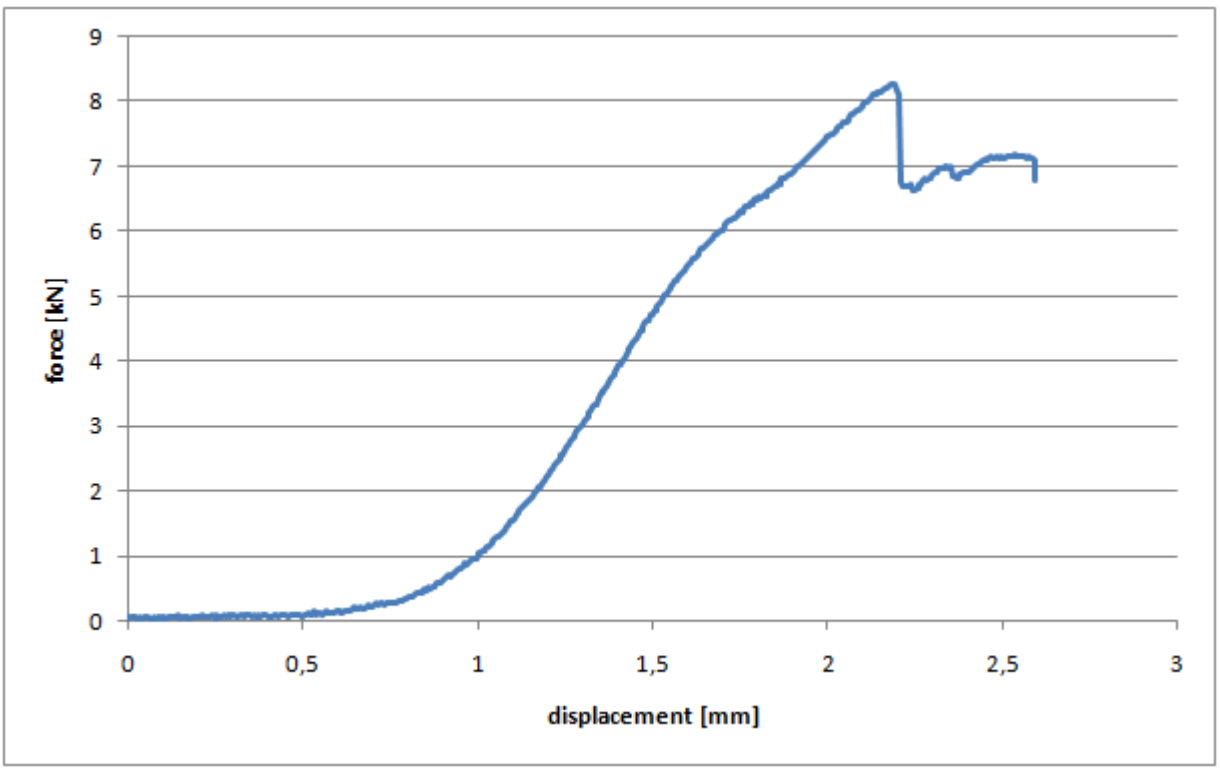
Test No.	**I-C-7**
	
Failure of the stressed face	

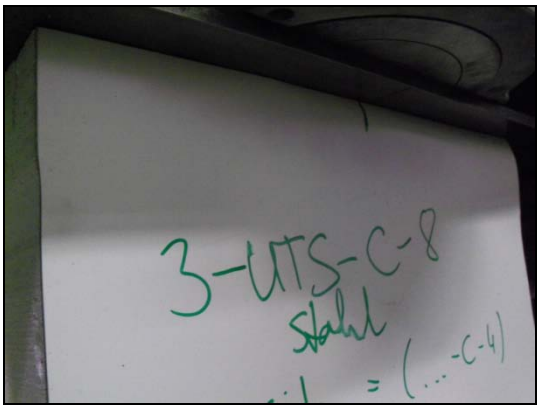
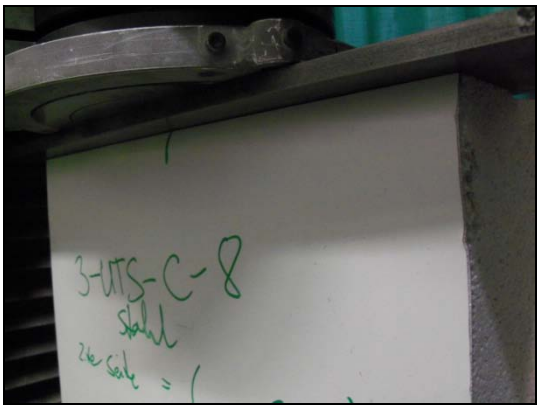
Test No.		**I-C-8**
type of test	introduction of load by contact	
load introduction	steel sheet	
type of panel	C	
faces	0,60 mm steel	
core	100 mm EPS	
stressed face	-	

Measured dimensions:		
width b	390	mm
height l	292	mm
thickness d	100	mm

ultimate load	8,26	kN
ultimate stress	39,3	N/mm^2
ultimate stress based on failed width	52,4	N/mm^2

Failure mode	crippling of the stressed face
Remarks	failed width 3/4b



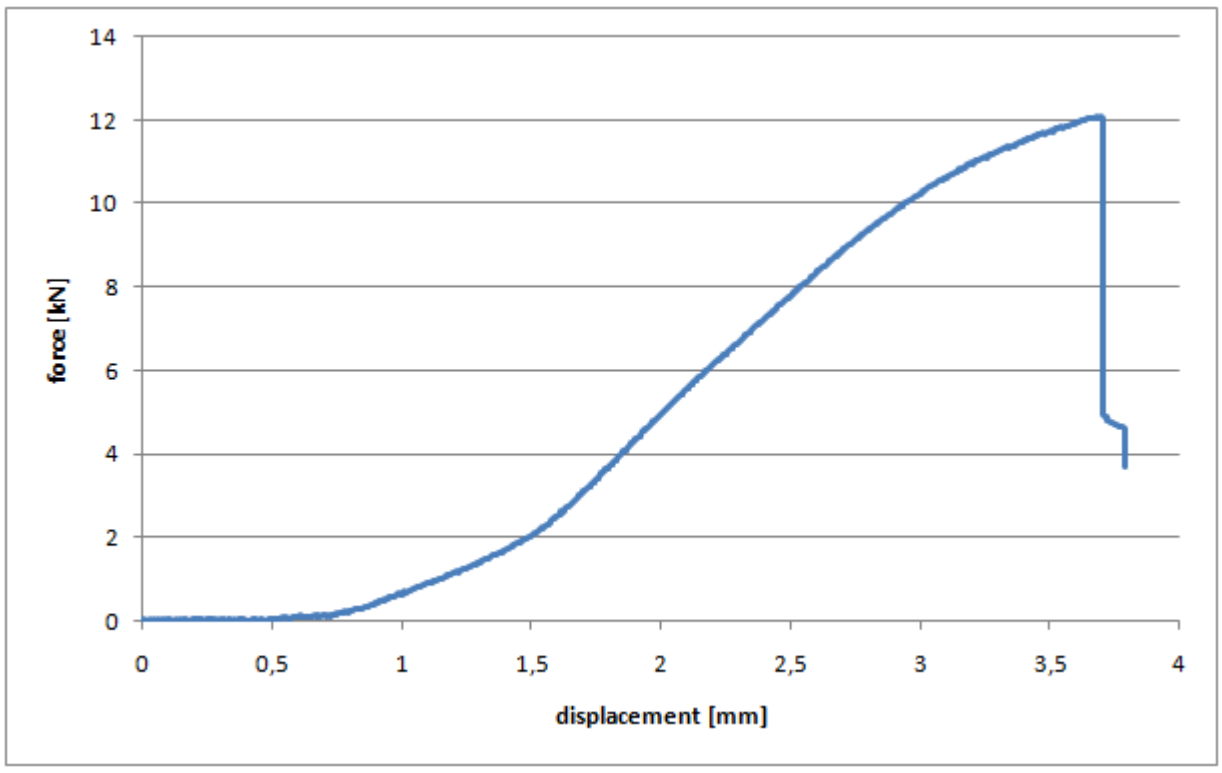
Test No.	**I-C-8**
	
Failure of the stressed face	

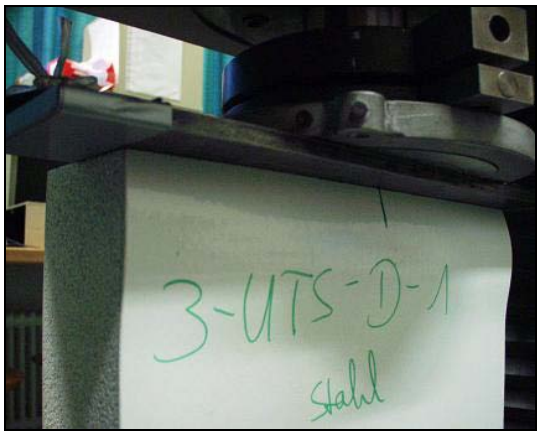
Test No.		**I-D-1**
type of test	introduction of load by contact	
load introduction	steel sheet	
type of panel	D	
faces	1,80 mm GFRP	
core	100 mm EPS	
stressed face	-	

Measured dimensions:		
width b	400	mm
height l	300	mm
thickness d	101	mm

ultimate load	12,10	kN
ultimate stress	16,8	N/mm^2
ultimate stress based on failed width	16,8	N/mm^2

Failure mode	long wave buckling of the stressed face
Remarks	failed width b



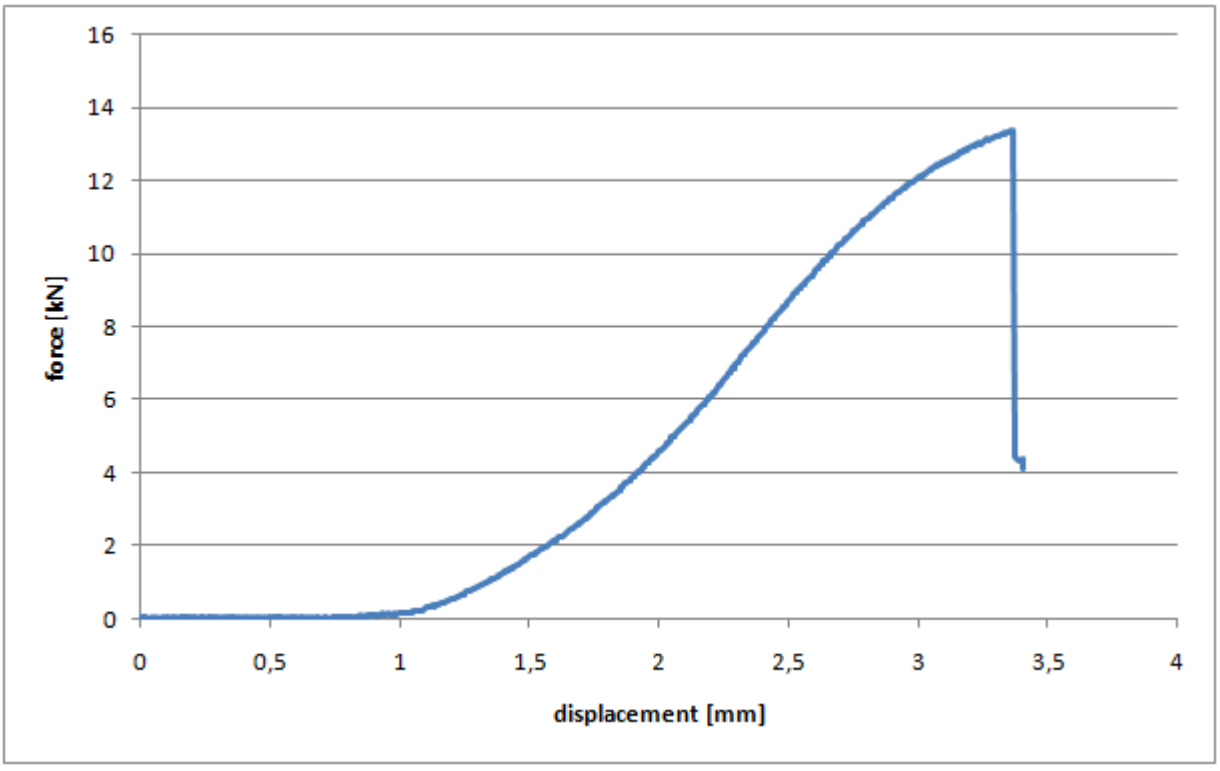
Test No.	**I-D-1**
	
Failure of the stressed face	

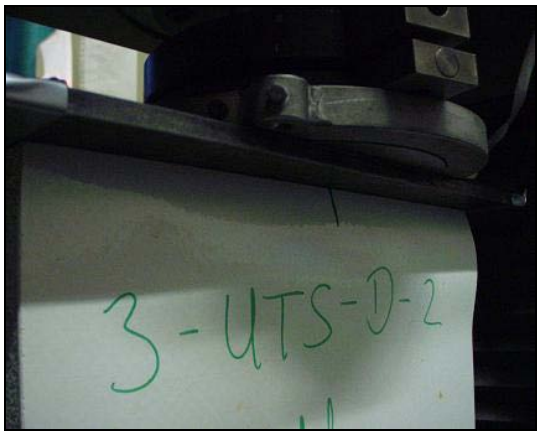
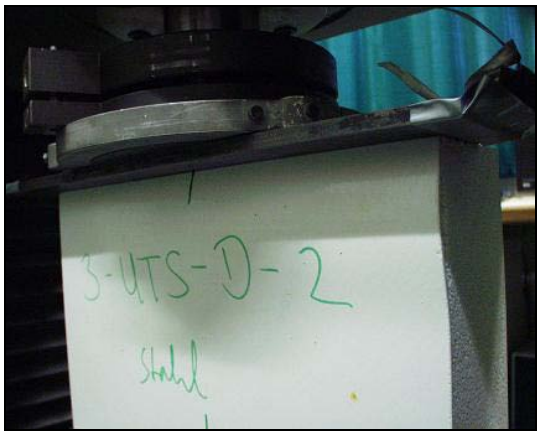
Test No.		**I-D-2**
type of test	introduction of load by contact	
load introduction	steel sheet	
type of panel	D	
faces	1,80 mm GFRP	
core	100 mm EPS	
stressed face	-	

Measured dimensions:		
width b	399	mm
height l	300	mm
thickness d	102	mm

ultimate load	13,37	kN
ultimate stress	18,6	N/mm^2
ultimate stress based on failed width	18,6	N/mm^2

Failure mode	long wave buckling of the stressed face
Remarks	failed width b



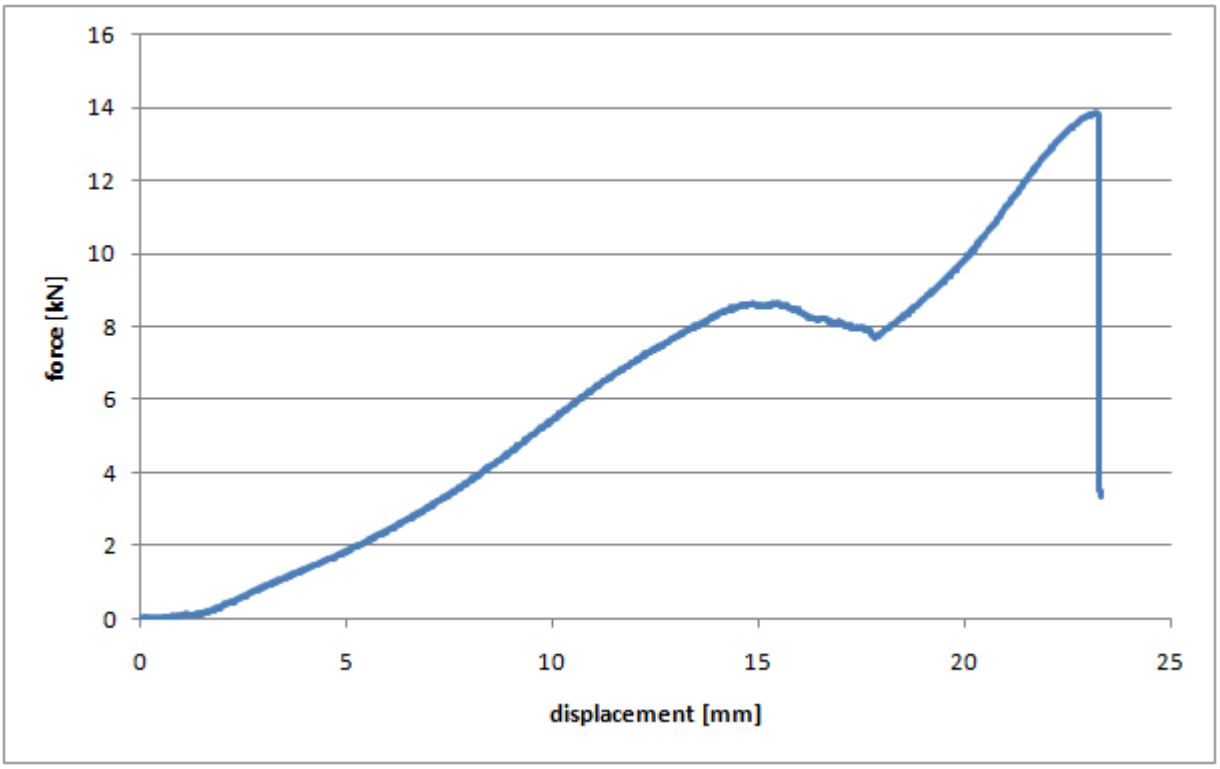
Test No.	**I-D-2**
 Failure of the stressed face	

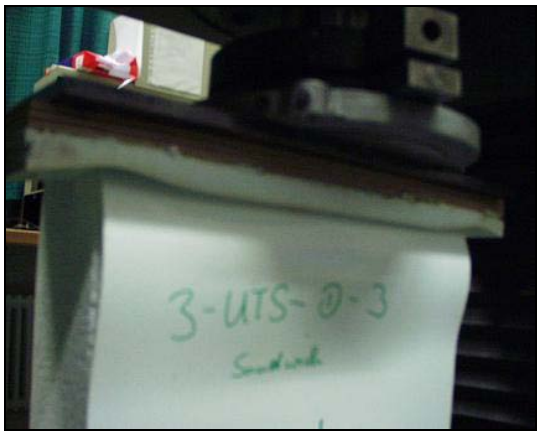
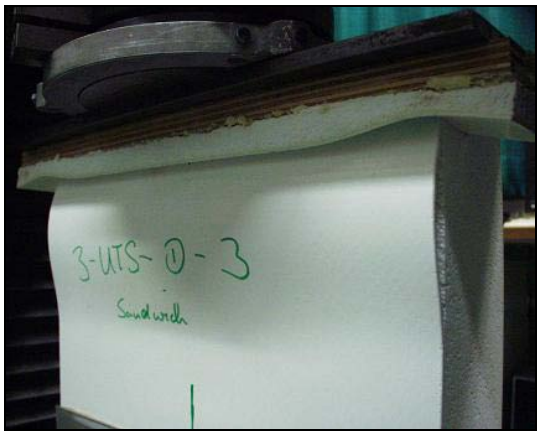
Test No.		**I-D-3**
type of test	introduction of load by contact	
load introduction	sandwich panel	
type of panel	D	
faces	1,80 mm GFRP	
core	100 mm EPS	
stressed face	-	

Measured dimensions:		
width b	399	mm
height l	300	mm
thickness d	102	mm

ultimate load	13,87	kN
ultimate stress	19,3	N/mm^2
ultimate stress based on failed width	19,3	N/mm^2

Failure mode	long wave buckling of the stressed face
Remarks	failed width b



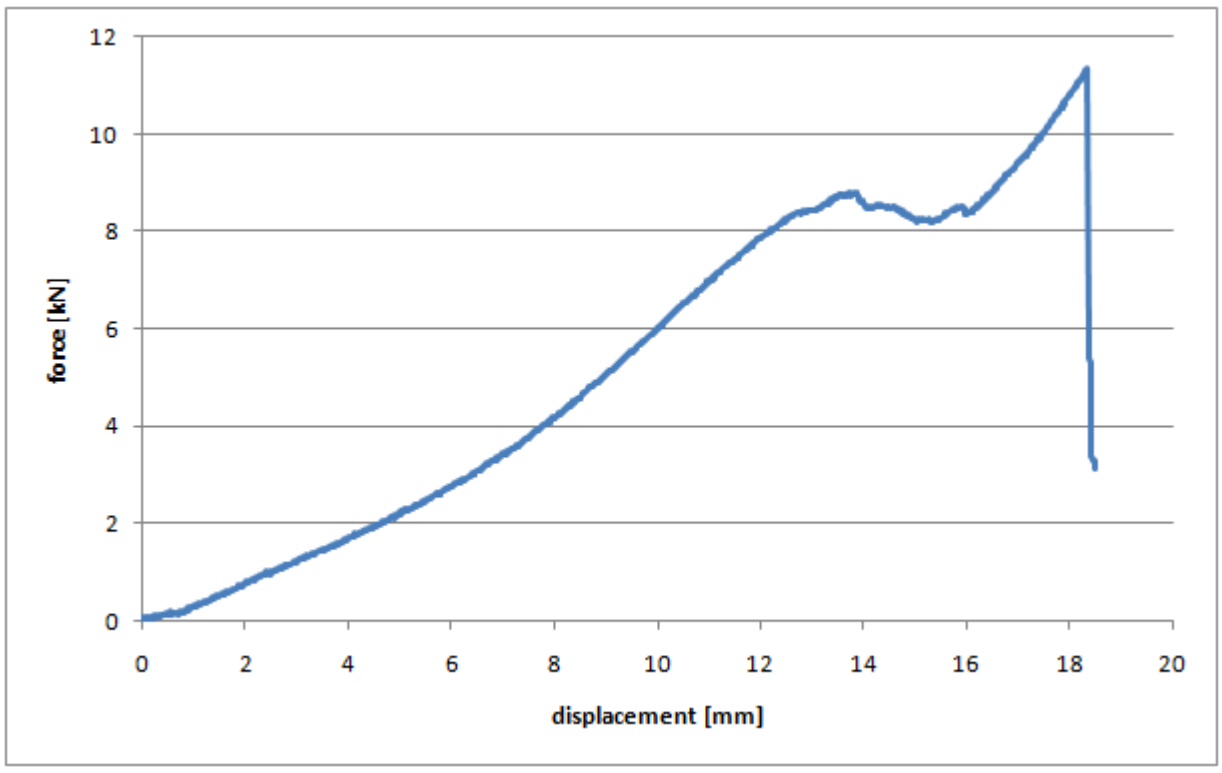
Test No.	**I-D-3**
 Failure of the stressed face	
	
sandwich panel used for introduction of load	

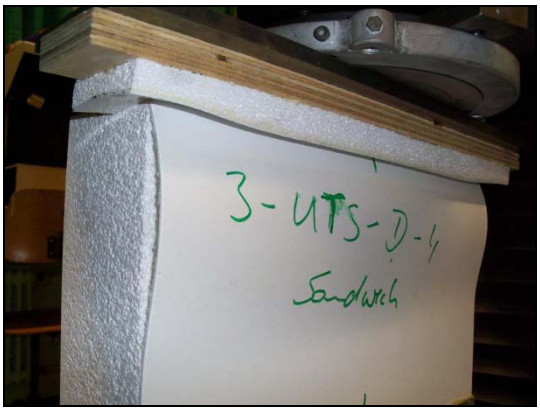
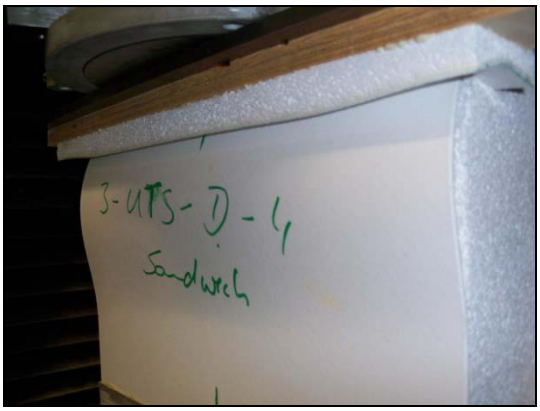
Test No.		**I-D-4**
type of test	introduction of load by contact	
load introduction	sandwich panel	
type of panel	D	
faces	1,80 mm GFRP	
core	100 mm EPS	
stressed face	-	

Measured dimensions:		
width b	399	mm
height l	300	mm
thickness d	102	mm

ultimate load	11,34	kN
ultimate stress	15,8	N/mm^2
ultimate stress based on failed width	15,8	N/mm^2

Failure mode	long wave buckling of the stressed face
Remarks	failed width b



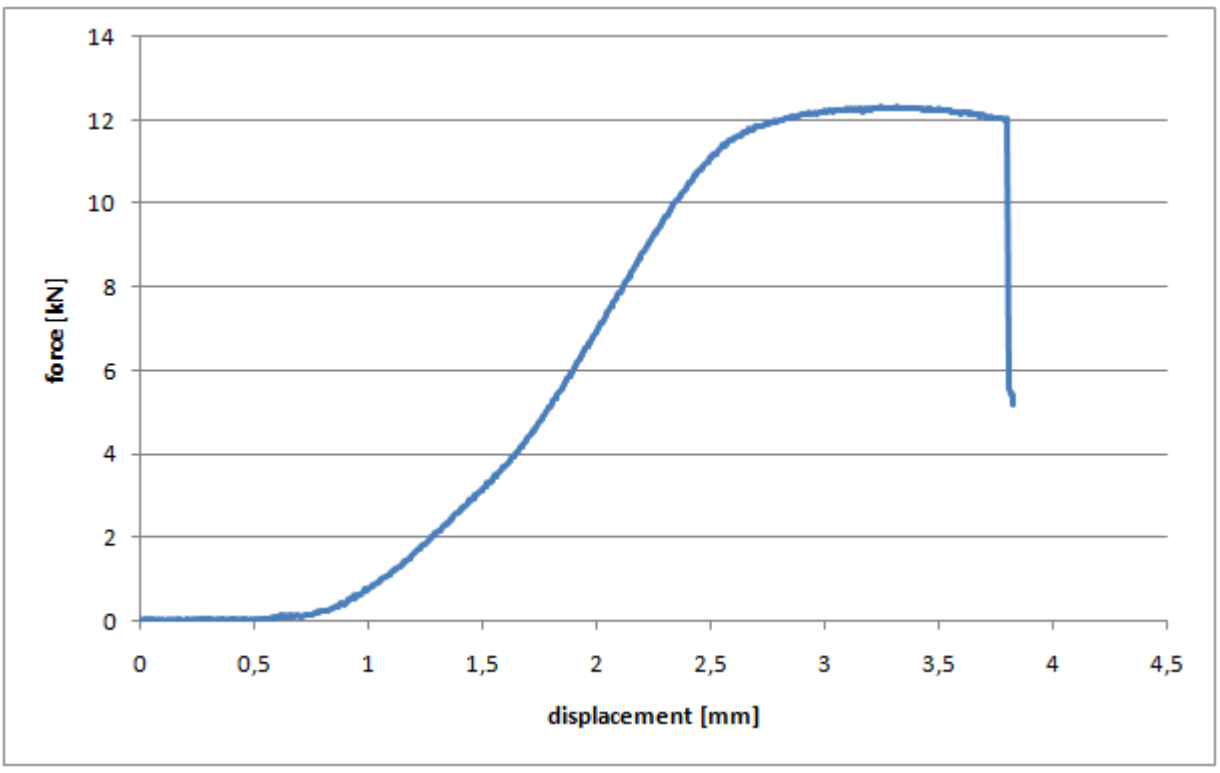
Test No.	**I-D-4**
 Failure of the stressed face	
	
sandwich panel used for introduction of load	

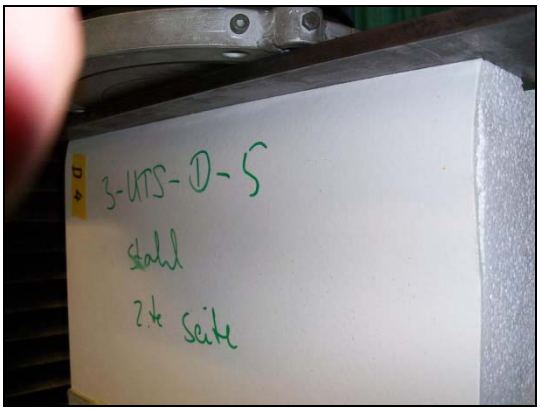
Test No.		**I-D-5**
type of test	introduction of load by contact	
load introduction	steel sheet	
type of panel	D	
faces	1,80 mm GFRP	
core	100 mm EPS	
stressed face	-	

Measured dimensions:		
width b	399	mm
height l	300	mm
thickness d	102	mm

ultimate load	12,35	kN
ultimate stress	17,2	N/mm^2
ultimate stress based on failed width	17,2	N/mm^2

Failure mode	long wave buckling of the stressed face
Remarks	failed width b



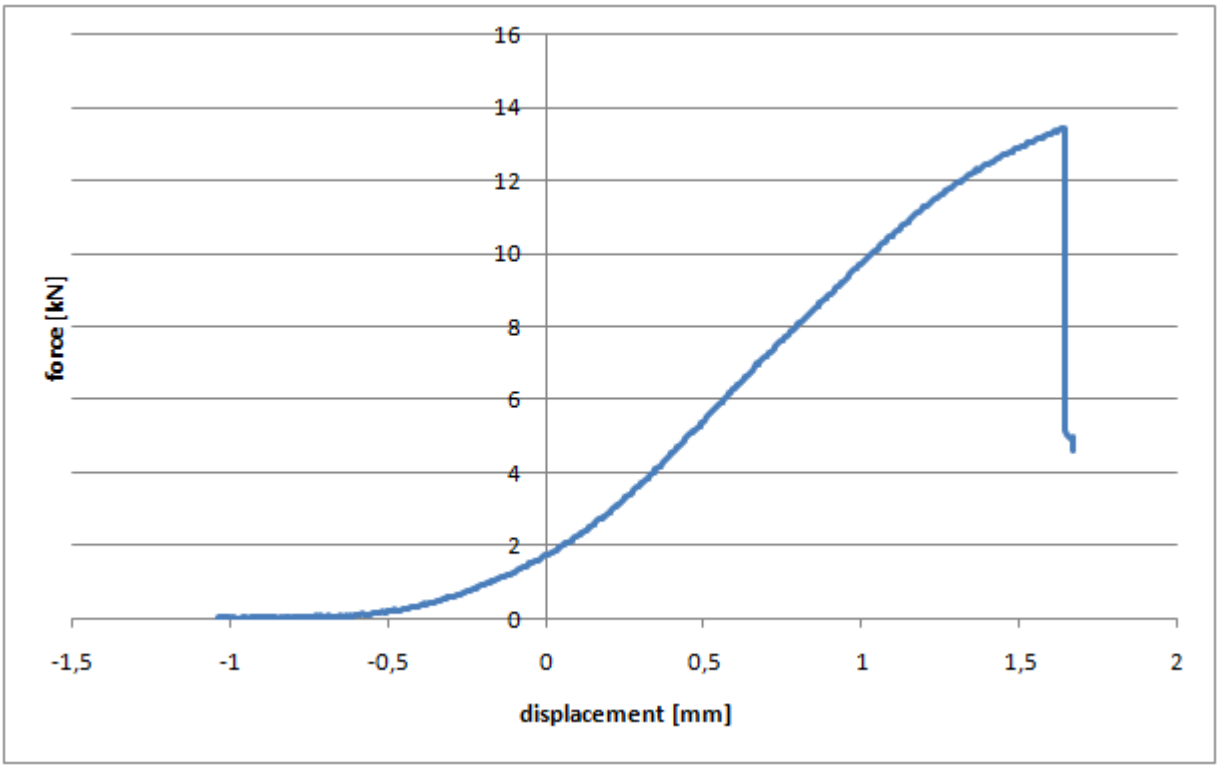
Test No.	**I-D-5**
	
Failure of the stressed face	

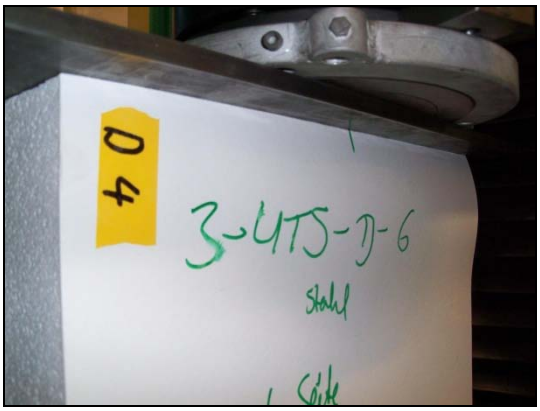
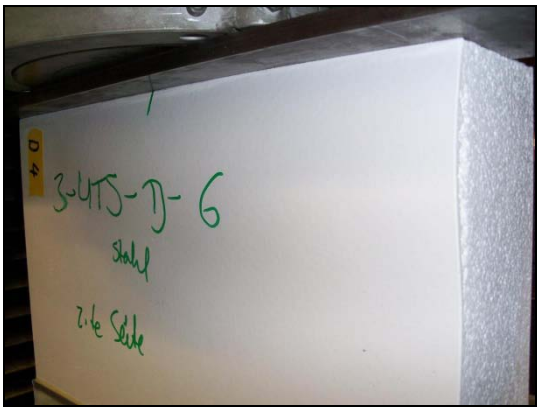
Test No.		**I-D-6**
type of test	introduction of load by contact	
load introduction	steel sheet	
type of panel	D	
faces	1,80 mm GFRP	
core	100 mm EPS	
stressed face	-	

Measured dimensions:		
width b	399	mm
height l	300	mm
thickness d	102	mm

ultimate load	13,43	kN
ultimate stress	18,7	N/mm^2
ultimate stress based on failed width	18,7	N/mm^2

Failure mode	long wave buckling of the stressed face
Remarks	failed width b



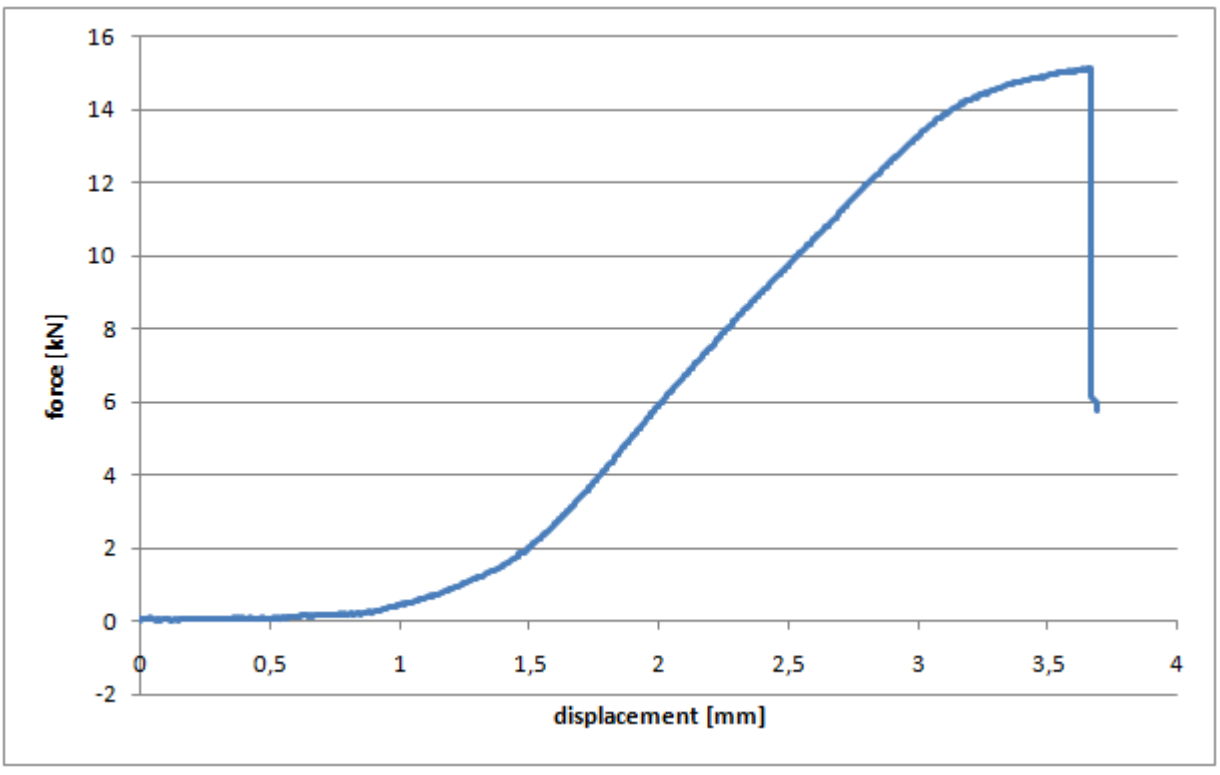
Test No.	**I-D-6**
 Failure of the stressed face	

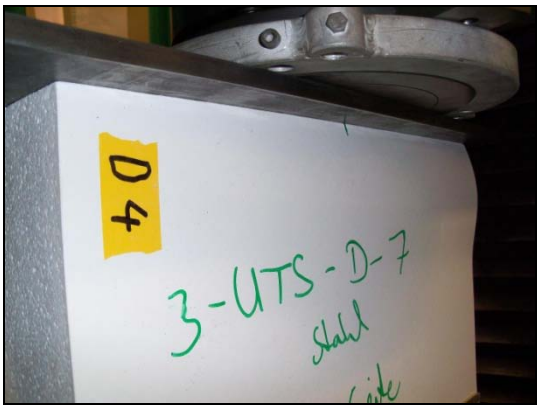
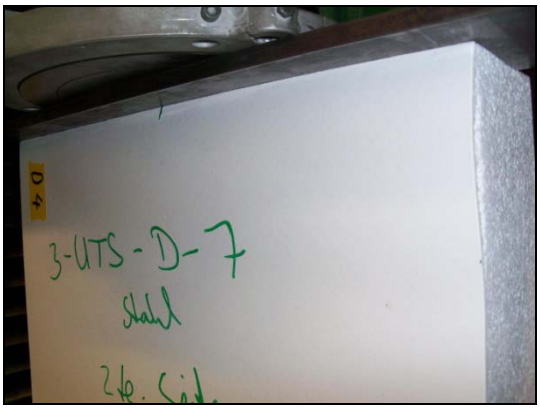
Test No.		**I-D-7**
type of test	introduction of load by contact	
load introduction	steel sheet	
type of panel	D	
faces	1,80 mm GFRP	
core	100 mm EPS	
stressed face	-	

Measured dimensions:		
width b	400	mm
height l	300	mm
thickness d	101	mm

ultimate load	15,16	kN
ultimate stress	21,0	N/mm^2
ultimate stress based on failed width	21,0	N/mm^2

Failure mode	long wave buckling of the stressed face
Remarks	failed width b



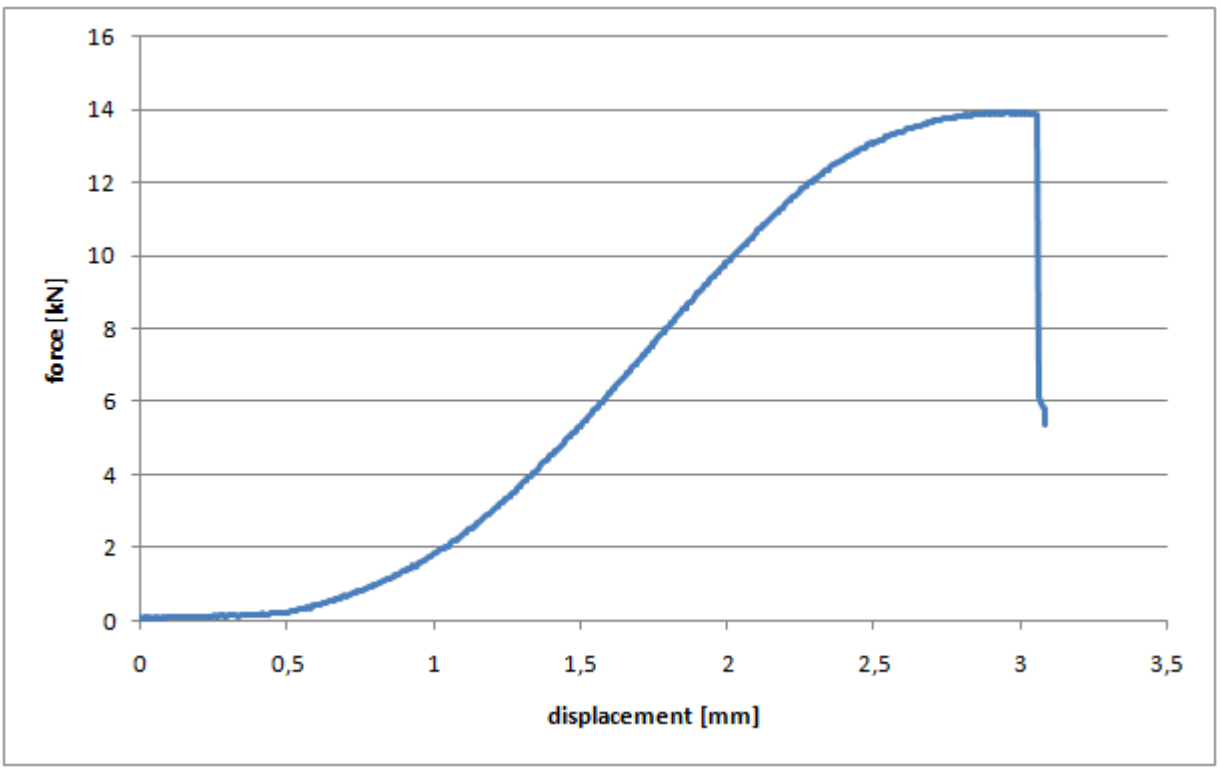
Test No.	**I-D-7**
	
Failure of the stressed face	

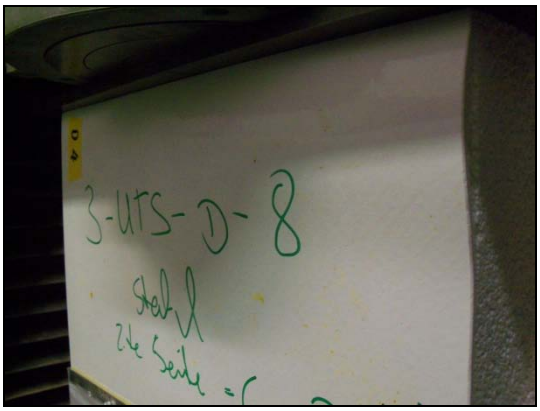
Test No.		**I-D-8**
type of test	introduction of load by contact	
load introduction	steel sheet	
type of panel	D	
faces	1,80 mm GFRP	
core	100 mm EPS	
stressed face	-	

Measured dimensions:		
width b	399	mm
height l	300	mm
thickness d	102	mm

ultimate load	13,91	kN
ultimate stress	19,4	N/mm^2
ultimate stress based on failed width	19,4	N/mm^2

Failure mode	long wave buckling of the stressed face
Remarks	failed width b



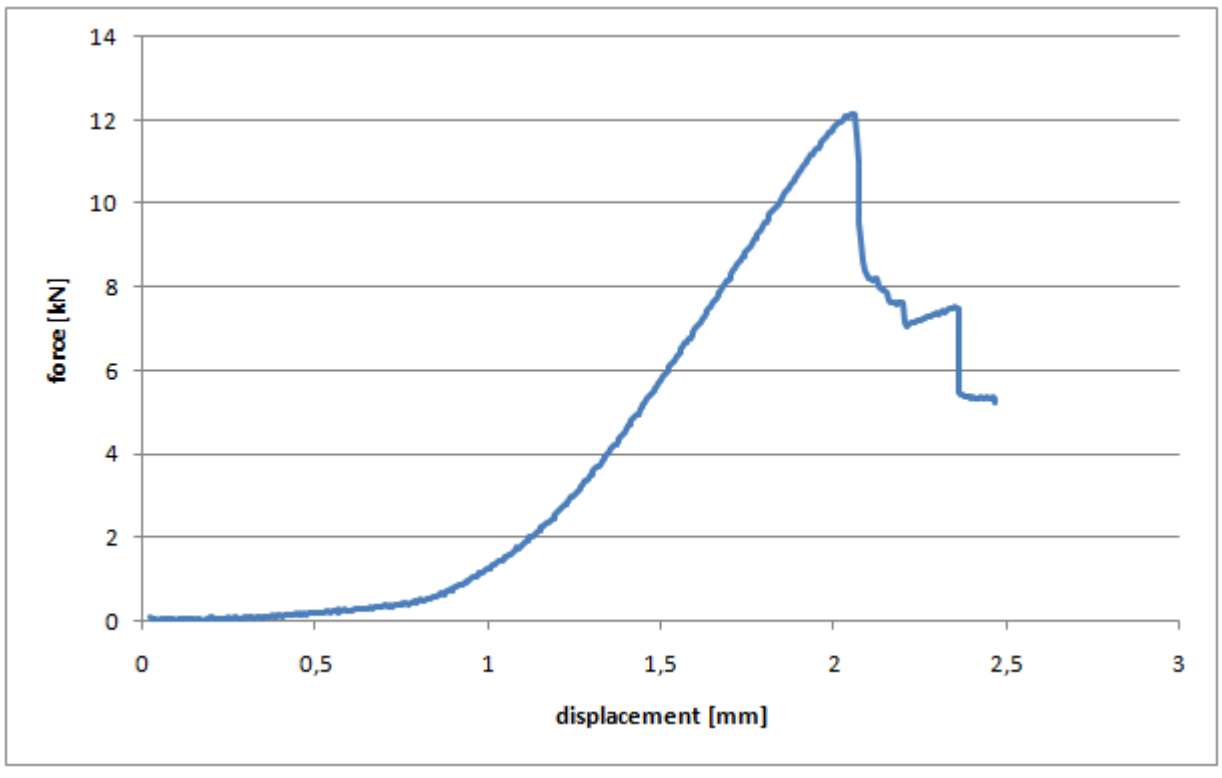
Test No.	**I-D-8**
	
Failure of the stressed face	

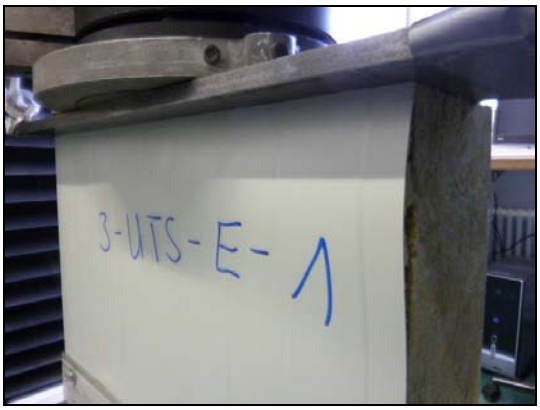
Test No.		**I-E-1**
type of test	introduction of load by contact	
load introduction	steel sheet	
type of panel	E	
faces	0,50 mm steel	
core	100 mm Mineral wool	
stressed face	-	

Measured dimensions:		
width b	401	mm
height l	299	mm
thickness d	100	mm

ultimate load	12,12	kN
ultimate stress	63,7	N/mm^2
ultimate stress based on failed width	72,8	N/mm^2

Failure mode	long wave buckling of the stressed face
Remarks	failed width b=351mm



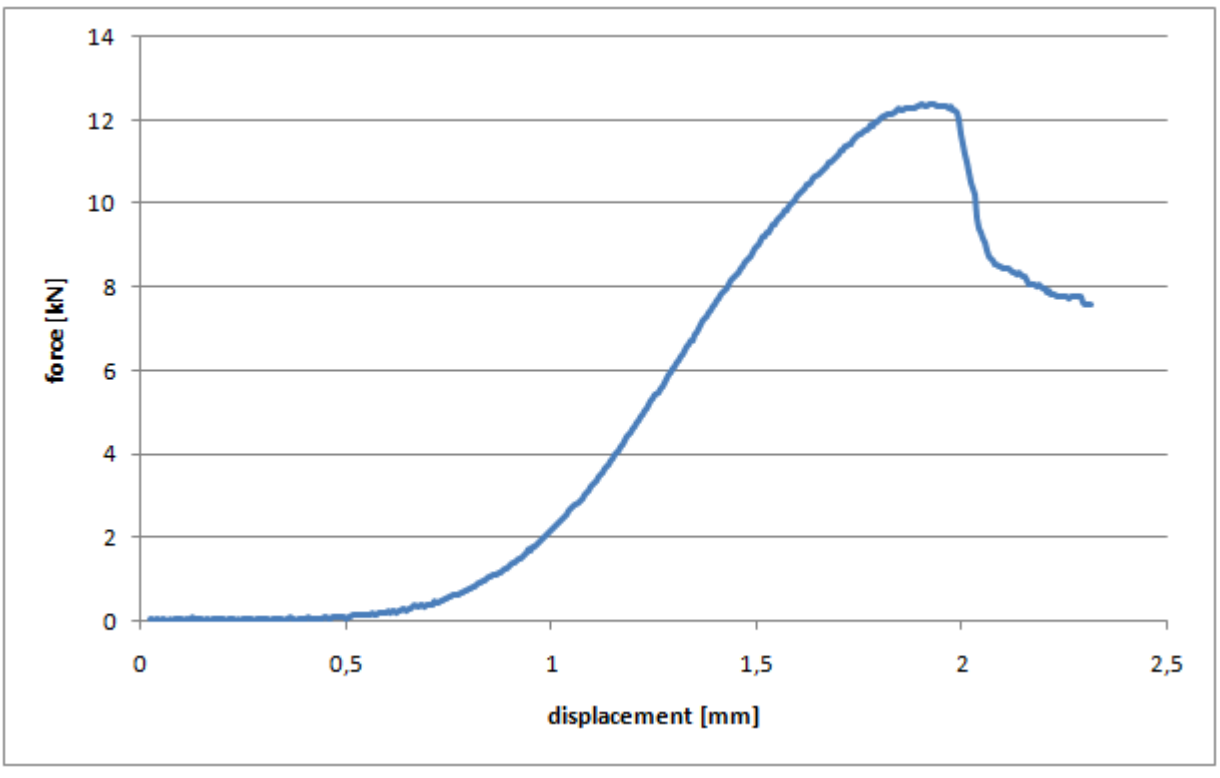
Test No.	**I-E-1**
	
Failure of the stressed face	
	
Compound between core and face	

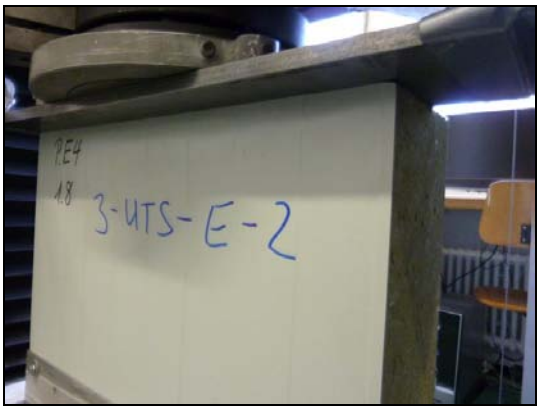
Test No.		**I-E-2**
type of test	introduction of load by contact	
load introduction	steel sheet	
type of panel	E	
faces	0,50 mm steel	
core	100 mm Mineral wool	
stressed face	-	

Measured dimensions:		
width b	401	mm
height l	299	mm
thickness d	100	mm

ultimate load	12,37	kN
ultimate stress	64,9	N/mm^2
ultimate stress based on failed width	66,8	N/mm^2

Failure mode	crippling of the stressed face
Remarks	failed width b=390mm



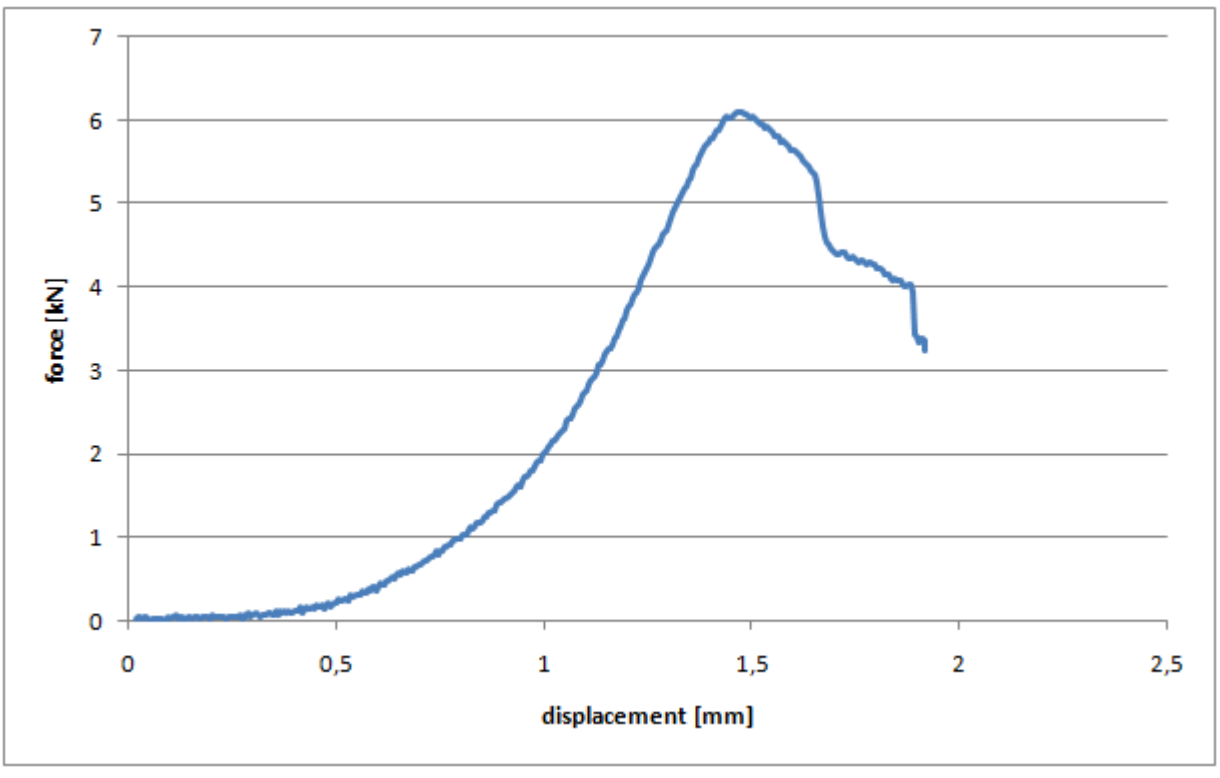
Test No.	**I-E-2**
	
Failure of the stressed face	
	
Compound between core and face	

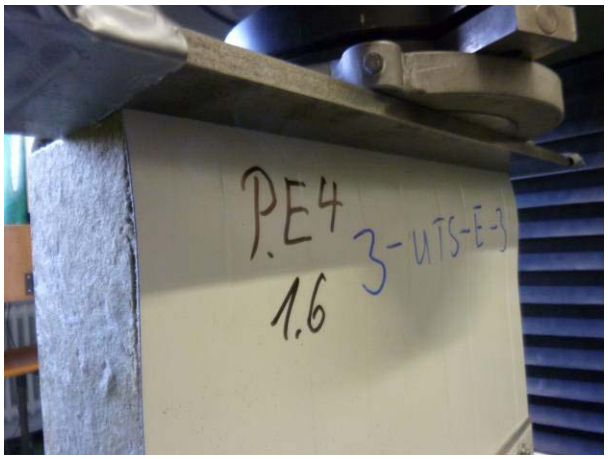
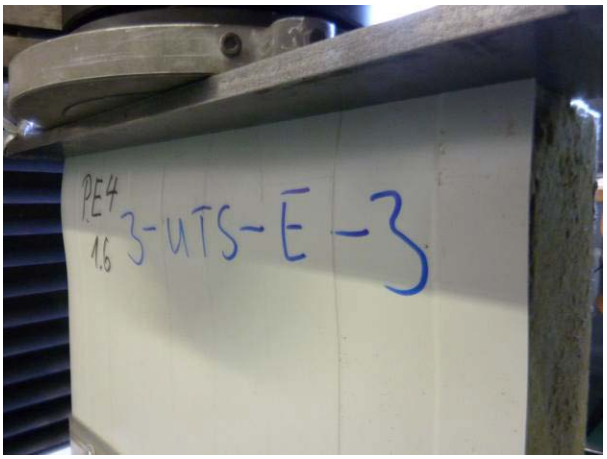
Test No.		**I-E-3**
type of test	introduction of load by contact	
load introduction	steel sheet	
type of panel	E	
faces	0,50 mm steel	
core	100 mm Mineral wool	
stressed face	-	

Measured dimensions:		
width b	400	mm
height l	300,5	mm
thickness d	99,5	mm

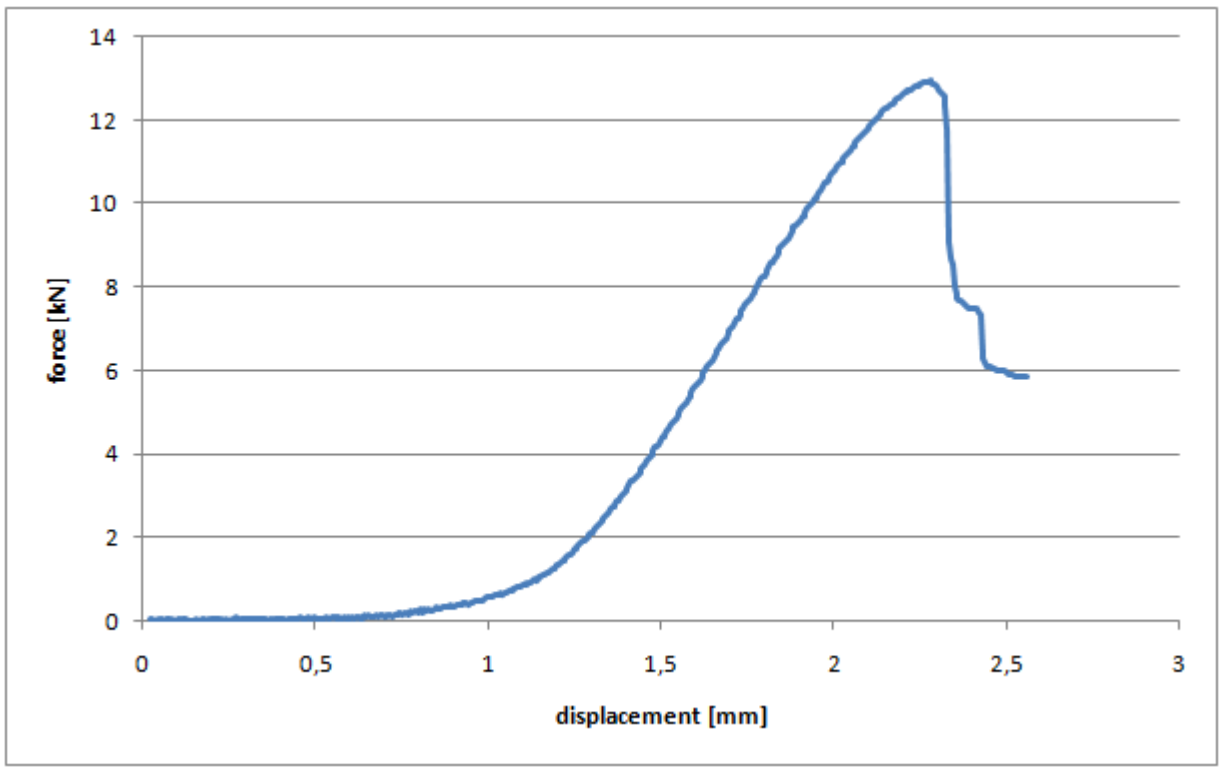
ultimate load	6,10	kN
ultimate stress	32,1	N/mm^2
ultimate stress based on failed width	32,1	N/mm^2

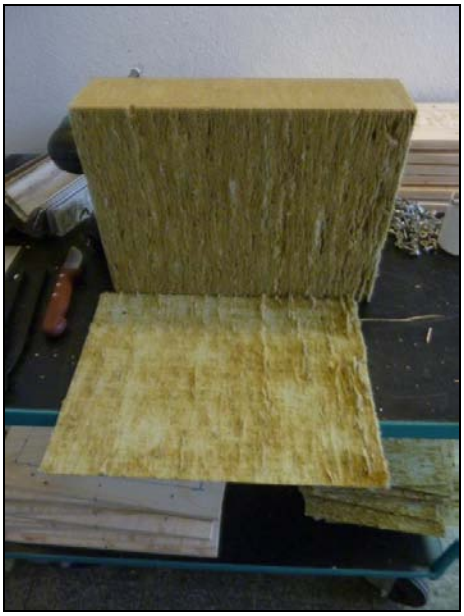
Failure mode	crippling of the stressed face
Remarks	failed width b



Test No.	**I-E-3**
	
Failure of the stressed face	
	
Compound between core and face	

Test No.		**I-E-4**
type of test	introduction of load by contact	
load introduction	steel sheet	
type of panel	E	
faces	0,50 mm steel	
core	100 mm Mineral wool	
stressed face	-	
Measured dimensions:		
width b	400 mm	
height l	300,5 mm	
thickness d	99,5 mm	
ultimate load	12,97 kN	
ultimate stress	68,3 N/mm^2	
ultimate stress based on failed width	72,6 N/mm^2	
Failure mode	long wave buckling of the stressed face	
Remarks	failed width b=376mm	



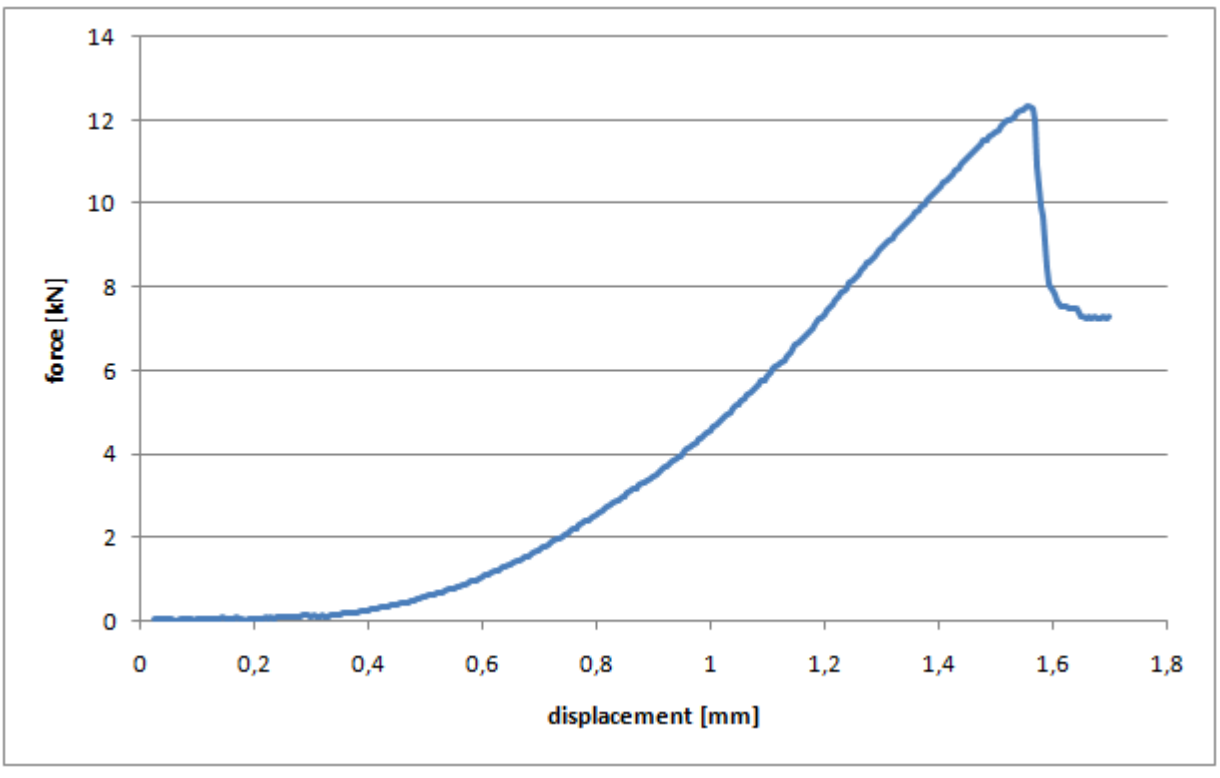
Test No.	**I-E-4**
 Failure of the stressed face	
	
Compound between core and face	

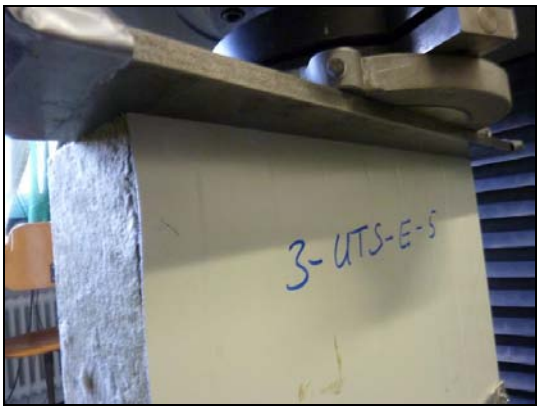
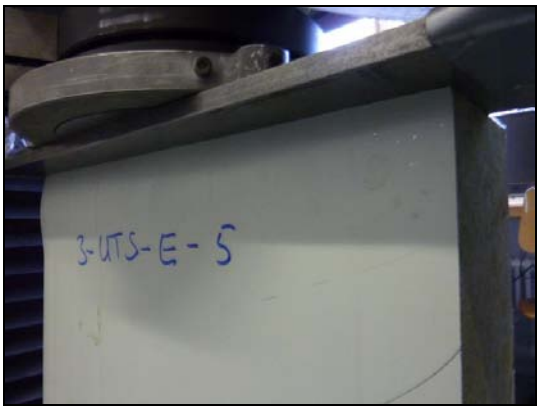
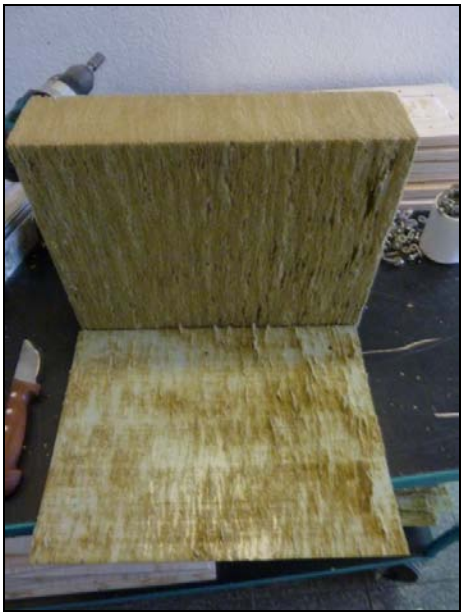
Test No.		**I-E-5**
type of test	introduction of load by contact	
load introduction	steel sheet	
type of panel	E	
faces	0,50 mm steel	
core	100 mm Mineral wool	
stressed face	-	

Measured dimensions:		
width b	401	mm
height l	302	mm
thickness d	99,5	mm

ultimate load	12,32	kN
ultimate stress	64,7	N/mm^2
ultimate stress based on failed width	65,7	N/mm^2

Failure mode	long wave buckling of the stressed face
Remarks	failed width b=395mm



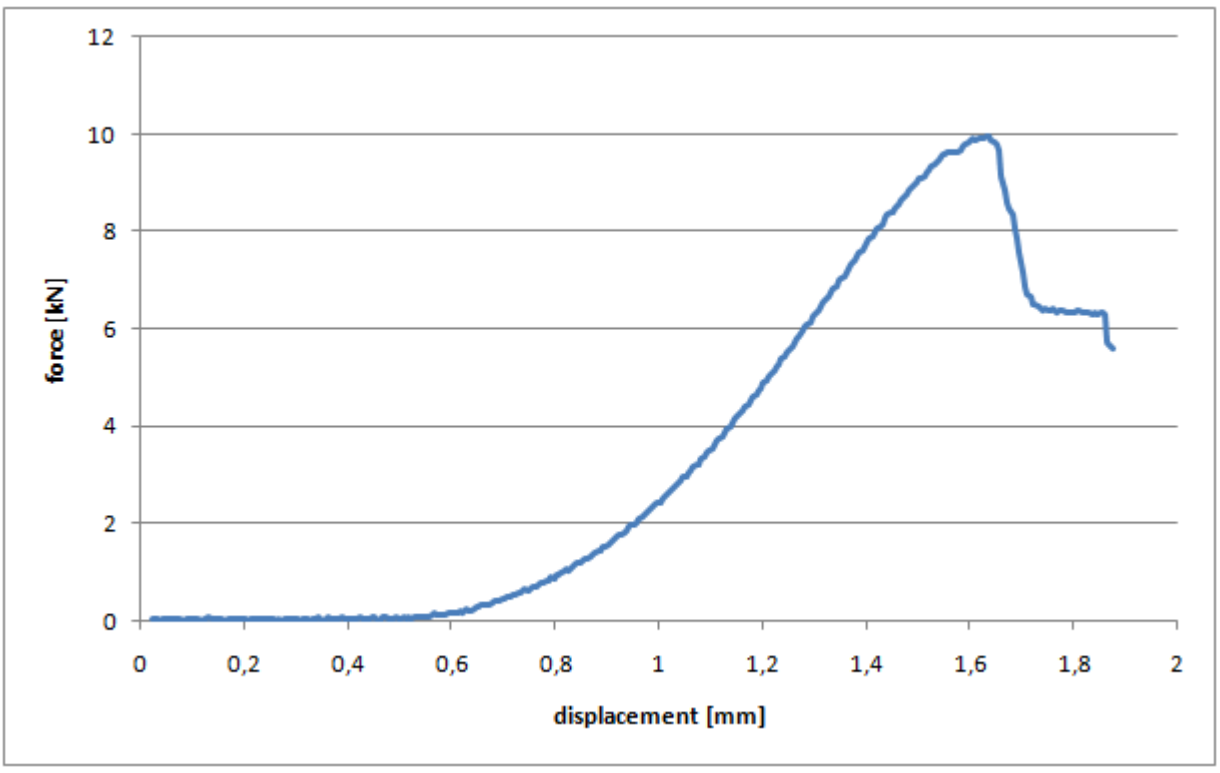
Test No.	**I-E-5**
 Failure of the stressed face	
	
Compound between core and face	

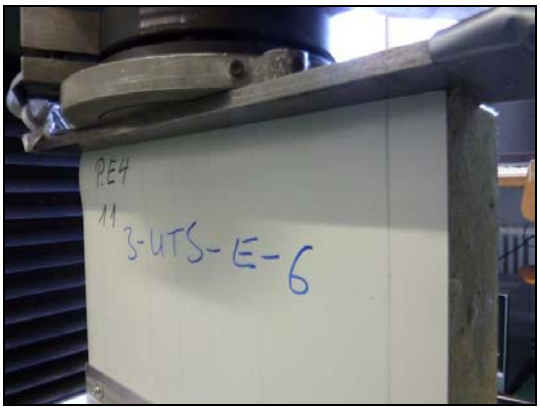
Test No.		**I-E-6**
type of test	introduction of load by contact	
load introduction	steel sheet	
type of panel	E	
faces	0,50 mm steel	
core	100 mm Mineral wool	
stressed face	-	

Measured dimensions:		
width b	401	mm
height l	302	mm
thickness d	99,5	mm

ultimate load	9,96	kN
ultimate stress	52,3	N/mm^2
ultimate stress based on failed width	58,7	N/mm^2

Failure mode	crippling of the stressed face
Remarks	failed width b=357mm



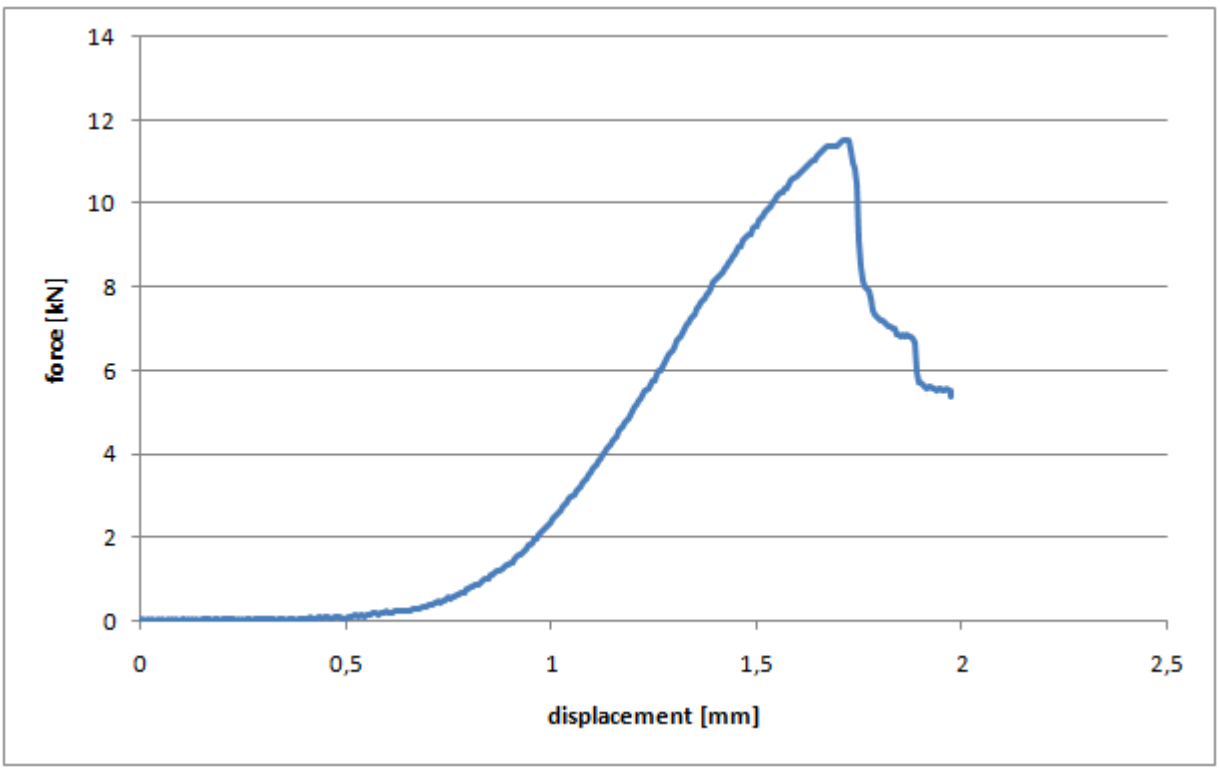
Test No.	**I-E-6**
 Failure of the stressed face	
	
Compound between core and face	

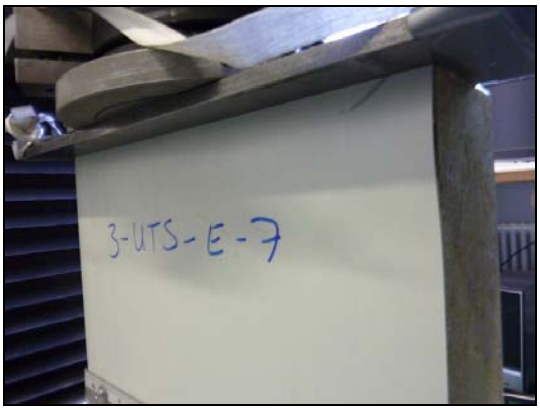
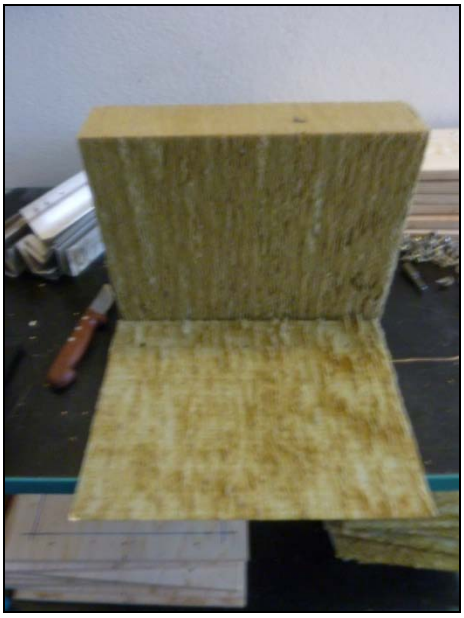
Test No.		**I-E-7**
type of test	introduction of load by contact	
load introduction	steel sheet	
type of panel	E	
faces	0,50 mm steel	
core	100 mm Mineral wool	
stressed face	-	

Measured dimensions:		
width b	400	mm
height l	300	mm
thickness d	99,5	mm

ultimate load	11,50	kN
ultimate stress	60,5	N/mm^2
ultimate stress based on failed width	64,4	N/mm^2

Failure mode	crippling of the stressed face
Remarks	failed width b=376mm



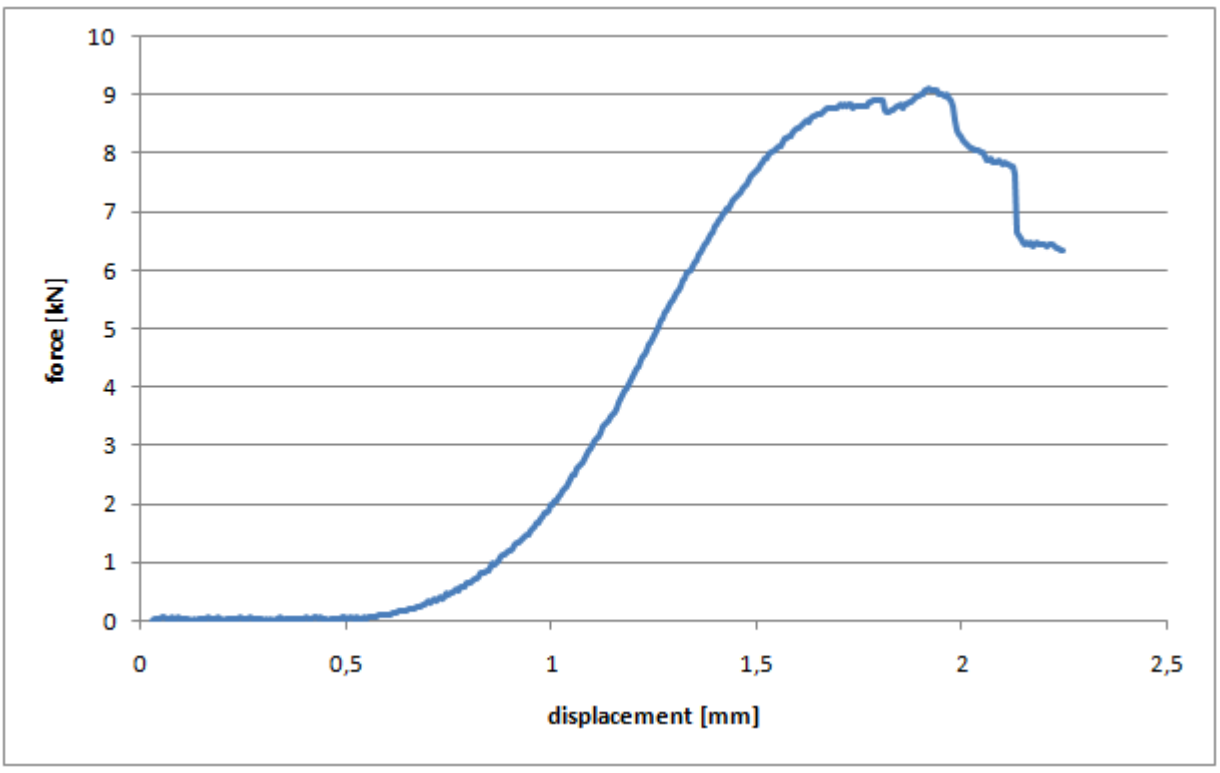
Test No.	**I-E-7**
 Failure of the stressed face	
	
Compound between core and face	

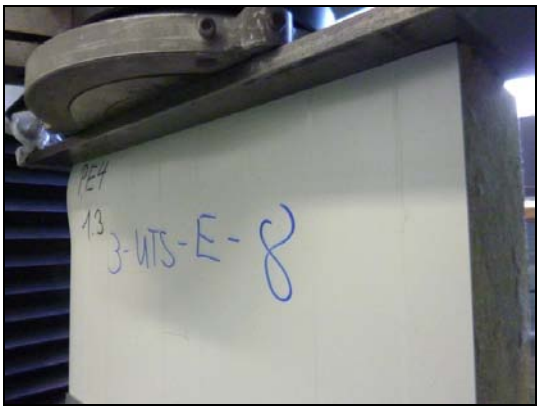
Test No.		**I-E-8**
type of test	introduction of load by contact	
load introduction	steel sheet	
type of panel	E	
faces	0,50 mm steel	
core	100 mm Mineral wool	
stressed face	-	

Measured dimensions:		
width b	400	mm
height l	301	mm
thickness d	99,5	mm

ultimate load	9,13	kN
ultimate stress	48,1	N/mm^2
ultimate stress based on failed width	51,4	N/mm^2

Failure mode	crippling of the stressed face
Remarks	failed width b=374mm



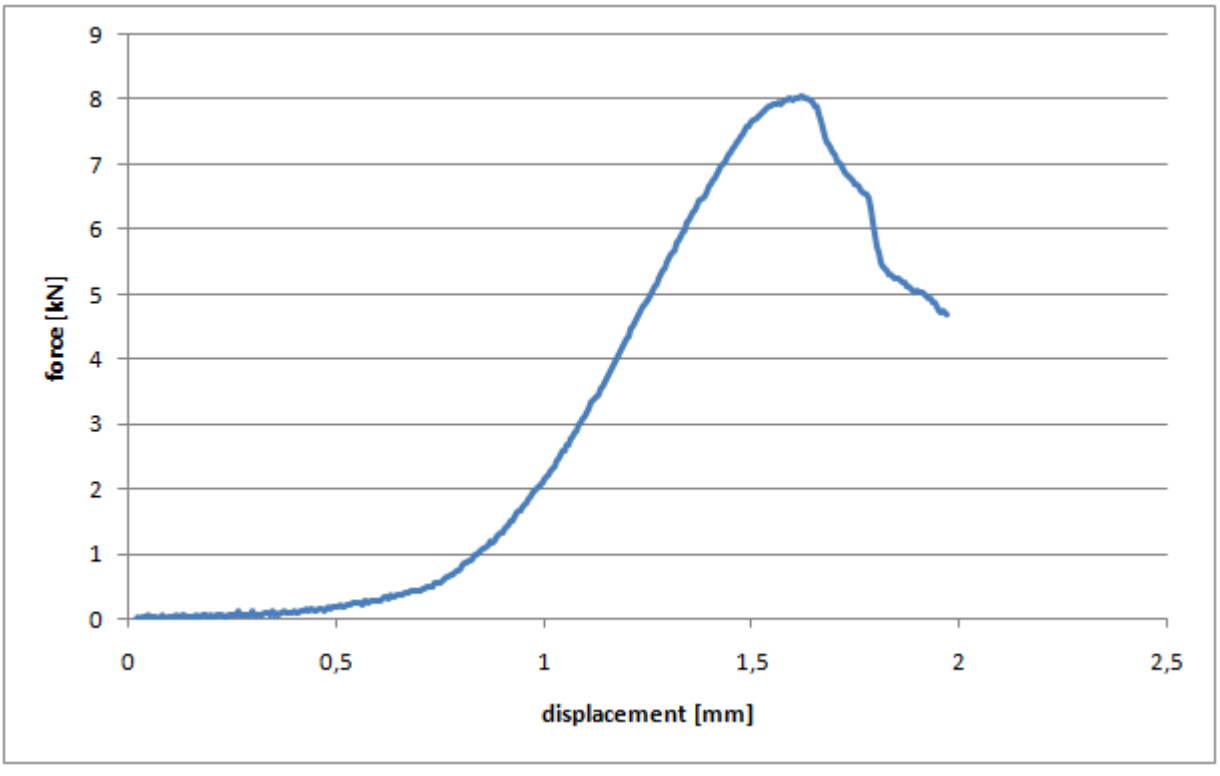
Test No.	**I-E-8**
 Failure of the stressed face	
 Compound between core and face	

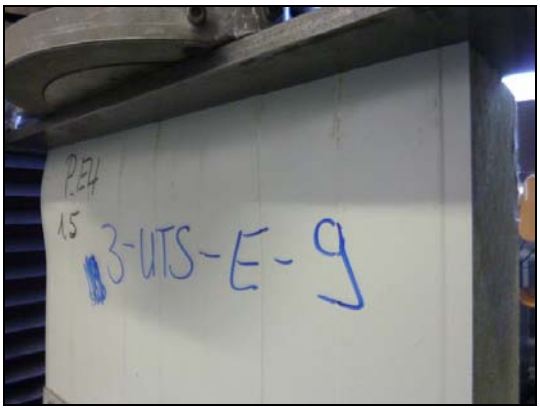
Test No.		**I-E-9**
type of test	introduction of load by contact	
load introduction	steel sheet	
type of panel	E	
faces	0,50 mm steel	
core	100 mm Mineral wool	
stressed face	-	

Measured dimensions:		
width b	400	mm
height l	301	mm
thickness d	99,5	mm

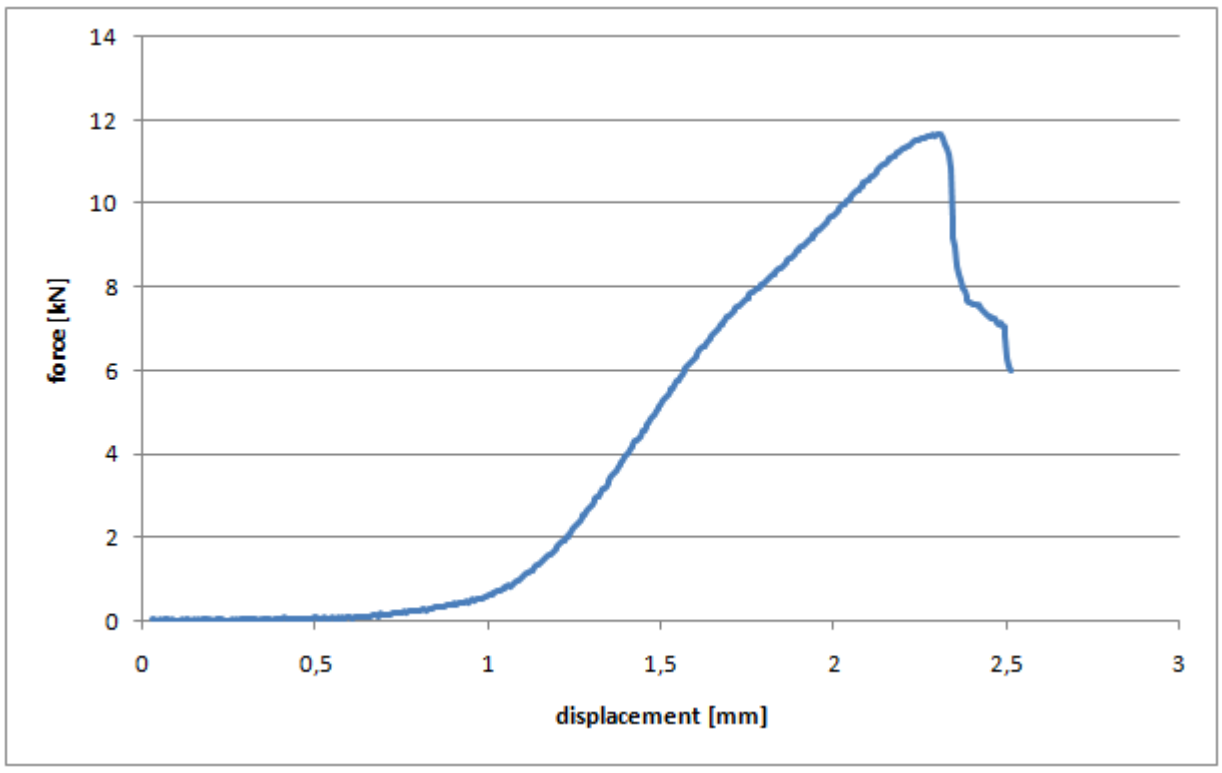
ultimate load	8,04	kN
ultimate stress	42,3	N/mm^2
ultimate stress based on failed width	46,4	N/mm^2

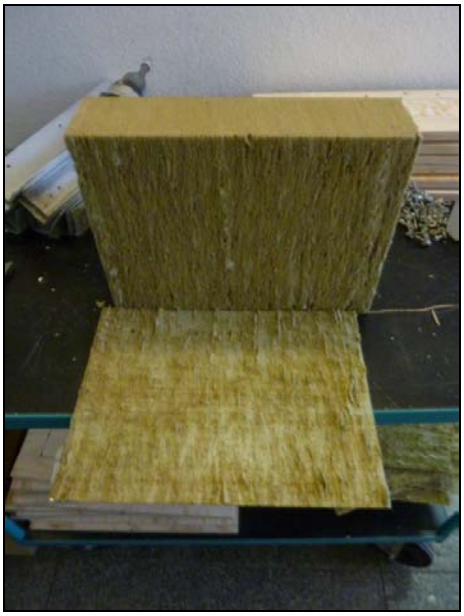
Failure mode	crippling of the stressed face
Remarks	failed width b=365mm



Test No.	**I-E-9**
 Failure of the stressed face	
	
Compound between core and face	

Test No.		**I-E-10**
type of test	introduction of load by contact	
load introduction	steel sheet	
type of panel	E	
faces	0,50 mm steel	
core	100 mm Mineral wool	
stressed face	-	
Measured dimensions:		
width b	400 mm	
height l	301 mm	
thickness d	99,5 mm	
ultimate load	11,66	kN
ultimate stress	61,4	N/mm^2
ultimate stress based on failed width	64,1	N/mm^2
Failure mode	crippling of the stressed face	
Remarks	failed width b=383mm	



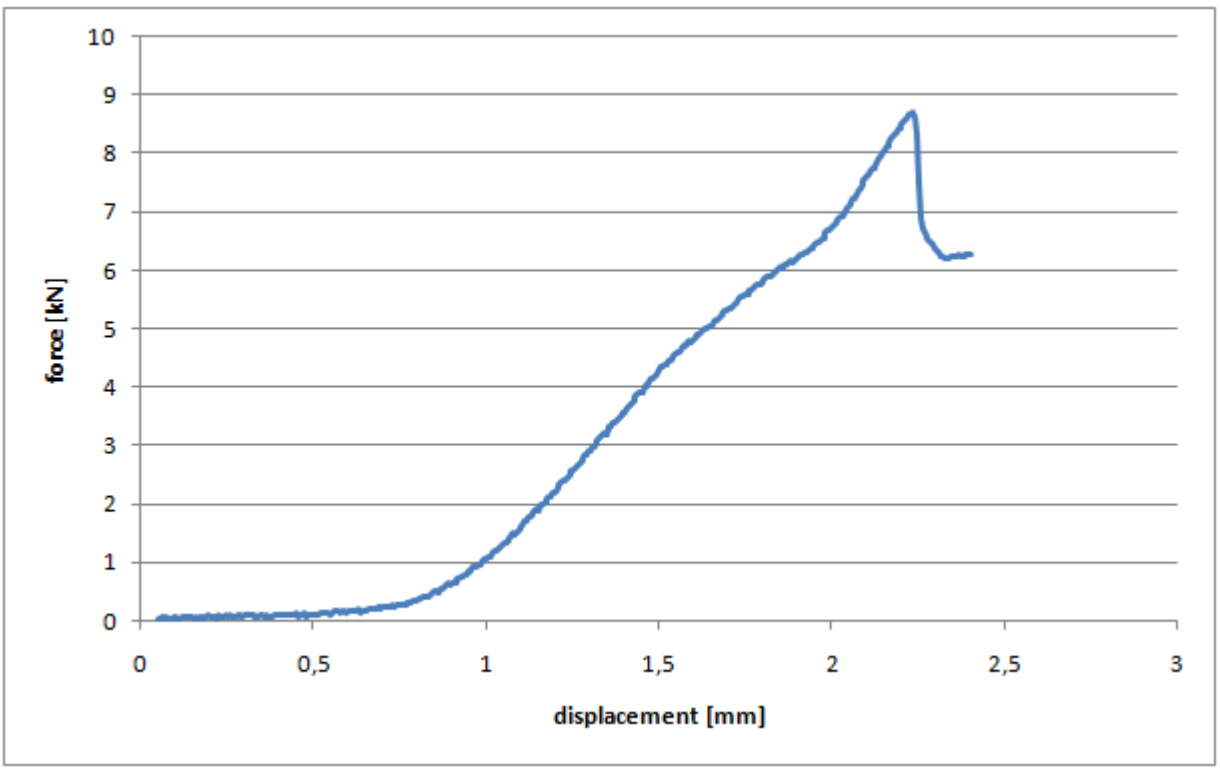
Test No.	**I-E-10**
 Failure of the stressed face	
 Compound between core and face	

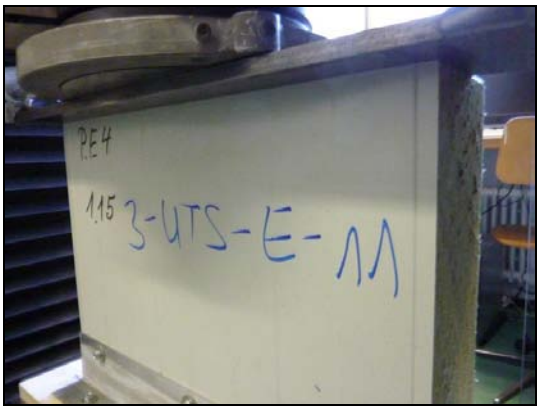
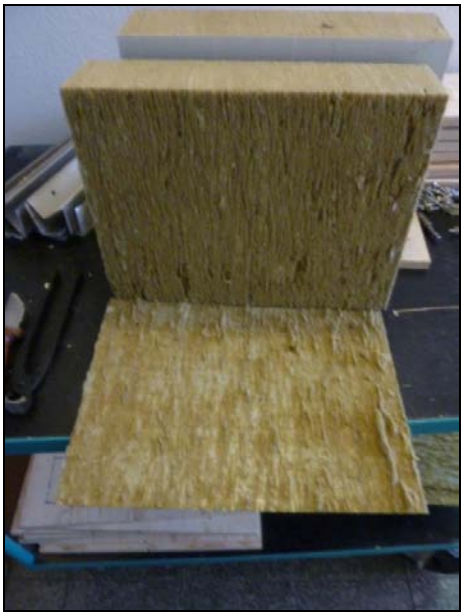
Test No.		**I-E-11**
type of test	introduction of load by contact	
load introduction	steel sheet	
type of panel	E	
faces	0,50 mm steel	
core	100 mm Mineral wool	
stressed face	-	

Measured dimensions:		
width b	401	mm
height l	302	mm
thickness d	99	mm

ultimate load	8,71	kN
ultimate stress	45,7	N/mm^2
ultimate stress based on failed width	49,6	N/mm^2

Failure mode	crippling of the stressed face
Remarks	failed width b=370mm



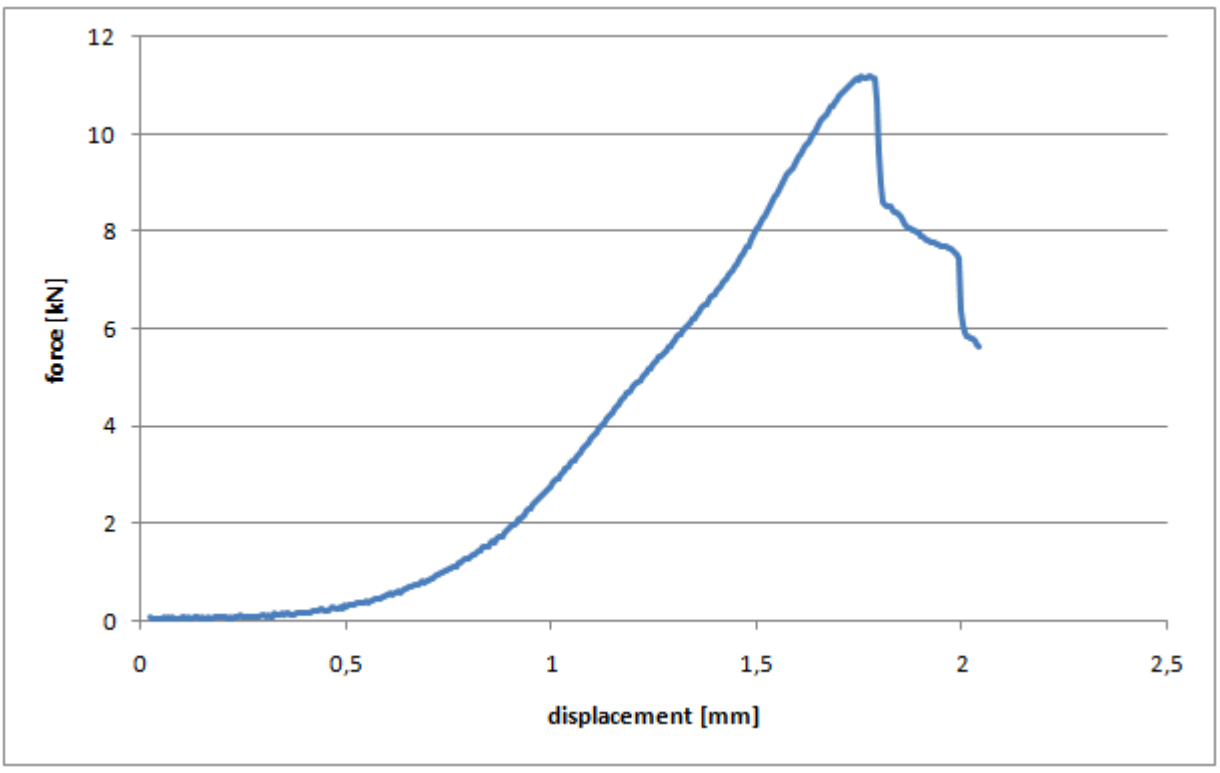
Test No.	**I-E-11**
 Failure of the stressed face	
 Compound between core and face	

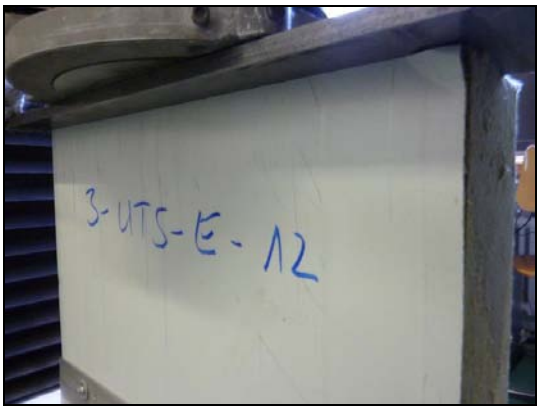
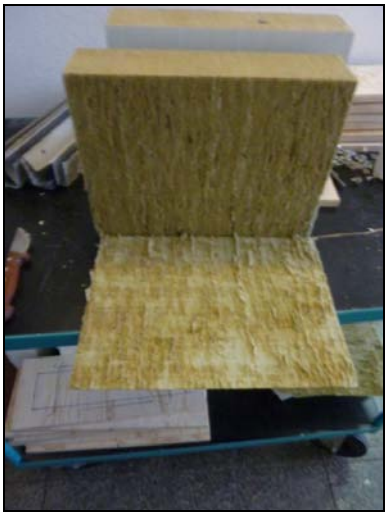
Test No.		**I-E-12**
type of test	introduction of load by contact	
load introduction	steel sheet	
type of panel	E	
faces	0,50 mm steel	
core	100 mm Mineral wool	
stressed face	-	

Measured dimensions:		
width b	401	mm
height l	302	mm
thickness d	99	mm

ultimate load	11,18	kN
ultimate stress	58,7	N/mm^2
ultimate stress based on failed width	67,3	N/mm^2

Failure mode	crippling of the stressed face
Remarks	failed width b=350mm



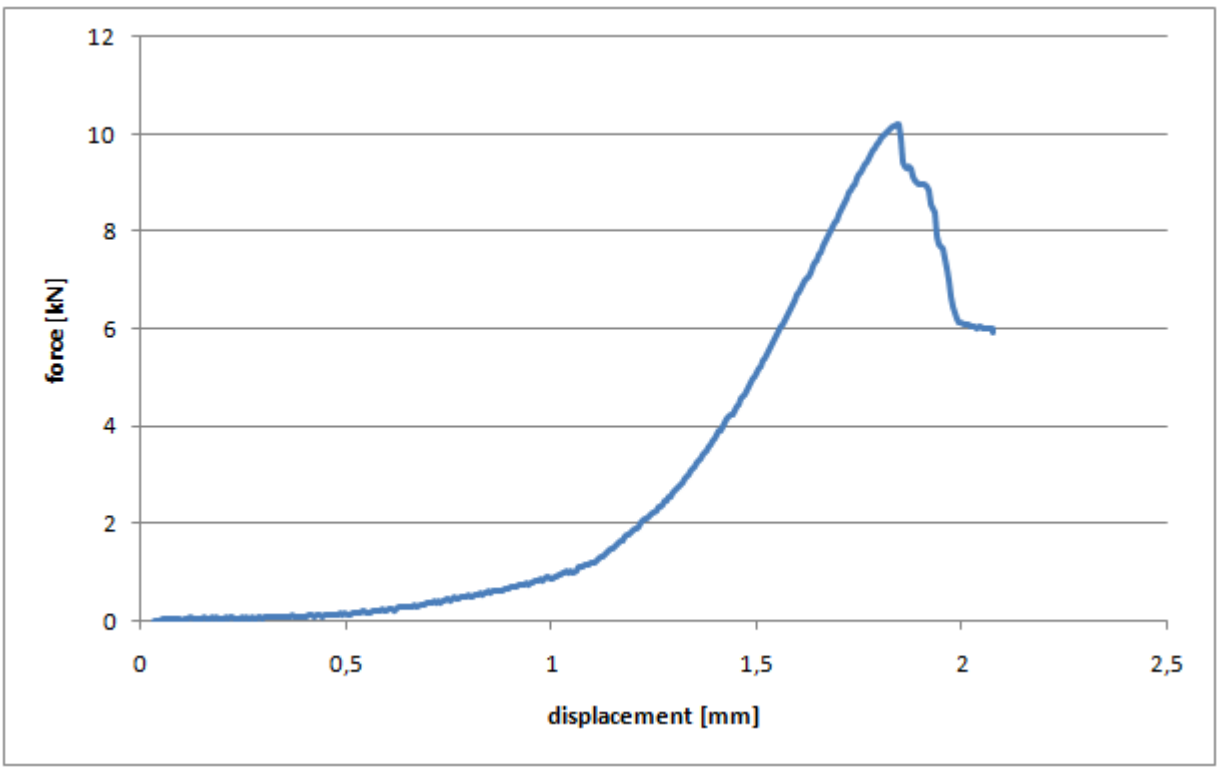
Test No.	**I-E-12**
 Failure of the stressed face	
 Compound between core and face	 Damage of the face

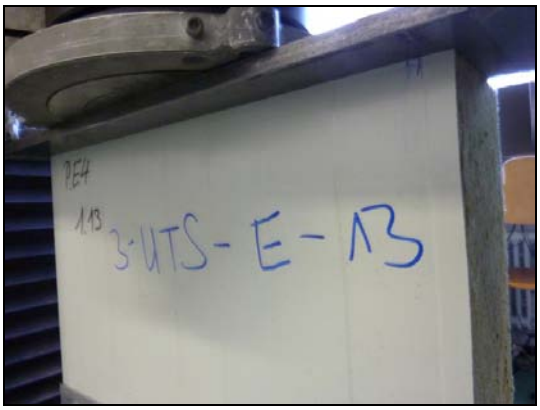
Test No.		**I-E-13**
type of test	introduction of load by contact	
load introduction	steel sheet	
type of panel	E	
faces	0,50 mm steel	
core	100 mm Mineral wool	
stressed face	-	

Measured dimensions:		
width b	400	mm
height l	300	mm
thickness d	100	mm

ultimate load	10,20	kN
ultimate stress	53,6	N/mm^2
ultimate stress based on failed width	59,6	N/mm^2

Failure mode	crippling of the stressed face
Remarks	failed width b=360mm



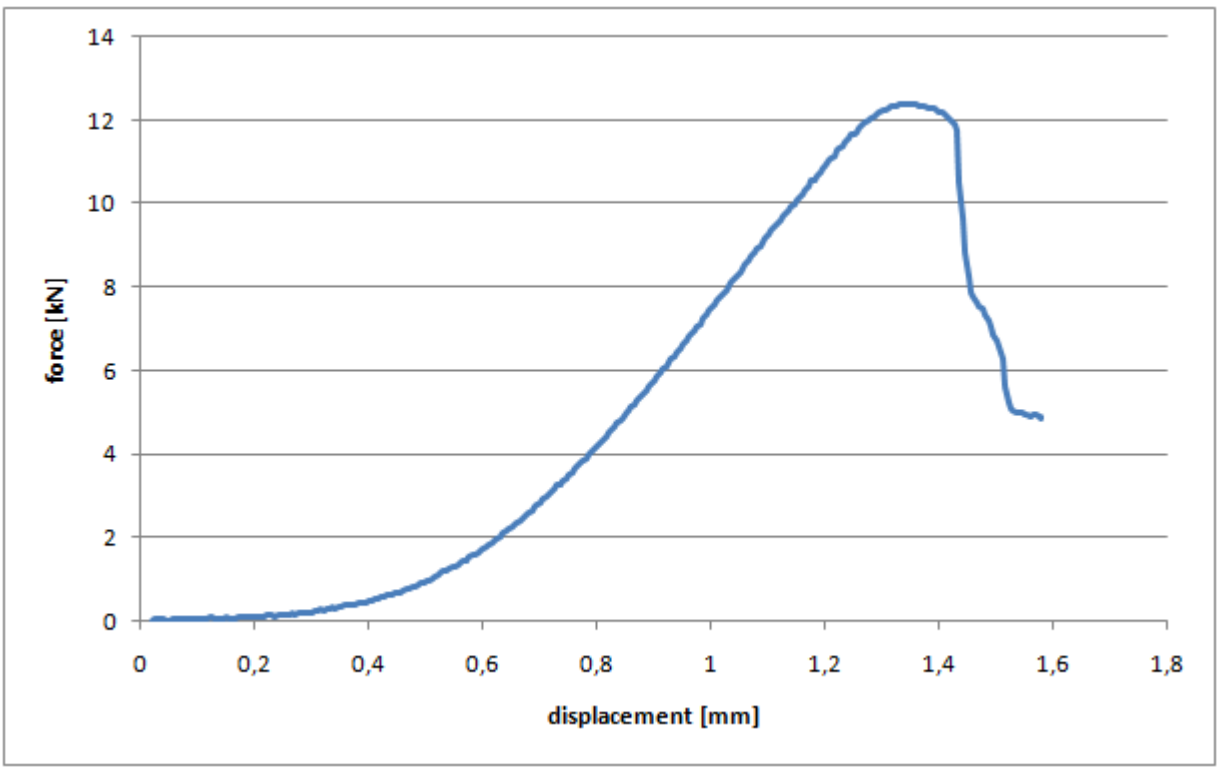
Test No.	**I-E-13**
	
Failure of the stressed face	
	
Compound between core and face	

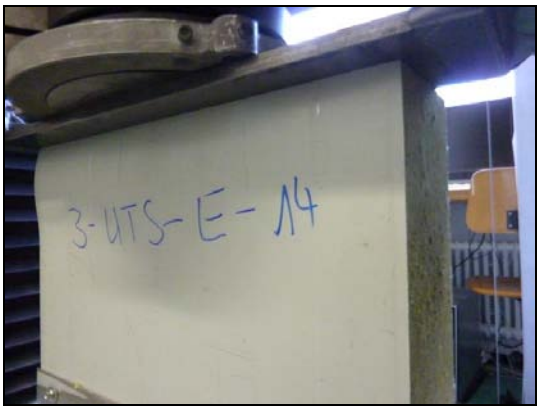
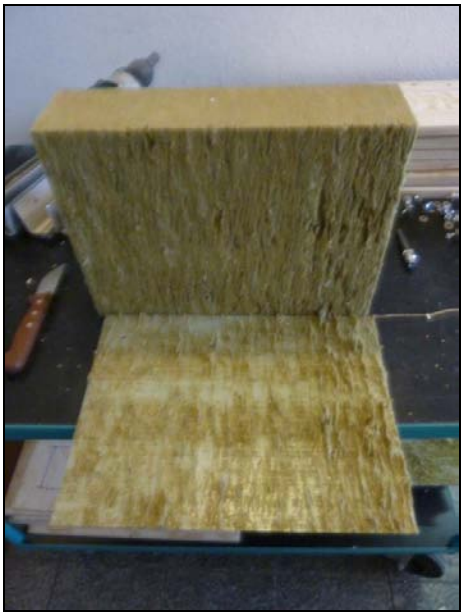
Test No.		**I-E-14**
type of test	introduction of load by contact	
load introduction	steel sheet	
type of panel	E	
faces	0,50 mm steel	
core	100 mm Mineral wool	
stressed face	-	

Measured dimensions:		
width b	401	mm
height l	300	mm
thickness d	100	mm

ultimate load	12,36	kN
ultimate stress	64,9	N/mm^2
ultimate stress based on failed width	68,5	N/mm^2

Failure mode	crippling of the stressed face
Remarks	failed width b=380mm



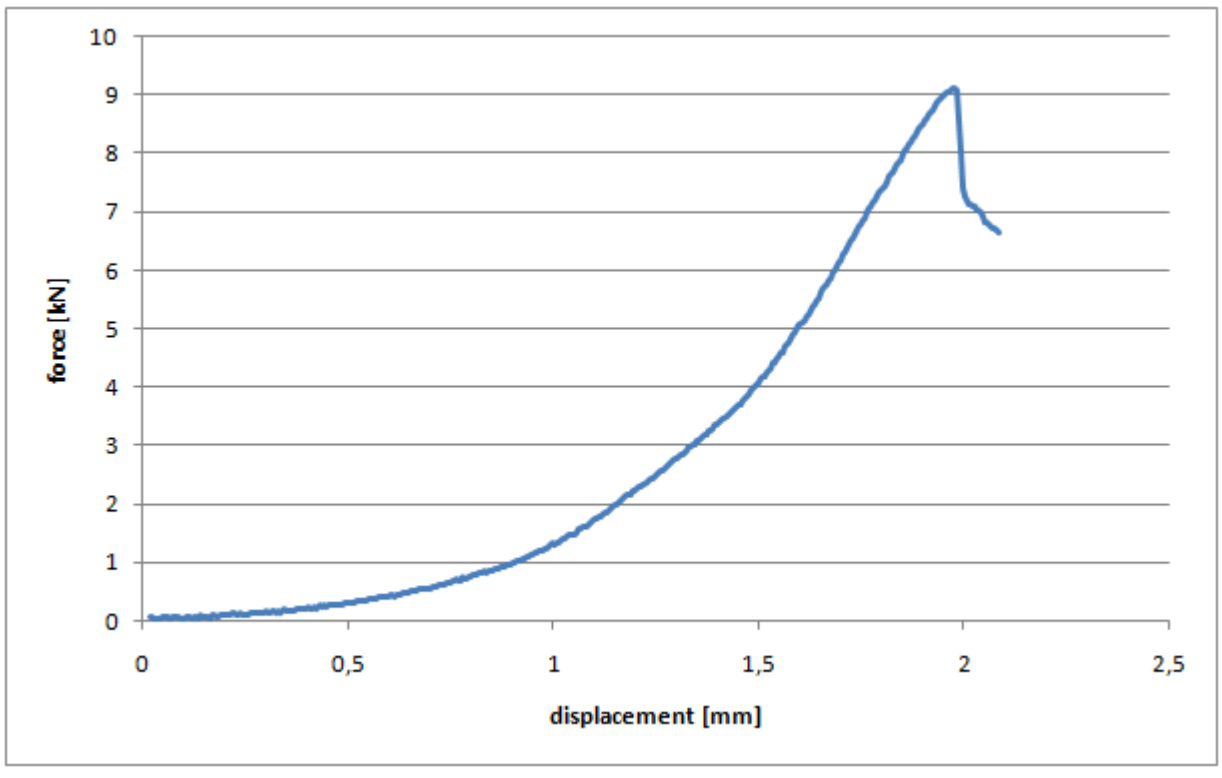
Test No.	**I-E-14**
 Failure of the stressed face	
	
Compound between core and face	

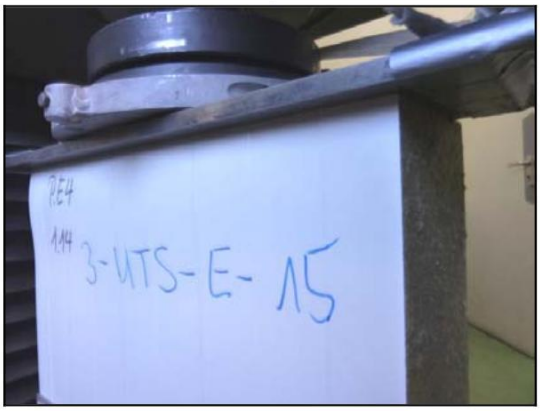
Test No.		**I-E-15**
type of test	introduction of load by contact	
load introduction	steel sheet	
type of panel	E	
faces	0,50 mm steel	
core	100 mm Mineral wool	
stressed face	-	

Measured dimensions:		
width b	401	mm
height l	300	mm
thickness d	100	mm

ultimate load	9,12	kN
ultimate stress	47,9	N/mm^2
ultimate stress based on failed width	53,3	N/mm^2

Failure mode	crippling of the stressed face
Remarks	failed width b=360mm



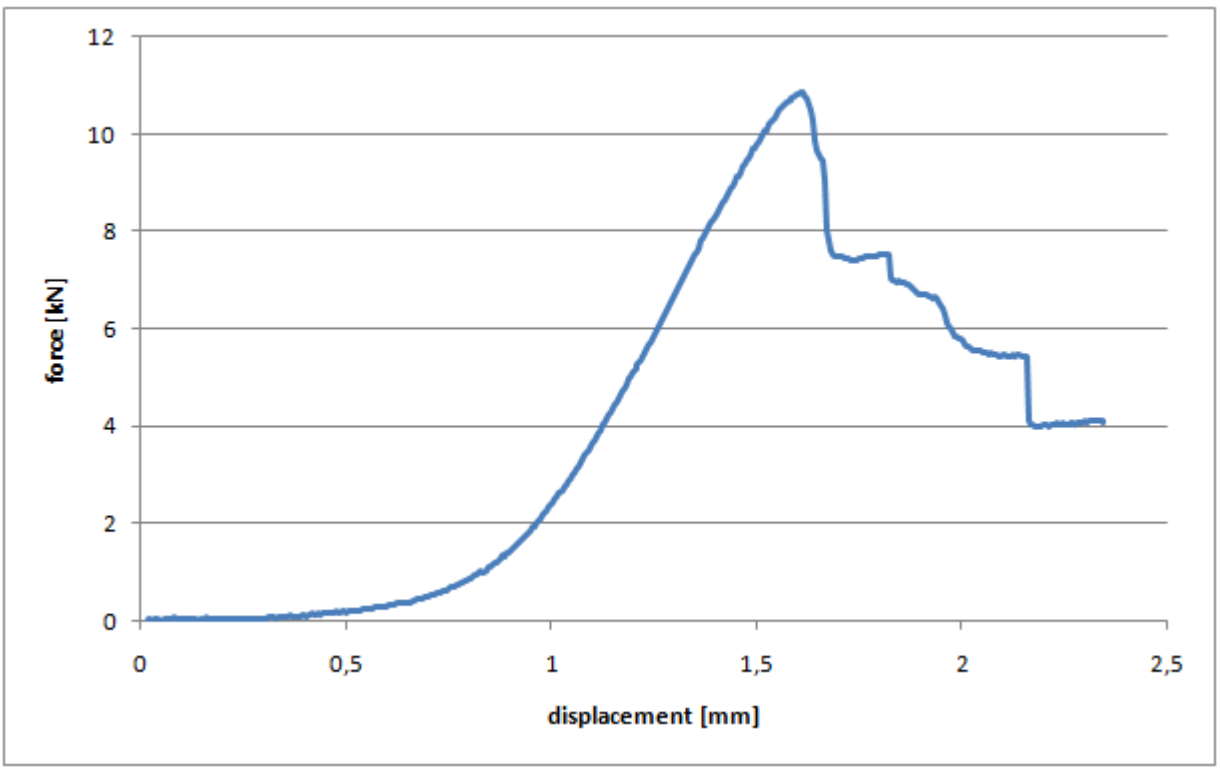
Test No.	**I-E-15**
 Failure of the stressed face	
 Compound between core and face	

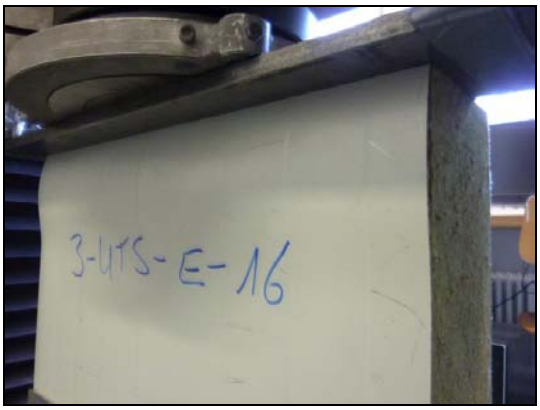
Test No.		**I-E-16**
type of test	introduction of load by contact	
load introduction	steel sheet	
type of panel	E	
faces	0,50 mm steel	
core	100 mm Mineral wool	
stressed face	-	

Measured dimensions:		
width b	401	mm
height l	301	mm
thickness d	100	mm

ultimate load	10,87	kN
ultimate stress	57,1	N/mm^2
ultimate stress based on failed width	57,1	N/mm^2

Failure mode	crippling of the stressed face
Remarks	failed width b



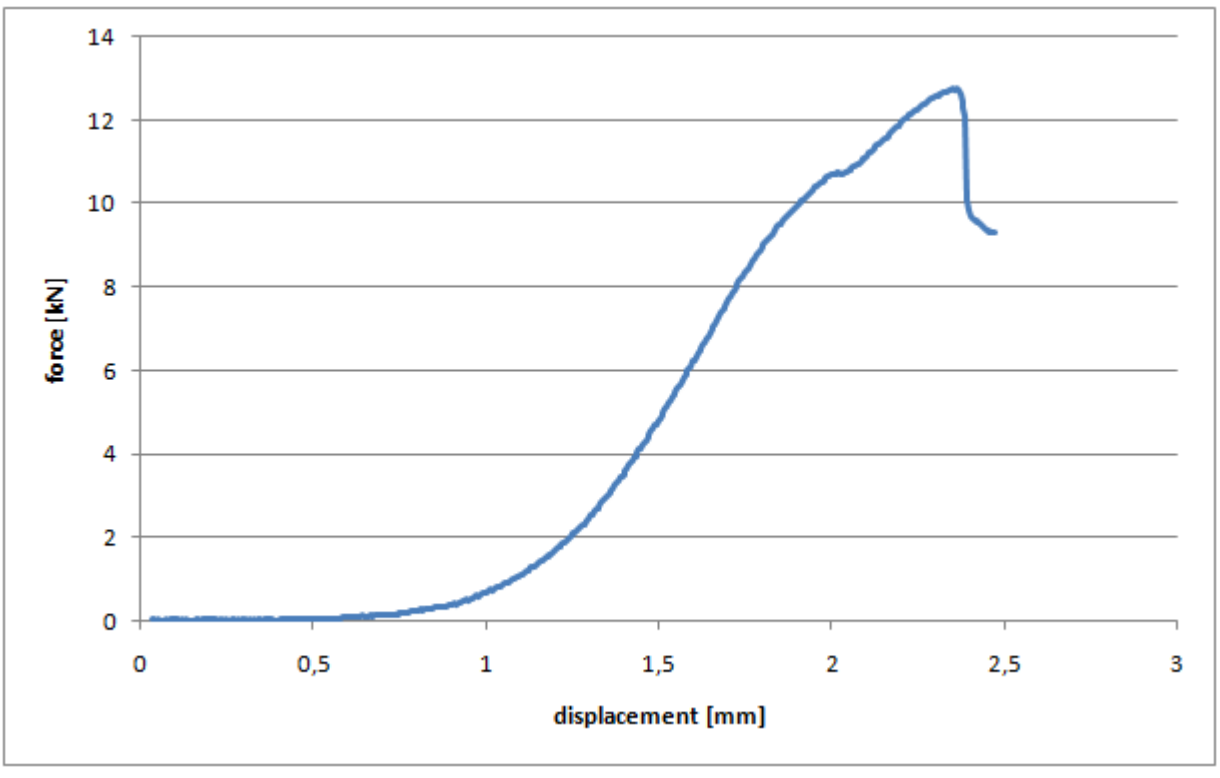
Test No.	**I-E-16**
 Failure of the stressed face	
	
Compound between core and face	

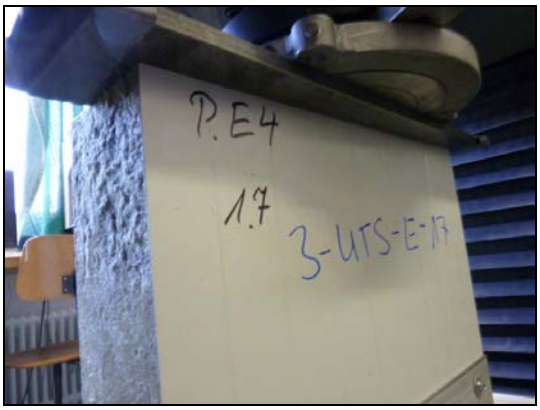
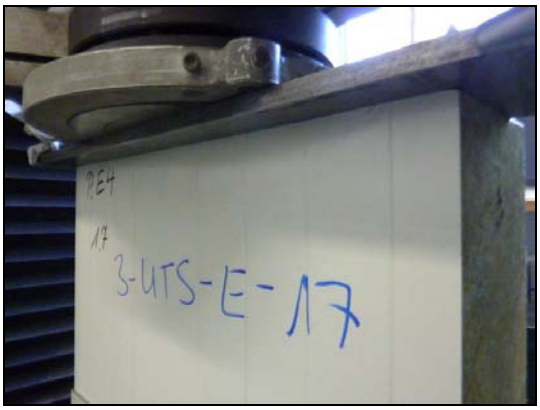
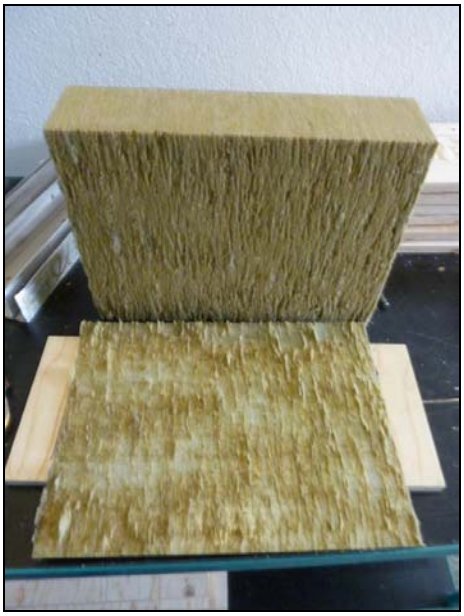
Test No.		**I-E-17**
type of test	introduction of load by contact	
load introduction	steel sheet	
type of panel	E	
faces	0,50 mm steel	
core	100 mm Mineral wool	
stressed face	-	

Measured dimensions:		
width b	400	mm
height l	300	mm
thickness d	99,5	mm

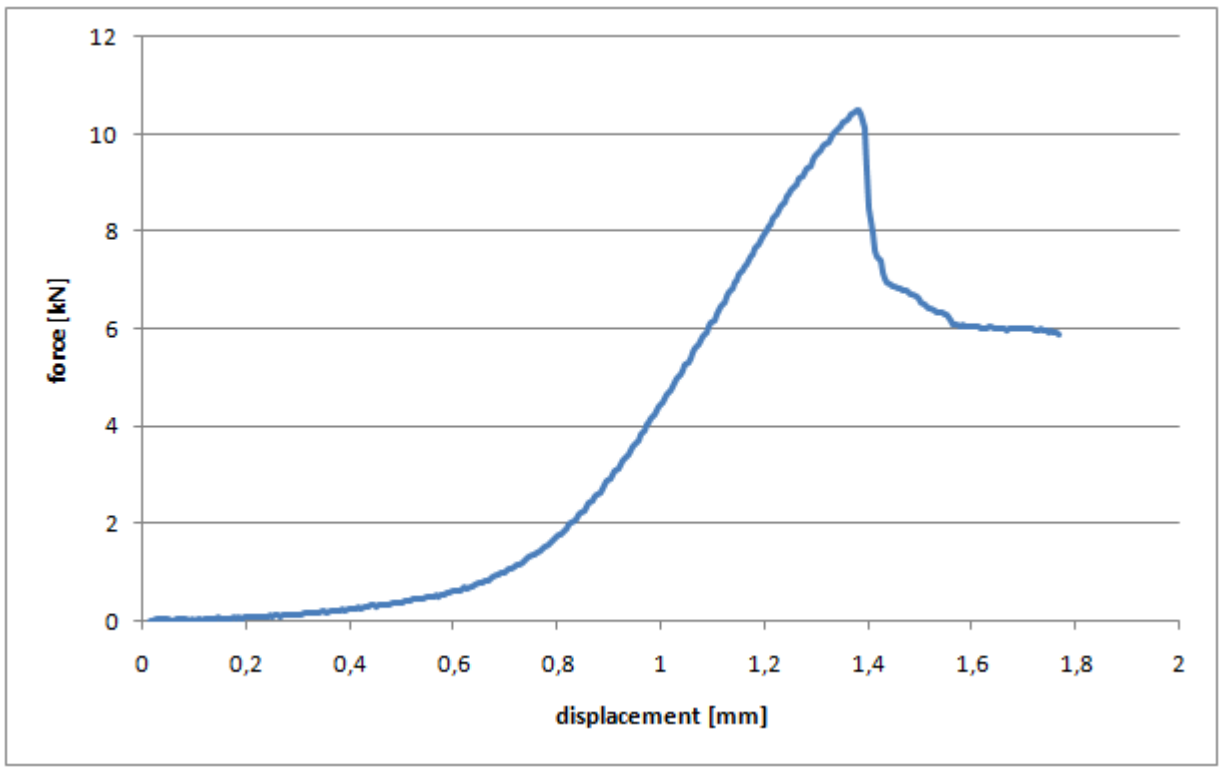
ultimate load	12,76	kN
ultimate stress	67,2	N/mm^2
ultimate stress based on failed width	81,4	N/mm^2

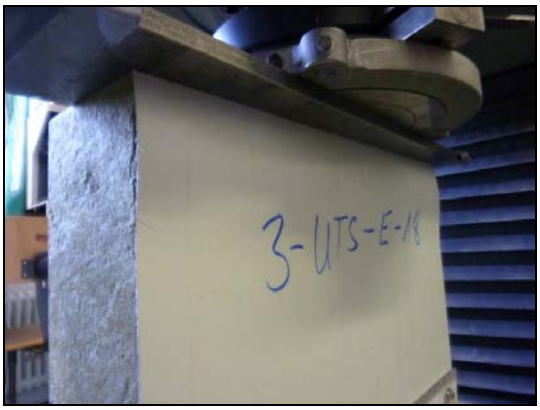
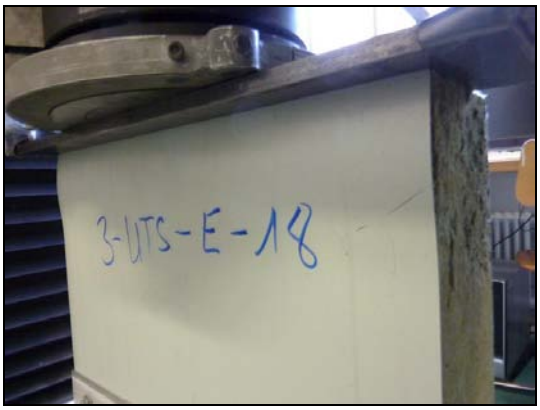
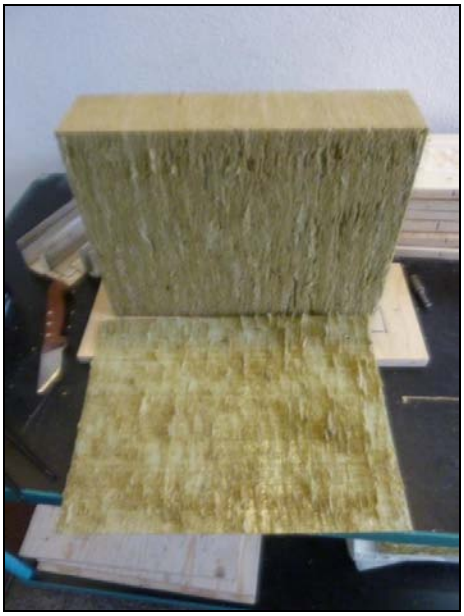
Failure mode	crippling of the stressed face
Remarks	failed width b=330mm



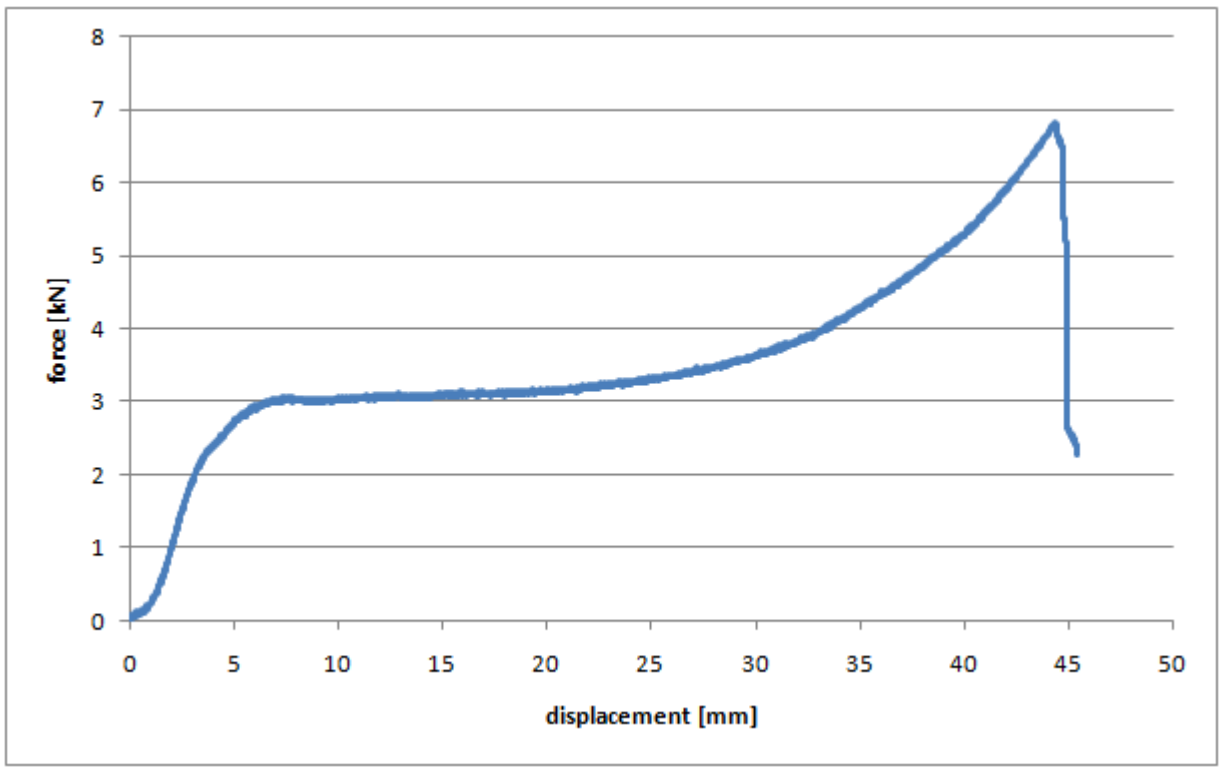
Test No.	**I-E-17**
	
Failure of the stressed face	
	
Compound between core and face	

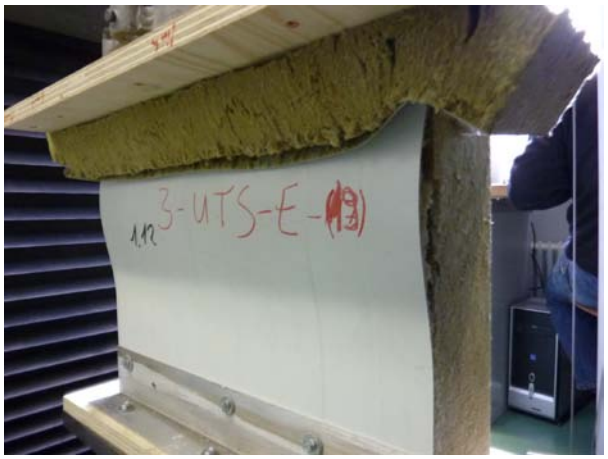
Test No.		**I-E-18**
type of test	introduction of load by contact	
load introduction	steel sheet	
type of panel	E	
faces	0,50 mm steel	
core	100 mm Mineral wool	
stressed face	-	
Measured dimensions:		
width b	400 mm	
height l	300 mm	
thickness d	99,5 mm	
ultimate load	10,51 kN	
ultimate stress	55,3 N/mm^2	
ultimate stress based on failed width	55,3 N/mm^2	
Failure mode	crippling of the stressed face	
Remarks	failed width b	



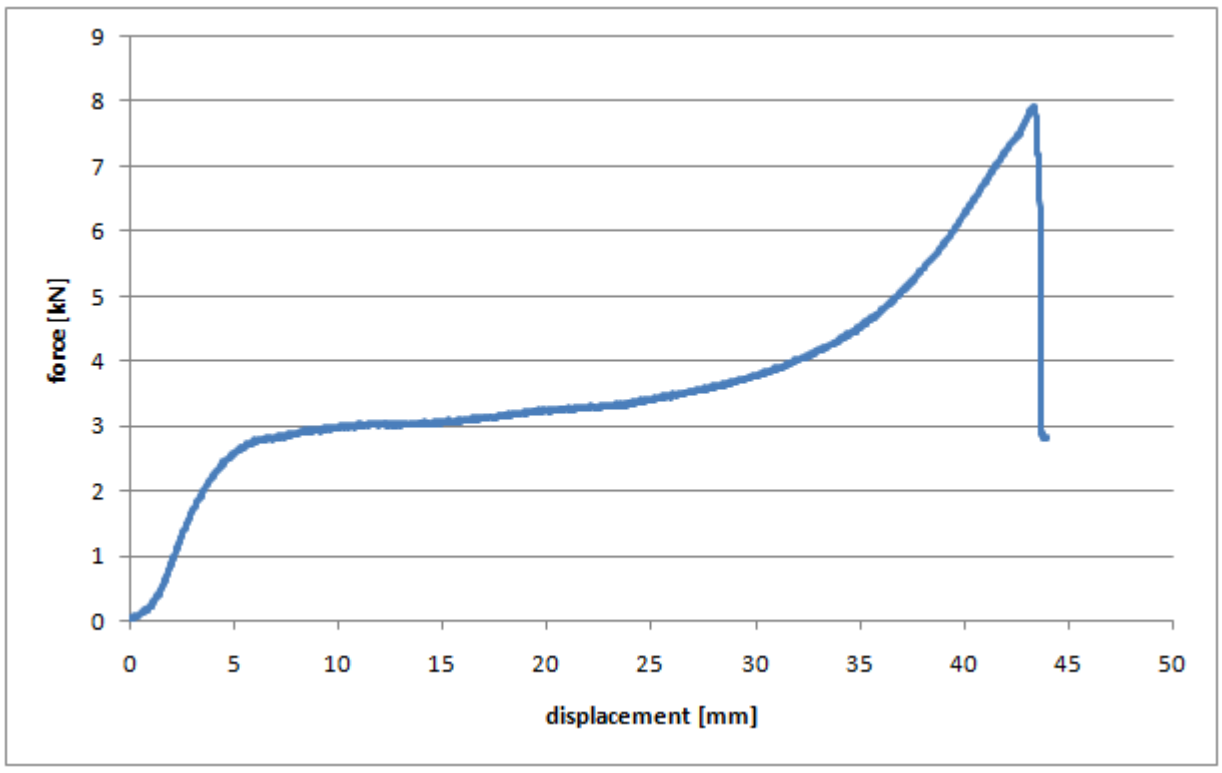
Test No.	**I-E-18**
 Failure of the stressed face	
 Compound between core and face	

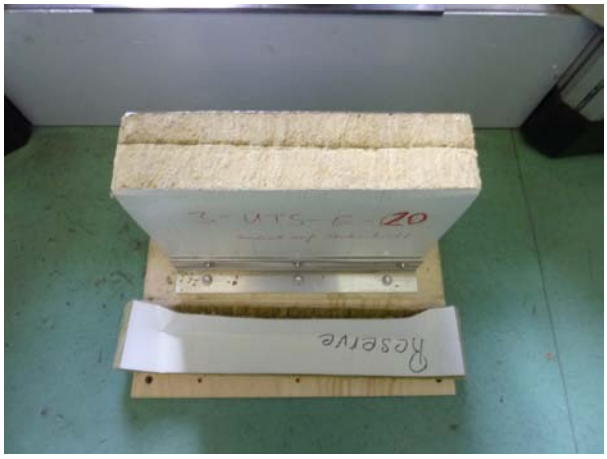
Test No.		**I-E-19**
type of test	introduction of load by contact	
load introduction	sandwich panel	
type of panel	E	
faces	0,50 mm steel	
core	100 mm Mineral wool	
stressed face	-	
Measured dimensions:		
width b	400 mm	
height l		
thickness d		
ultimate load	6,84 kN	
ultimate stress	36,0 N/mm^2	
ultimate stress based on failed width	36,0 N/mm^2	
Failure mode	buckling of the stressed face	
Remarks	failed width b	



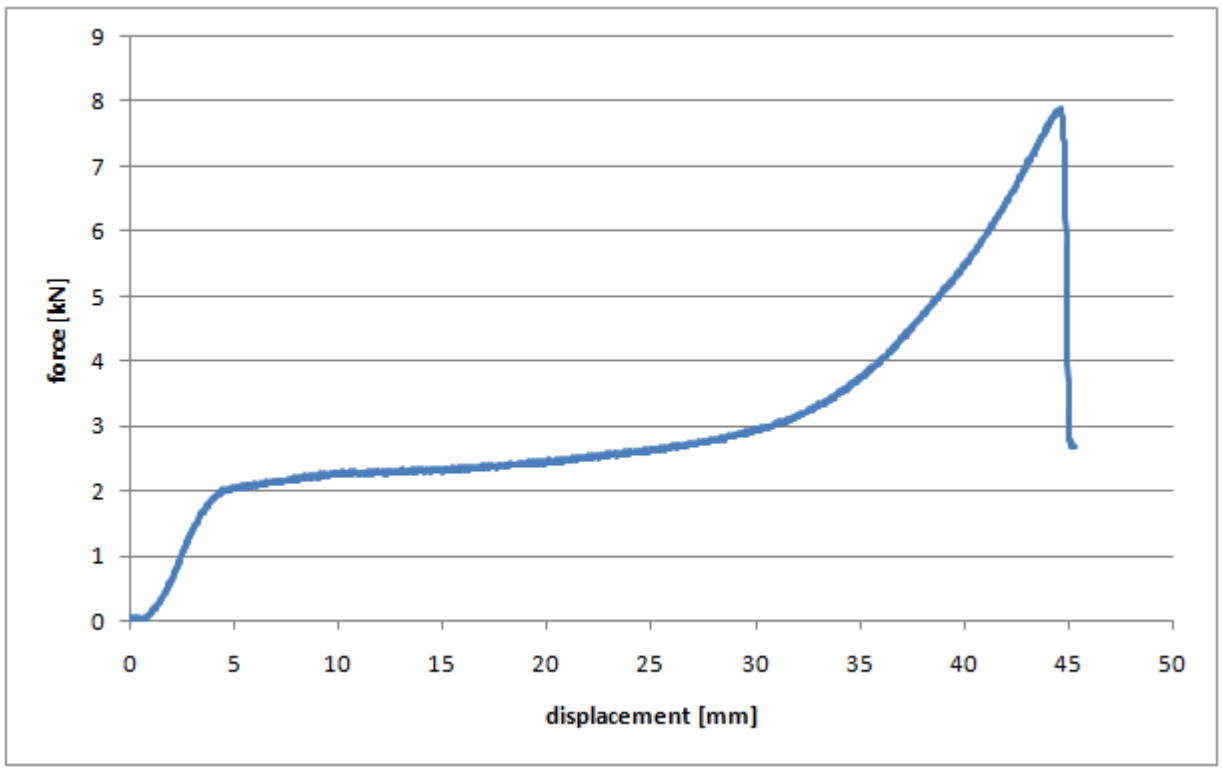
Test No.	**I-E-19**
	
Failure of the stressed face	Failure of the stressed face
	
Compound between core and face	

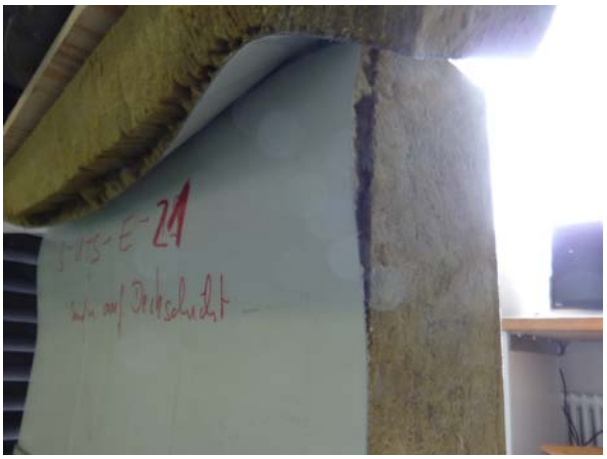
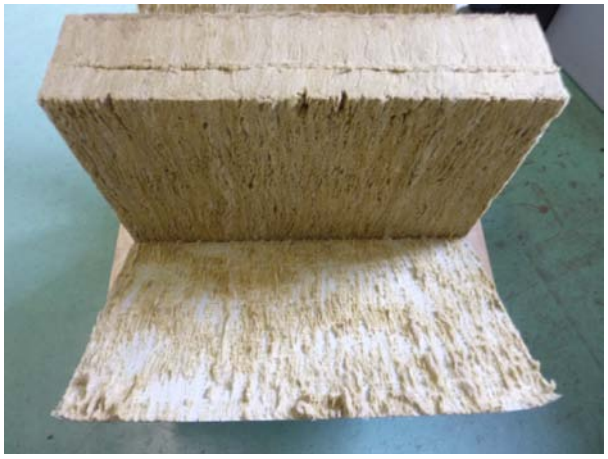
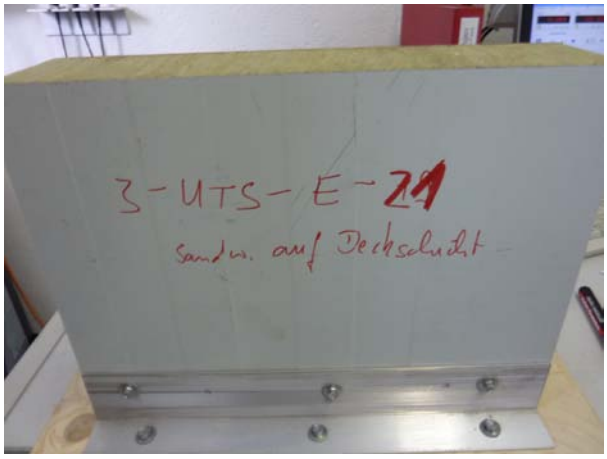
Test No.		**I-E-20**
type of test	introduction of load by contact	
load introduction	sandwich panel	
type of panel	E	
faces	0,50 mm steel	
core	100 mm Mineral wool	
stressed face	-	
Measured dimensions:		
width b	400 mm	
height l	- mm	
thickness d	- mm	
ultimate load	7,93 kN	
ultimate stress	41,7 N/mm^2	
ultimate stress based on failed width	41,7 N/mm^2	
Failure mode	buckling of the stressed face	
Remarks	failed width b	



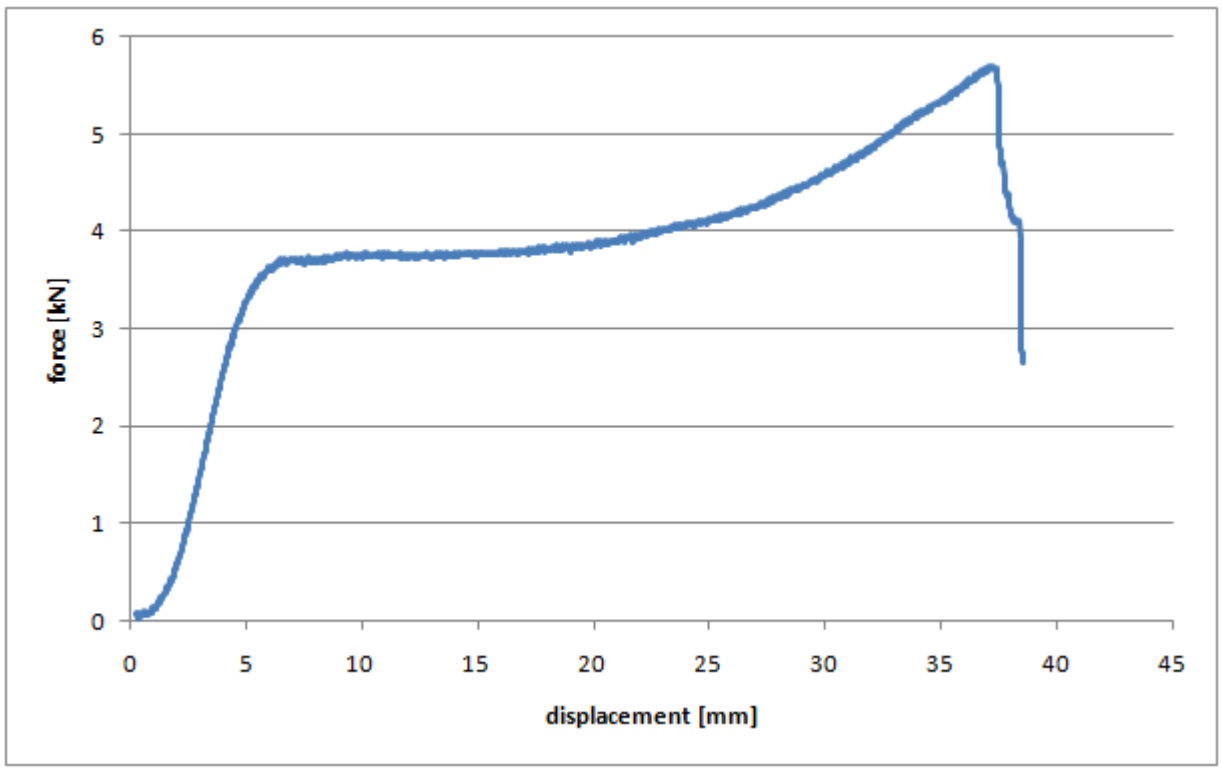
Test No.	**I-E-20**
	
Failure of the stressed face	Failure of the stressed face
	
Compound between core and face	

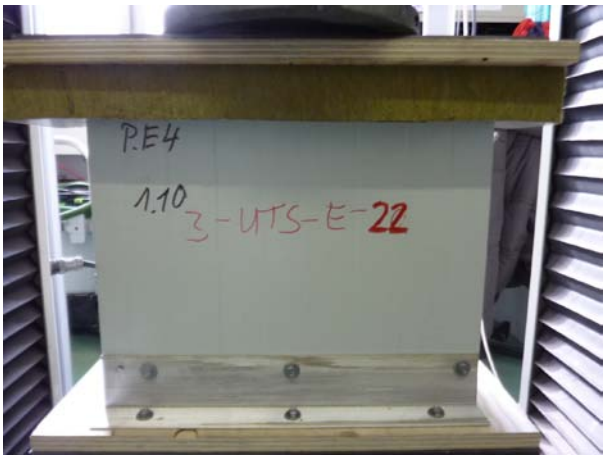
Test No.		**I-E-21**
type of test	introduction of load by contact	
load introduction	sandwich panel	
type of panel	E	
faces	0,50 mm steel	
core	100 mm Mineral wool	
stressed face	-	
Measured dimensions:		
width b	400 mm	
height l	- mm	
thickness d	- mm	
ultimate load	7,90 kN	
ultimate stress	41,6 N/mm^2	
ultimate stress based on failed width	41,6 N/mm^2	
Failure mode	crippling of the stressed face	
Remarks	failed width b	



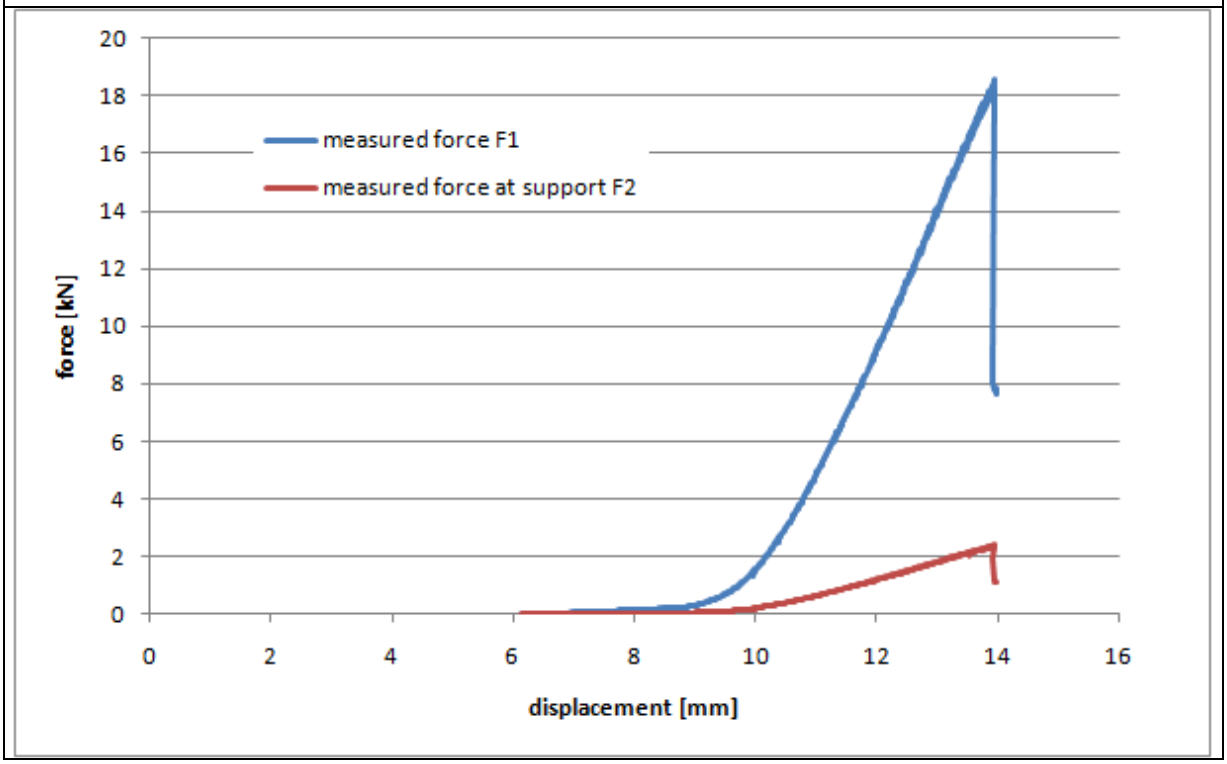
Test No.	**I-E-21**
	
Failure of the stressed face	Failure of the stressed face
	
Compound between core and face	

Test No.		**I-E-22**
type of test	introduction of load by contact	
load introduction	sandwich panel	
type of panel	E	
faces	0,50 mm steel	
core	100 mm Mineral wool	
stressed face	-	
Measured dimensions:		
width b	400 mm	
height l	- mm	
thickness d	- mm	
ultimate load	5,69 kN	
ultimate stress	29,9 N/mm^2	
ultimate stress based on failed width	29,9 N/mm^2	
Failure mode	buckling of the stressed face	
Remarks	failed width b	

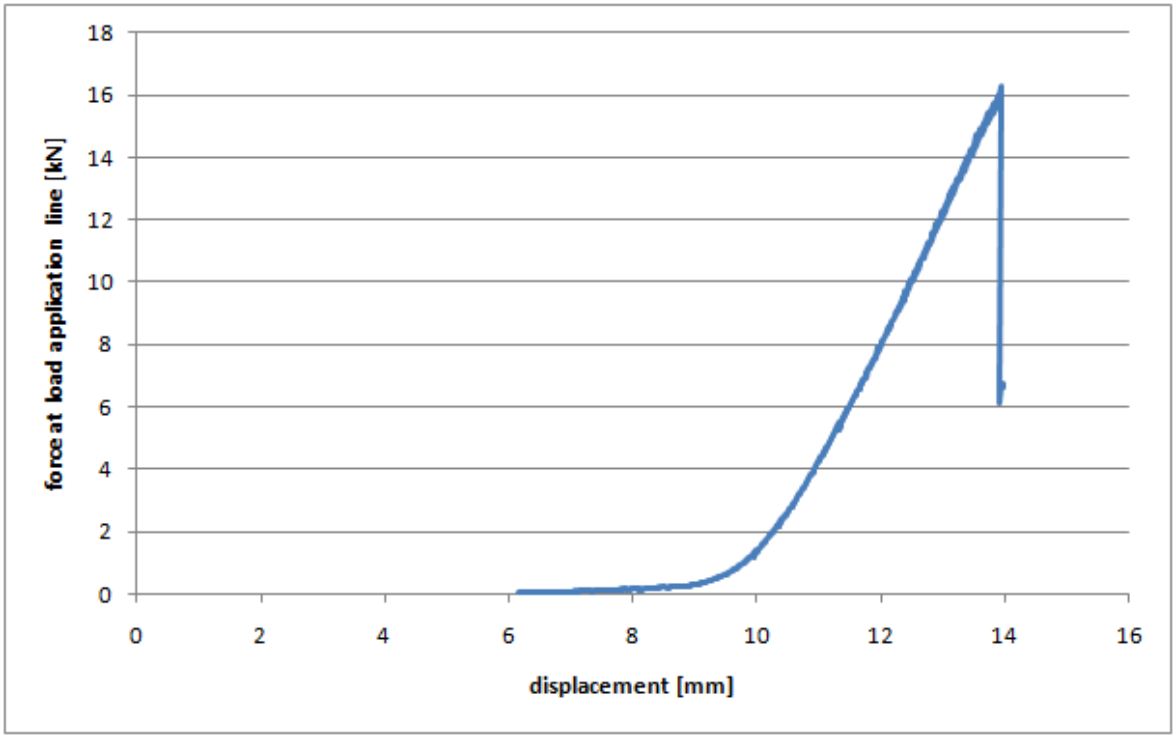


Test No.	**I-E-22**
	
Failure of the stressed face	
	
Compound between core and face	Failure of the stressed face

Test No.			**II-A-8**
type of test	test on corner details, introduction of load by contact		
load introduction	steel sheet		
type of panel	A		
faces	steel 0,50 mm		
core	PU 100 mm		
stressed face	top side of production		
Measured dimensions:		Dimensions of test set up	
width b	400 mm	a	100 mm
height h_1	296 mm	e	100 mm
thickness D	96 mm	f	400 mm
height of cutting h_2	100 mm	g	800 mm
thickness of cutting d_2	49 mm	α	0,516 °
ultimate load at line of load application			16,29 kN
ultimate stress of compressed face			85,9 N/mm^2
Failure mode	crippling of the compressed face		
Remarks			



Test No.	**II-A-8**

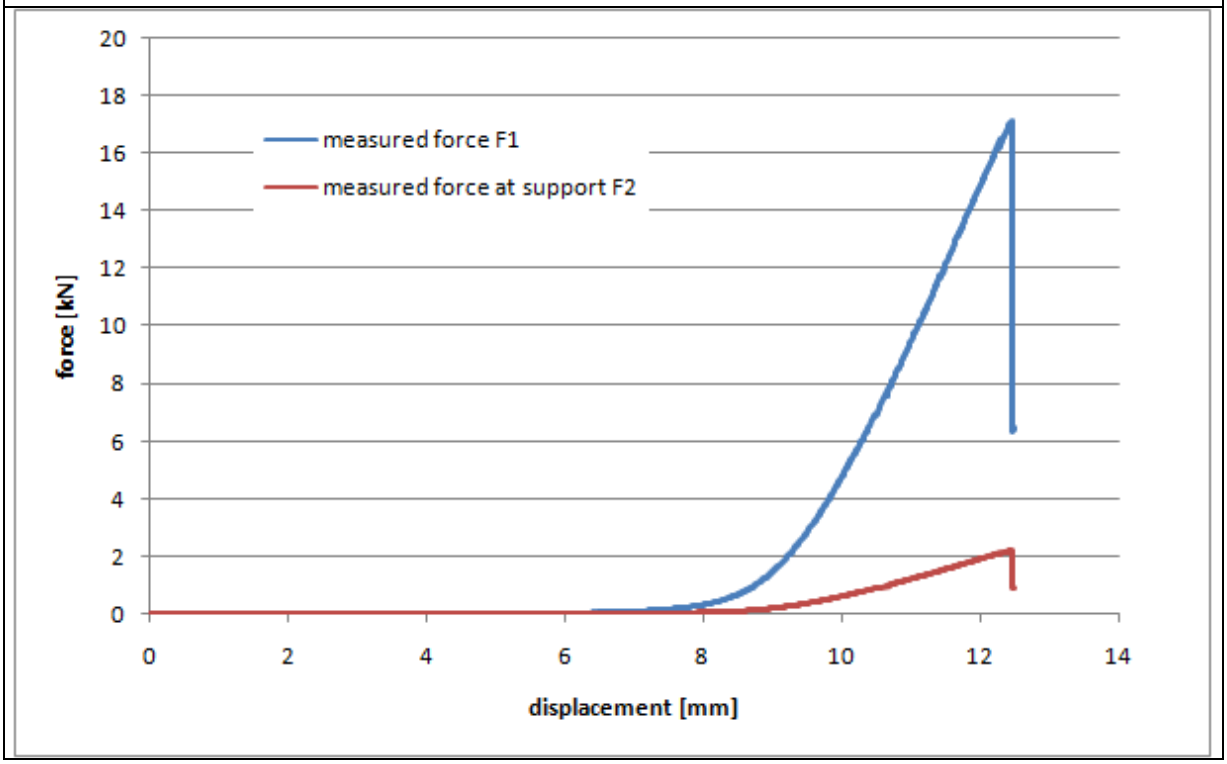


Failure of the stressed face

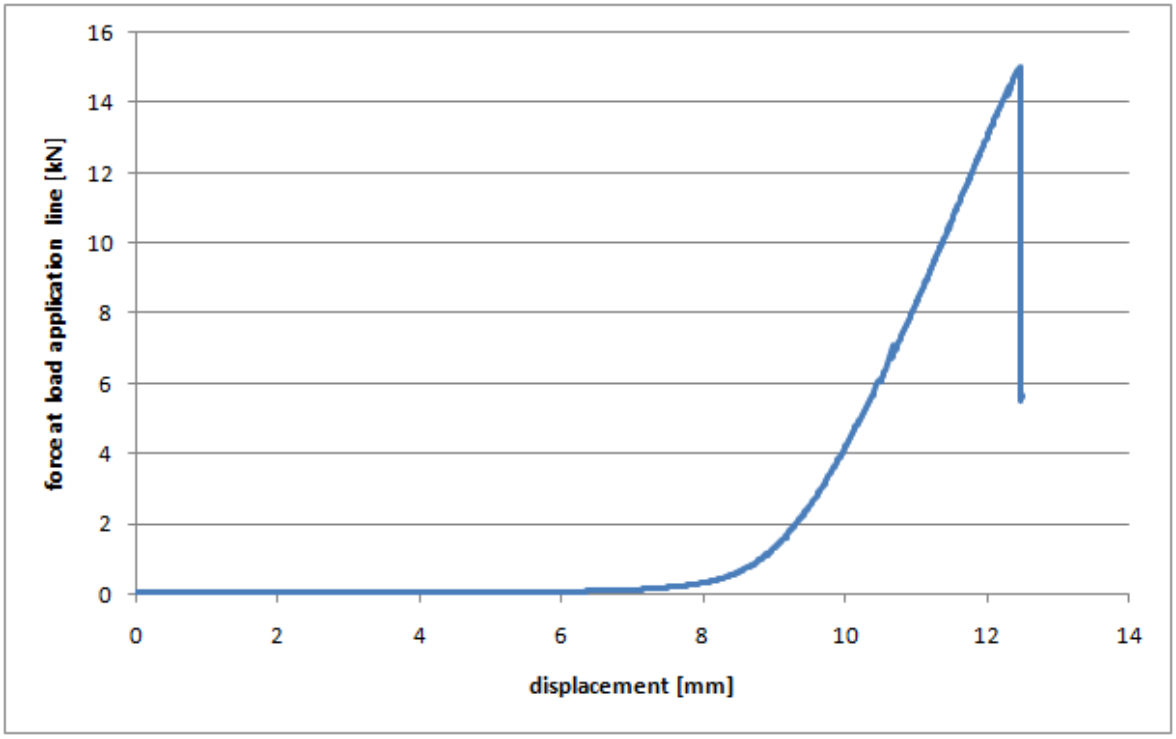
Test No.		**II-A-9**
type of test	test on corner details, introduction of load by contact	
load introduction	steel sheet	
type of panel	A	
faces	steel 0,50 mm	
core	PU 100 mm	
stressed face	top side of production	

Measured dimensions:		Dimensions of test set up		
width b	399 mm	a	100	mm
height h_1	304 mm	e	100	mm
thickness D	96 mm	f	400	mm
height of cutting h_2	101 mm	g	800	mm
thickness of cutting d_2	49 mm	α	1,5472	°

ultimate load at line of load application	15,01	kN
ultimate stress of compressed face	79,4	N/mm^2
Failure mode	crippling of the compressed face	
Remarks		



Test No.	**II-A-9**

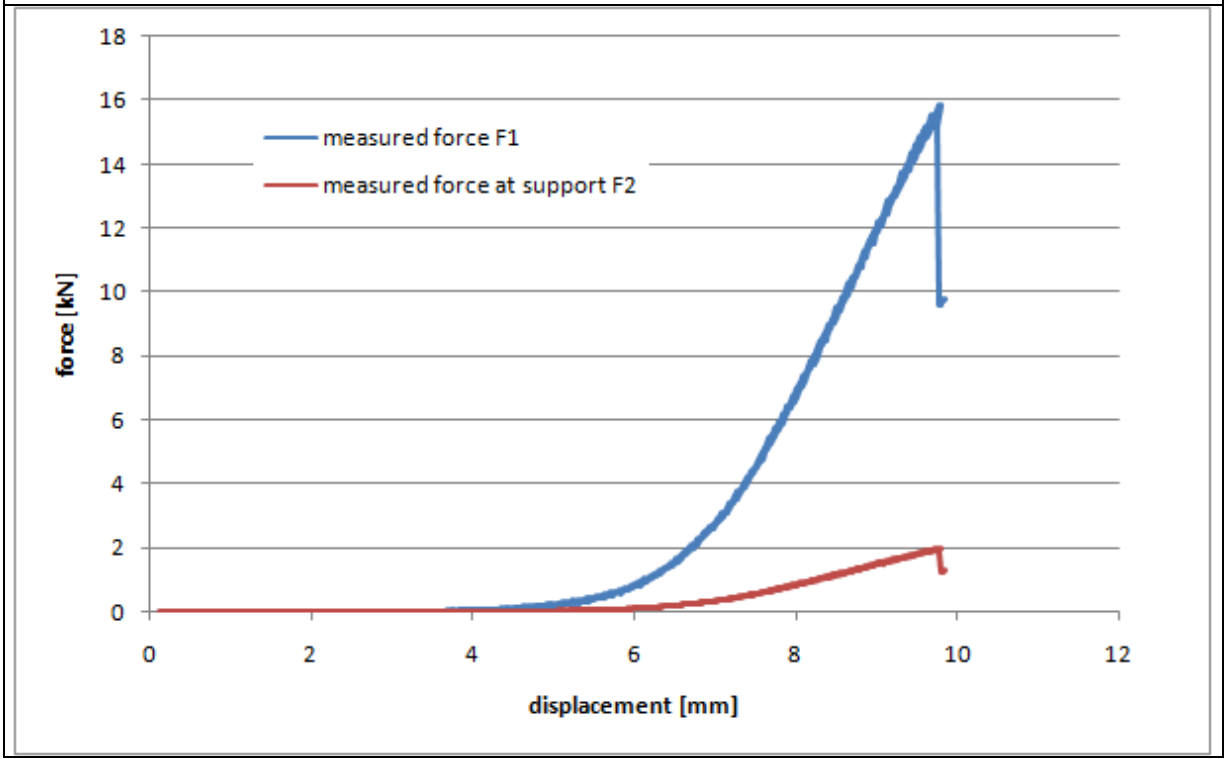


Failure of the stressed face

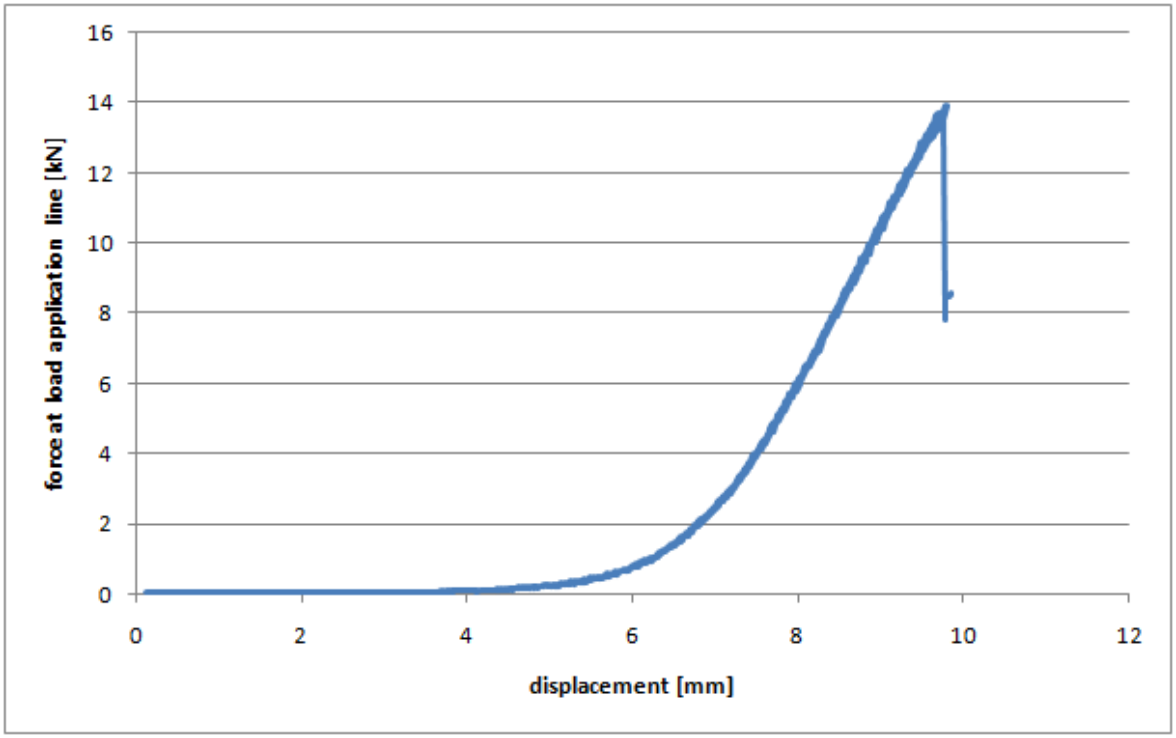
Test No.		**II-A-10**
type of test	test on corner details, introduction of load by contact	
load introduction	steel sheet	
type of panel	A	
faces	steel 0,50 mm	
core	PU 100 mm	
stressed face	top side of production	

Measured dimensions:			Dimensions of test set up		
width b	399	mm	a	100	mm
height h_1	300	mm	e	100	mm
thickness D	95	mm	f	400	mm
height of cutting h_2	100	mm	g	800	mm
thickness of cutting d_2	48	mm	α		°

ultimate load at line of load application	13,93	kN
ultimate stress of compressed face	73,7	N/mm^2
Failure mode	crippling of the compressed face	
Remarks		



Test No.	**II-A-10**

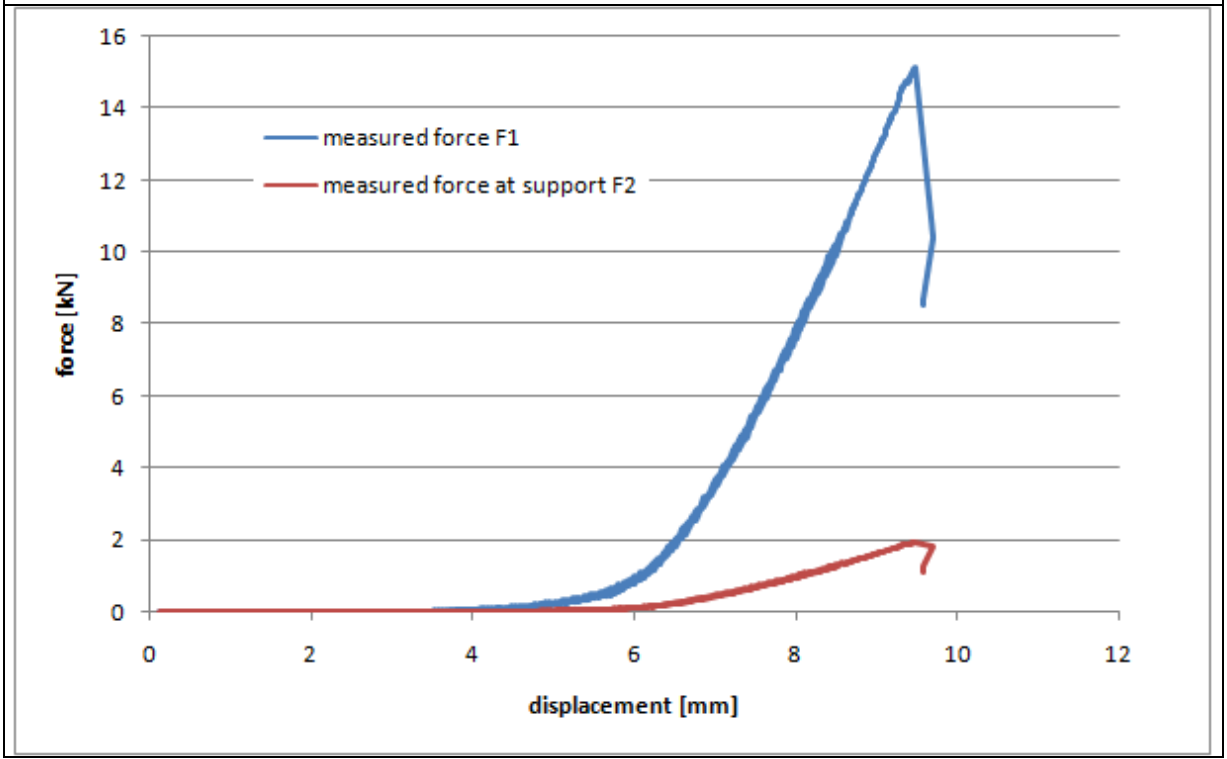


Failure of the stressed face

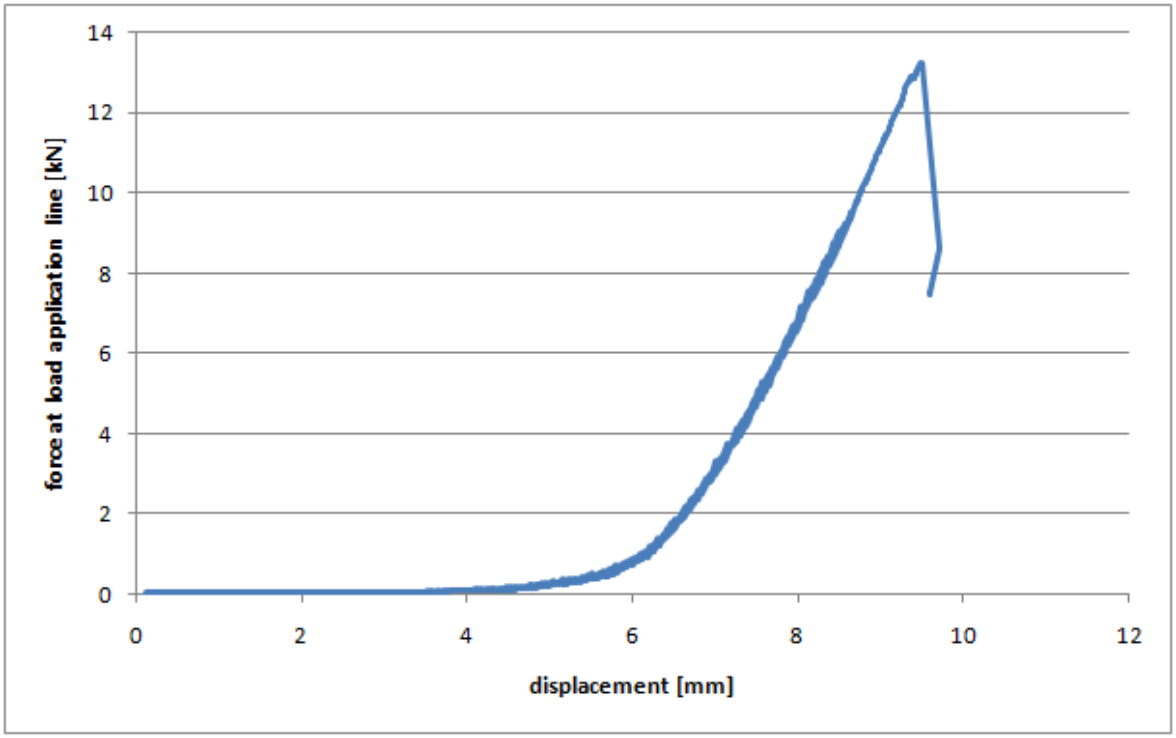
Test No.		**II-A-11**
type of test	test on corner details, introduction of load by contact	
load introduction	steel sheet	
type of panel	A	
faces	steel 0,50 mm	
core	PU 100 mm	
stressed face	top side of production	

Measured dimensions:			Dimensions of test set up		
width b	399	mm	a	100	mm
height h_1	300	mm	e	100	mm
thickness D	94	mm	f	400	mm
height of cutting h_2	100	mm	g	800	mm
thickness of cutting d_2	46	mm	α	1,3179	°

ultimate load at line of load application	13,26	kN
ultimate stress of compressed face	70,1	N/mm^2
Failure mode	crippling of the compressed face	
Remarks		

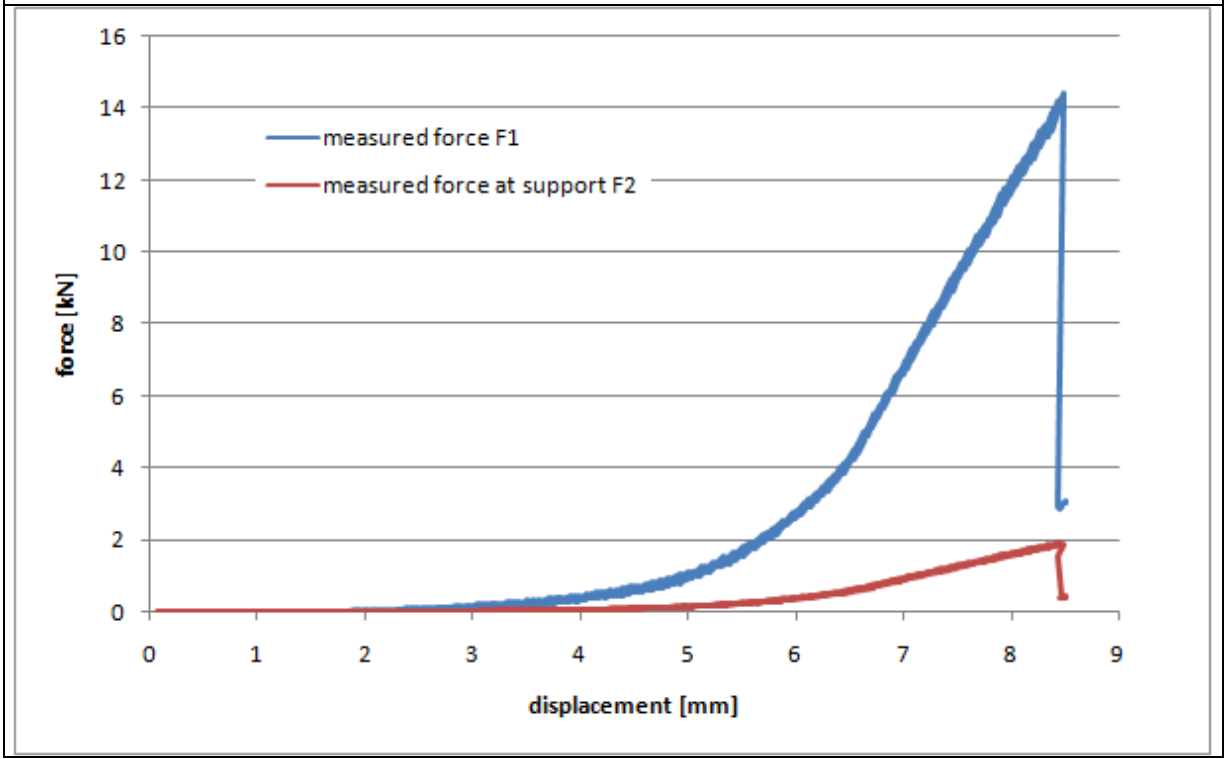


Test No.	**II-A-11**

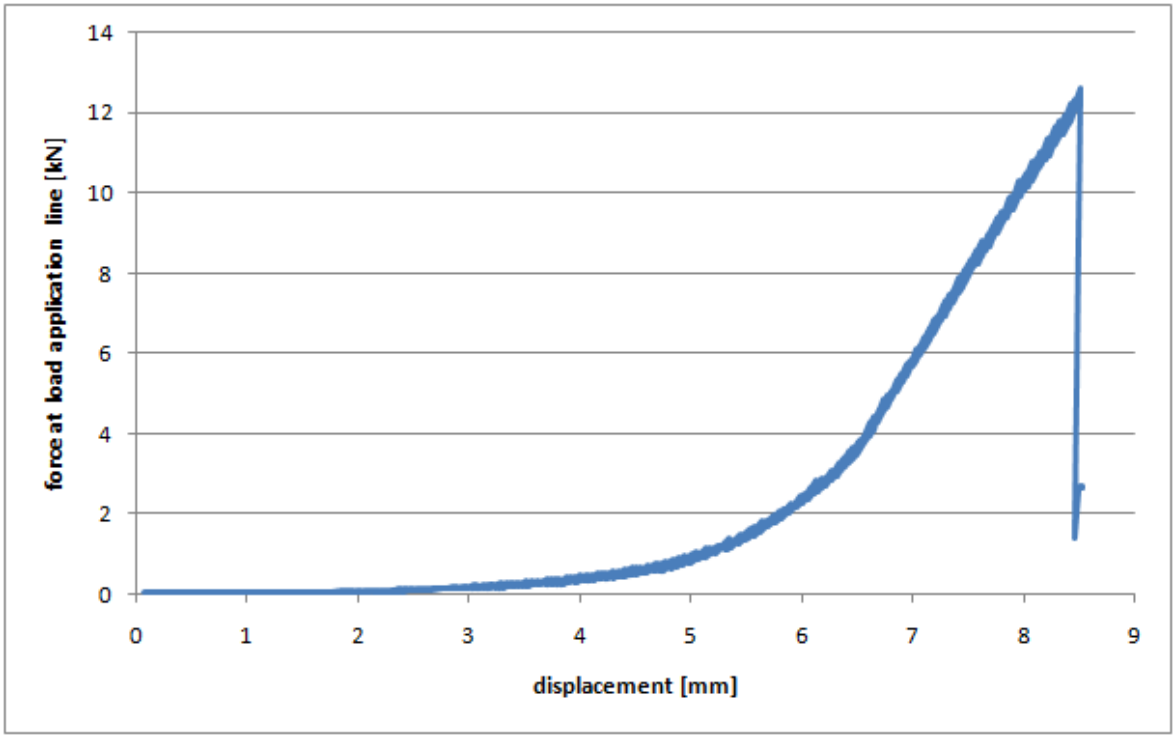


Failure of the stressed face

Test No.			**II-A-12**
type of test	test on corner details, introduction of load by contact		
load introduction	steel sheet		
type of panel	A		
faces	steel 0,50 mm		
core	PU 100 mm		
stressed face	top side of production		
Measured dimensions:		Dimensions of test set up	
width b	400 mm	a	100 mm
height h_1	296 mm	e	100 mm
thickness D	99 mm	f	400 mm
height of cutting h_2	100 mm	g	800 mm
thickness of cutting d_2	49 mm	α	2,178 °
ultimate load at line of load application			12,63 kN
ultimate stress of compressed face			66,6 N/mm^2
Failure mode	crippling of the compressed face		
Remarks			



Test No.	**II-A-12**

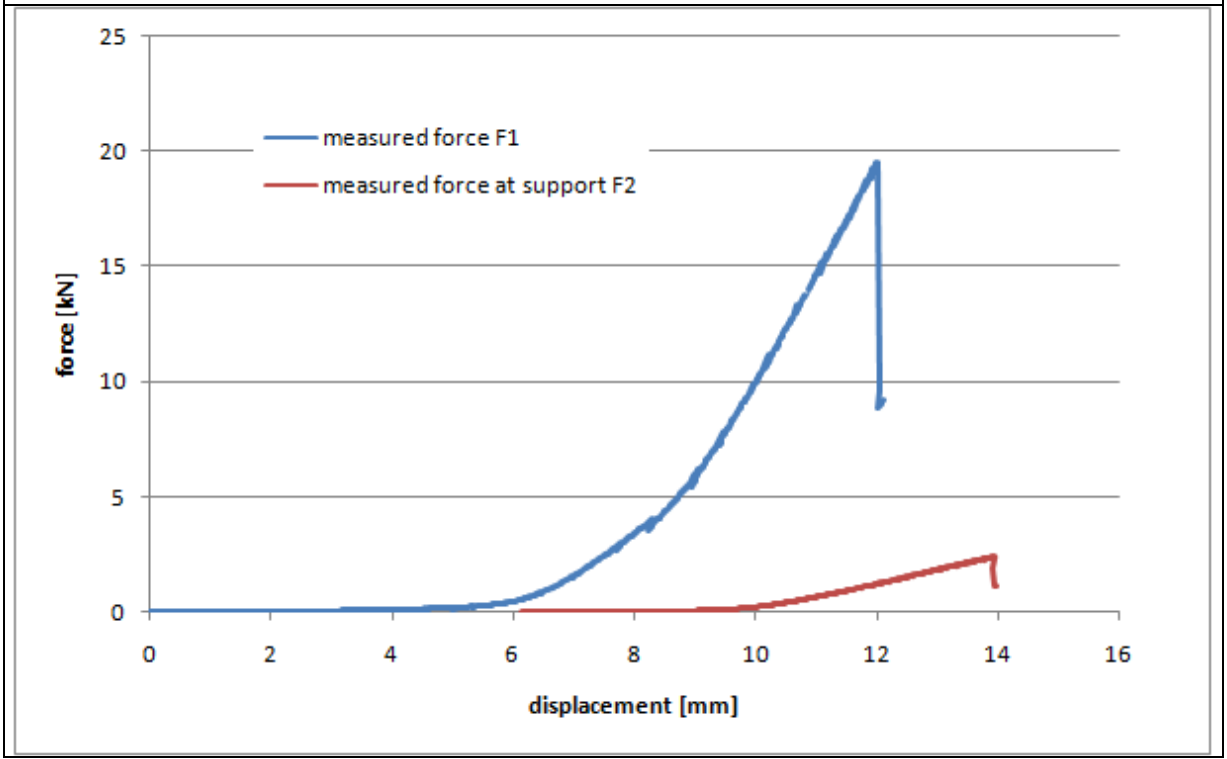


Failure of the stressed face

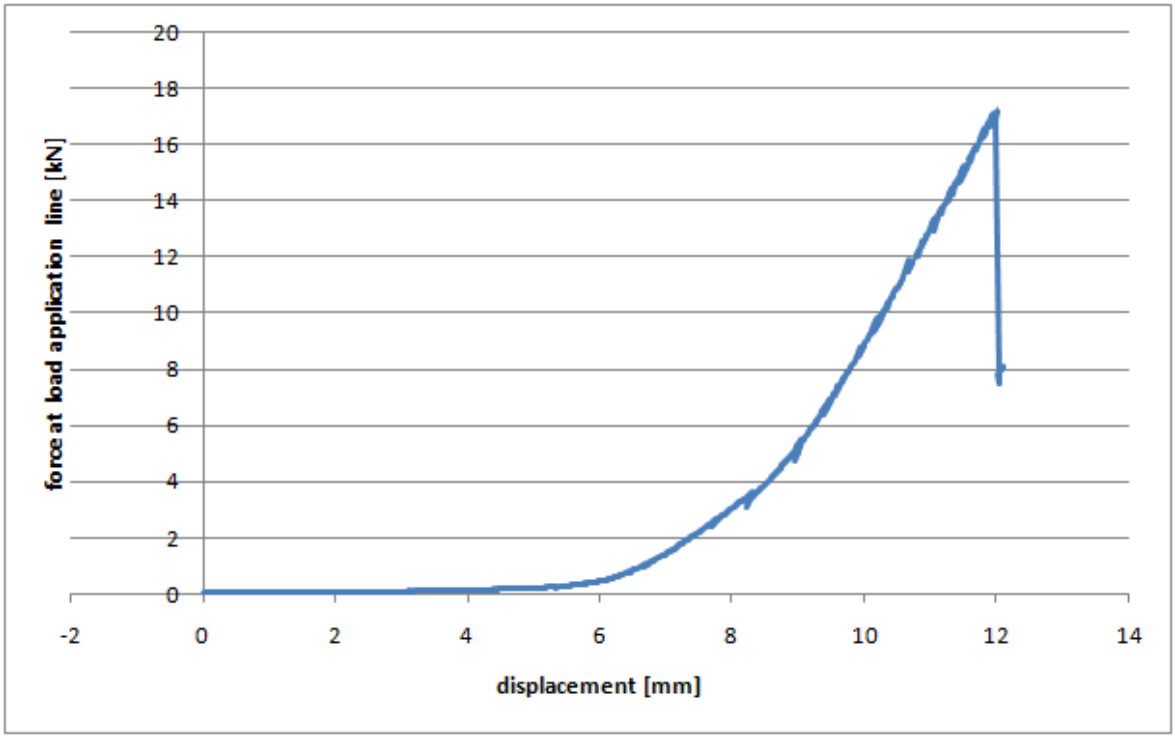
Test No.		**II-A-13**
type of test	test on corner details, introduction of load by contact	
load introduction	steel sheet	
type of panel	A	
faces	steel 0,50 mm	
core	PU 100 mm	
stressed face	top side of production	

Measured dimensions:		Dimensions of test set up		
width b	398 mm	a	100	mm
height h_1	302 mm	e	100	mm
thickness D	96 mm	f	400	mm
height of cutting h_2	100 mm	g	800	mm
thickness of cutting d_2	47 mm	α	0,688	°

ultimate load at line of load application		17,27	kN
ultimate stress of compressed face		91,5	N/mm^2
Failure mode	crippling of the compressed face		
Remarks			



Test No.	**II-A-13**

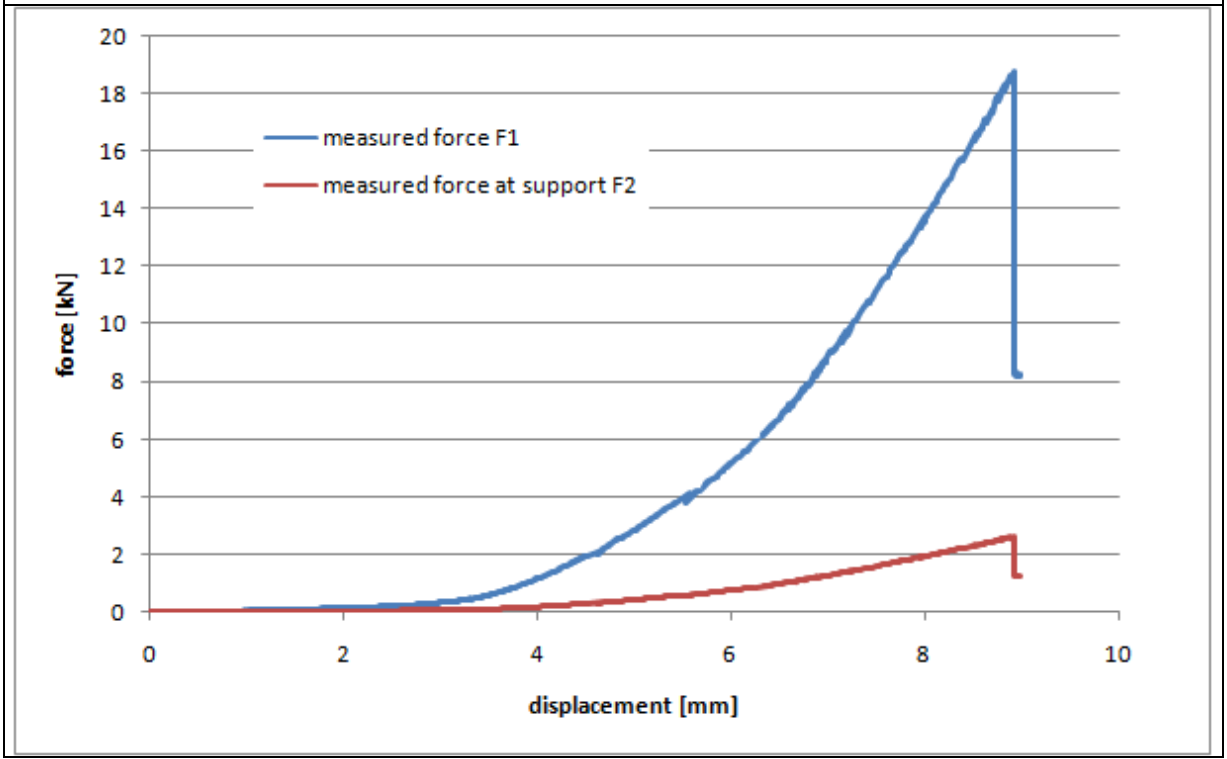


Failure of the stressed face

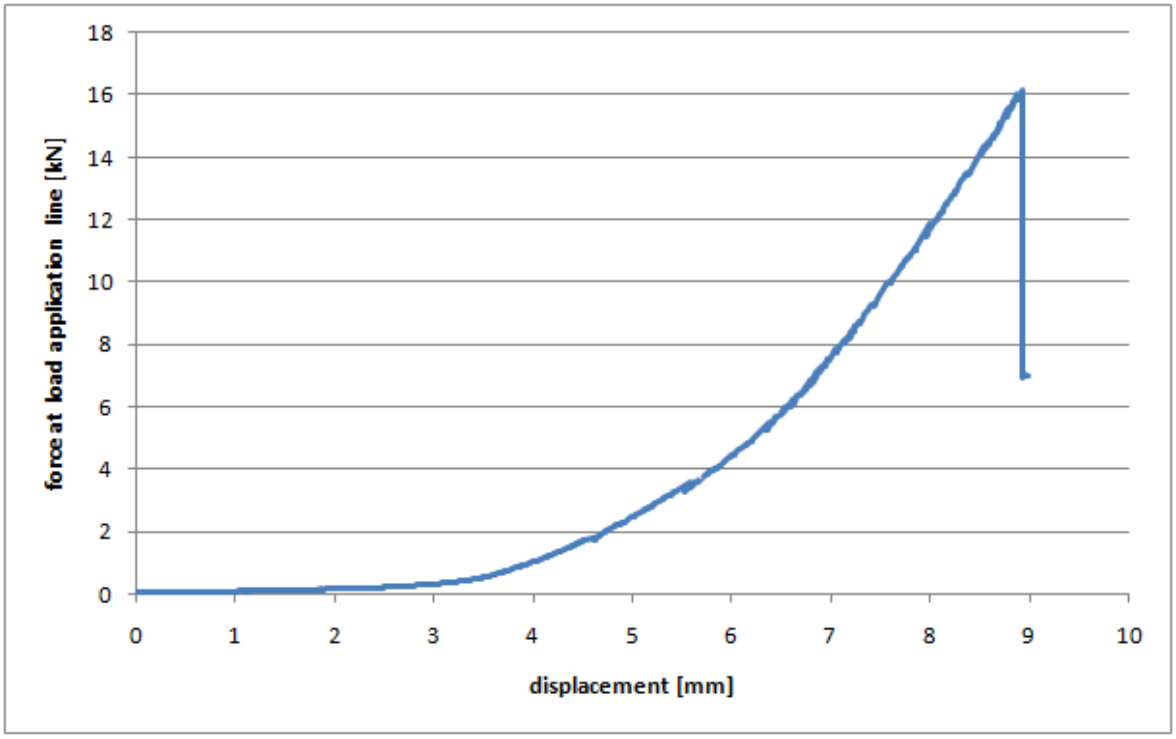
Test No.		**II-A-14**
type of test	test on corner details, introduction of load by contact	
load introduction	steel sheet	
type of panel	A	
faces	steel 0,50 mm	
core	PU 100 mm	
stressed face	top side of production	

Measured dimensions:			Dimensions of test set up		
width b	399	mm	a	100	mm
height h_1	296	mm	e	100	mm
thickness D	96	mm	f	400	mm
height of cutting h_2	100	mm	g	800	mm
thickness of cutting d_2	49	mm	α	0,115	°

ultimate load at line of load application	16,17	kN
ultimate stress of compressed face	85,5	N/mm^2
Failure mode	crippling of the compressed face	
Remarks		

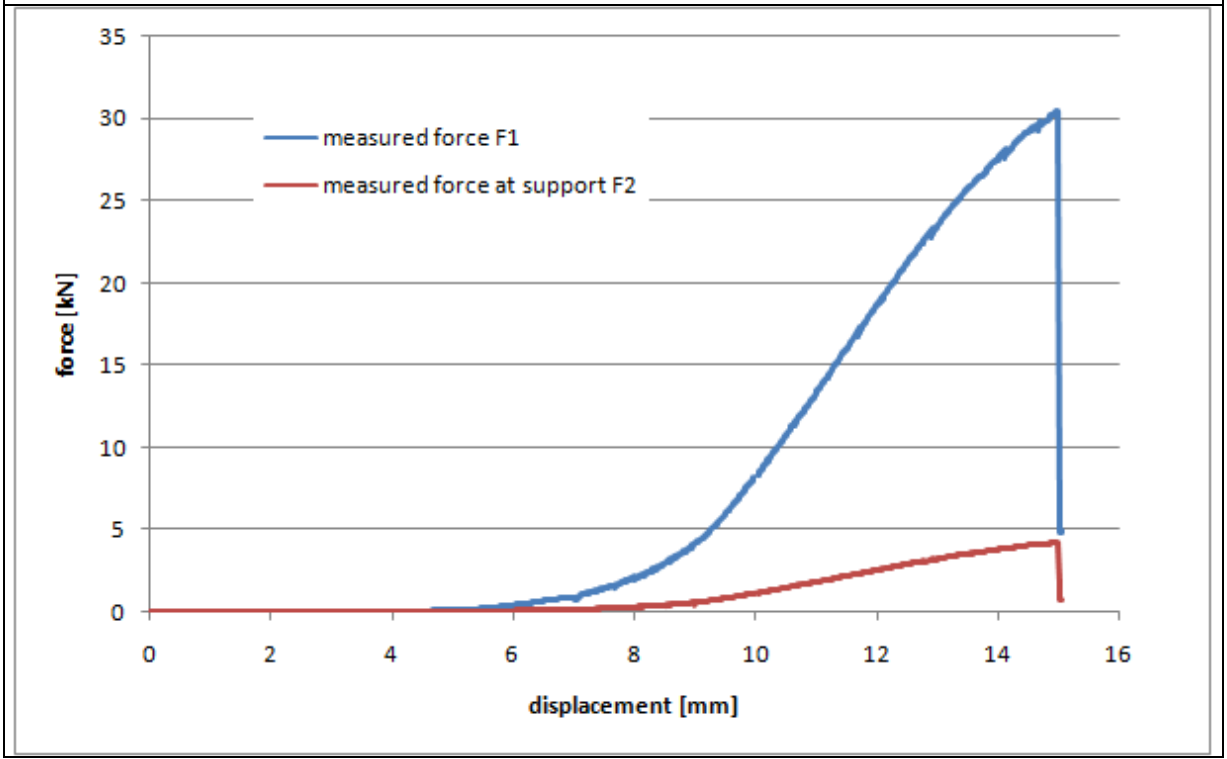


Test No.	**II-A-14**

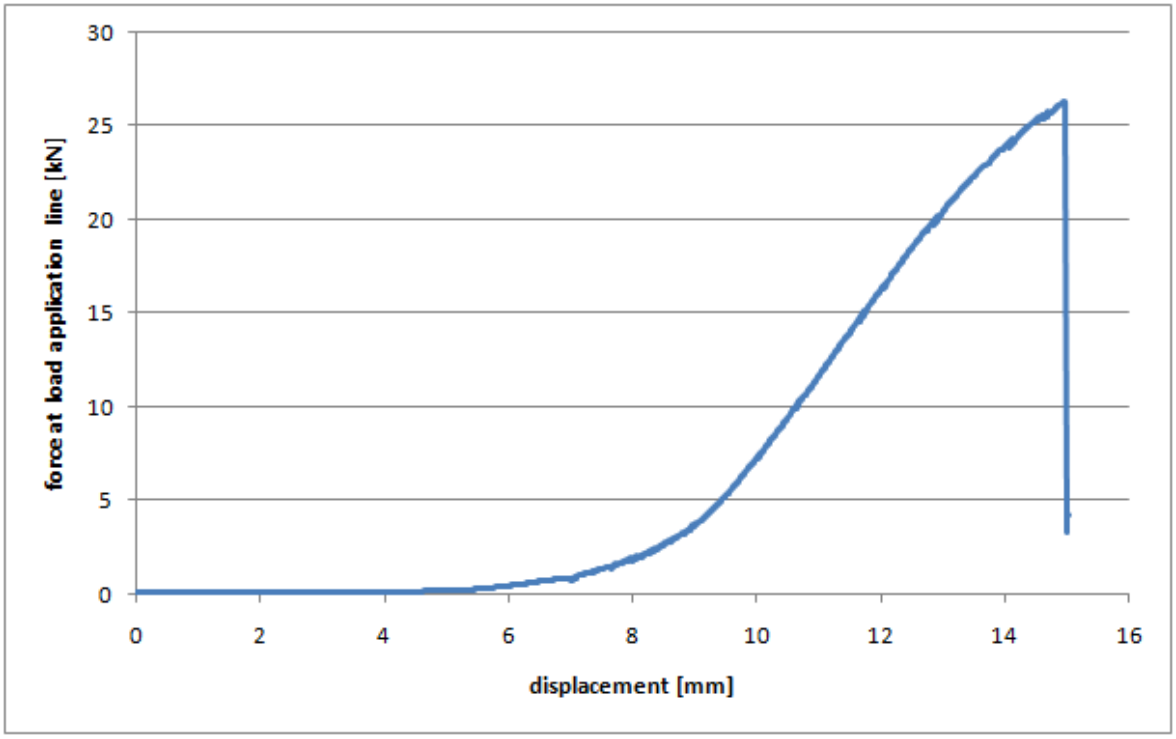


Failure of the stressed face

Test No.			**II-B-1**
type of test	test on corner details, introduction of load by contact		
load introduction	steel sheet		
type of panel	B		
faces	steel 0,75 mm		
core	PU 100 mm		
stressed face	top side of production		
Measured dimensions:		Dimensions of test set up	
width b	400 mm	a	100 mm
height h_1	295 mm	e	100 mm
thickness D	99 mm	f	400 mm
height of cutting h_2	101 mm	g	800 mm
thickness of cutting d_2	48 mm	α	1,891 °
ultimate load at line of load application			26,28 kN
ultimate stress of compressed face			86,2 N/mm^2
Failure mode	crippling of the compressed face		
Remarks			



Test No.	**II-B-1**



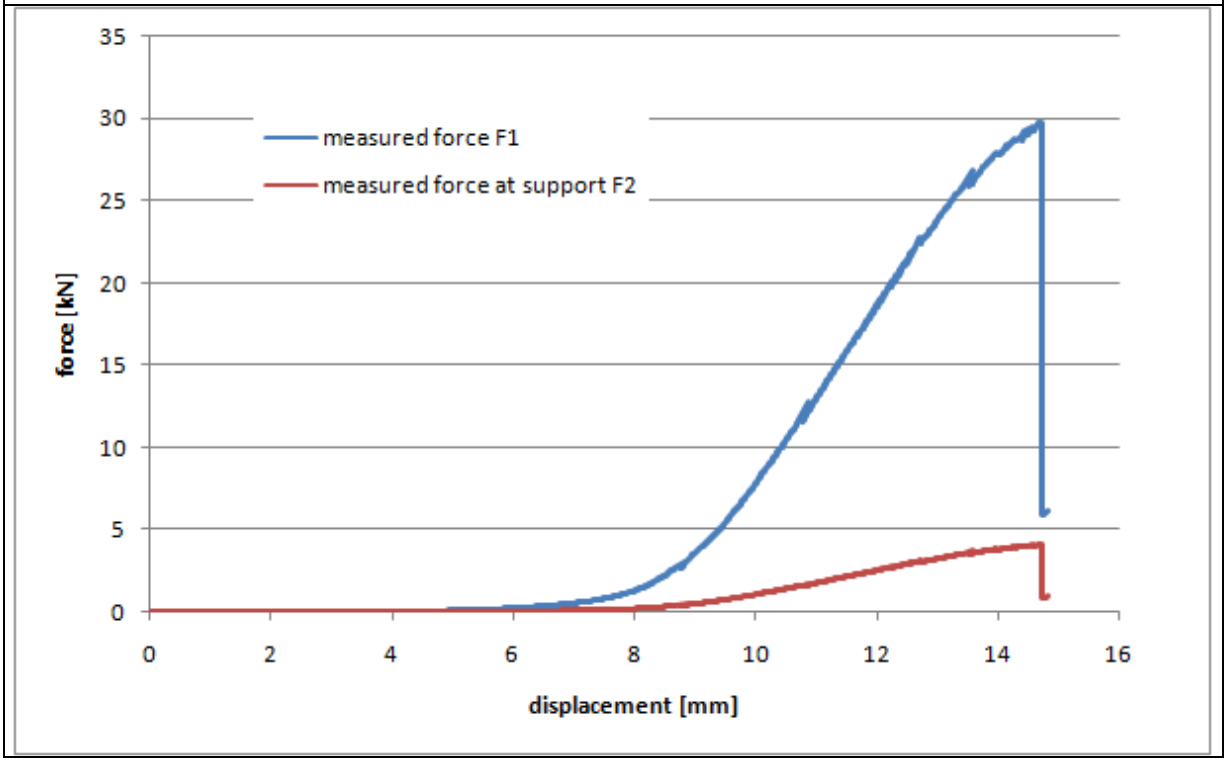
Failure of the stressed face

Compound between core and face

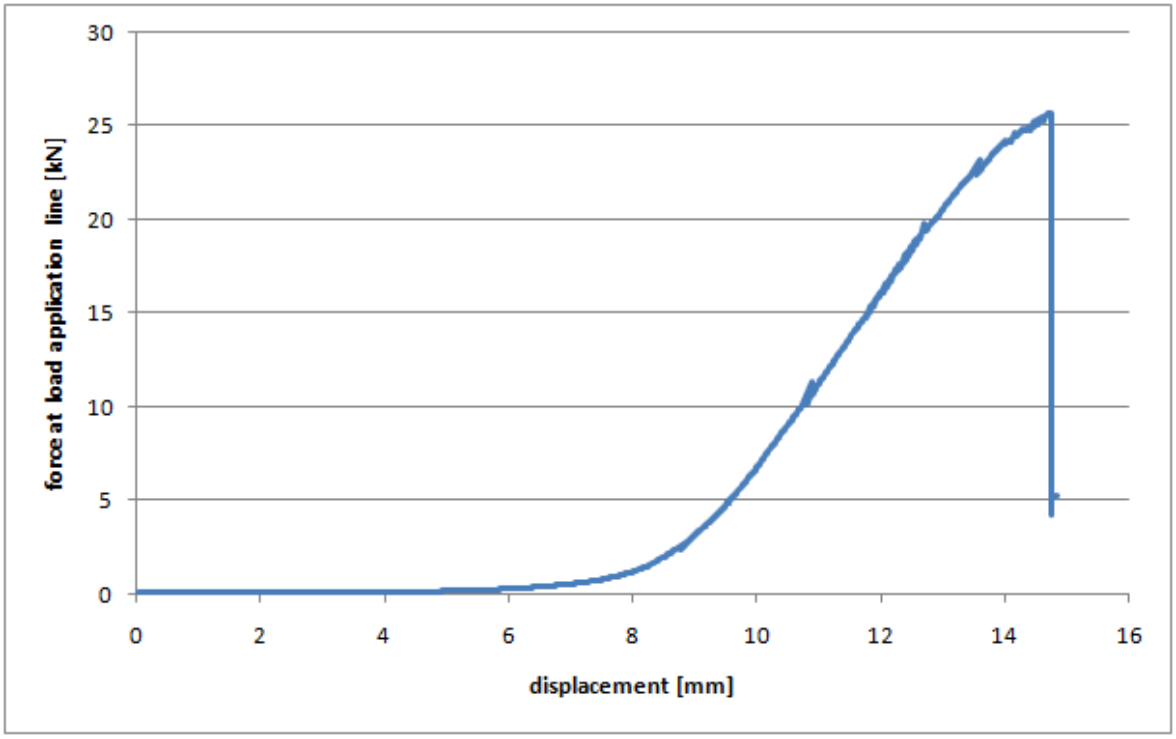
Test No.		**II-B-2**
type of test	test on corner details, introduction of load by contact	
load introduction	steel sheet	
type of panel	B	
faces	steel 0,75 mm	
core	PU 100 mm	
stressed face	top side of production	

Measured dimensions:			Dimensions of test set up		
width b	400	mm	a	100	mm
height h_1	300	mm	e	100	mm
thickness D	99	mm	f	400	mm
height of cutting h_2	101	mm	g	800	mm
thickness of cutting d_2	49	mm	α	1,0314	°

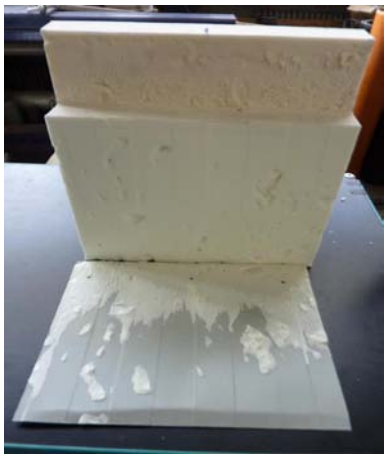
ultimate load at line of load application	25,72	kN
ultimate stress of compressed face	84,4	N/mm^2
Failure mode	crippling of the compressed face	
Remarks		



Test No.	**II-B-2**



Failure of the stressed face

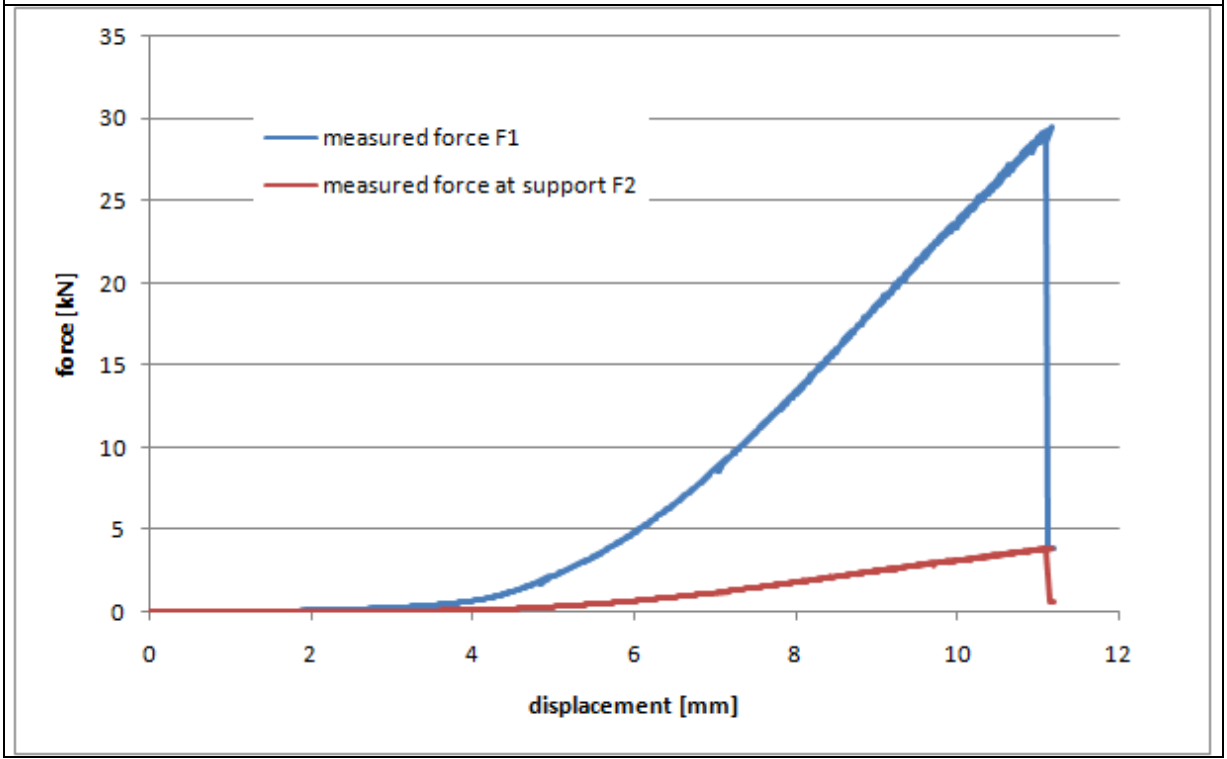


Compound between core and face

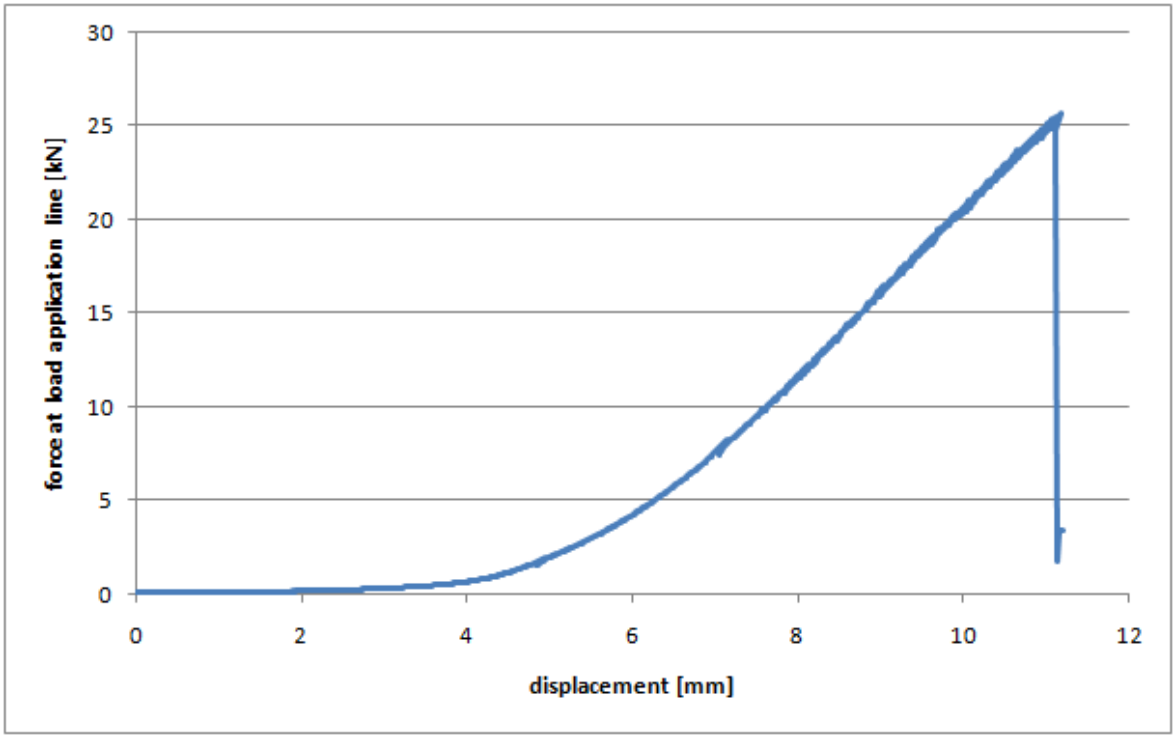
Test No.		**II-B-3**
type of test	test on corner details, introduction of load by contact	
load introduction	steel sheet	
type of panel	B	
faces	steel 0,75 mm	
core	PU 100 mm	
stressed face	top side of production	

Measured dimensions:			Dimensions of test set up		
width b	400	mm	a	100	mm
height h_1	300	mm	e	100	mm
thickness D	99	mm	f	400	mm
height of cutting h_2	101	mm	g	800	mm
thickness of cutting d_2	48	mm	α	0,3438	°

ultimate load at line of load application	25,70	kN
ultimate stress of compressed face	84,3	N/mm^2
Failure mode	buckling and delamination of the compressed face	
Remarks		



Test No.	**II-B-3**



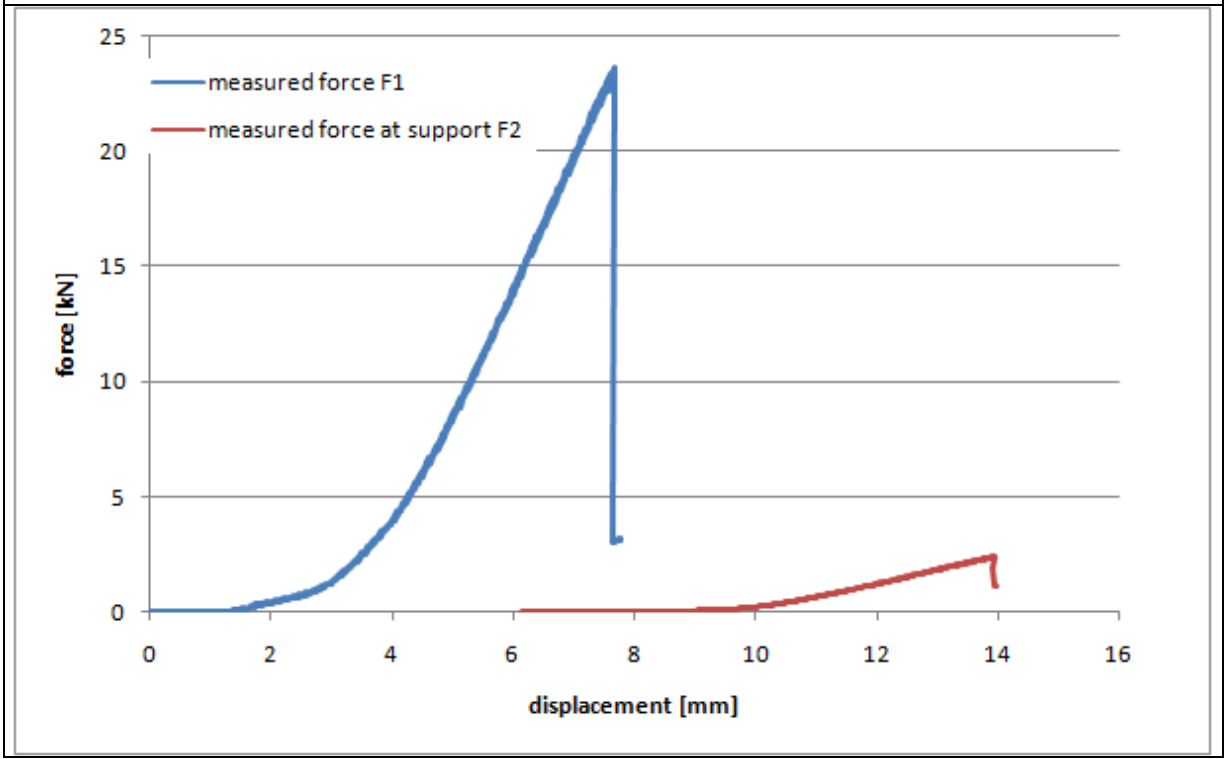
Failure of the stressed face

Compound between core and face

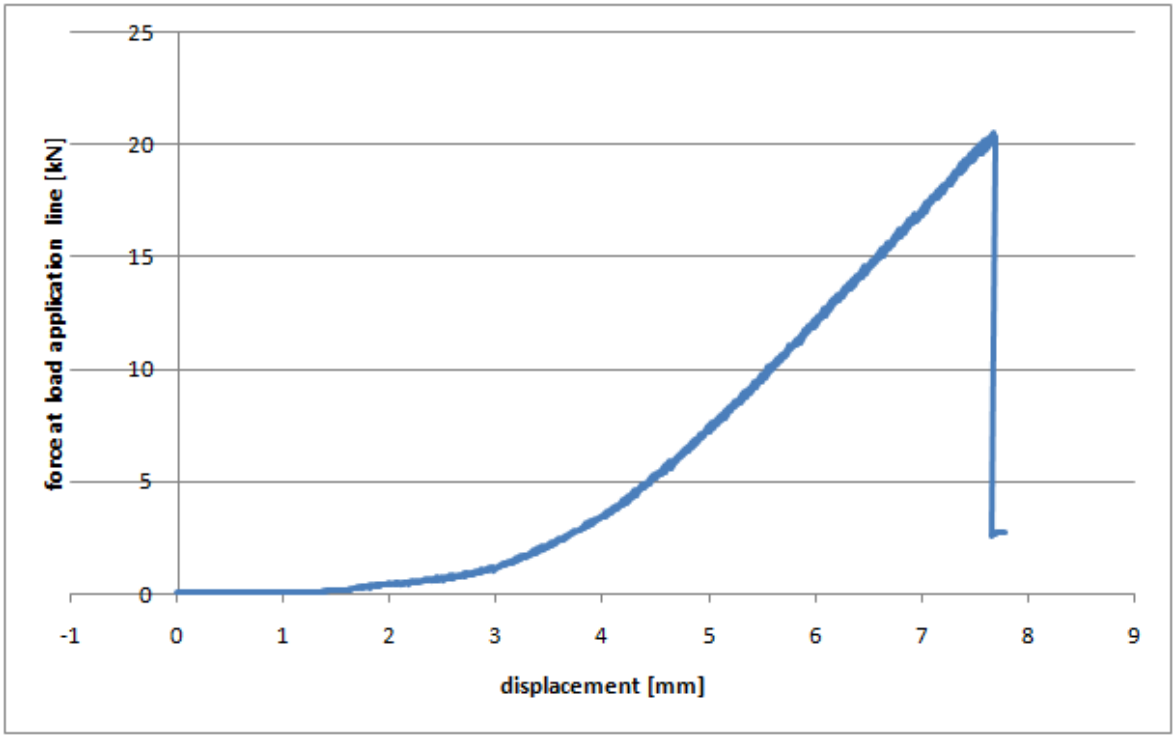
Test No.		**II-B-4**
type of test	test on corner details, introduction of load by contact	
load introduction	steel sheet	
type of panel	B	
faces	steel 0,75 mm	
core	PU 100 mm	
stressed face	top side of production	

Measured dimensions:			Dimensions of test set up		
width b	401	mm	a	100	mm
height h_1	296	mm	e	100	mm
thickness D	99	mm	f	400	mm
height of cutting h_2	101	mm	g	800	mm
thickness of cutting d_2	50	mm	α		°

ultimate load at line of load application	20,55	kN
ultimate stress of compressed face	67,3	N/mm^2
Failure mode	buckling and delamination of the compressed face	
Remarks		



Test No.	**II-B-4**



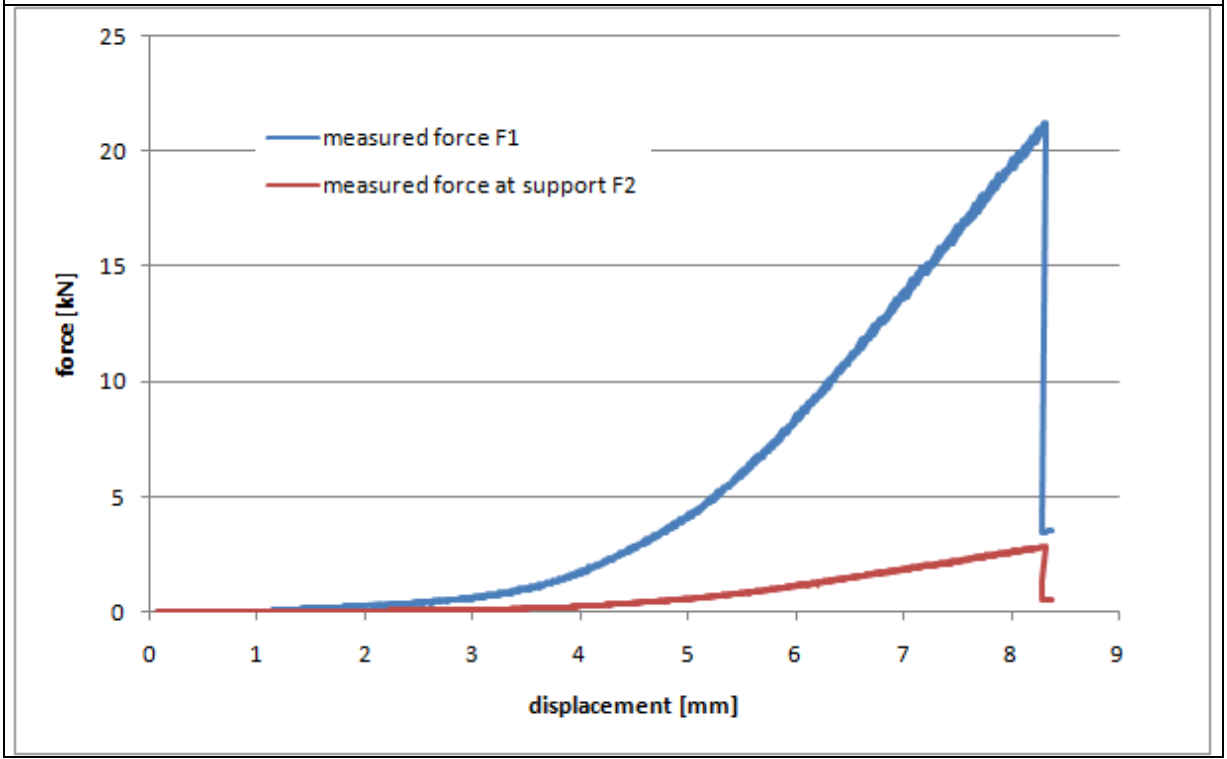
Failure of the stressed face

Compound between core and face

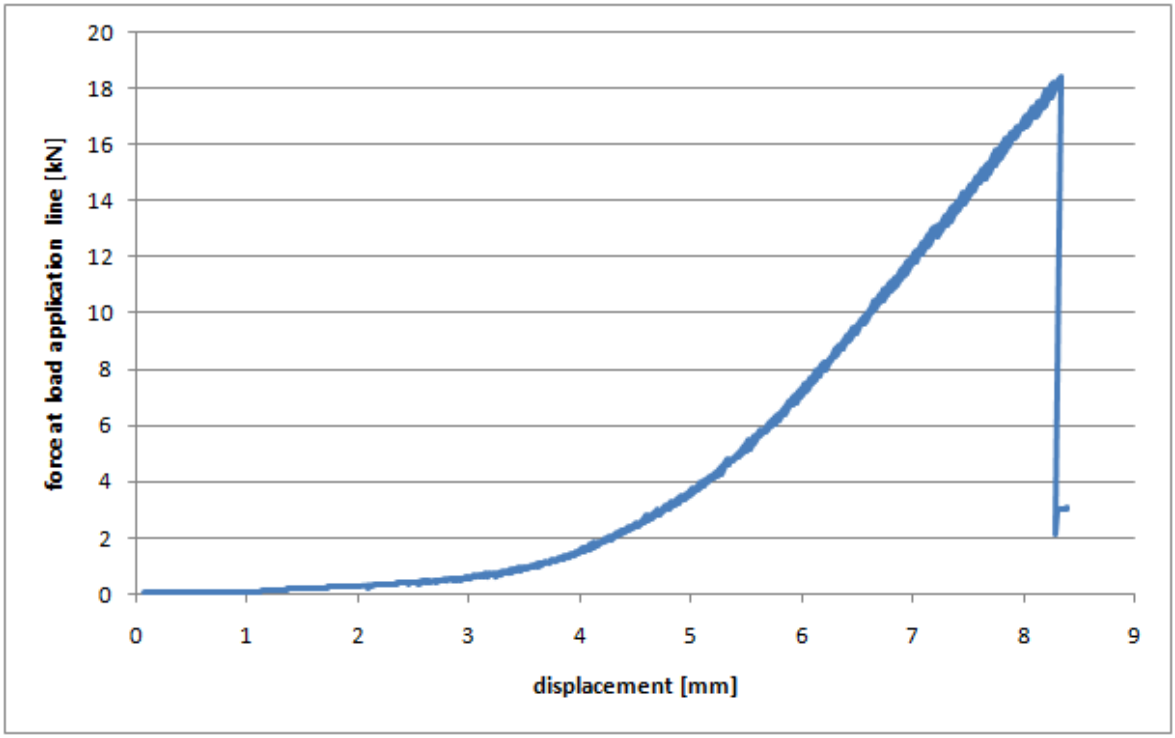
Test No.		**II-B-5**
type of test	test on corner details, introduction of load by contact	
load introduction	steel sheet	
type of panel	B	
faces	steel 0,75 mm	
core	PU 100 mm	
stressed face	top side of production	

Measured dimensions:			Dimensions of test set up		
width b	400	mm	a	100	mm
height h_1	299	mm	e	100	mm
thickness D	99	mm	f	400	mm
height of cutting h_2	101	mm	g	800	mm
thickness of cutting d_2	49	mm	α	0,34378	°

ultimate load at line of load application	18,43	kN
ultimate stress of compressed face	60,5	N/mm^2
Failure mode	buckling and delamination of the compressed face	
Remarks		



Test No.	**II-B-5**



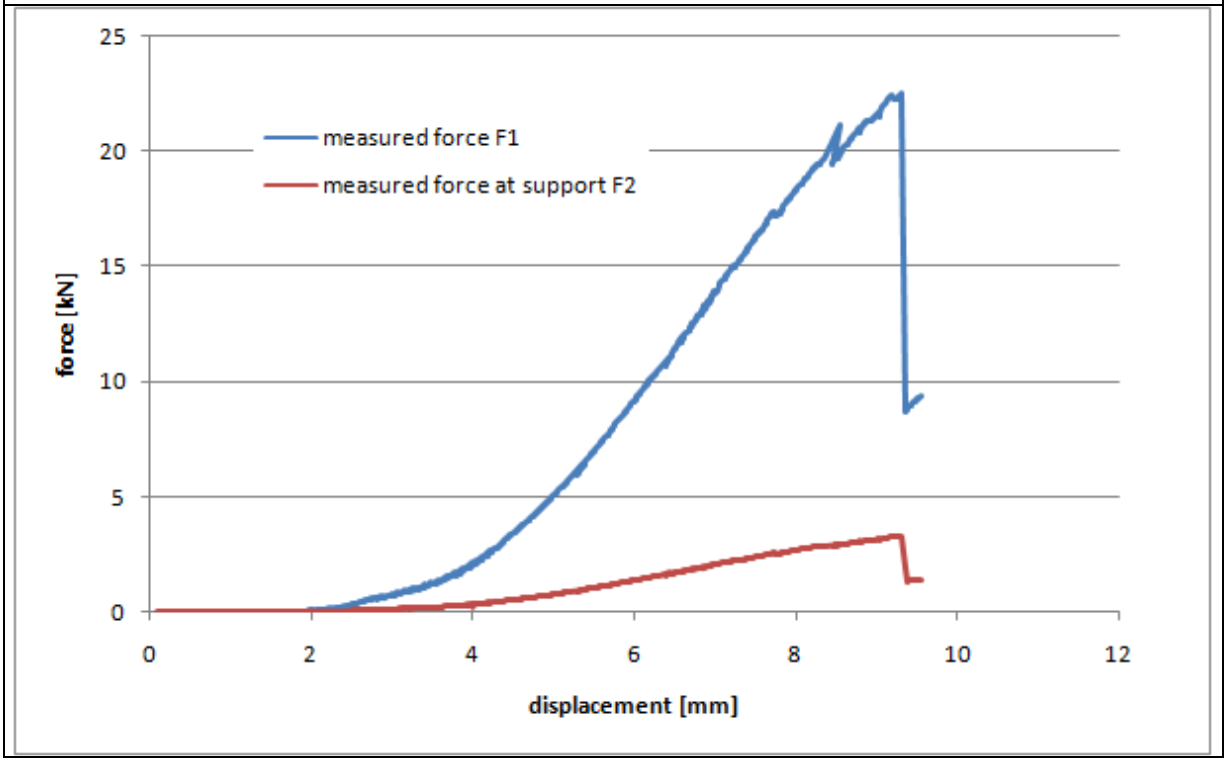
Failure of the stressed face

Compound between core and face

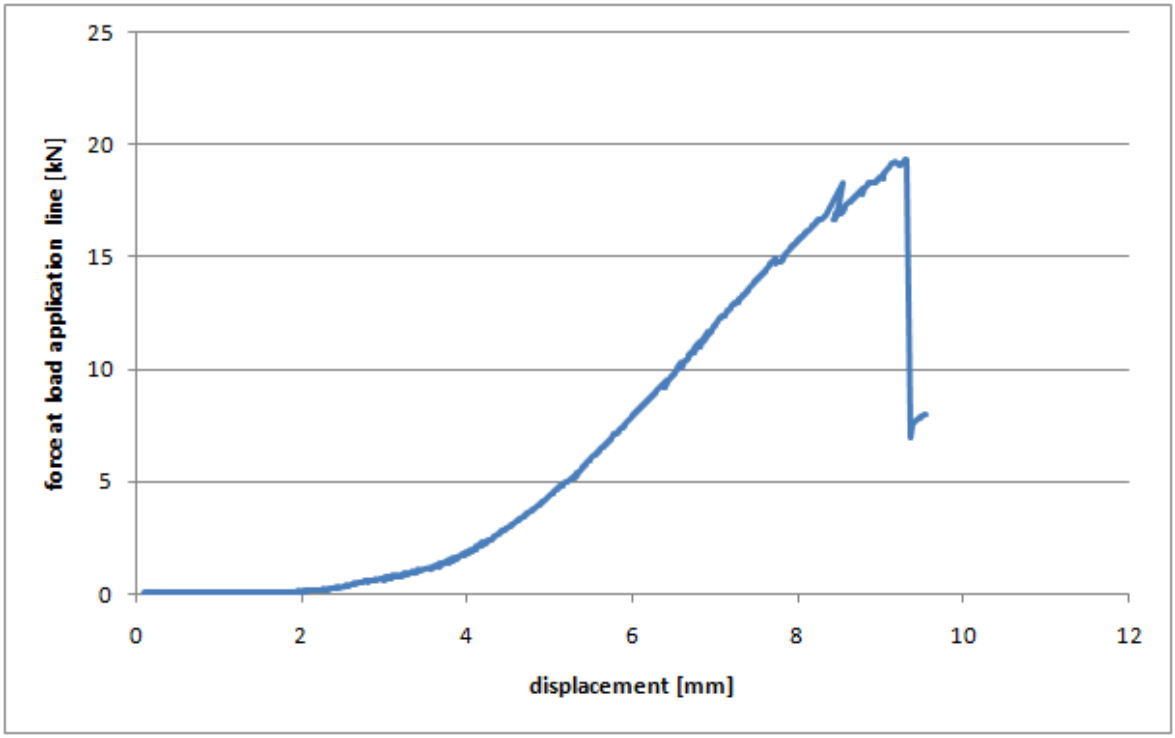
Test No.		**II-B-6**
type of test	test on corner details, introduction of load by contact	
load introduction	steel sheet	
type of panel	B	
faces	steel 0,75 mm	
core	PU 100 mm	
stressed face	top side of production	

Measured dimensions:			Dimensions of test set up		
width b	400	mm	a	100	mm
height h_1	296	mm	e	100	mm
thickness D	99	mm	f	400	mm
height of cutting h_2	100	mm	g	800	mm
thickness of cutting d_2	49	mm	α	1,26061	°

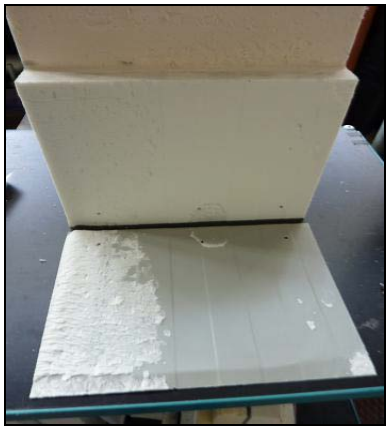
ultimate load at line of load application	19,37	kN
ultimate stress of compressed face	63,6	N/mm^2
Failure mode	crippling of the compressed face	
Remarks		



Test No.	**II-B-6**



Failure of the stressed face

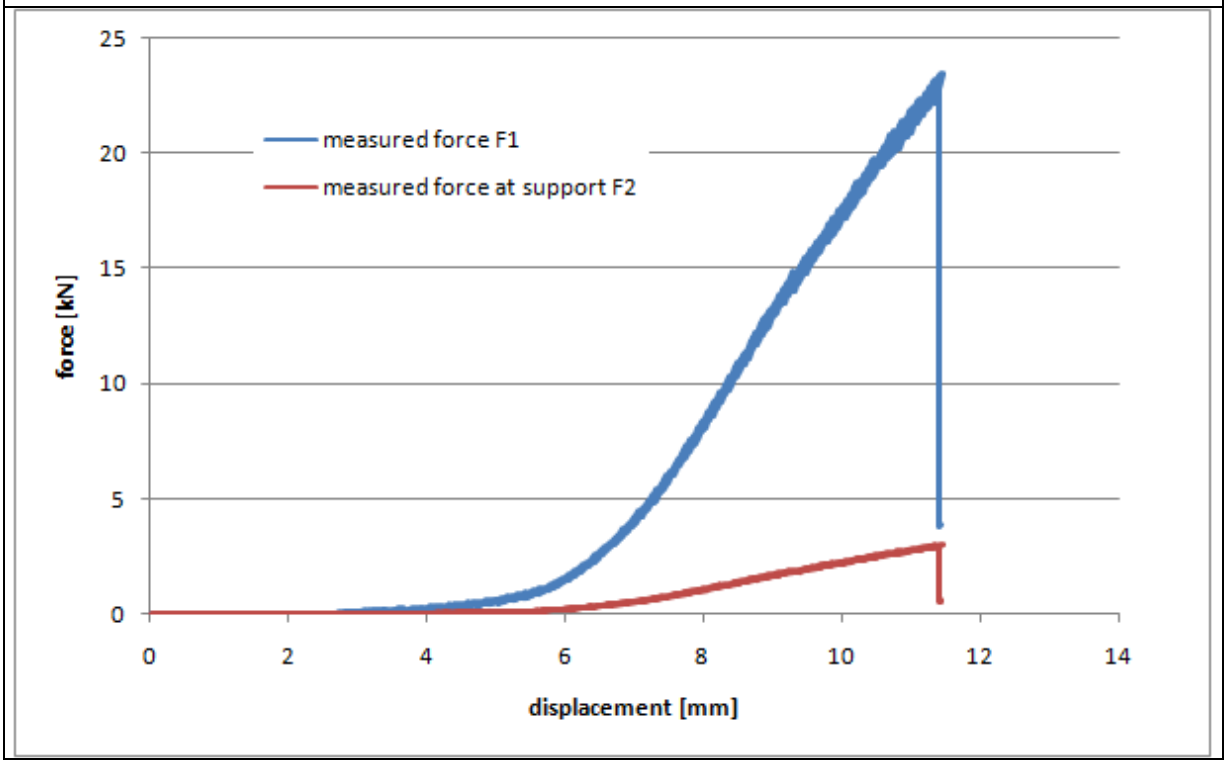


Compound between core and face

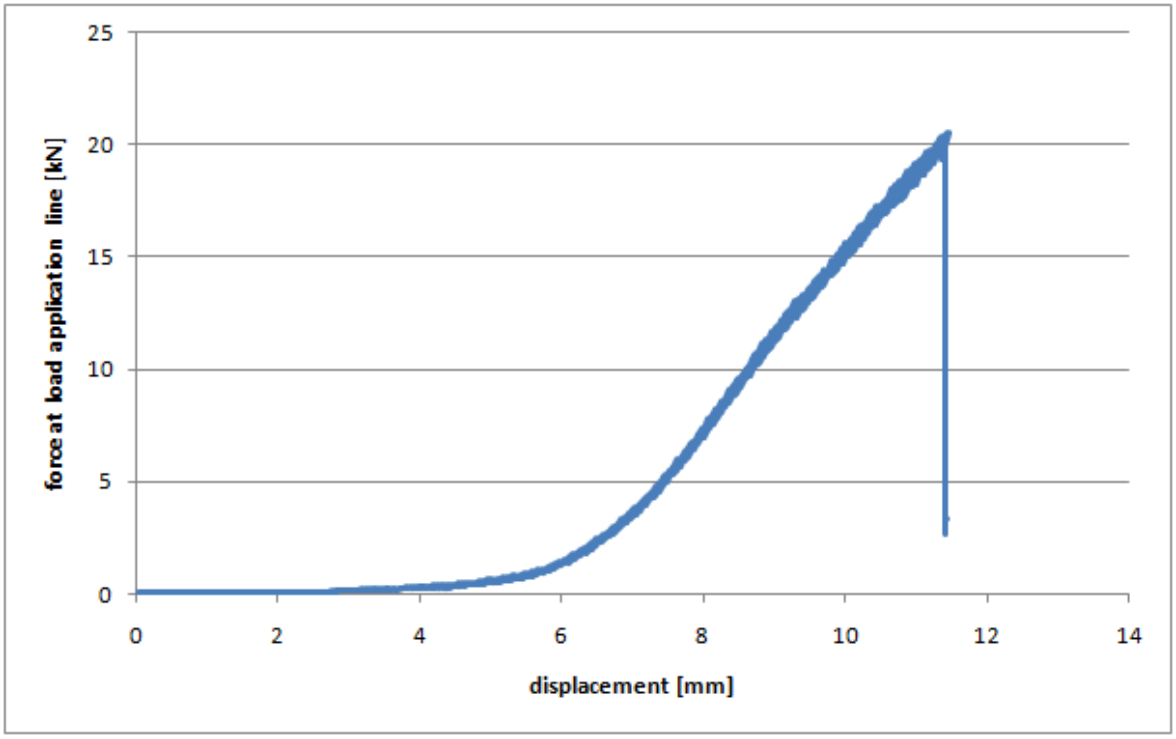
Test No.		**II-B-7**
type of test	test on corner details, introduction of load by contact	
load introduction	steel sheet	
type of panel	B	
faces	steel 0,75 mm	
core	PU 100 mm	
stressed face	top side of production	

Measured dimensions:			Dimensions of test set up		
width b	400	mm	a	100	mm
height h_1	301	mm	e	100	mm
thickness D	99	mm	f	400	mm
height of cutting h_2	101	mm	g	800	mm
thickness of cutting d_2	49	mm	α	0,45837	°

ultimate load at line of load application	20,56	kN
ultimate stress of compressed face	67,4	N/mm^2
Failure mode	buckling and delamination of the compressed face	
Remarks		



Test No.	**II-B-7**



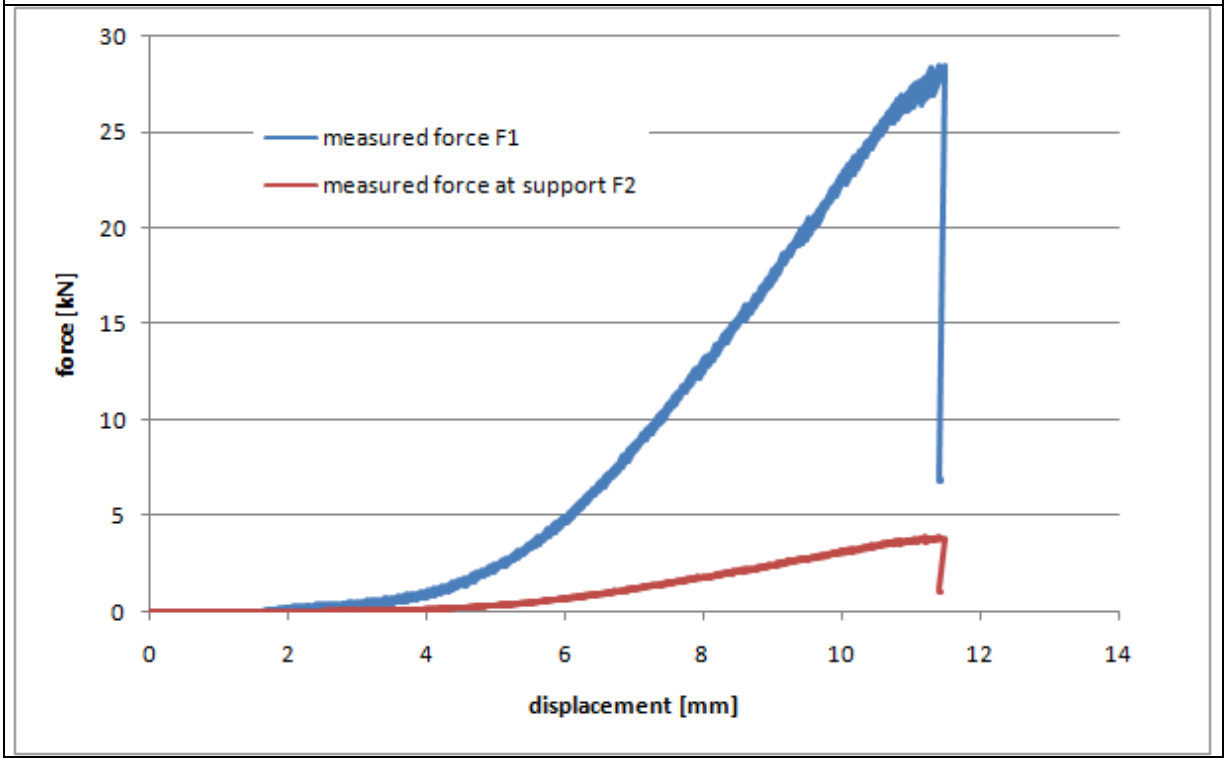
Failure of the stressed face

Compound between core and face

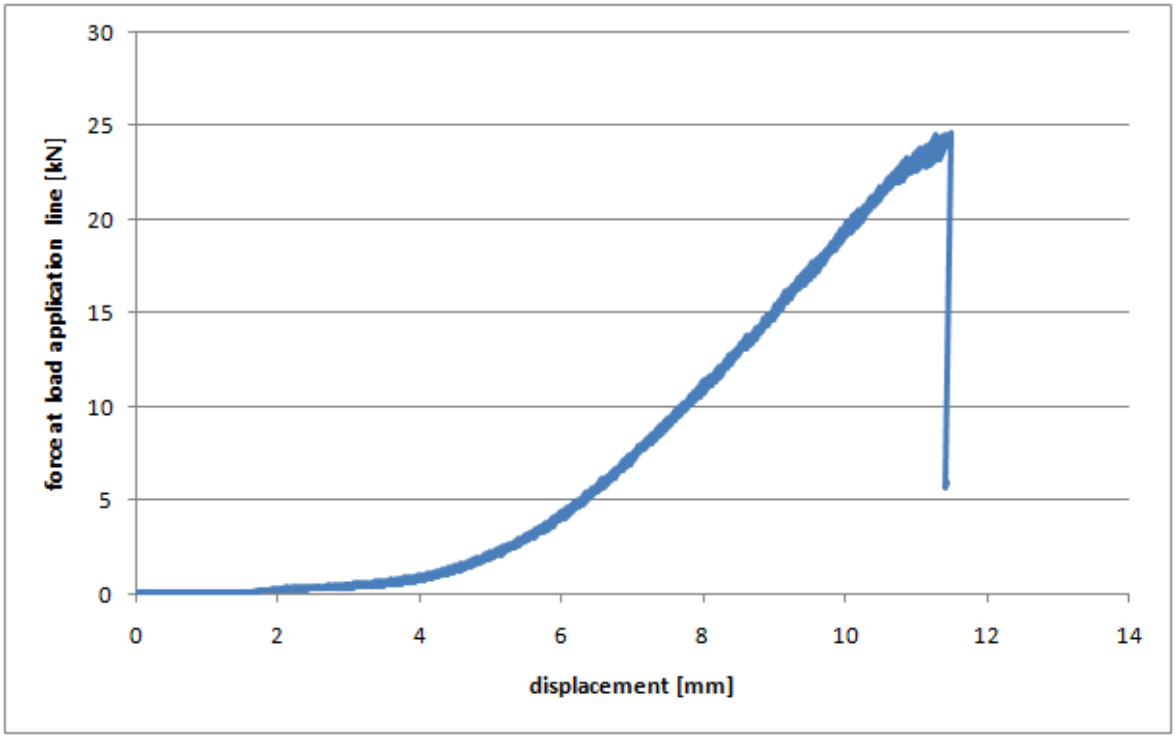
Test No.		**II-B-8**
type of test	test on corner details, introduction of load by contact	
load introduction	steel sheet	
type of panel	B	
faces	steel 0,75 mm	
core	PU 100 mm	
stressed face	top side of production	

Measured dimensions:			Dimensions of test set up		
width b	400	mm	a	100	mm
height h_1	302	mm	e	100	mm
thickness D	99	mm	f	400	mm
height of cutting h_2	100	mm	g	800	mm
thickness of cutting d_2	49	mm	α	0,51567	°

ultimate load at line of load application	24,67	kN
ultimate stress of compressed face	80,9	N/mm^2
Failure mode	crippling of the compressed face	
Remarks		



Test No.	**II-B-8**



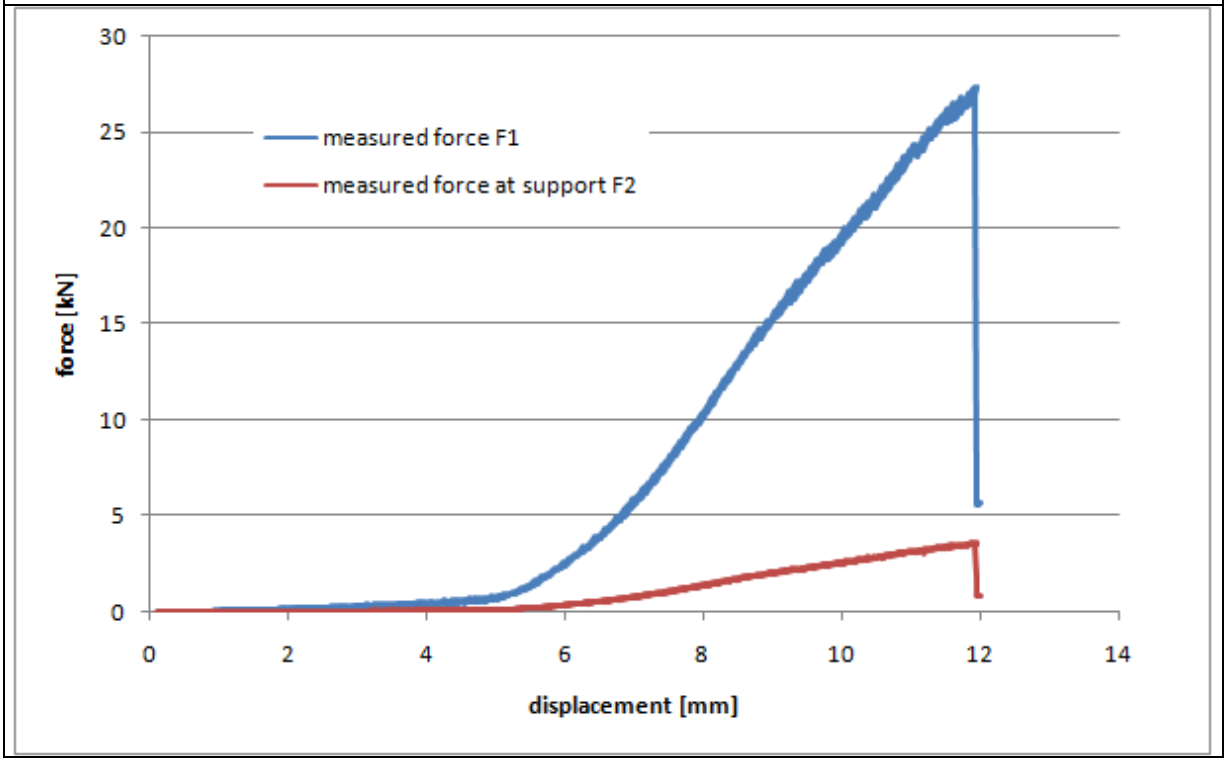
Failure of the stressed face

Compound between core and face

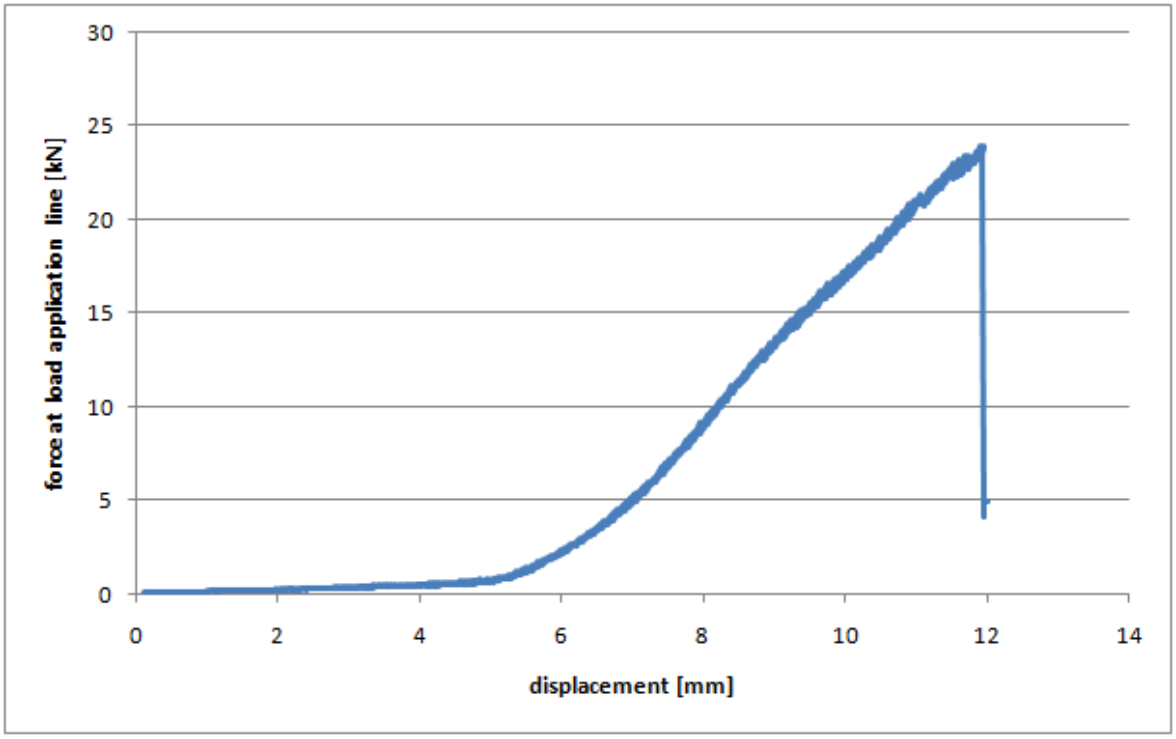
Test No.		**II-B-9**
type of test	test on corner details, introduction of load by contact	
load introduction	steel sheet	
type of panel	B	
faces	steel 0,75 mm	
core	PU 100 mm	
stressed face	top side of production	

Measured dimensions:			Dimensions of test set up		
width b	400	mm	a	100	mm
height h_1	301	mm	e	100	mm
thickness D	99	mm	f	400	mm
height of cutting h_2	101	mm	g	800	mm
thickness of cutting d_2	49	mm	α	1,08869	°

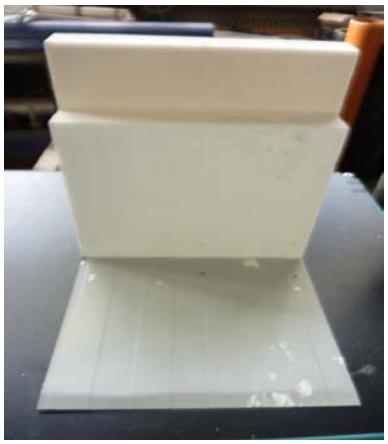
ultimate load at line of load application	23,90	kN
ultimate stress of compressed face	78,4	N/mm^2
Failure mode	crippling of the compressed face	
Remarks		



Test No.	**II-B-9**



Failure of the stressed face

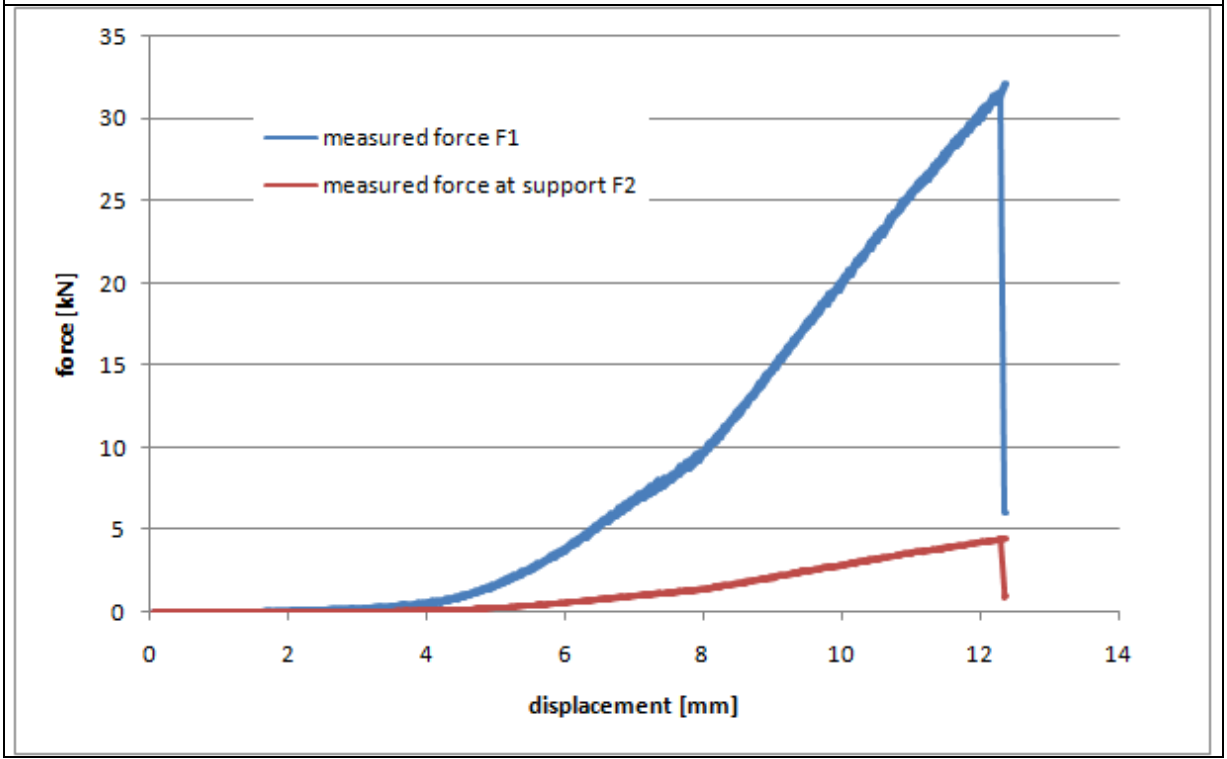


Compound between core and face

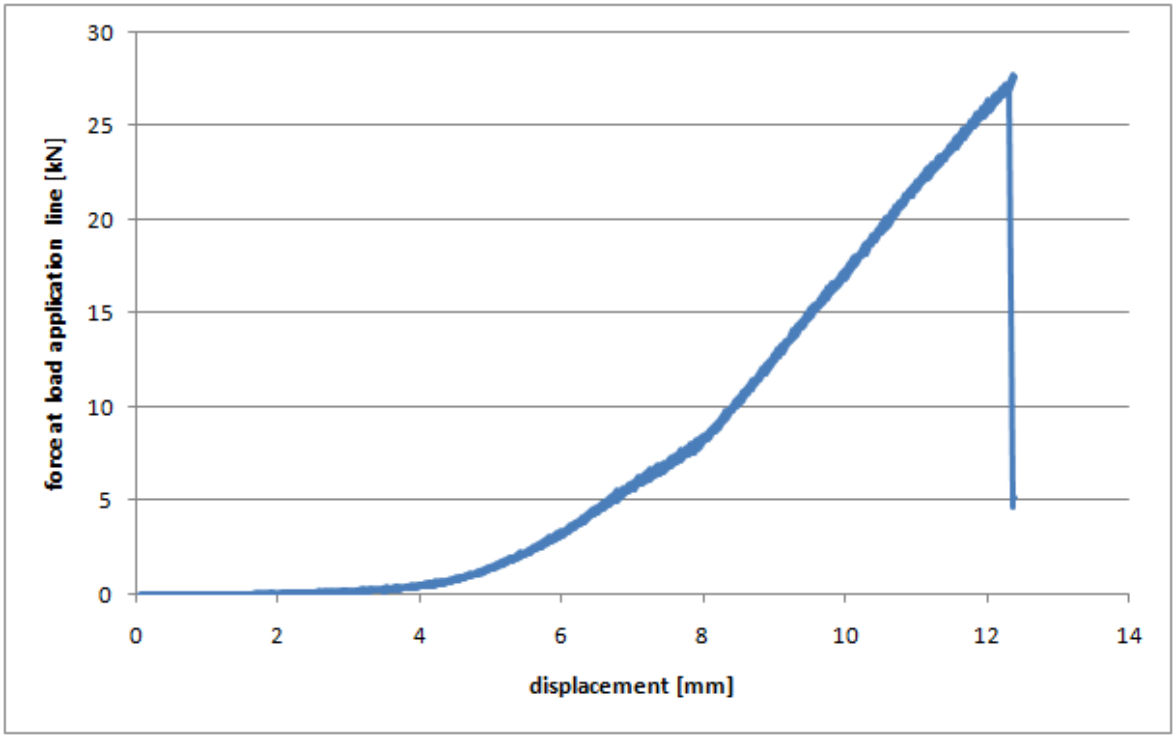
Test No.		**II-B-10**
type of test	test on corner details, introduction of load by contact	
load introduction	steel sheet	
type of panel	B	
faces	steel 0,75 mm	
core	PU 100 mm	
stressed face	top side of production	

Measured dimensions:		Dimensions of test set up		
width b	399 mm	a	100	mm
height h_1	300 mm	e	100	mm
thickness D	100 mm	f	400	mm
height of cutting h_2	101 mm	g	800	mm
thickness of cutting d_2	50 mm	α	1,26061	°

ultimate load at line of load application	27,80	kN
ultimate stress of compressed face	91,4	N/mm^2
Failure mode	crippling of the compressed face	
Remarks		



Test No.	**II-B-10**



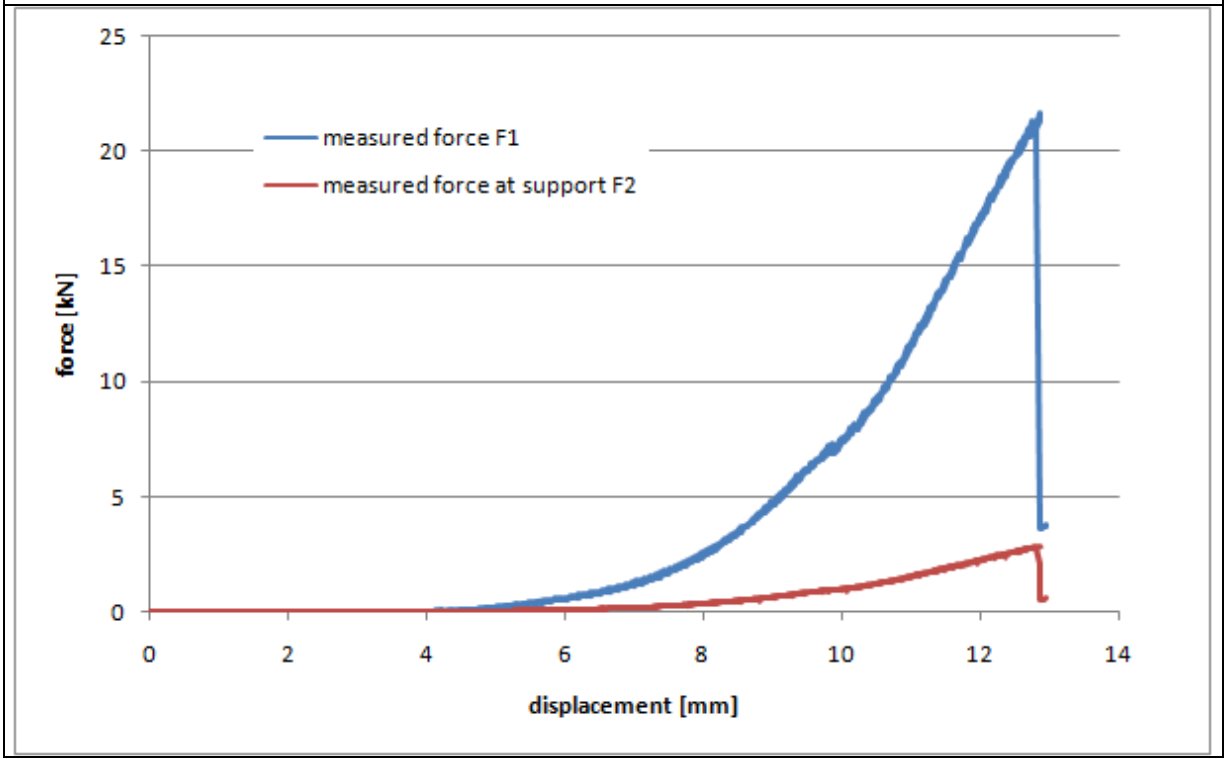
Failure of the stressed face

Compound between core and face

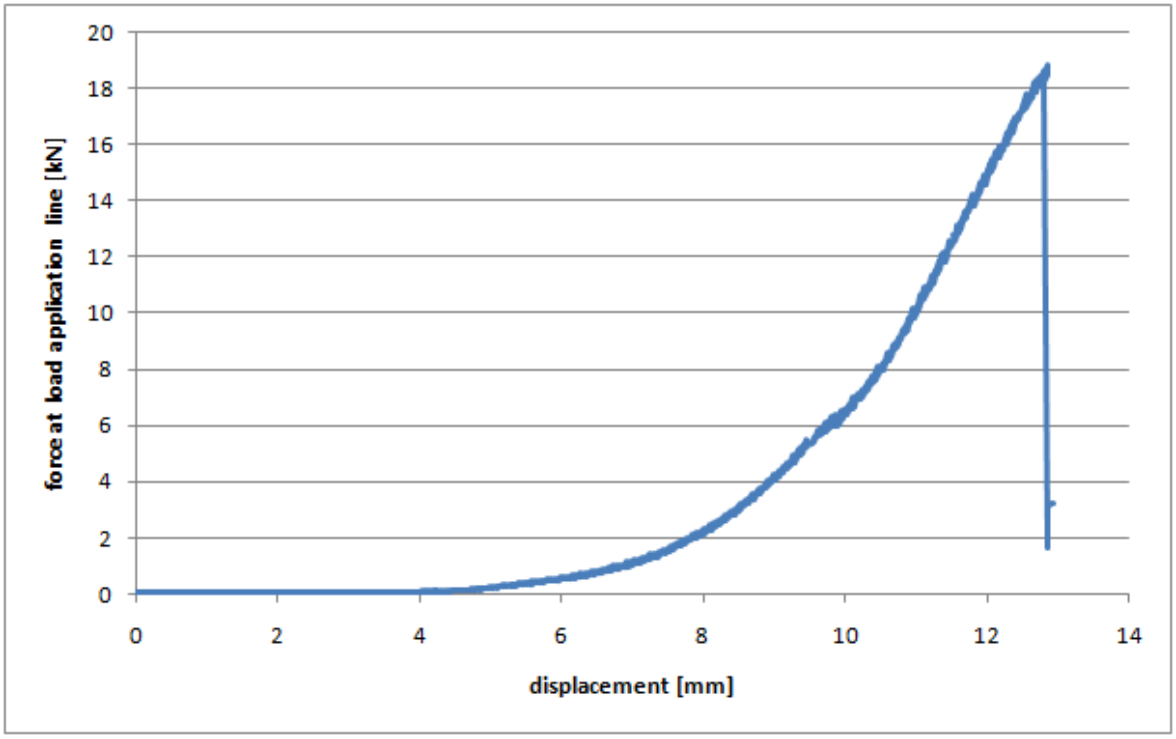
Test No.		**II-B-11**
type of test	test on corner details, introduction of load by contact	
load introduction	steel sheet	
type of panel	B	
faces	steel 0,75 mm	
core	PU 100 mm	
stressed face	top side of production	

Measured dimensions:			Dimensions of test set up		
width b	400	mm	a	100	mm
height h_1	299	mm	e	100	mm
thickness D	99	mm	f	400	mm
height of cutting h_2	101	mm	g	800	mm
thickness of cutting d_2	52	mm	α	0,458	°

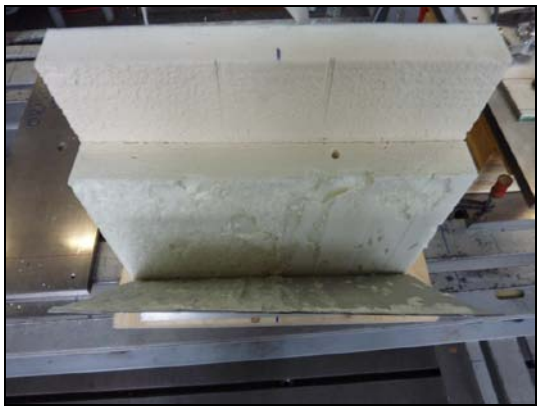
ultimate load at line of load application	18,86	kN
ultimate stress of compressed face	61,9	N/mm^2
Failure mode	buckling and delamination of the compressed face	
Remarks		



Test No.	**II-B-11**



Failure of the stressed face

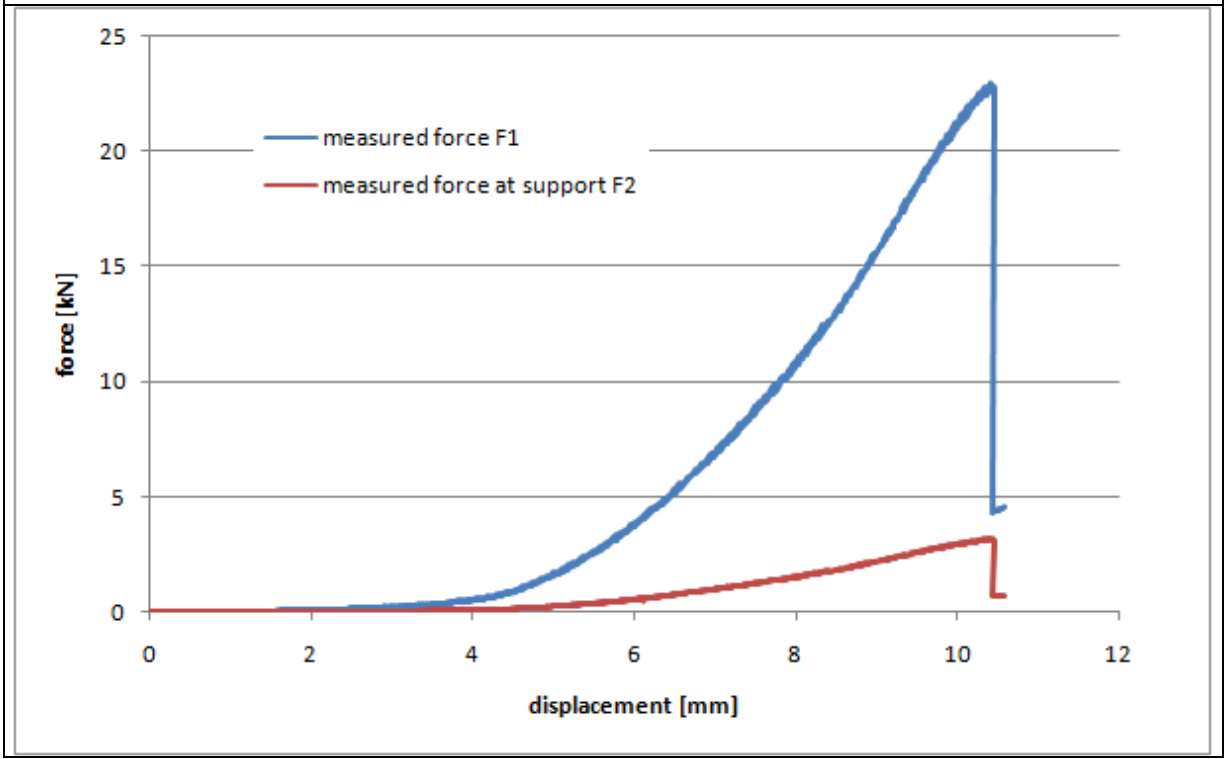


Compound between core and face

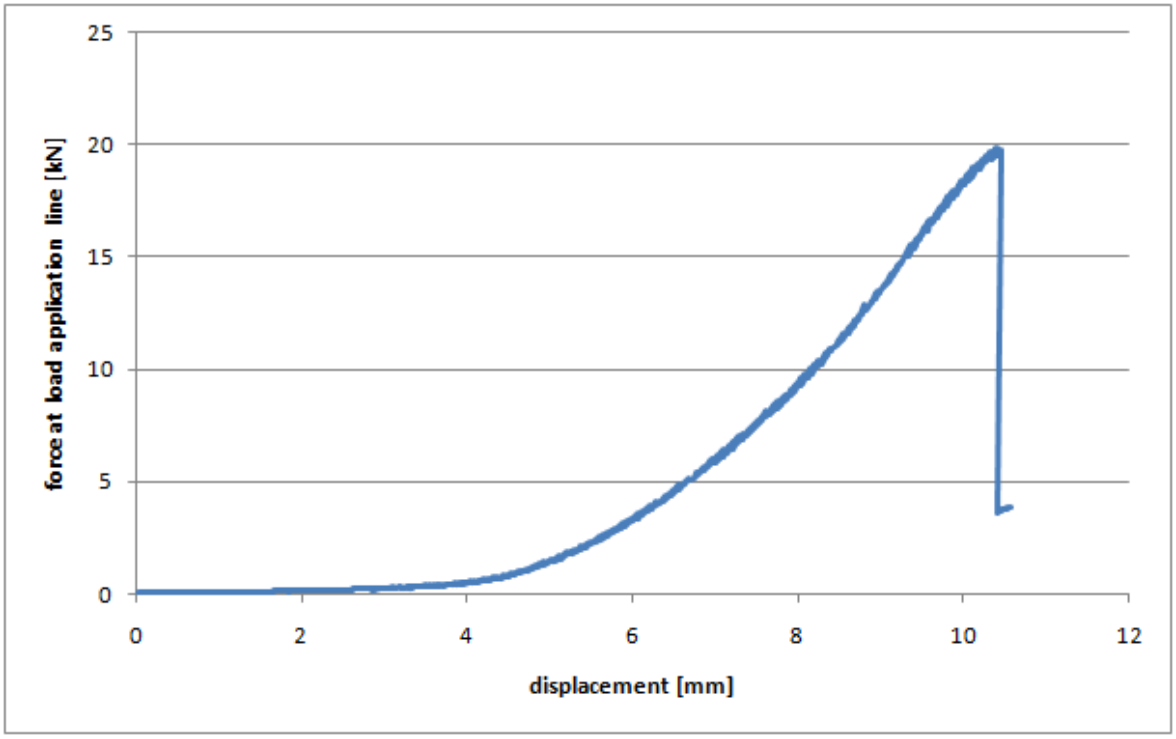
Test No.		**II-B-12**
type of test	test on corner details, introduction of load by contact	
load introduction	steel sheet	
type of panel	B	
faces	steel 0,75 mm	
core	PU 100 mm	
stressed face	top side of production	

Measured dimensions:			Dimensions of test set up		
width b	400	mm	a	100	mm
height h_1	298	mm	e	100	mm
thickness D	99	mm	f	400	mm
height of cutting h_2	102	mm	g	800	mm
thickness of cutting d_2	49	mm	α	0,358	°

ultimate load at line of load application	19,88	kN
ultimate stress of compressed face	65,2	N/mm^2
Failure mode	buckling and delamination of the compressed face	
Remarks		



Test No.	**II-B-12**



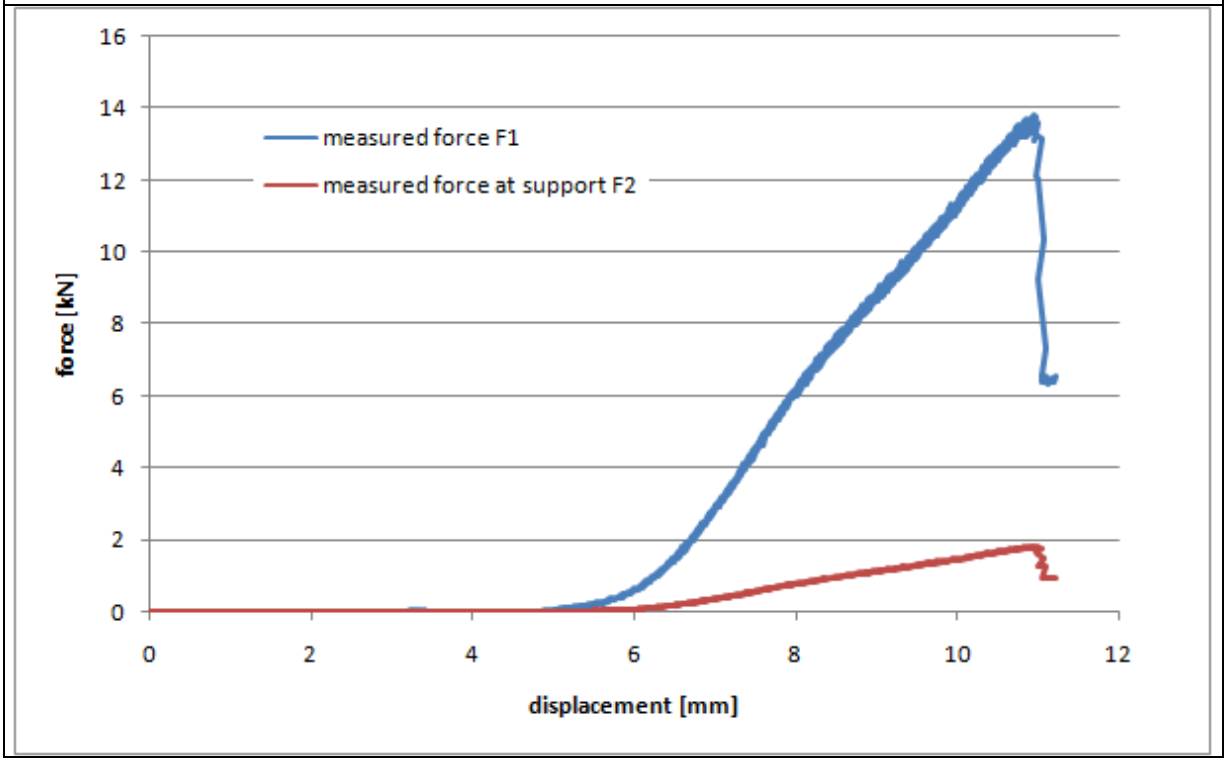
Failure of the stressed face

Compound between core and face

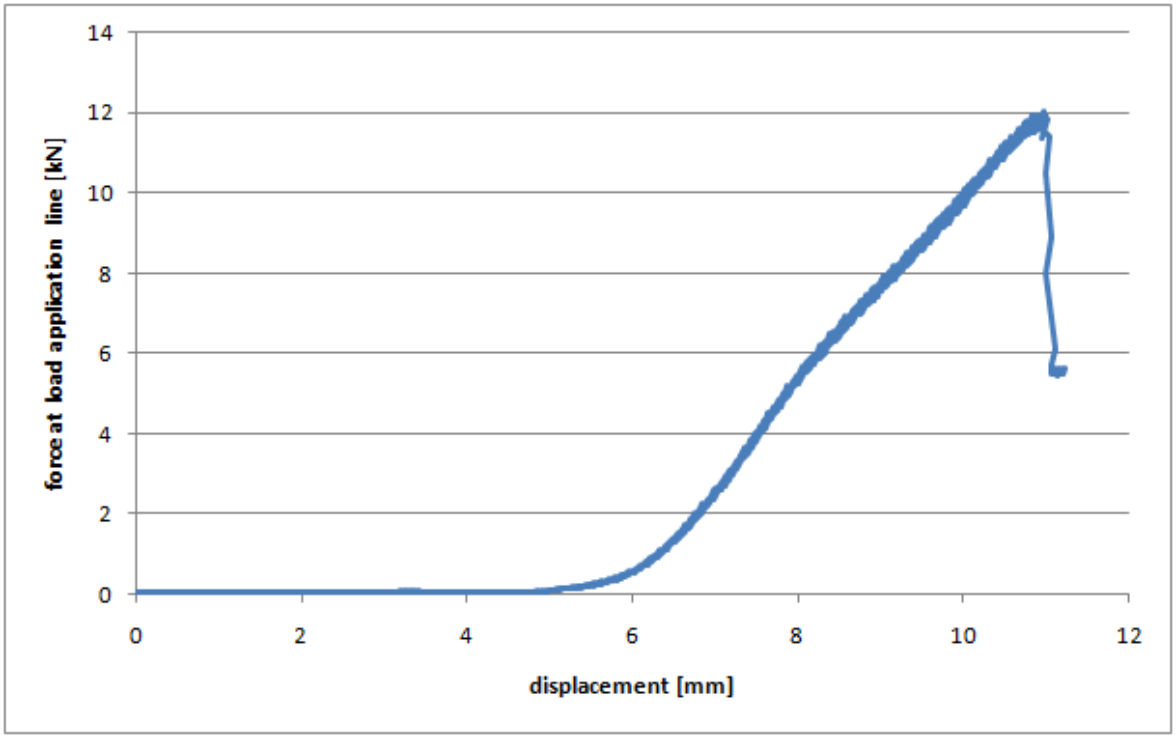
Test No.		**II-C-1**
type of test	test on corner details, introduction of load by contact	
load introduction	steel sheet	
type of panel	C	
faces	steel 0,60 mm	
core	EPS 100 mm	
stressed face	top side of production	

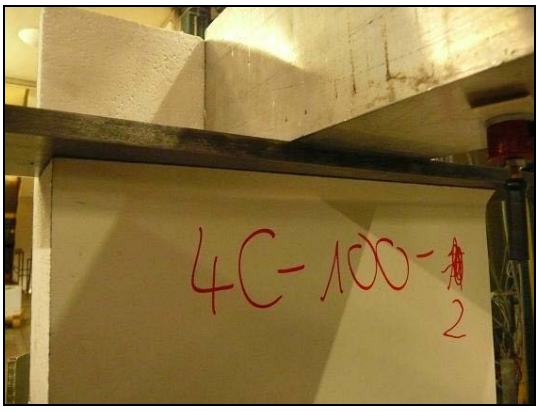
Measured dimensions:			Dimensions of test set up		
width b	299	mm	a	100	mm
height h_1	279	mm	e	100	mm
thickness D	100	mm	f	400	mm
height of cutting h_2	101	mm	g	800	mm
thickness of cutting d_2	71	mm	α	1,20	°

ultimate load at line of load application	12,05	kN
ultimate stress of compressed face	56	N/mm^2
Failure mode	crippling of the compressed face	
Remarks		



Test No.	**II-C-1**



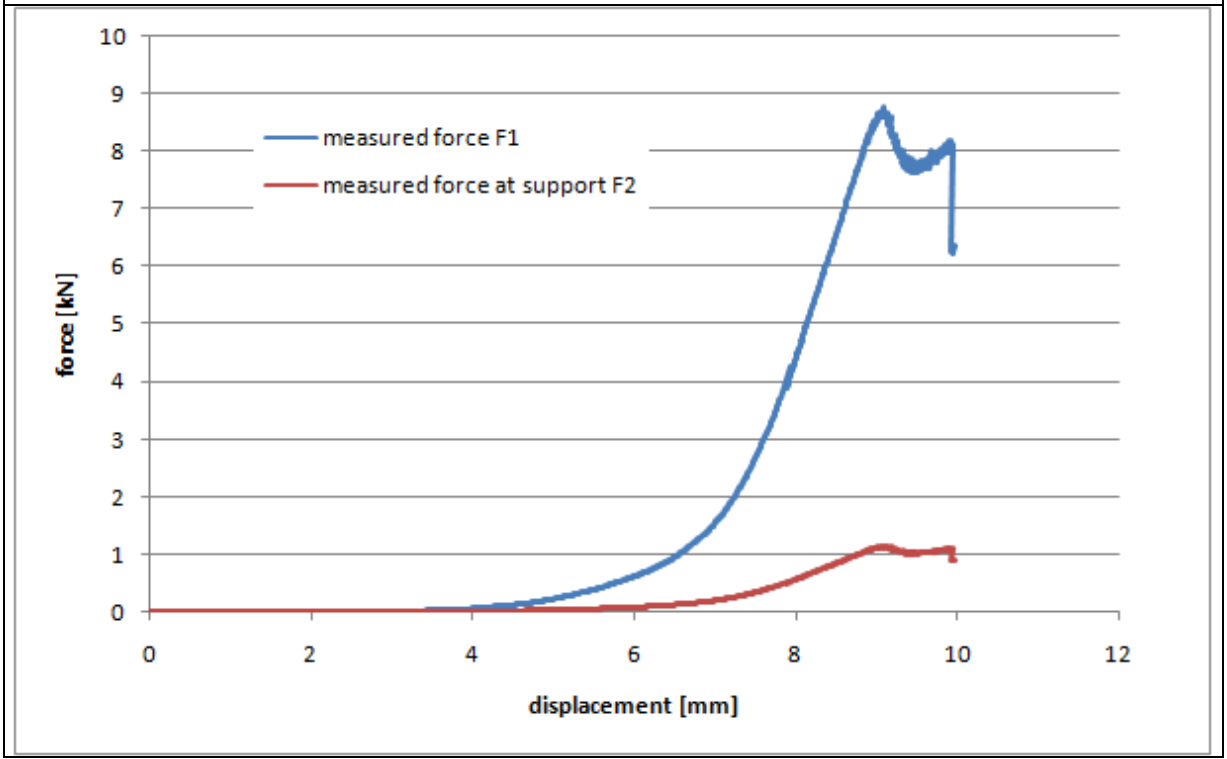


Failure of the stressed face

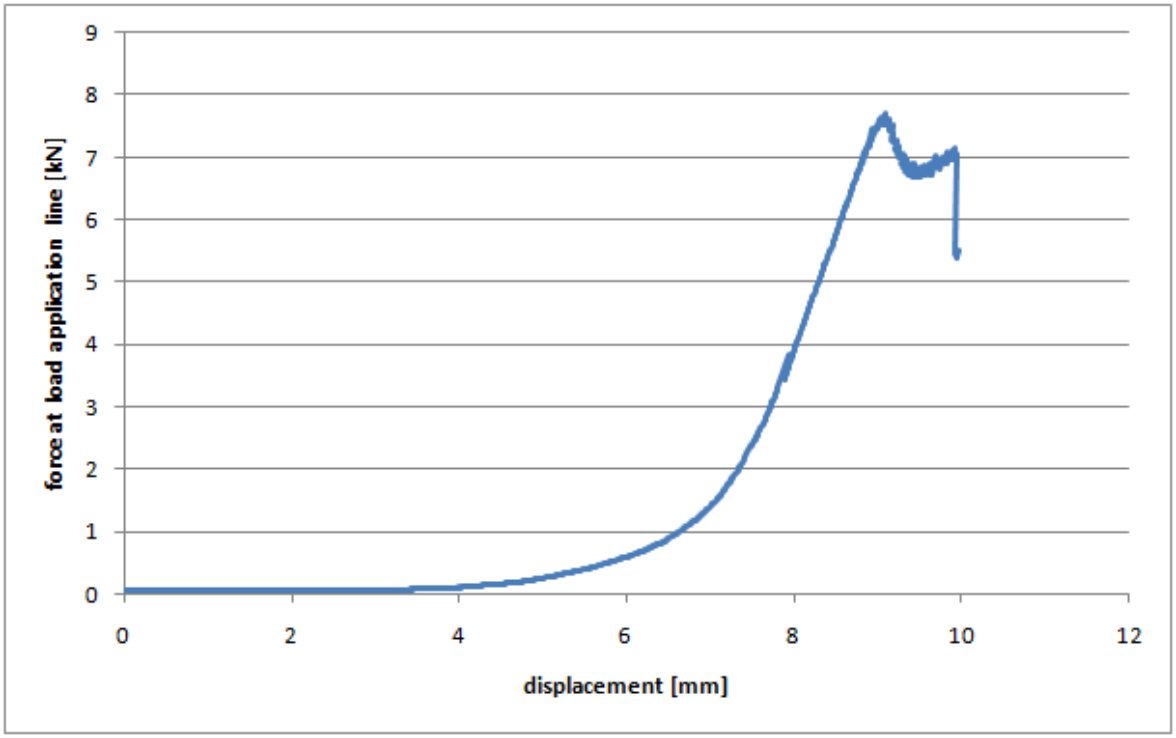
Test No.		**II-C-6**
type of test	test on corner details, introduction of load by contact	
load introduction	steel sheet	
type of panel	C	
faces	steel 0,60 mm	
core	EPS 100 mm	
stressed face	top side of production	

Measured dimensions:			Dimensions of test set up		
width b	391	mm	a	100	mm
height h_1	292	mm	e	100	mm
thickness D	100	mm	f	400	mm
height of cutting h_2	-	mm	g	800	mm
thickness of cutting d_2	-	mm	α	1,547	°

ultimate load at line of load application	7,10	kN
ultimate stress of compressed face	33,7	N/mm^2
Failure mode	crippling of the compressed face	
Remarks		



Test No.	**II-C-6**

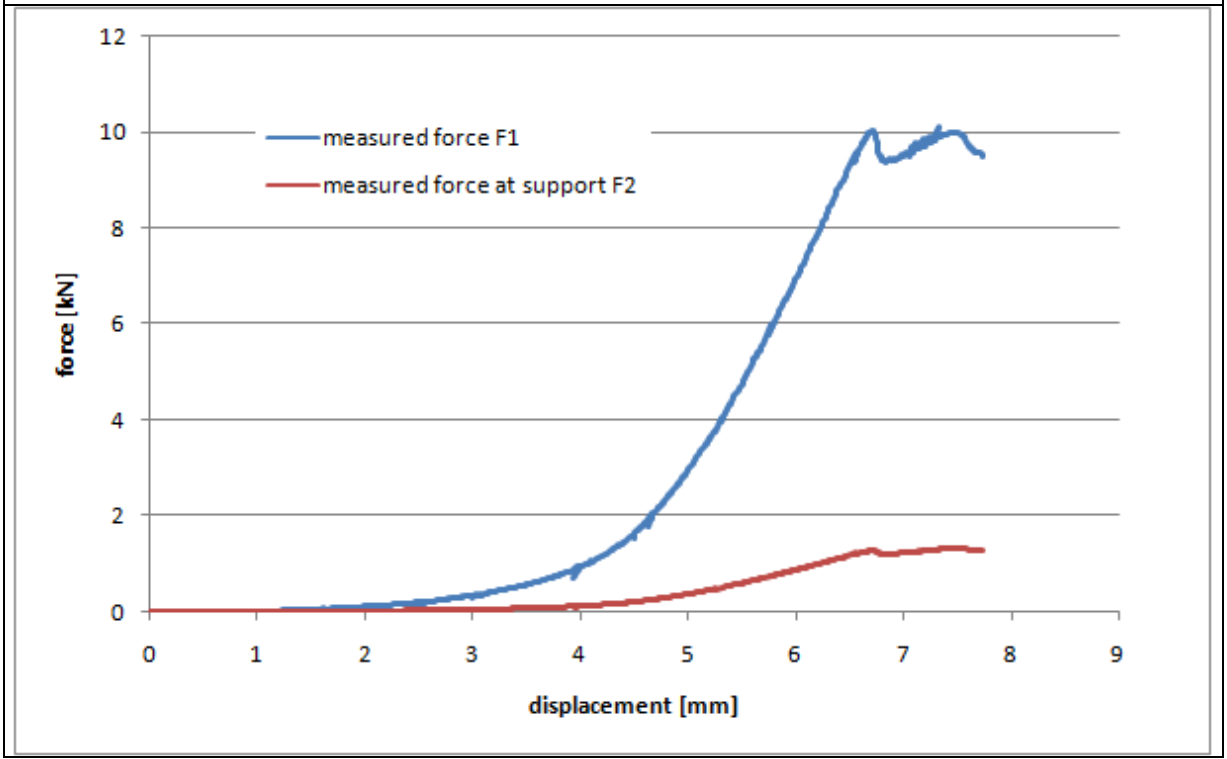


Failure of the stressed face

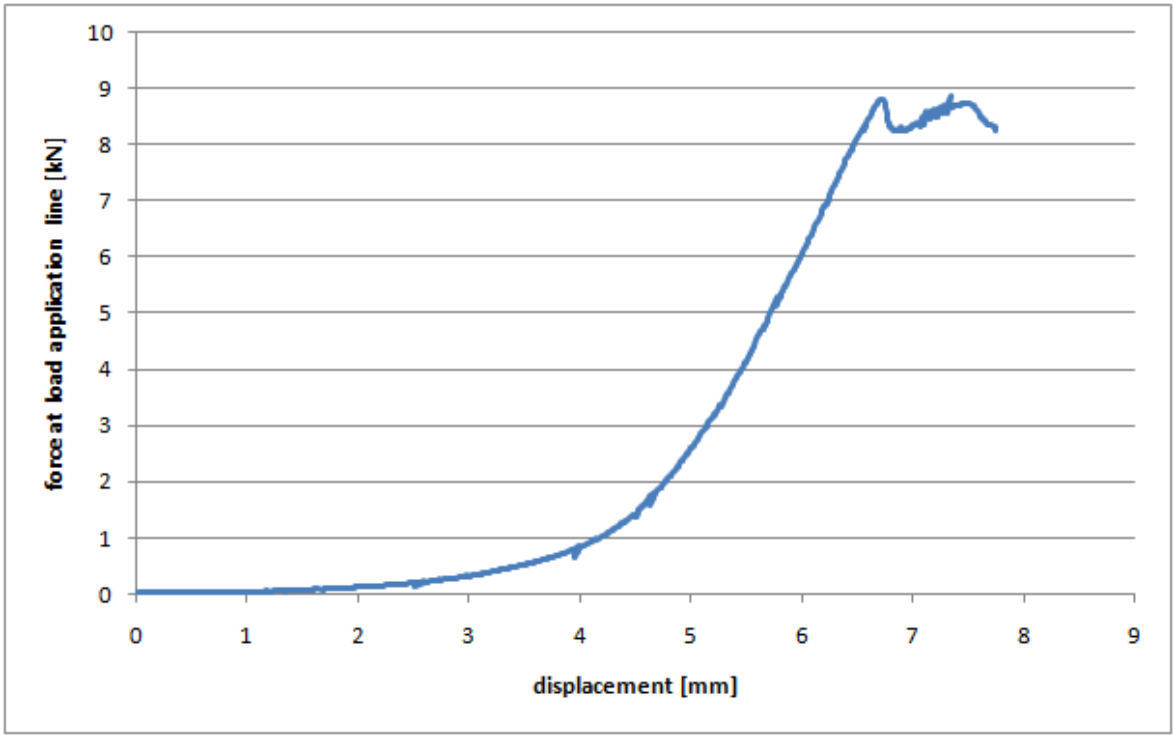
Test No.			**II-C-7**
type of test	test on corner details, introduction of load by contact		
load introduction	steel sheet		
type of panel	C		
faces	steel 0,60 mm		
core	EPS 100 mm		
stressed face	top side of production		

Measured dimensions:			Dimensions of test set up		
width b	391	mm	a	100	mm
height h_1	292	mm	e	100	mm
thickness D	99	mm	f	400	mm
height of cutting h_2	-	mm	g	800	mm
thickness of cutting d_2	-	mm	α	0,516	°

ultimate load at line of load application	8,88	kN
ultimate stress of compressed face	42,1	N/mm^2
Failure mode	crippling of the compressed face	
Remarks		

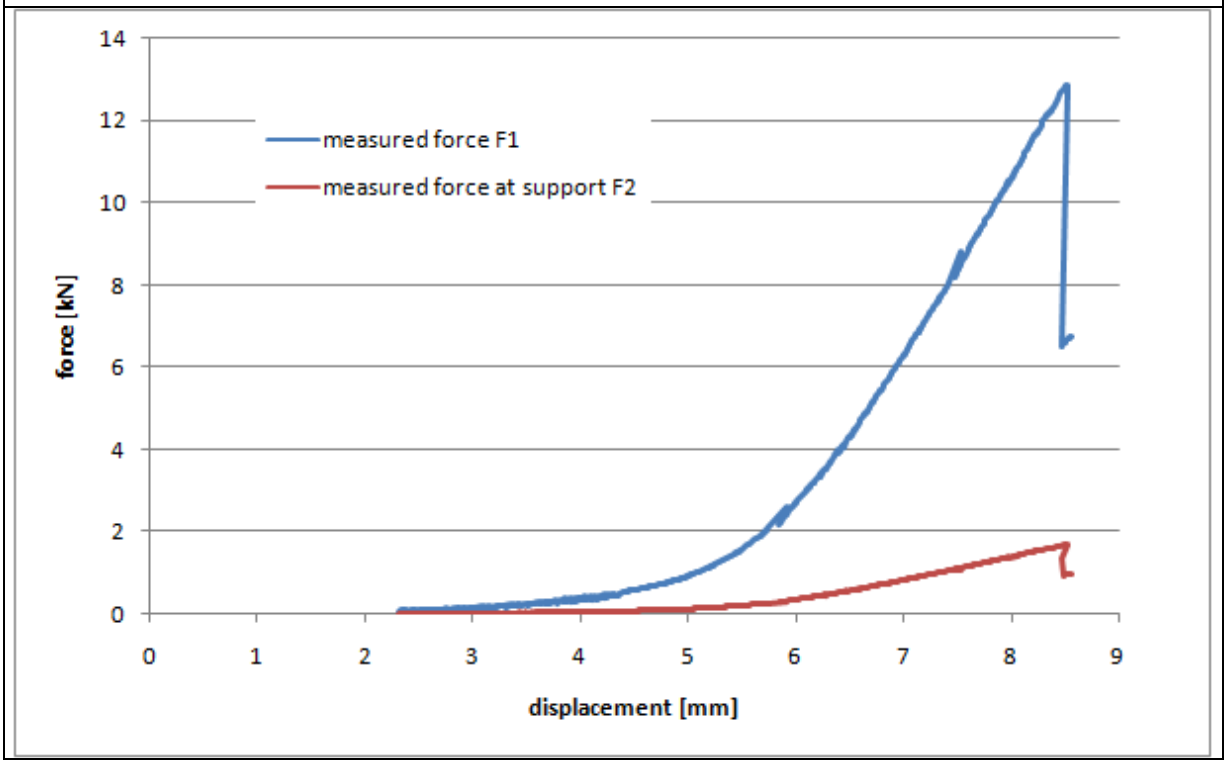


Test No.	**II-C-7**

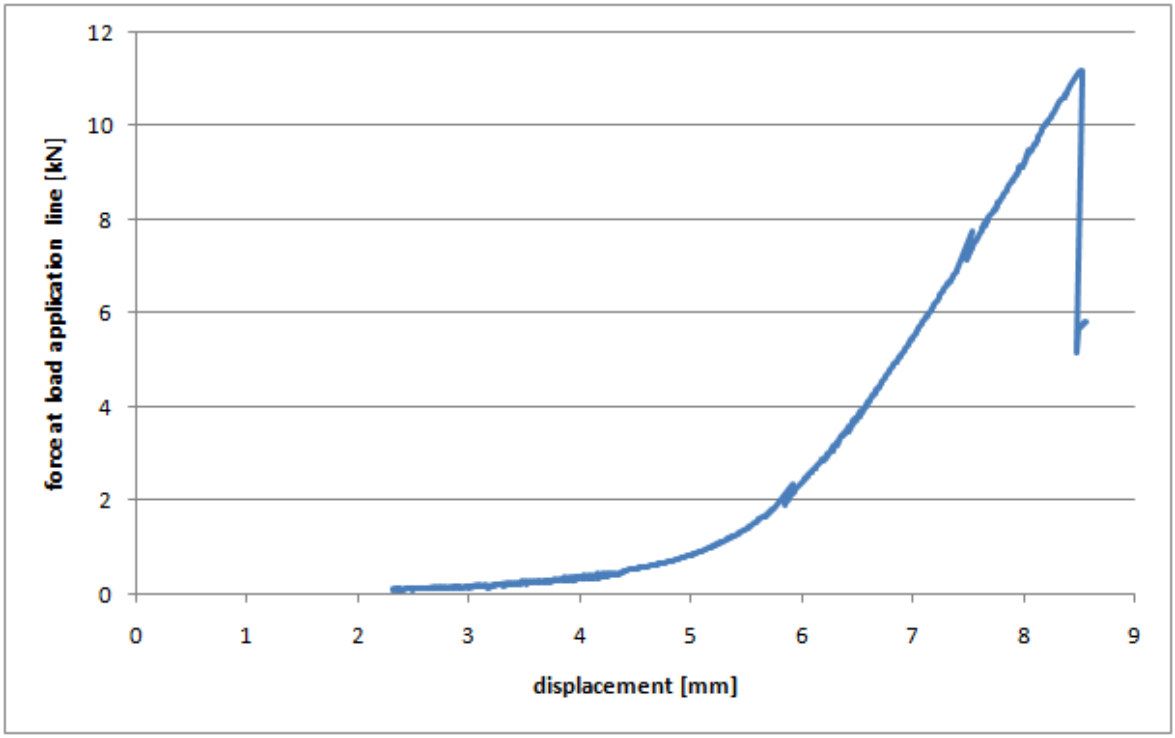


Failure of the stressed face

Test No.			**II-C-8**
type of test	test on corner details, introduction of load by contact		
load introduction	steel sheet		
type of panel	C		
faces	steel 0,60 mm		
core	EPS 100 mm		
stressed face	top side of production		
Measured dimensions:		Dimensions of test set up	
width b	391 mm	a	100 mm
height h_1	292 mm	e	100 mm
thickness D	99 mm	f	400 mm
height of cutting h_2	- mm	g	800 mm
thickness of cutting d_2	- mm	α	0,688 °
ultimate load at line of load application			11,20 kN
ultimate stress of compressed face			53,2 N/mm^2
Failure mode	crippling of the compressed face		
Remarks			



Test No.	**II-C-8**

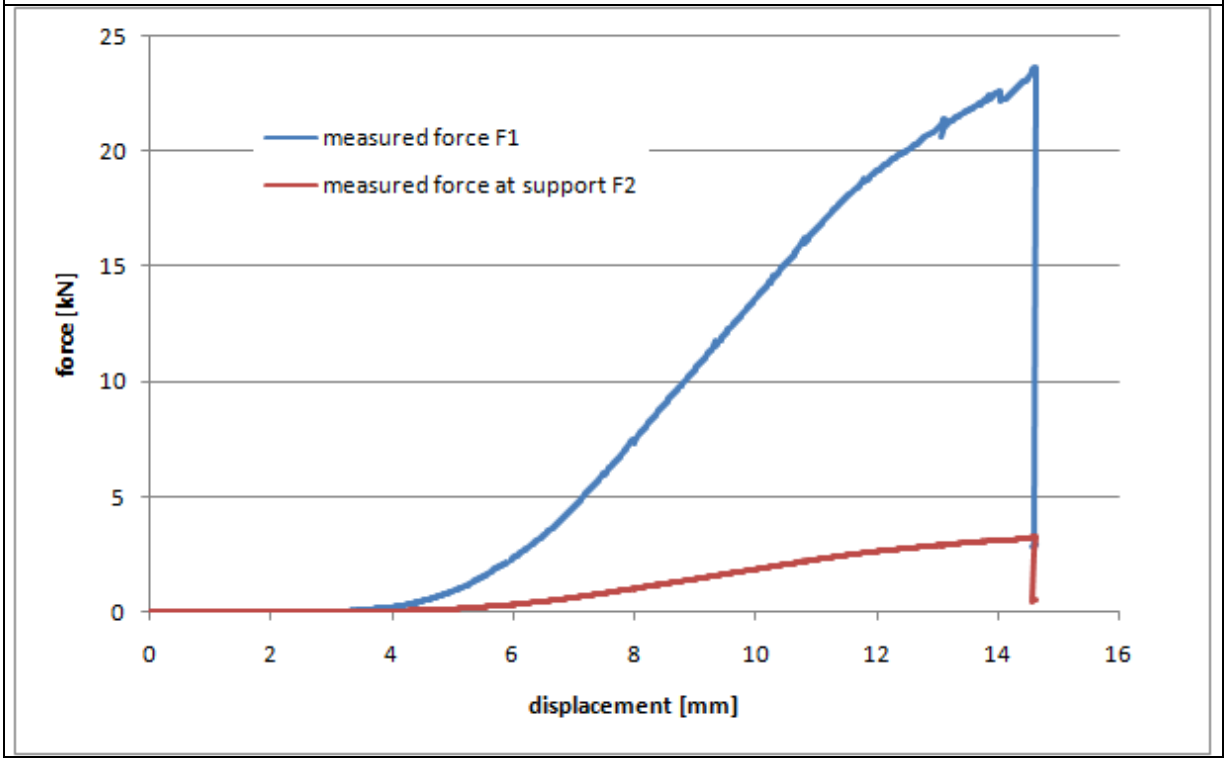


Failure of the stressed face

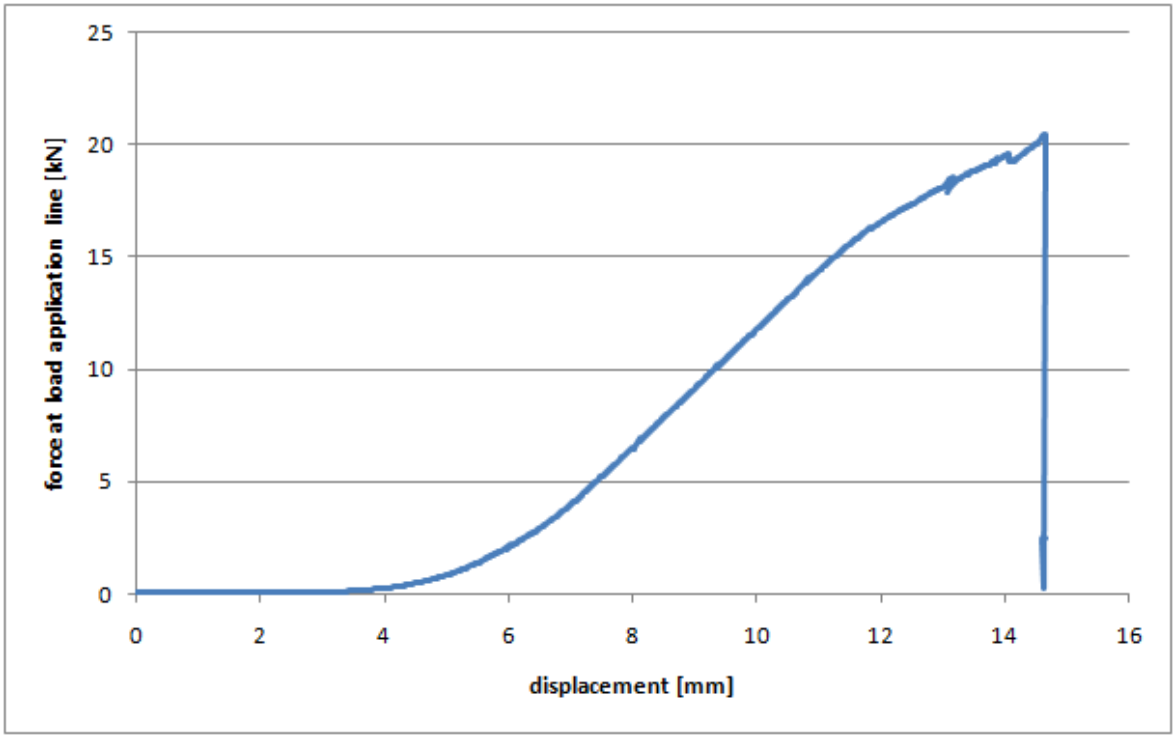
Test No.		**II-D-4**
type of test	test on corner details, introduction of load by contact	
load introduction	steel sheet	
type of panel	D	
faces	GFRP 1,8mm	
core	EPS 100 mm	
stressed face	top side of production	

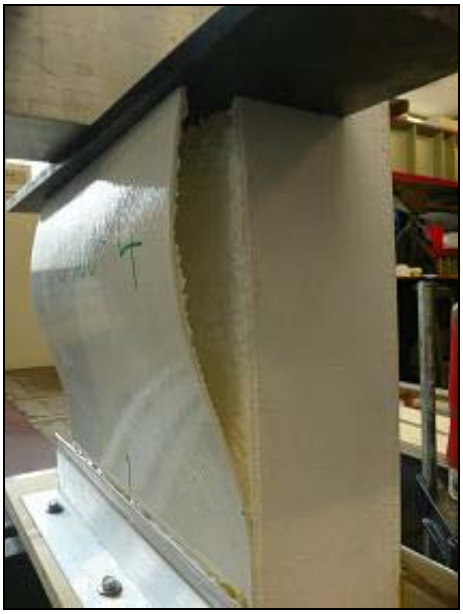
Measured dimensions:			Dimensions of test set up		
width b	300	mm	a	100	mm
height h_1	299	mm	e	100	mm
thickness D	101	mm	f	400	mm
height of cutting h_2	100	mm	g	800	mm
thickness of cutting d_2	70	mm	α	1,09	°

ultimate load at line of load application	20,44	kN
ultimate stress of compressed face	37,8	N/mm^2
Failure mode	buckling of the compressed face	
Remarks		



Test No.	**II-D-4**



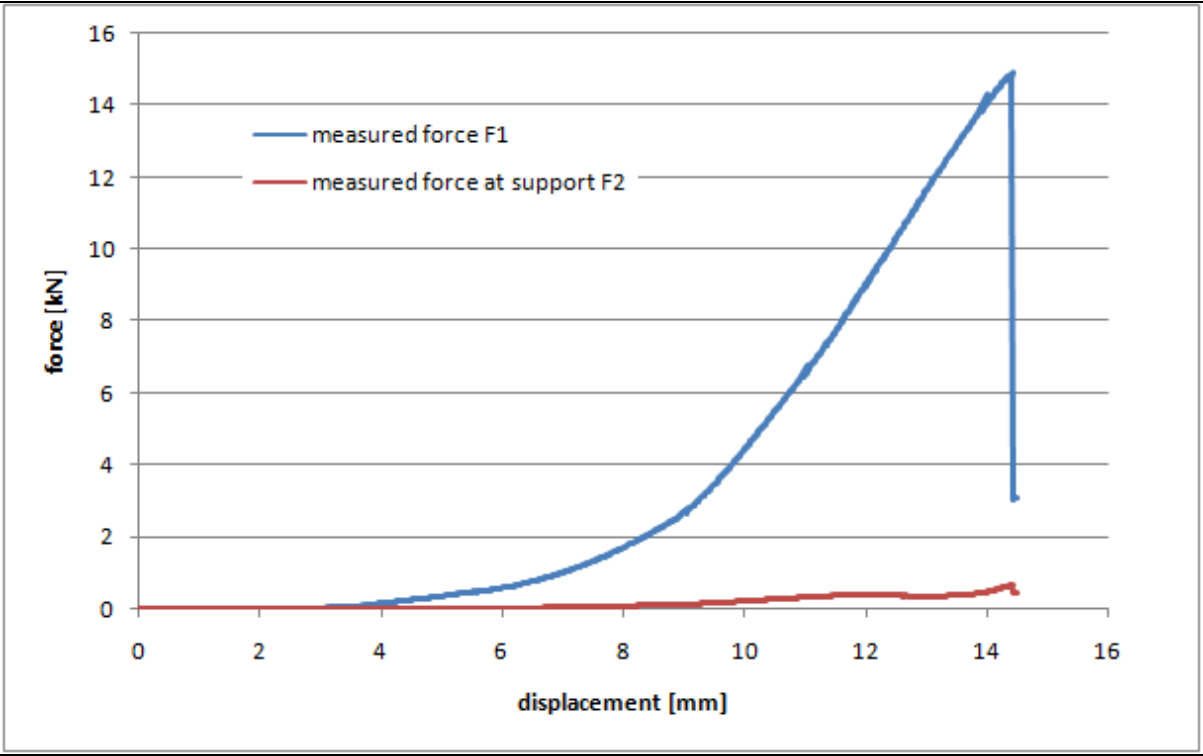


Failure of the stressed face

Test No.		**II-D-5**
type of test	test on corner details, introduction of load by contact	
load introduction	steel sheet	
type of panel	D	
faces	GFRP 1,8mm	
core	EPS 100 mm	
stressed face	top side of production	

Measured dimensions:			Dimensions of test set up		
width b	299	mm	a	100	mm
height h_1	299	mm	e	100	mm
thickness D	102	mm	f	400	mm
height of cutting h_2	99	mm	g	800	mm
thickness of cutting d_2	70	mm	α	1,72	°

ultimate load at line of load application	13,09	kN
ultimate stress of compressed face	24,3	N/mm^2
Failure mode	buckling of the compressed face	
Remarks	measurement of force F_2 failed, ultimate load at load application line determined by calculation	

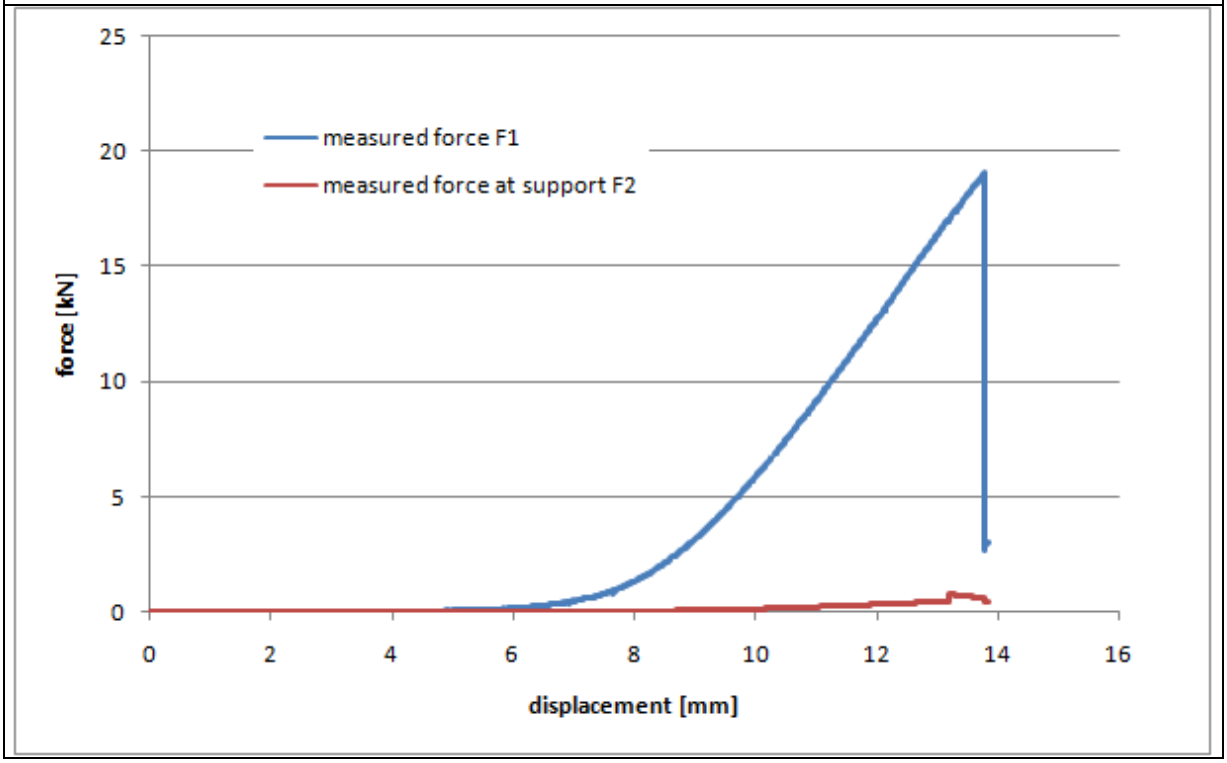


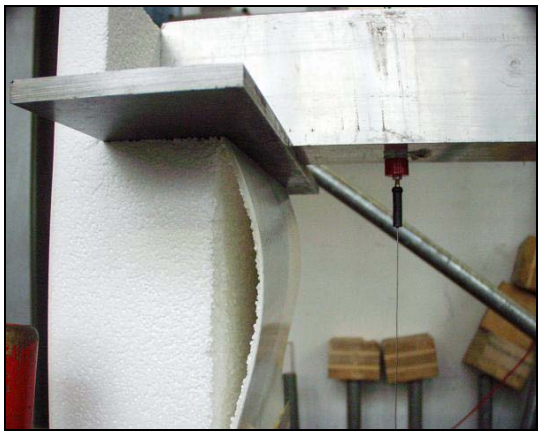
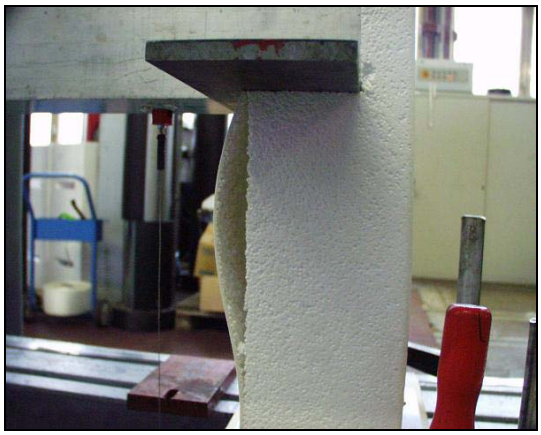
Test No.	**II-D-5**
 Failure of the stressed face	

Test No.		**II-D-6**
type of test	test on corner details, introduction of load by contact	
load introduction	steel sheet	
type of panel	D	
faces	GFRP 1,8mm	
core	EPS 100 mm	
stressed face	top side of production	

Measured dimensions:			Dimensions of test set up		
width b	300	mm	a	100	mm
height h_1	299	mm	e	100	mm
thickness D	102	mm	f	400	mm
height of cutting h_2	100	mm	g	800	mm
thickness of cutting d_2	70	mm	α	0	°

ultimate load at line of load application	16,72	kN
ultimate stress of compressed face	31	N/mm^2
Failure mode	buckling of the compressed face	
Remarks	measurement of force F_2 failed, ultimate load at load application line determined by calculation	

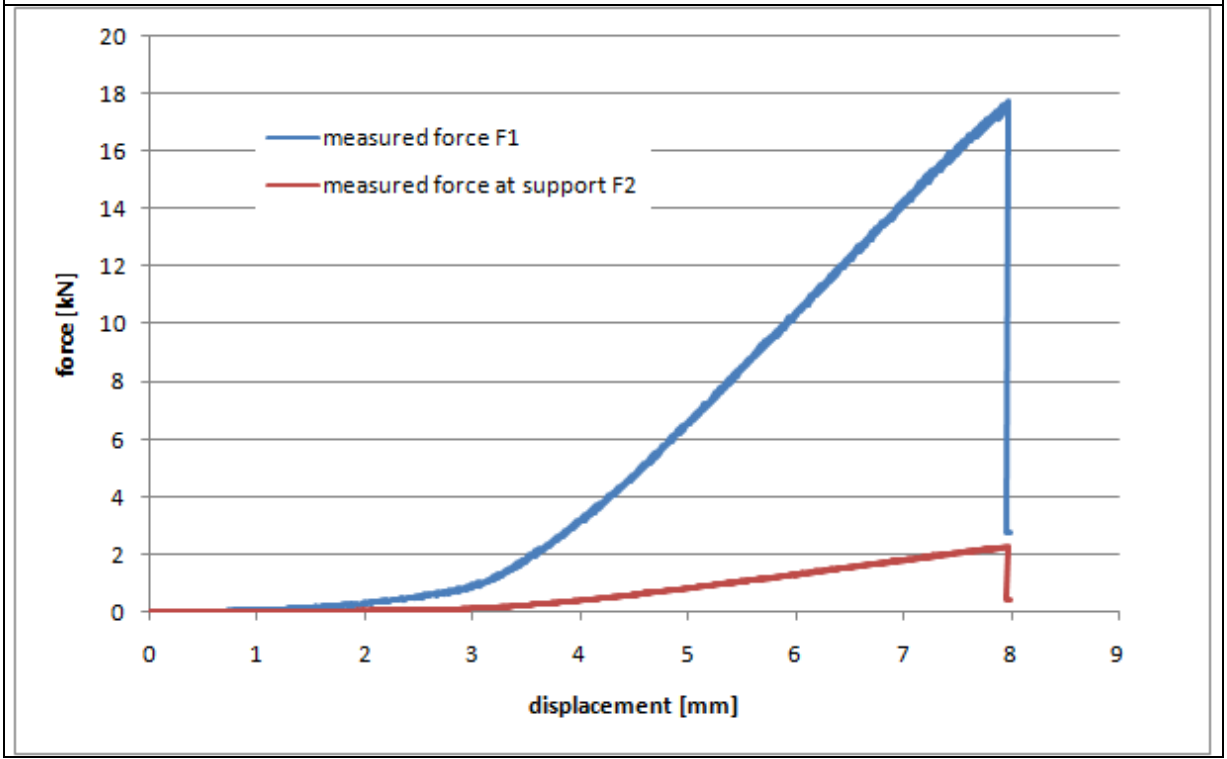


Test No.	**II-D-6**
 Failure of the stressed face	

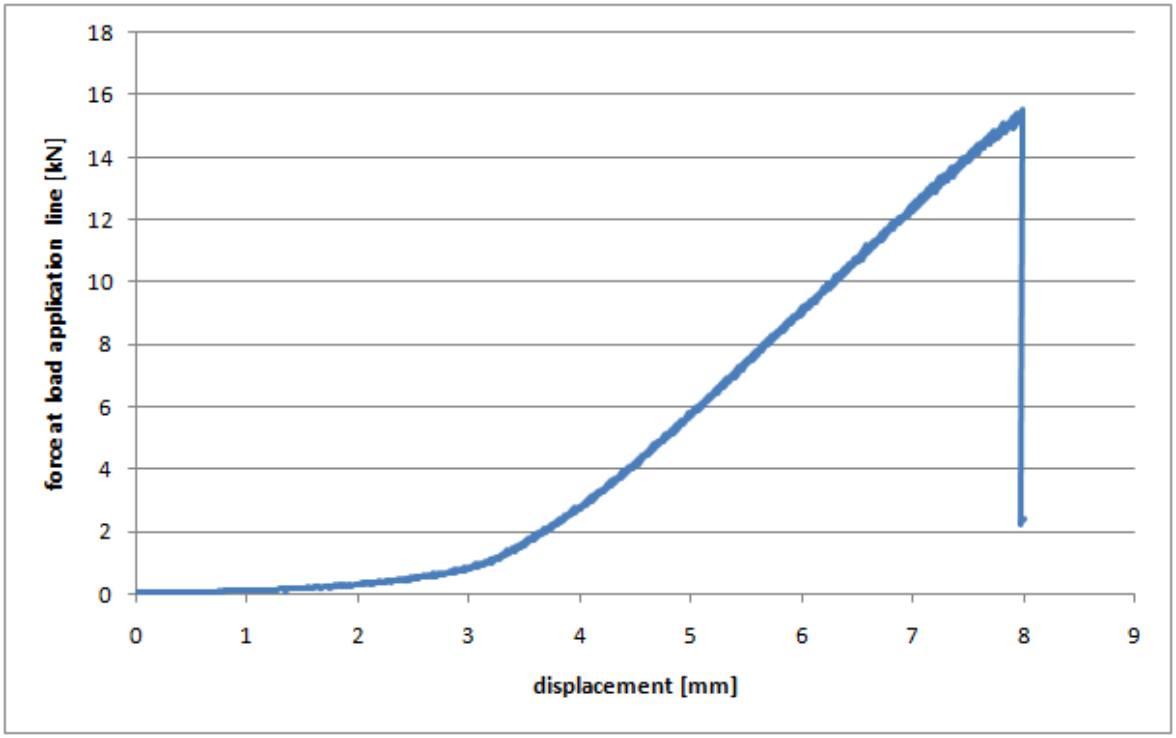
Test No.		**II-D-7**
type of test	test on corner details, introduction of load by contact	
load introduction	steel sheet	
type of panel	D	
faces	GFRP 1,8mm	
core	EPS 100 mm	
stressed face	top side of production	

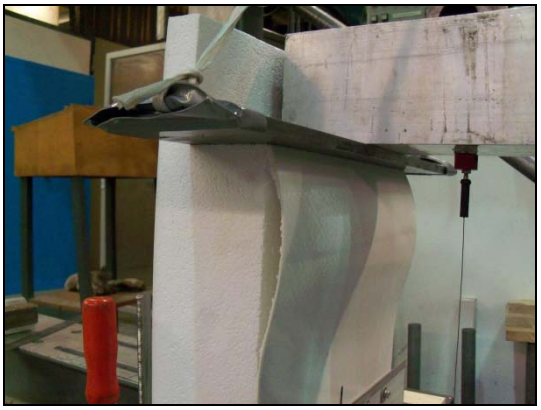
Measured dimensions:			Dimensions of test set up		
width b	299	mm	a	100	mm
height h_1	299	mm	e	100	mm
thickness D	102	mm	f	400	mm
height of cutting h_2	100	mm	g	800	mm
thickness of cutting d_2	70	mm	α	1,38	°

ultimate load at line of load application	15,52	kN
ultimate stress of compressed face	28,8	N/mm^2
Failure mode	buckling of the compressed face	
Remarks		



Test No.	**II-D-7**



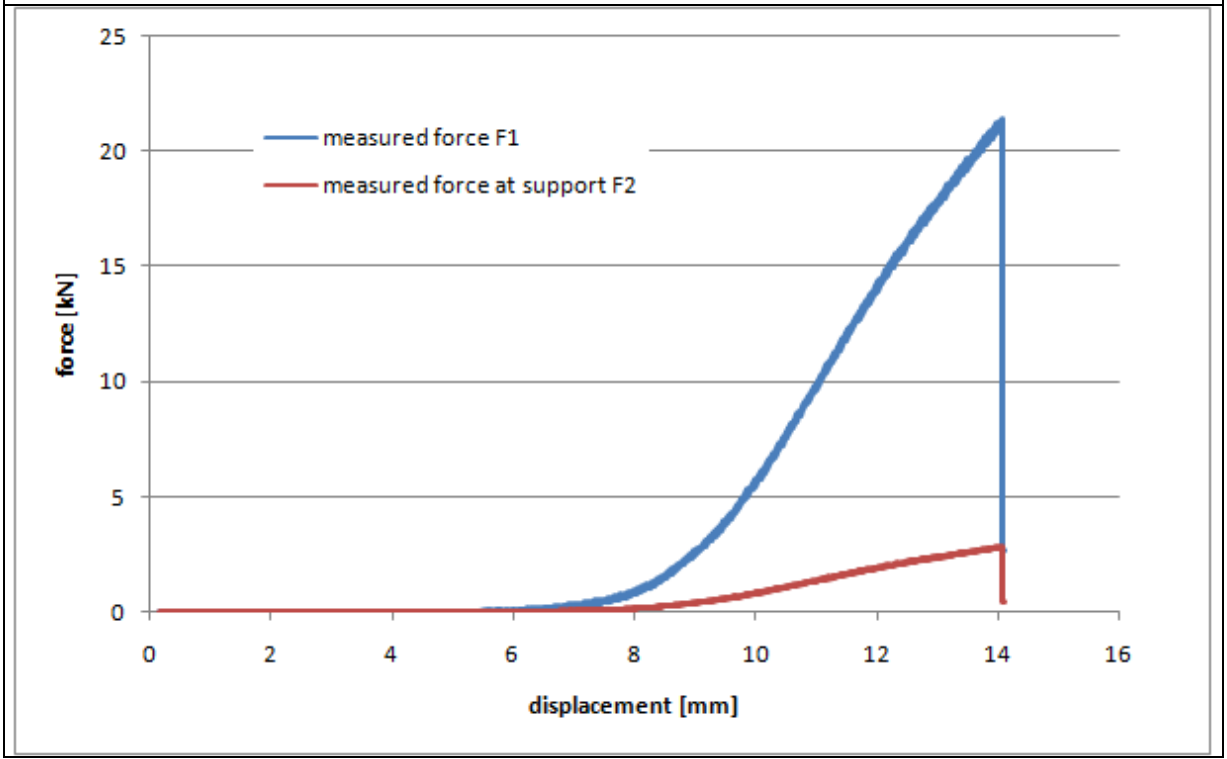


Failure of the stressed face

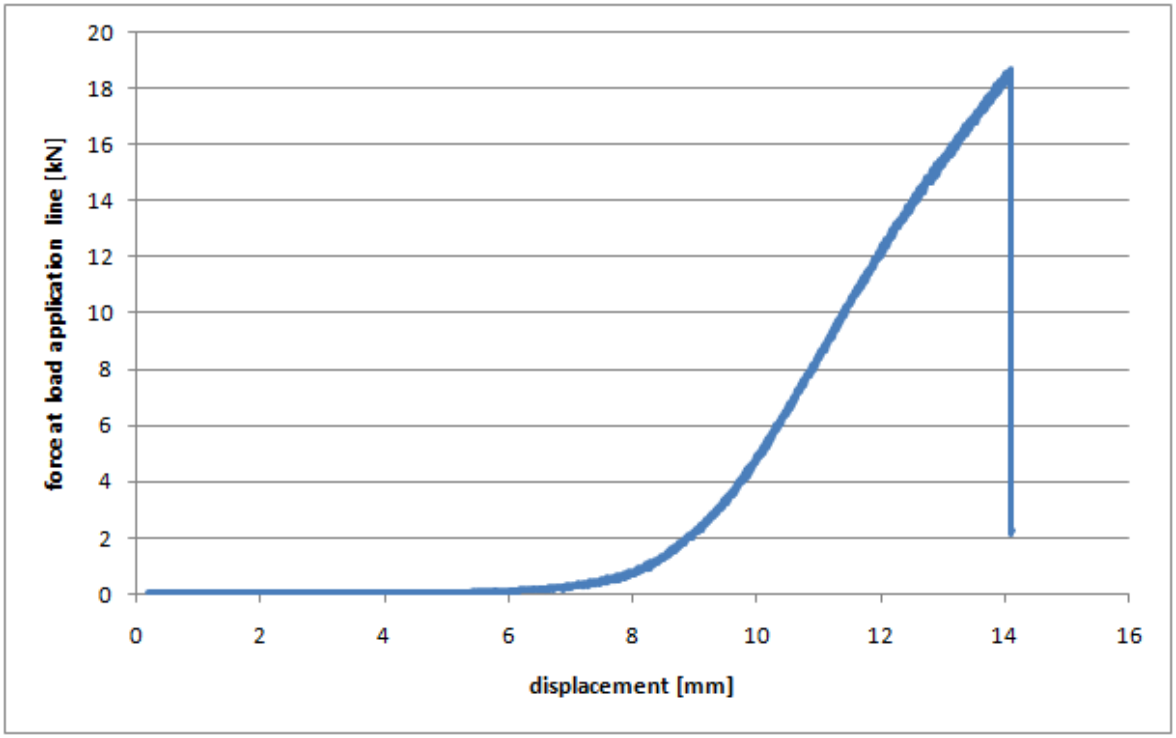
Test No.		**II-D-8**
type of test	test on corner details, introduction of load by contact	
load introduction	steel sheet	
type of panel	D	
faces	GFRP 1,8mm	
core	EPS 100 mm	
stressed face	top side of production	

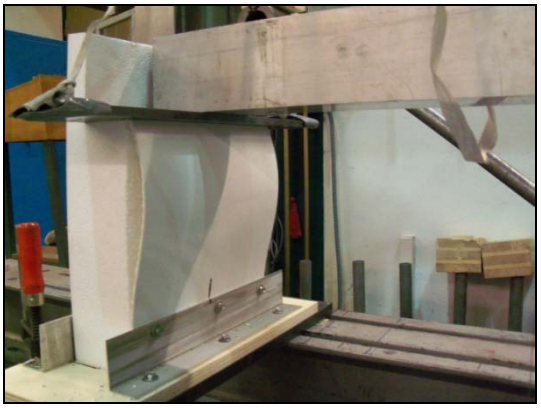
Measured dimensions:			Dimensions of test set up		
width b	299	mm	a	100	mm
height h_1	299	mm	e	100	mm
thickness D	102	mm	f	400	mm
height of cutting h_2	100	mm	g	800	mm
thickness of cutting d_2	70	mm	α	0,286	°

ultimate load at line of load application	18,73	kN
ultimate stress of compressed face	34,8	N/mm^2
Failure mode	buckling of the compressed face	
Remarks		



Test No.	**II-D-8**



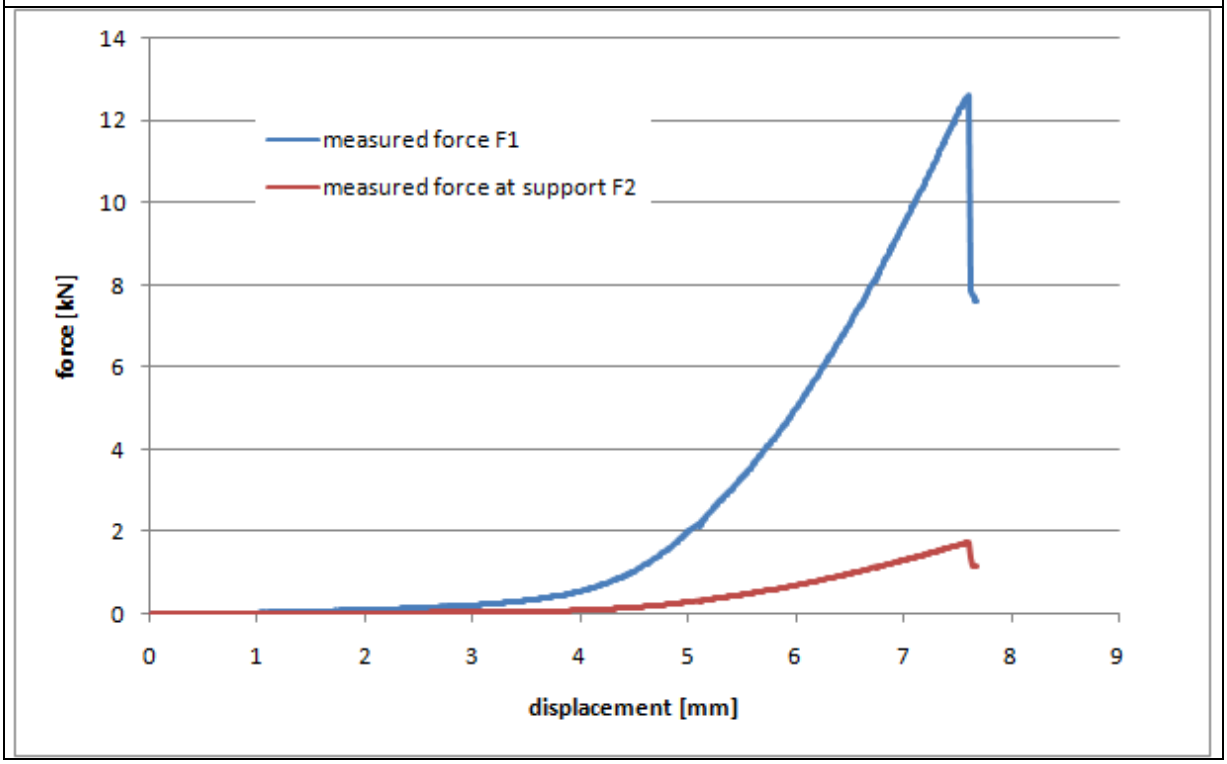


Failure of the stressed face

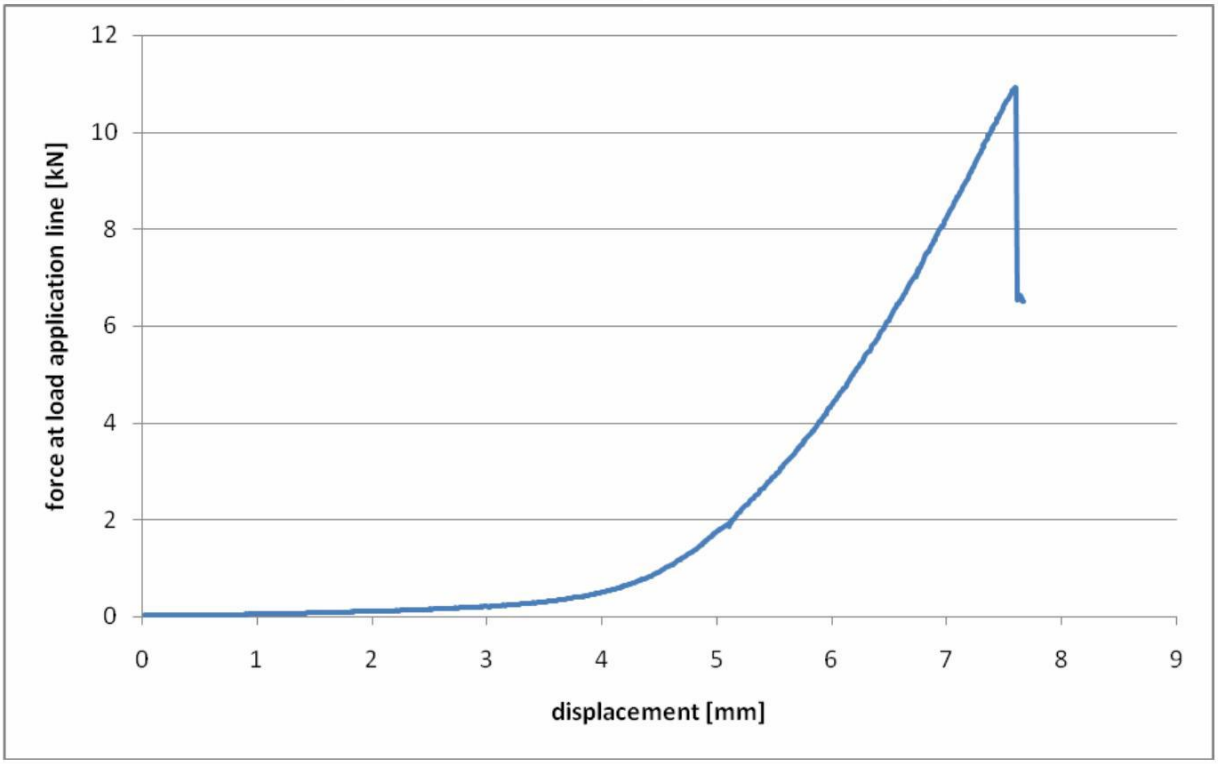
Test No.		**II-E-1**
type of test	test on corner details, introduction of load by contact	
load introduction	steel sheet	
type of panel	E	
faces	Steel 0,50mm	
core	Mineral wool 100 mm	
stressed face	top side of production	

Measured dimensions:		Dimensions of test set up	
width b	400 mm	a	100 mm
height h_1	301 mm	e	100 mm
thickness D	100 mm	f	400 mm
height of cutting h_2	100 mm	g	800 mm
thickness of cutting d_2	70 mm	α	1,662 °

ultimate load at line of load application		10,93 kN
ultimate stress of compressed face		57,5 N/mm^2
Failure mode	crippling of the compressed face	
Remarks		



Test No.	**II-E-1**

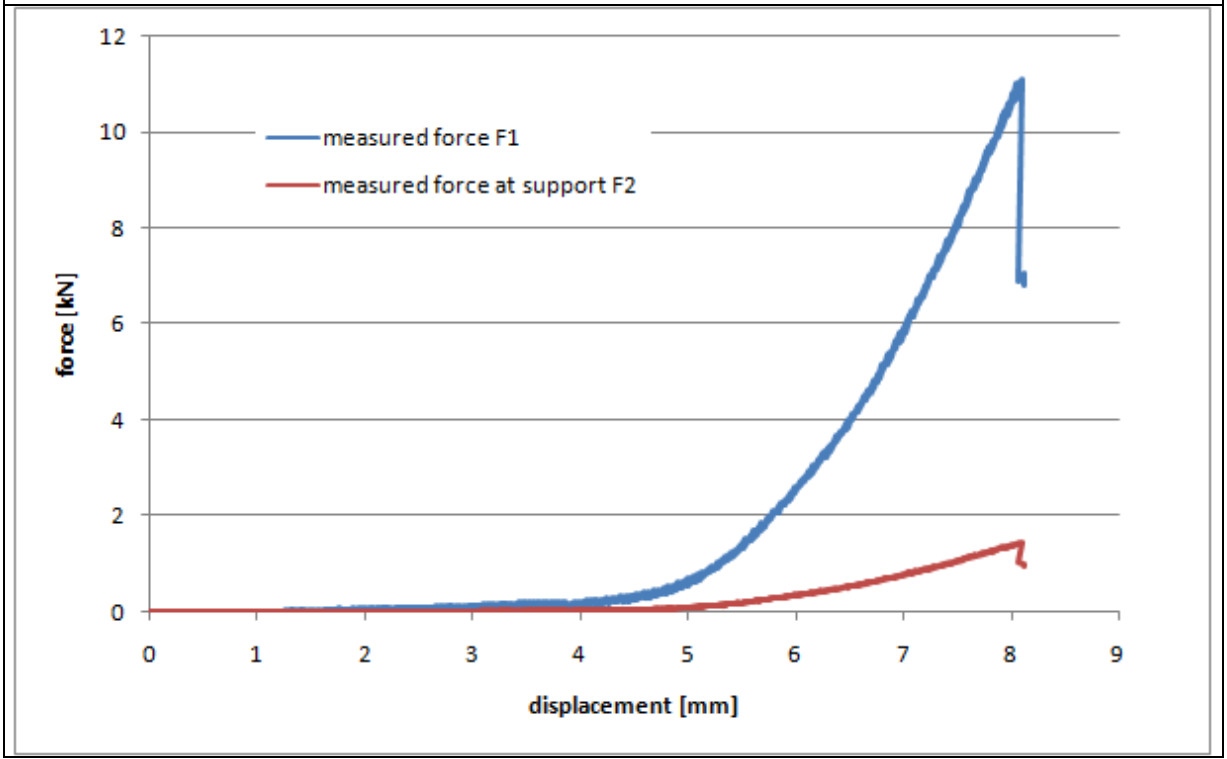


Failure of the stressed face

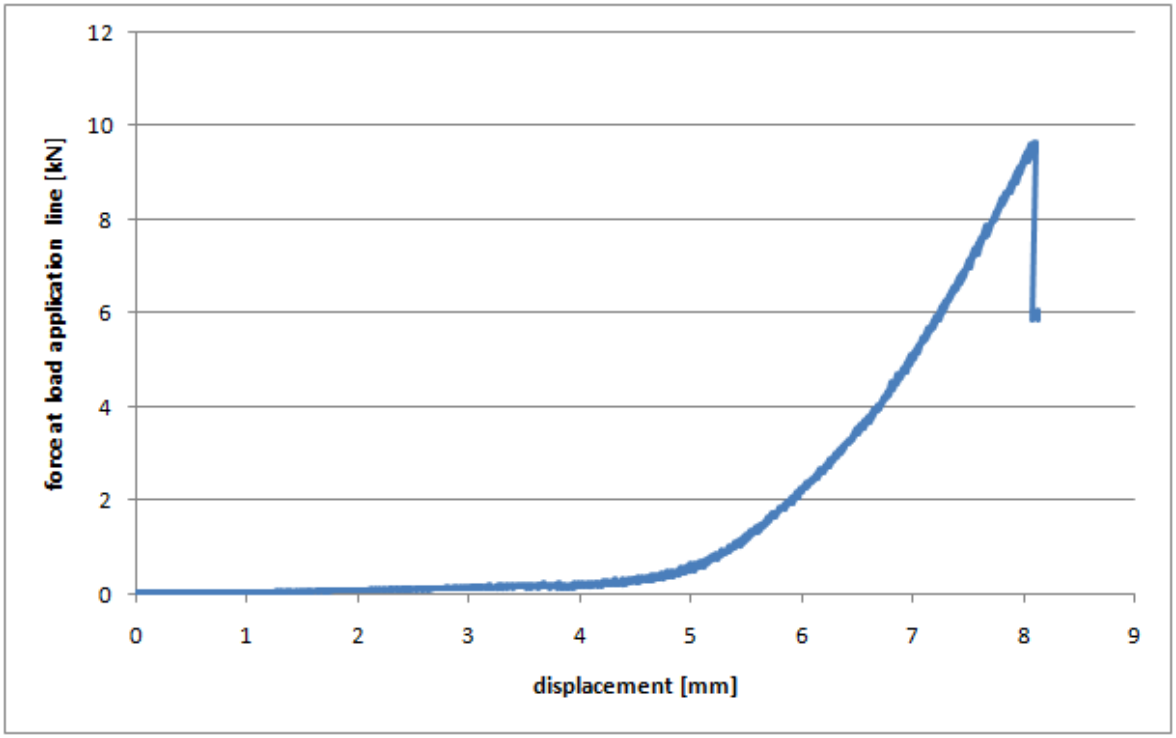
Test No.		**II-E-2**
type of test	test on corner details, introduction of load by contact	
load introduction	steel sheet	
type of panel	E	
faces	Steel 0,50mm	
core	Mineral wool 100 mm	
stressed face	top side of production	

Measured dimensions:			Dimensions of test set up		
width b	400	mm	a	100	mm
height h_1	301	mm	e	100	mm
thickness D	99	mm	f	400	mm
height of cutting h_2	100	mm	g	800	mm
thickness of cutting d_2	70	mm	α	1,089	°

ultimate load at line of load application	9,68	kN
ultimate stress of compressed face	50,9	N/mm^2
Failure mode	crippling of the compressed face	
Remarks		



Test No.	**II-E-2**

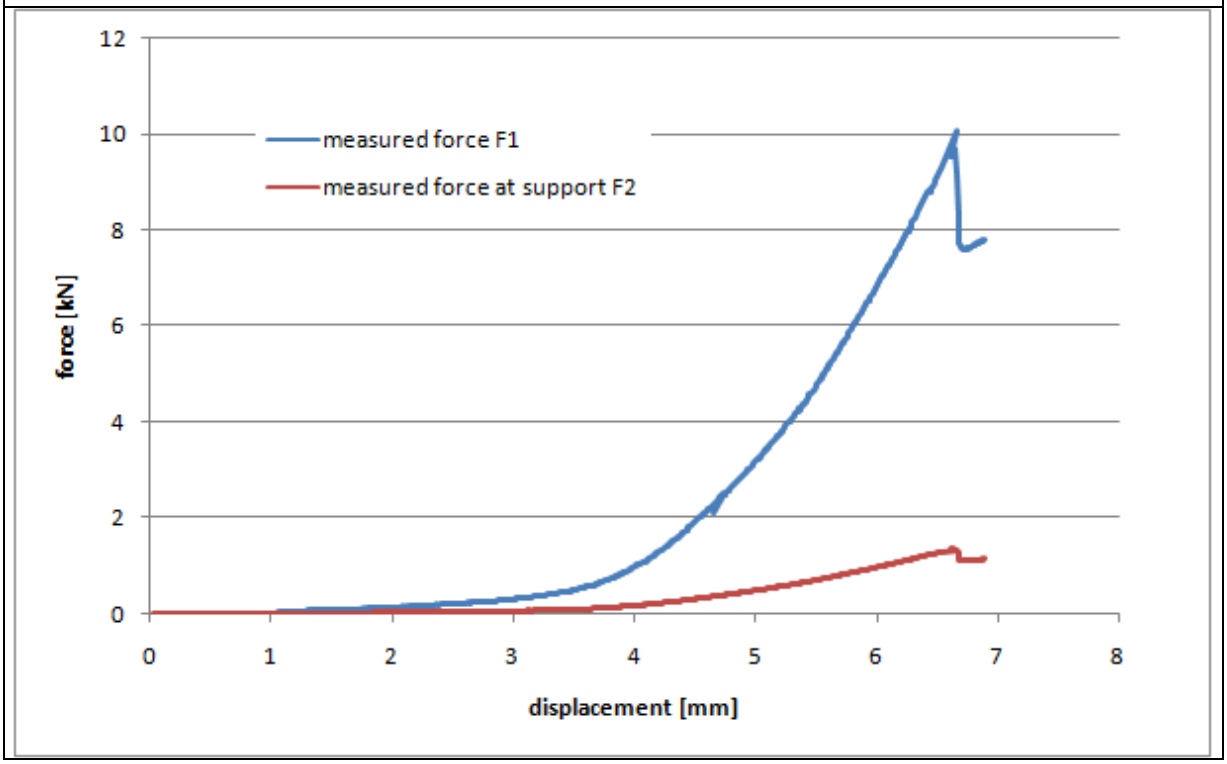


Failure of the stressed face

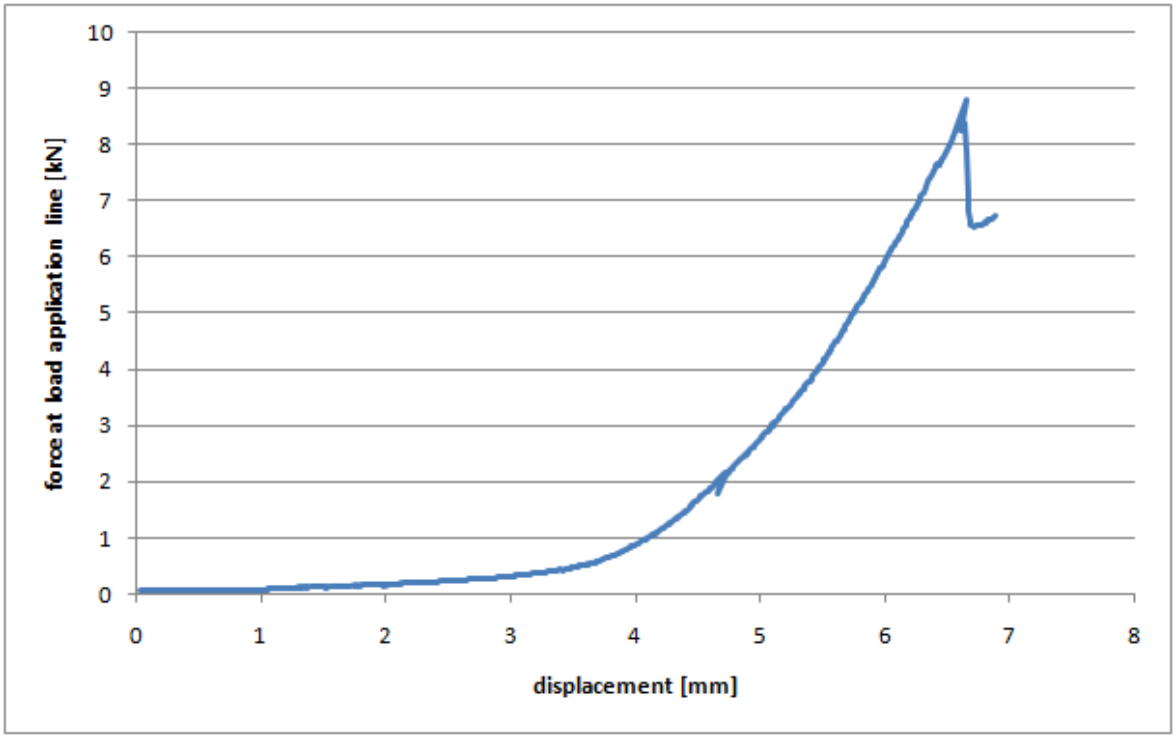
Test No.		**II-E-3**
type of test	test on corner details, introduction of load by contact	
load introduction	steel sheet	
type of panel	E	
faces	Steel 0,50mm	
core	Mineral wool 100 mm	
stressed face	top side of production	

Measured dimensions:		Dimensions of test set up	
width b	400 mm	a	100 mm
height h_1	303 mm	e	100 mm
thickness D	100 mm	f	400 mm
height of cutting h_2	99 mm	g	800 mm
thickness of cutting d_2	70 mm	α	0,401 °

ultimate load at line of load application		8,82 kN
ultimate stress of compressed face		46,4 N/mm^2
Failure mode	crippling of the compressed face	
Remarks		



Test No.	**II-E-3**

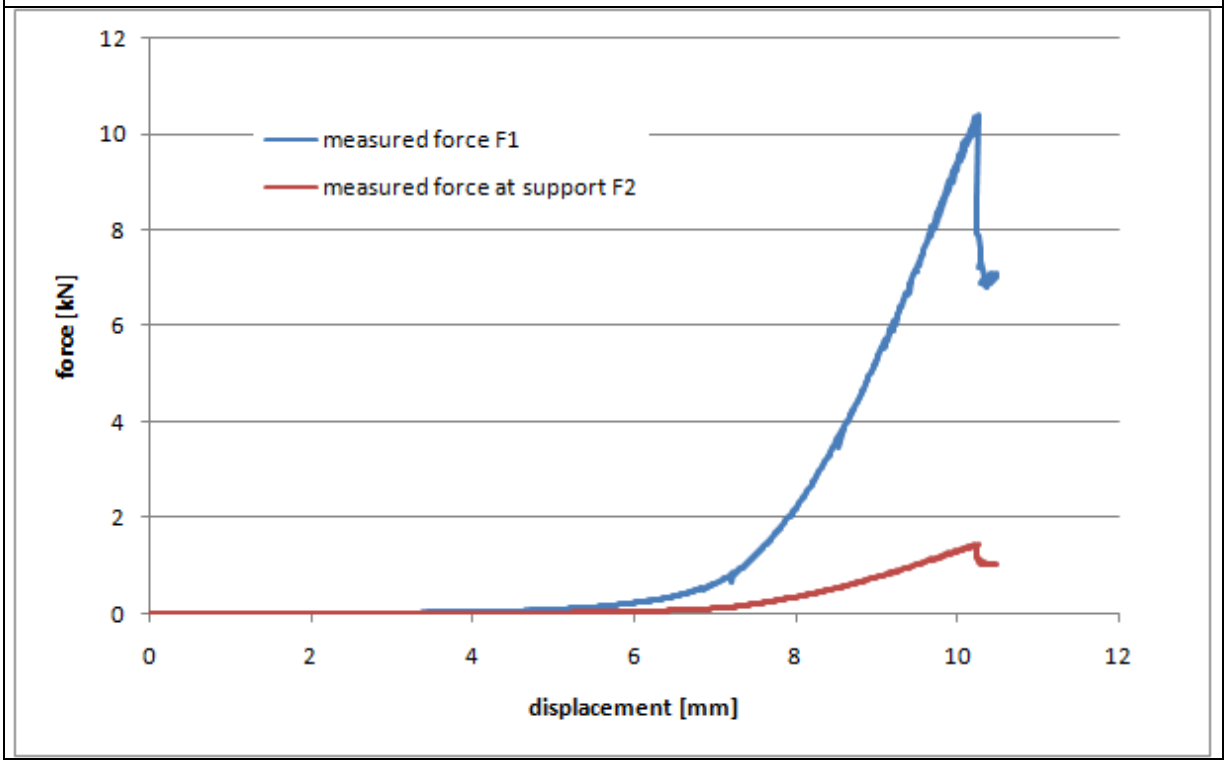


Failure of the stressed face

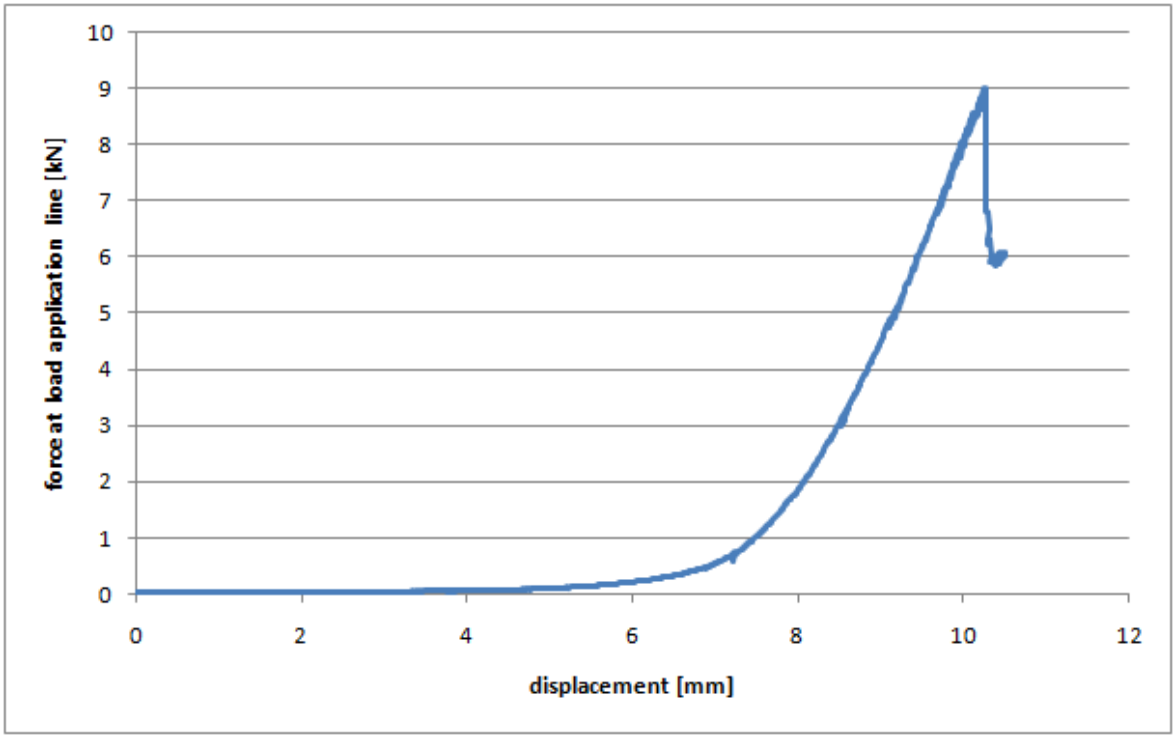
Test No.		**II-E-4**
type of test	test on corner details, introduction of load by contact	
load introduction	steel sheet	
type of panel	E	
faces	Steel 0,50mm	
core	Mineral wool 100 mm	
stressed face	top side of production	

Measured dimensions:		Dimensions of test set up	
width b	400 mm	a	100 mm
height h_1	302 mm	e	100 mm
thickness D	100 mm	f	400 mm
height of cutting h_2	99 mm	g	800 mm
thickness of cutting d_2	70 mm	α	0,344 °

ultimate load at line of load application		9,02 kN
ultimate stress of compressed face		47,5 N/mm^2
Failure mode	buckling of the compressed face	
Remarks		



Test No.	**II-E-4**

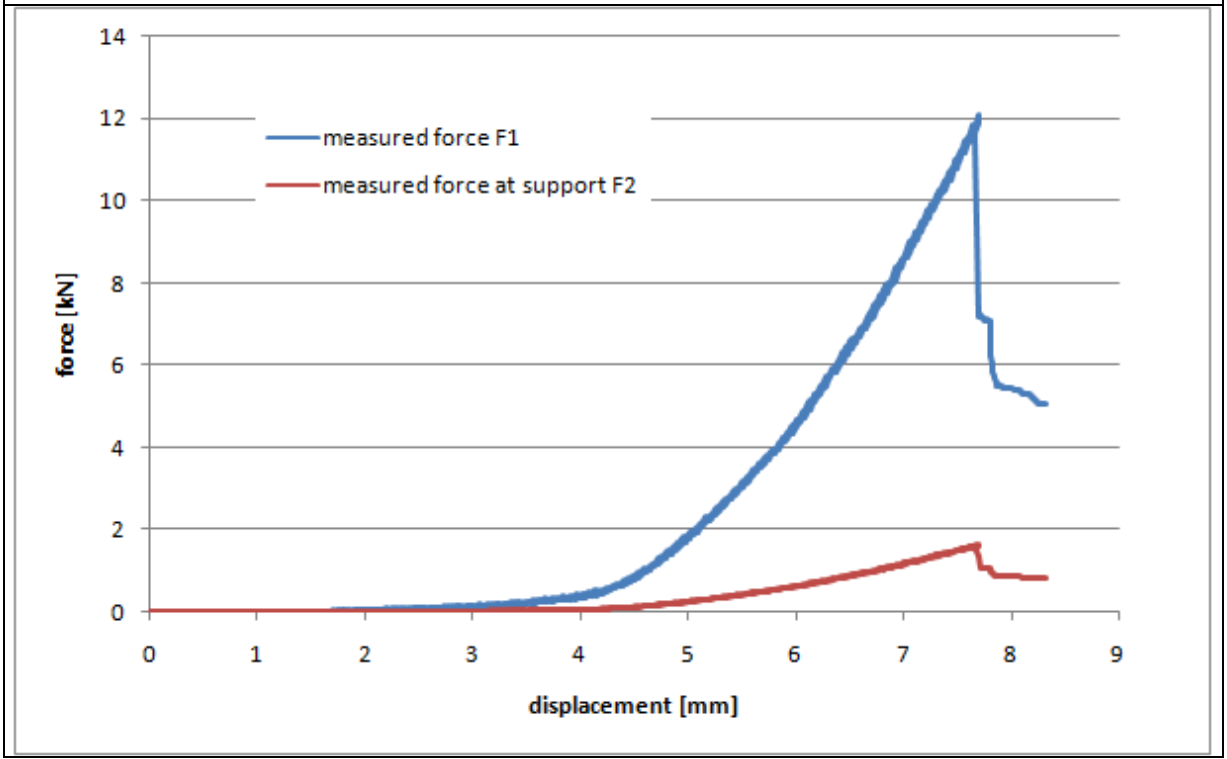


Failure of the stressed face

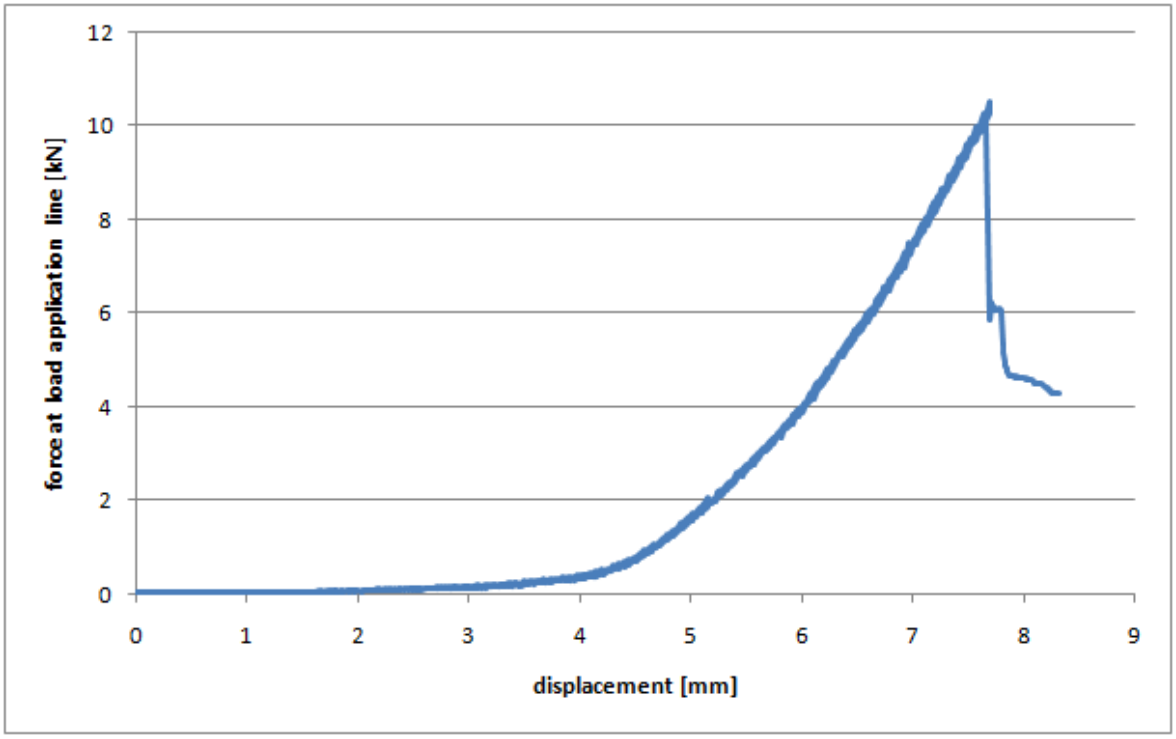
Test No.		**II-E-5**
type of test	test on corner details, introduction of load by contact	
load introduction	steel sheet	
type of panel	E	
faces	Steel 0,50mm	
core	Mineral wool 100 mm	
stressed face	top side of production	

Measured dimensions:			Dimensions of test set up		
width b	400	mm	a	100	mm
height h_1	301	mm	e	100	mm
thickness D	100	mm	f	400	mm
height of cutting h_2	100	mm	g	800	mm
thickness of cutting d_2	71	mm	α	1,089	°

ultimate load at line of load application	10,52	kN
ultimate stress of compressed face	55,4	N/mm^2
Failure mode	buckling of the compressed face	
Remarks		



Test No.	**II-E-5**



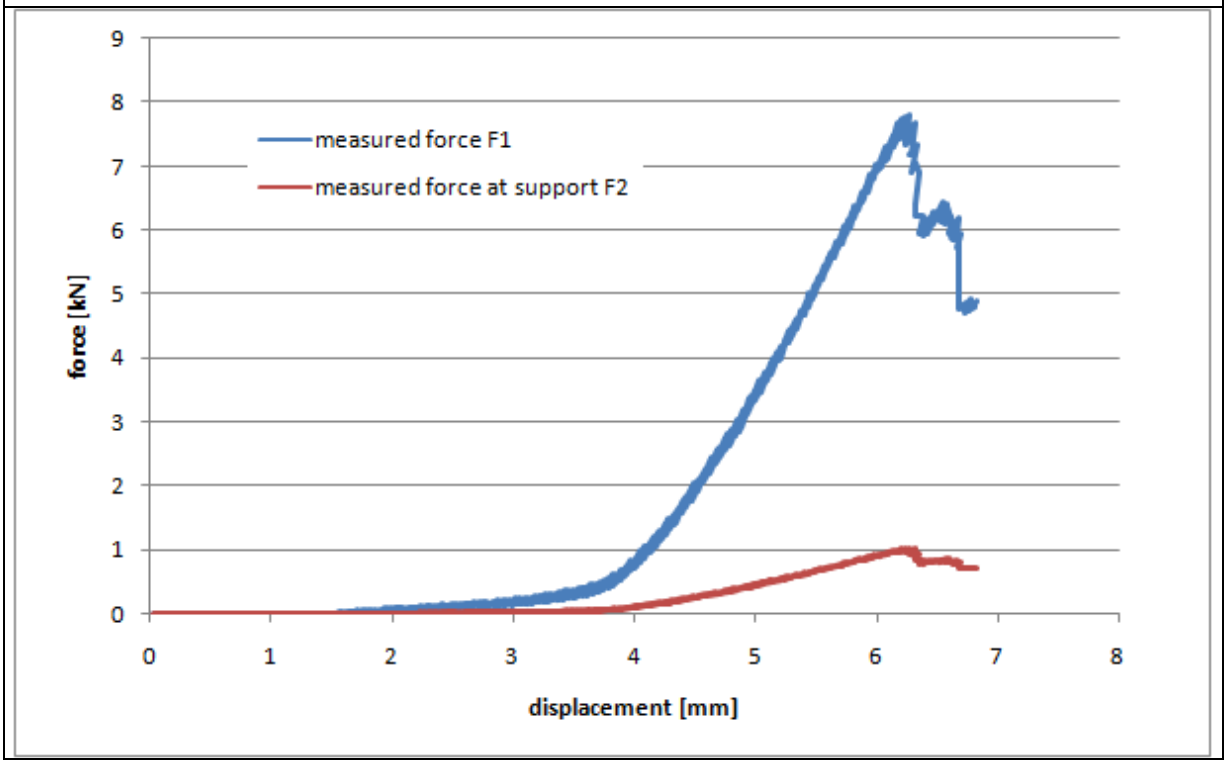
Failure of the stressed face

Compound between core and face

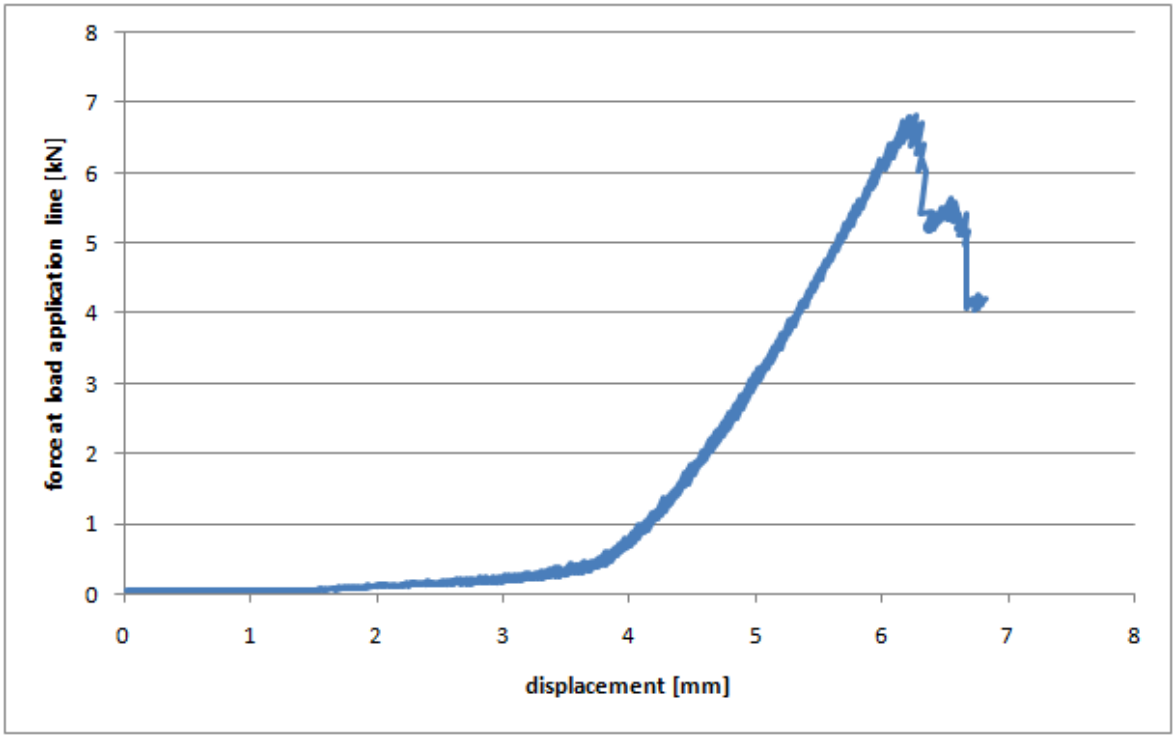
Test No.		**II-E-6**
type of test	test on corner details, introduction of load by contact	
load introduction	steel sheet	
type of panel	E	
faces	Steel 0,50mm	
core	Mineral wool 100 mm	
stressed face	top side of production	

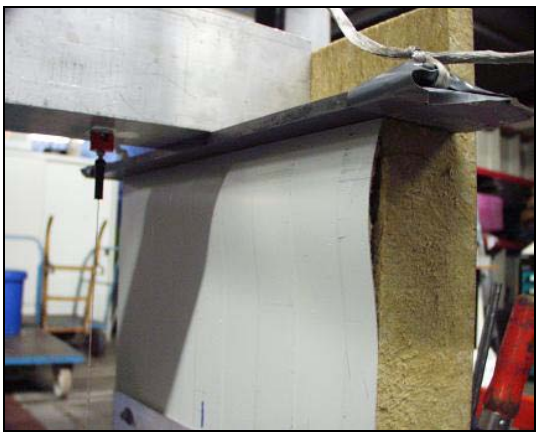
Measured dimensions:			Dimensions of test set up		
width b	400	mm	a	100	mm
height h_1	303	mm	e	100	mm
thickness D	100	mm	f	400	mm
height of cutting h_2	98	mm	g	800	mm
thickness of cutting d_2	71	mm	α	1,719	°

ultimate load at line of load application	6,82	kN
ultimate stress of compressed face	35,9	N/mm^2
Failure mode	buckling of the compressed face	
Remarks		



Test No.	**II-E-6**





Failure of the stressed face

Compound between core and face

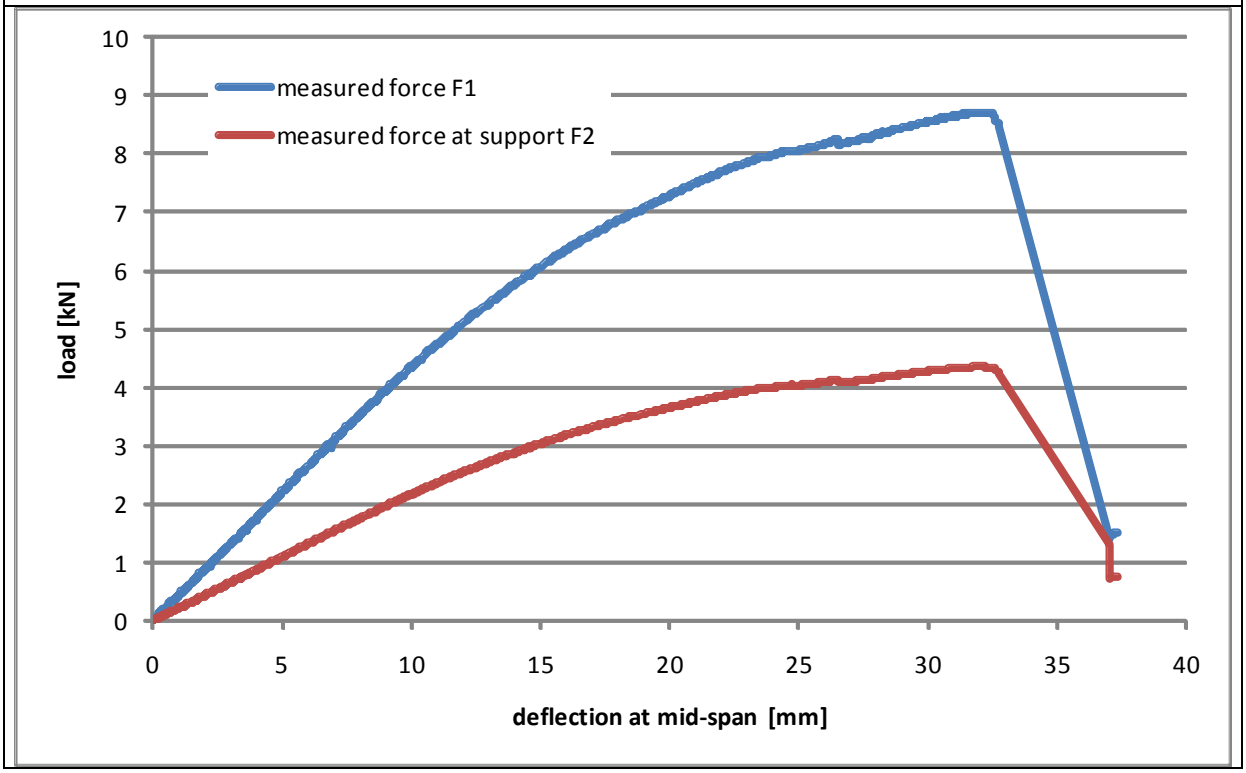
Test No.		**IIIa-A-2**
type of test	single span test with glued corner detail	
introduction of load	two line loads	
type of panel	A	
faces	0,50 mm steel	
core	100 mm PU	
stressed face	top side of production	

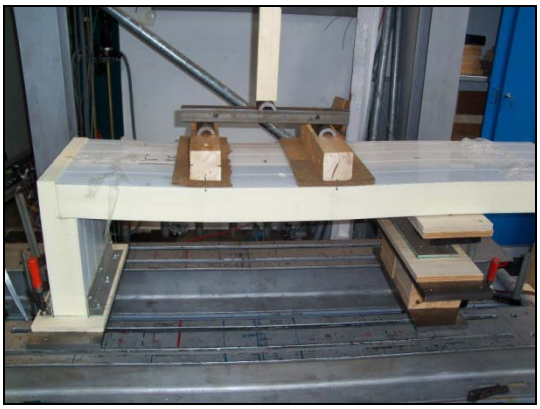
Measured dimensions of the wall panel:			Measured dimensions of the ceiling panel:		
width b	396	mm	length l	1499	mm
height h_1	302	mm	with b	379	mm
thickness D	97	mm	thickness D	102	mm
height of cutting h_2	101	mm			
thickness of cutting d_2	47	mm			

ultimate load F_1	8,72	kN
ultimate load at support F_2	4,36	kN

Failure mode: shear failure of the ceiling panel

Remarks



Test No.	**IIIa-A-2**
 test set-up	 shear failure of the ceiling panel
 shear failure of the ceiling panel	

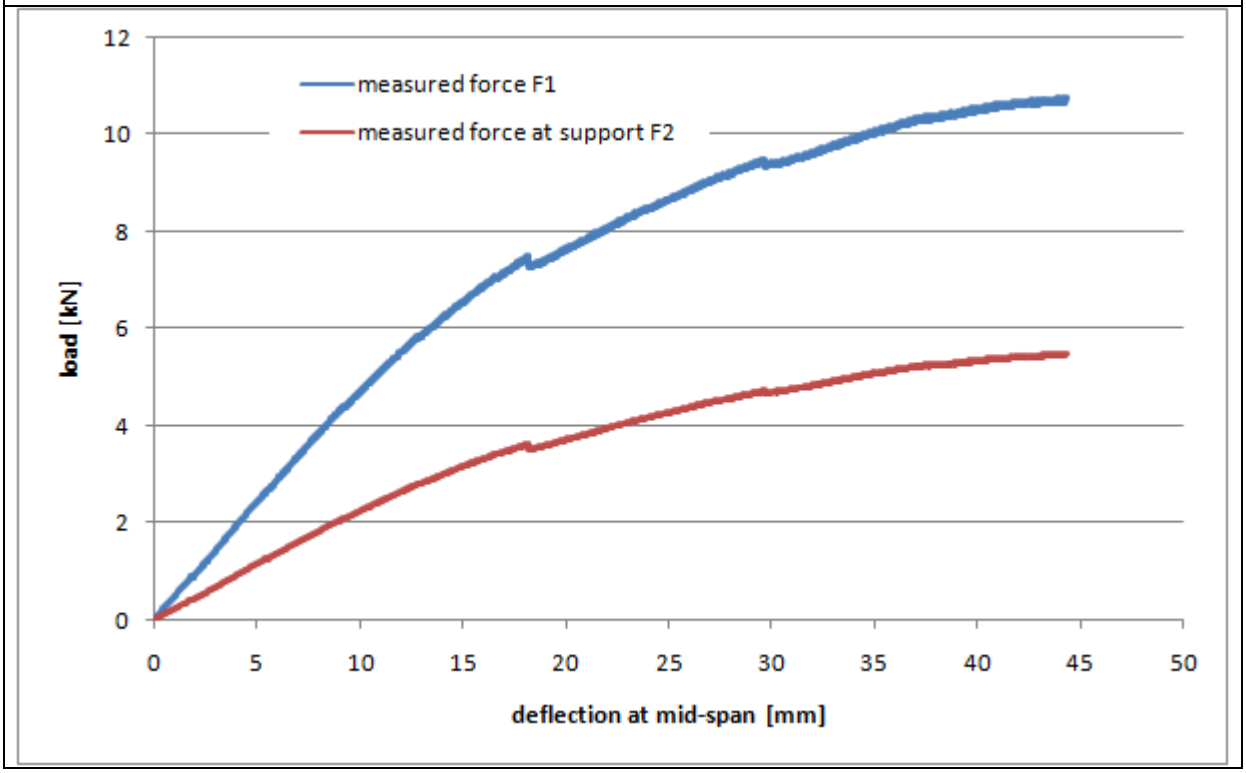
Test No.			**IIIa-A-3**
type of test	single span test with glued corner detail		
introduction of load	two line loads		
type of panel	A		
faces	0,50 mm steel		
core	100 mm PU		
stressed face	top side of production		

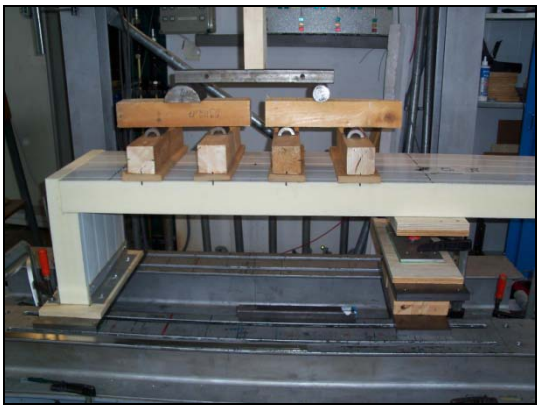
Measured dimensions of the wall panel:			Measured dimensions of the ceiling panel:		
width b	397	mm	length l	-	mm
height h_1	301	mm	with b	-	mm
thickness D	97	mm	thickness D	-	mm
height of cutting h_2	102	mm			
thickness of cutting d_2	50	mm			

ultimate load F_1	10,791	kN
ultimate load at support F_2	5,50	kN

Failure mode: failure of glued corner detail

Remarks



Test No.	**IIIa-A-3**
	
test set-up	failure of glued corner detail

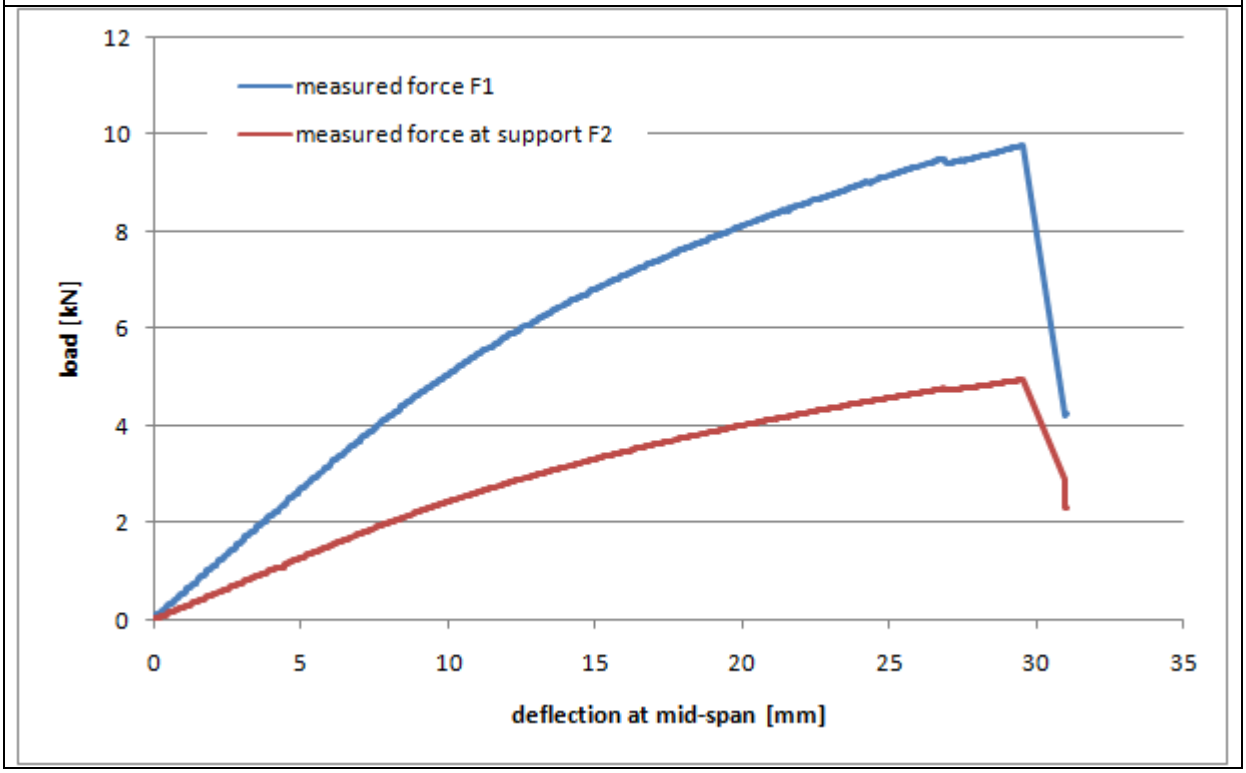
Test No.			**IIIa-A-4**
type of test	single span test with glued corner detail		
introduction of load	two line loads		
type of panel	A		
faces	0,50 mm steel		
core	100 mm PU		
stressed face	top side of production		

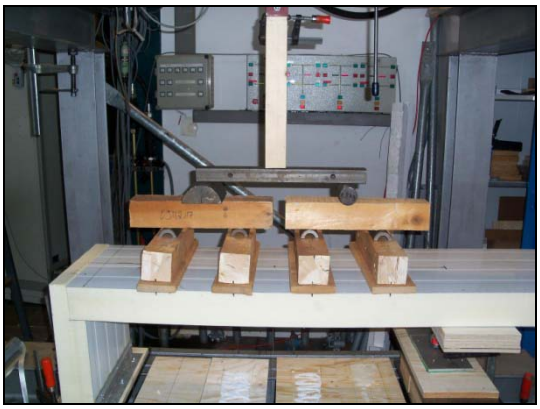
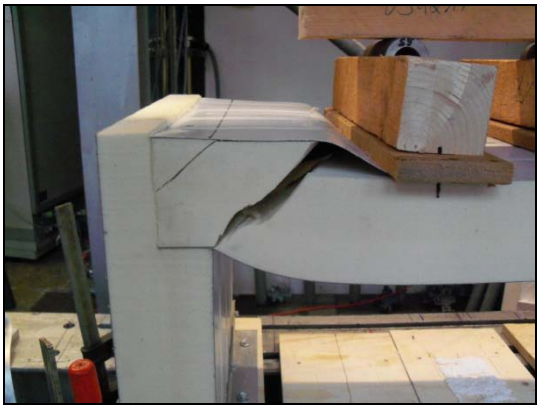
Measured dimensions of the wall panel:			Measured dimensions of the ceiling panel:		
width b	395	mm	length l	-	mm
height h_1	301	mm	with b	-	mm
thickness D	96	mm	thickness D	-	mm
height of cutting h_2	101	mm			
thickness of cutting d_2	48	mm			

ultimate load F_1	9,77	kN
ultimate load at support F_2	4,96	kN

Failure mode: shear failure of the ceiling panel

Remarks



Test No.	**IIIa-A-4**
	
test set-up	corner detail during the test
	
shear failure of the ceiling panel	

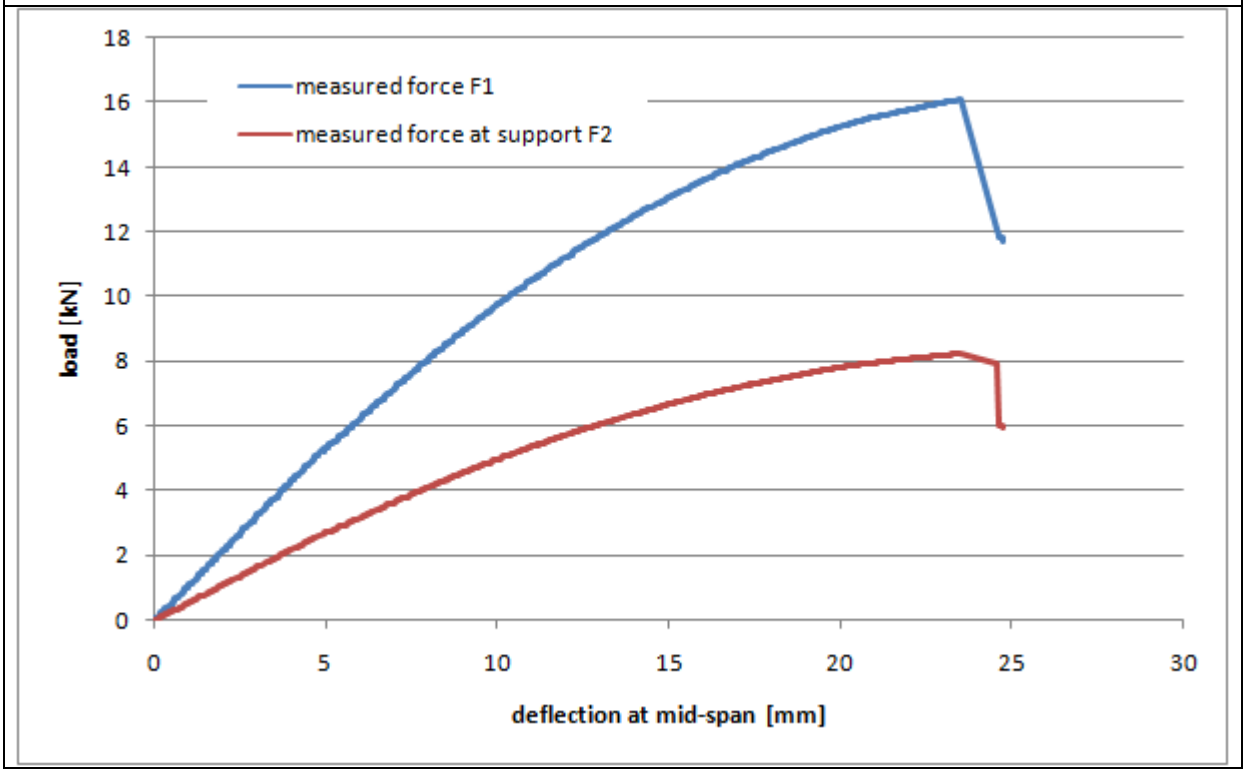
Test No.			**IIIa-B-1**
type of test	single span test with glued corner detail		
introduction of load	two line loads		
type of panel	B		
faces	0,75 mm steel		
core	100 mm PU		
stressed face	top side of production		

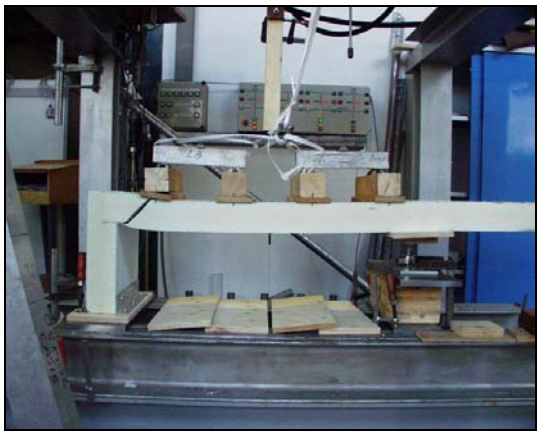
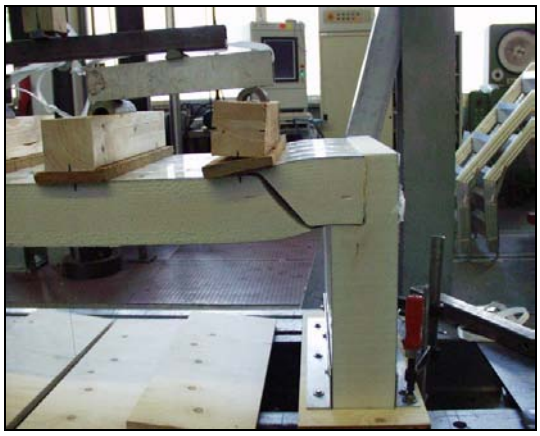
Measured dimensions of the wall panel:			Measured dimensions of the ceiling panel:		
width b	400	mm	length l	1495	mm
height h_1	297	mm	with b	400	mm
thickness D	99	mm	thickness D	99	mm
height of cutting h_2	100	mm			
thickness of cutting d_2	50	mm			

ultimate load F_1	16,07	kN
ultimate load at support F_2	8,22	kN

Failure mode: shear failure of the ceiling panel

Remarks



Test No.	**IIIa-B-1**
	
failure of the ceiling panel	

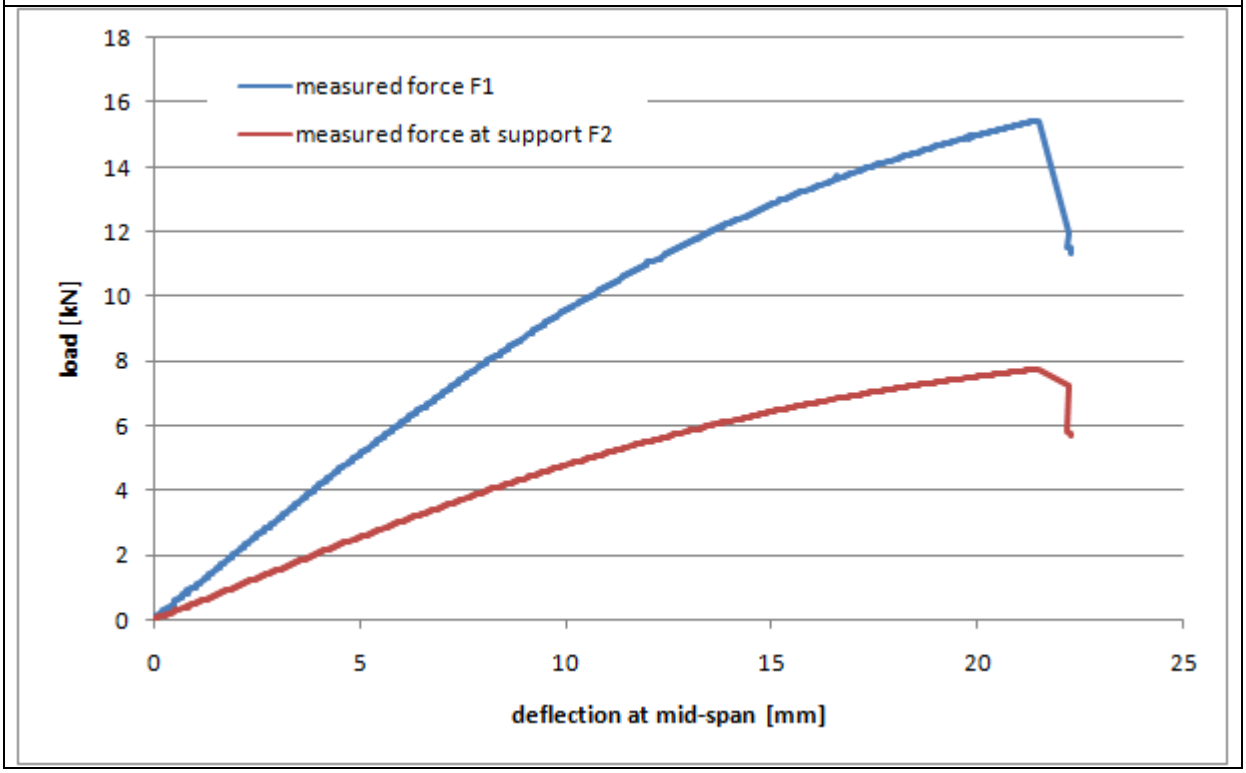
Test No.		**IIIa-B-3**
type of test	single span test with glued corner detail	
introduction of load	two line loads	
type of panel	B	
faces	0,75 mm steel	
core	100 mm PU	
stressed face	top side of production	

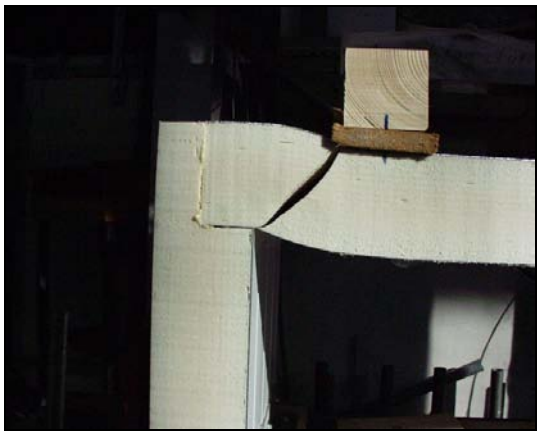
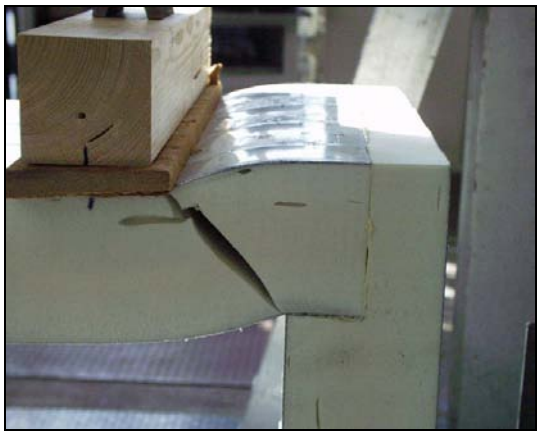
Measured dimensions of the wall panel:			Measured dimensions of the ceiling panel:		
width b	400	mm	length l	1497	mm
height h_1	304	mm	with b	400	mm
thickness D	99	mm	thickness D	101	mm
height of cutting h_2	101	mm			
thickness of cutting d_2	52	mm			

ultimate load F_1	15,44	kN
ultimate load at support F_2	7,72	kN

Failure mode: shear failure of the ceiling panel

Remarks



Test No.	**IIIa-B-3**
	
shear failure of the ceiling panel	

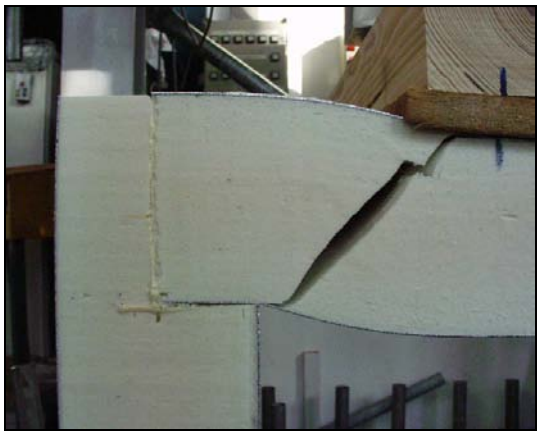
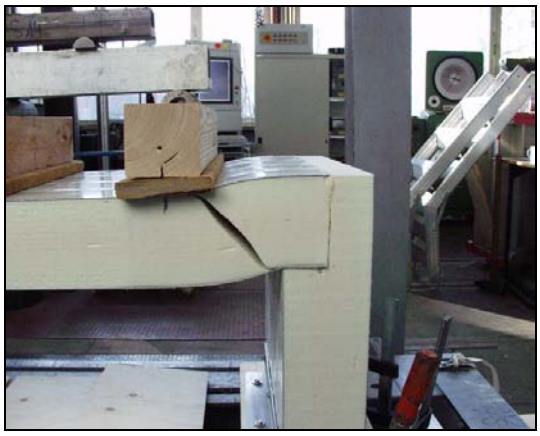
Test No.			**IIIa-B-4**
type of test	single span test with glued corner detail		
introduction of load	two line loads		
type of panel	B		
faces	0,75 mm steel		
core	100 mm PU		
stressed face	top side of production		

Measured dimensions of the wall panel:			Measured dimensions of the ceiling panel:		
width b	400	mm	length l	1505	mm
height h_1	300	mm	with b	399	mm
thickness D	99	mm	thickness D	101	mm
height of cutting h_2	100	mm			
thickness of cutting d_2	50	mm			

ultimate load F_1	14,09	kN
ultimate load at support F_2	7,17	kN

Failure mode: shear failure of the ceiling panel

Remarks

Test No.	**IIIa-B-4**
	
failure oft he ceiling panel	

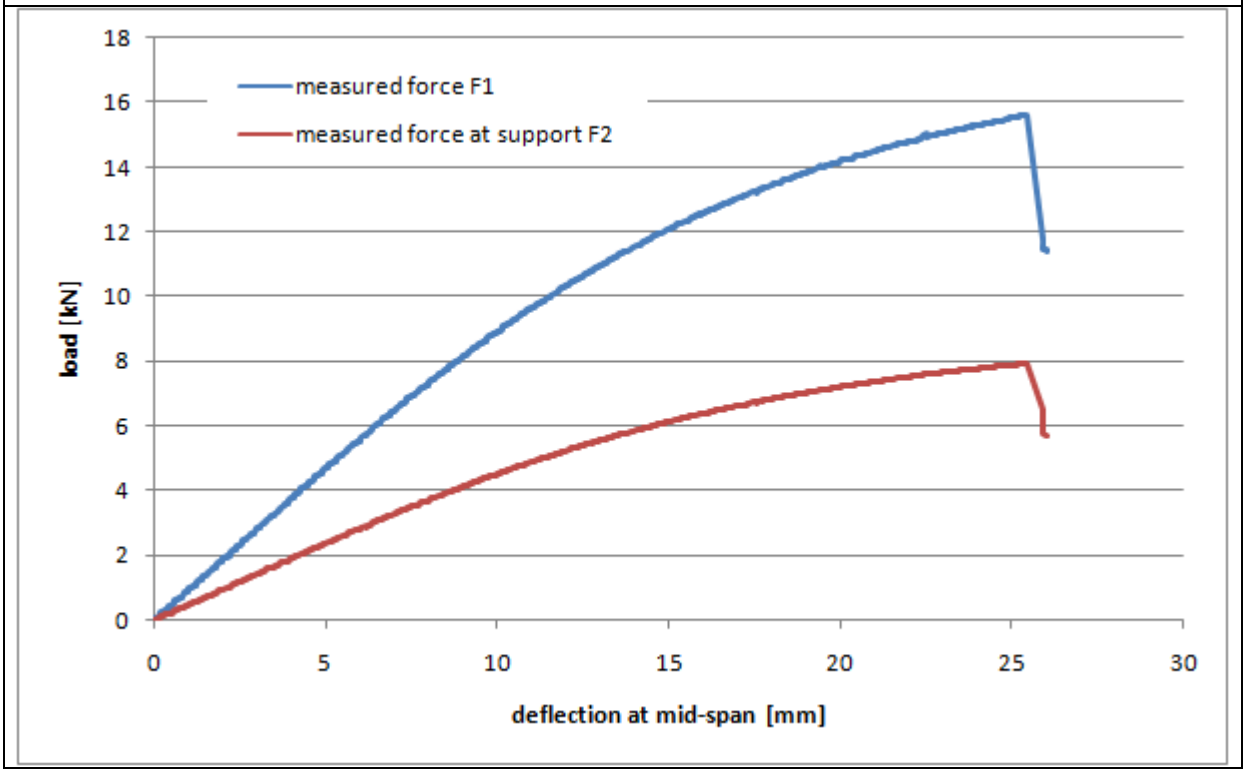
Test No.			**IIIa-B-5**
type of test	single span test with glued corner detail		
introduction of load	two line loads		
type of panel	B		
faces	0,75 mm steel		
core	100 mm PU		
stressed face	top side of production		

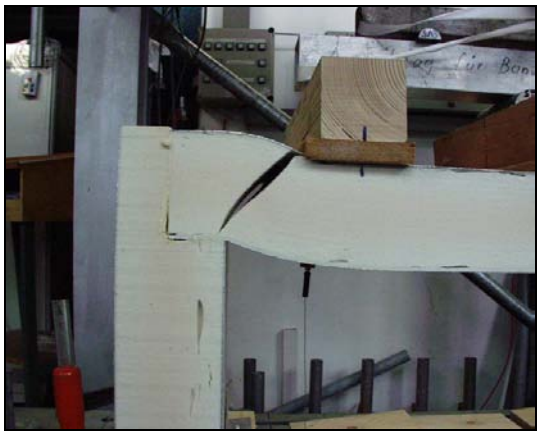
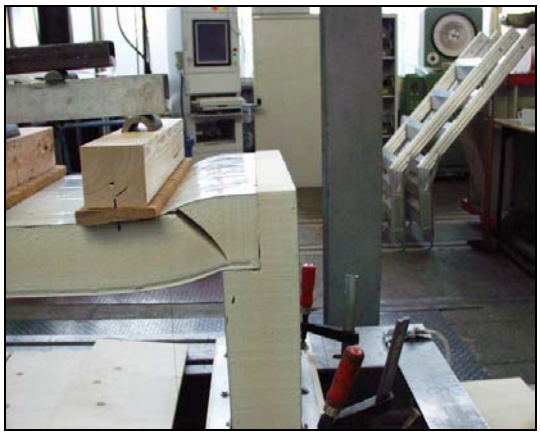
Measured dimensions of the wall panel:			Measured dimensions of the ceiling panel:		
width b	400	mm	length l	1504	mm
height h_1	300	mm	with b	399	mm
thickness D	99	mm	thickness D	98	mm
height of cutting h_2	100	mm			
thickness of cutting d_2	49	mm			

ultimate load F_1	15,59	kN
ultimate load at support F_2	7,94	kN

Failure mode: shear failure of the ceiling panel

Remarks



Test No.	**IIIa-B-5**
	
shear failure of the ceiling panel	

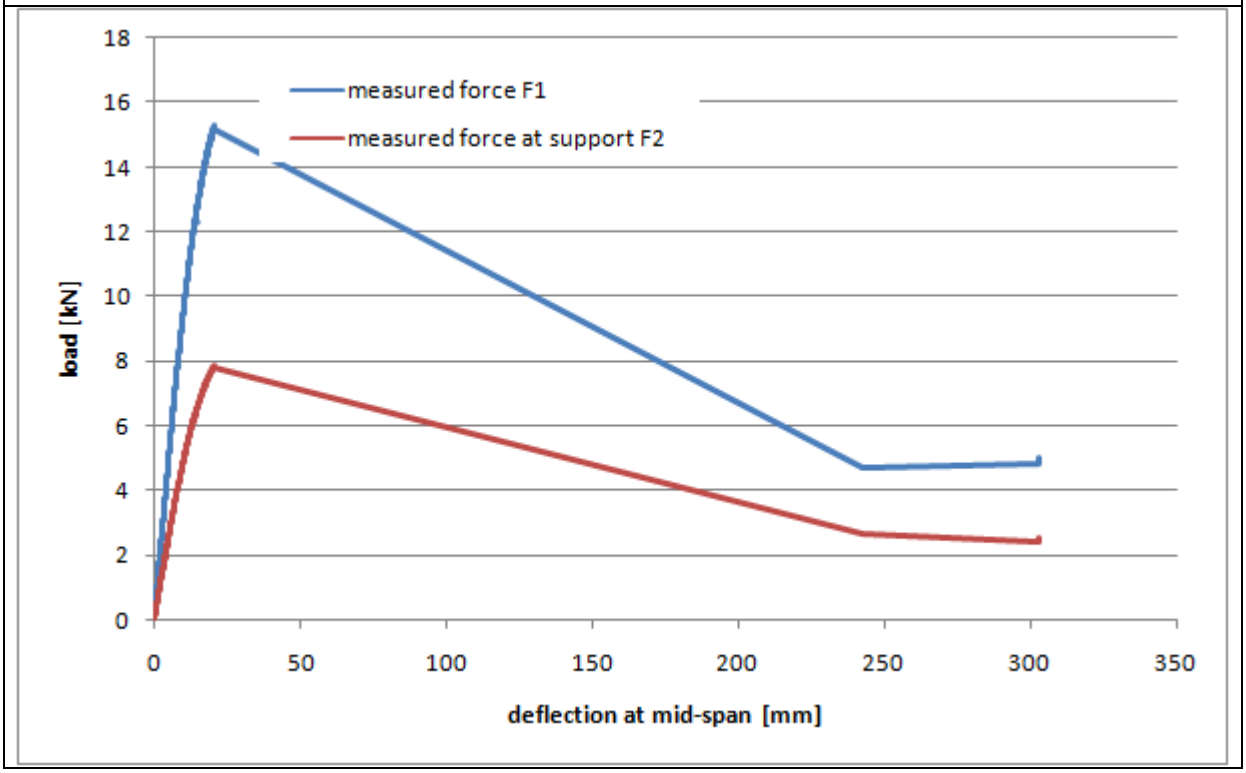
Test No.		**IIIa-B-6**
type of test	single span test with glued corner detail	
introduction of load	two line loads	
type of panel	B	
faces	0,75 mm steel	
core	100 mm PU	
stressed face	top side of production	

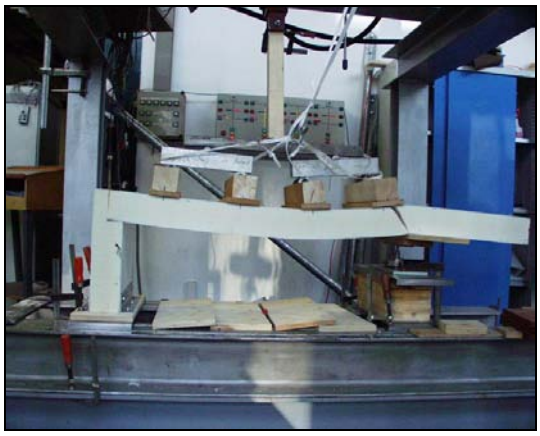
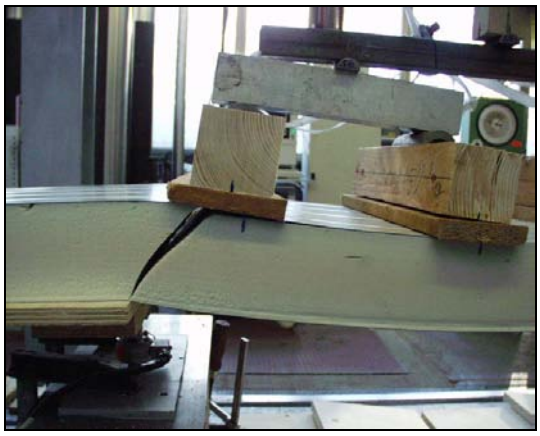
Measured dimensions of the wall panel:			Measured dimensions of the ceiling panel:		
width b	400	mm	length l	1489	mm
height h_1	300	mm	with b	400	mm
thickness D	99	mm	thickness D	99	mm
height of cutting h_2	100	mm			
thickness of cutting d_2	50	mm			

ultimate load F_1	15,29	kN
ultimate load at support F_2	7,88	kN

Failure mode: shear failure of the ceiling panel

Remarks



Test No.	**IIIa-B-6**
	
shear failure of the ceiling panel	

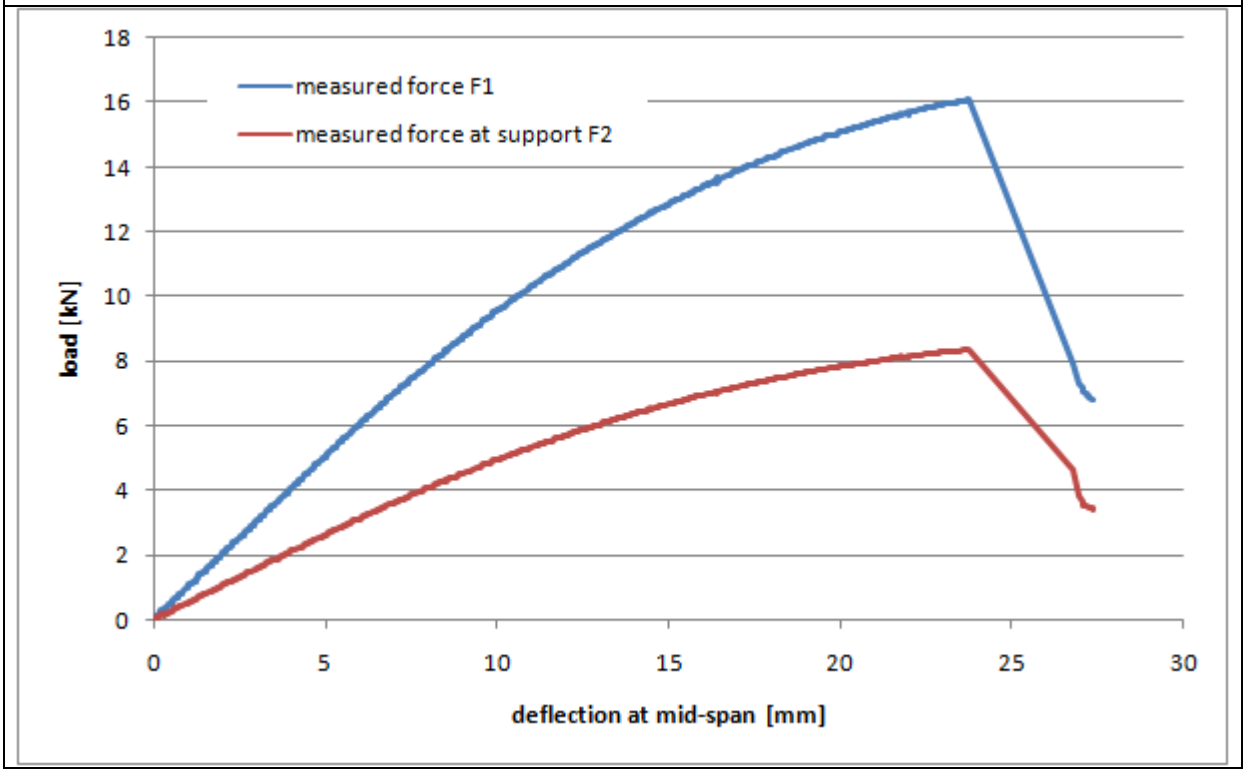
Test No.		**IIIa-B-7**
type of test	single span test with glued corner detail	
introduction of load	two line loads	
type of panel	B	
faces	0,75 mm steel	
core	100 mm PU	
stressed face	top side of production	

Measured dimensions of the wall panel:			Measured dimensions of the ceiling panel:		
width b	400	mm	length l	1497	mm
height h_1	293	mm	with b	399	mm
thickness D	100	mm	thickness D	101	mm
height of cutting h_2	101	mm			
thickness of cutting d_2	50	mm			

ultimate load F_1	16,11	kN
ultimate load at support F_2	8,39	kN

Failure mode shear failure of the ceiling panel

Remarks



Test No.	**IIIa-B-7**
	
shear failure of the ceiling panel	

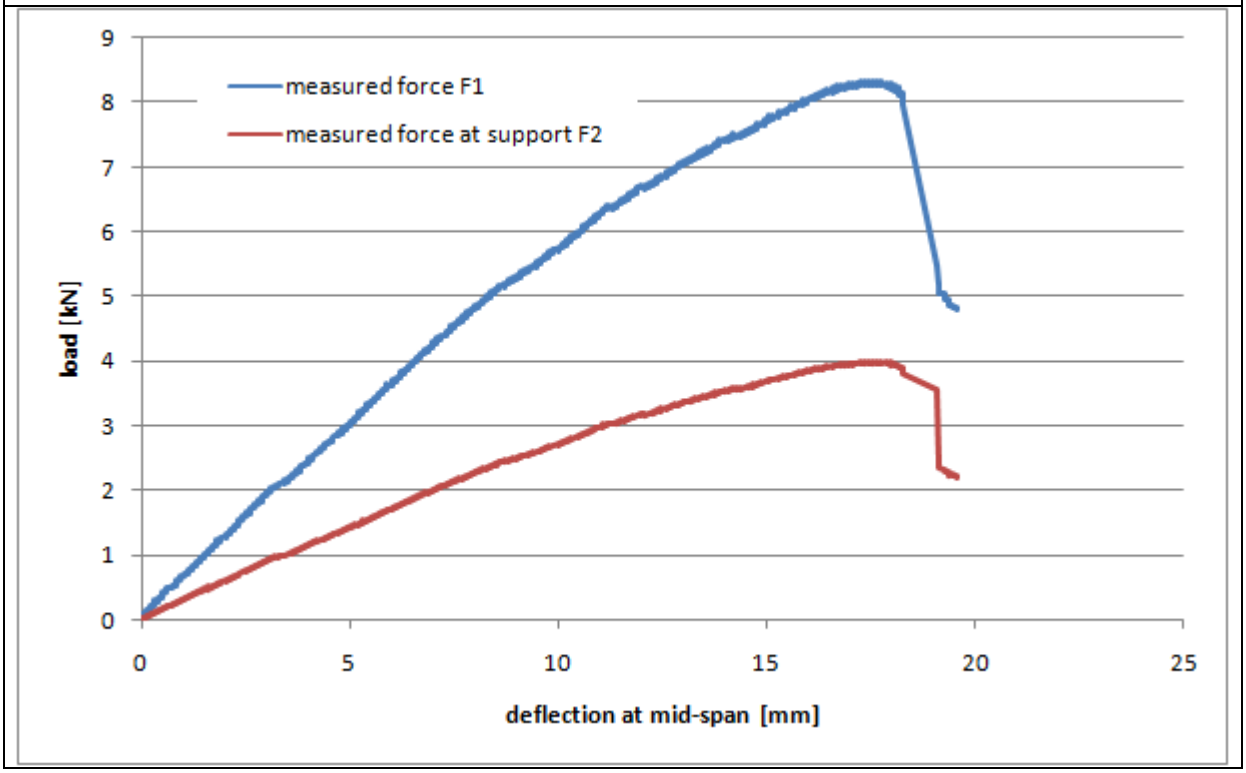
Test No.		**IIIa-C-2**
type of test	single span test with glued corner detail	
introduction of load	two line loads	
type of panel	C	
faces	0,60 mm steel	
core	100 mm EPS	
stressed face	top side of production	

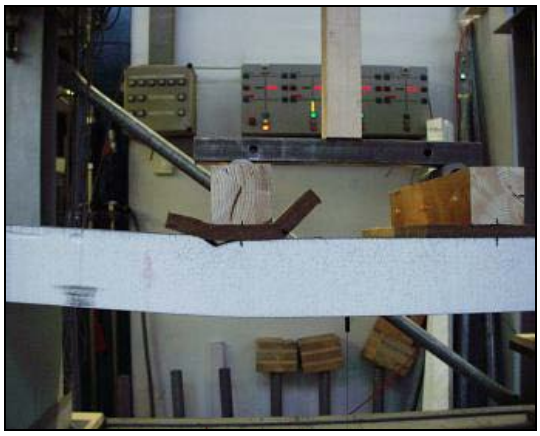
Measured dimensions of the wall panel:			Measured dimensions of the ceiling panel:		
width b	299	mm	length l	1498	mm
height h_1	281	mm	with b	399	mm
thickness D	99	mm	thickness D	99	mm
height of cutting h_2	101	mm			
thickness of cutting d_2	69	mm			

ultimate load F_1	8,34	kN
ultimate load at support F_2	3,99	kN

Failure mode: failure of the ceiling panel at load introduction

Remarks



Test No.	**IIIa-C-2**
	
failure at load introduction	

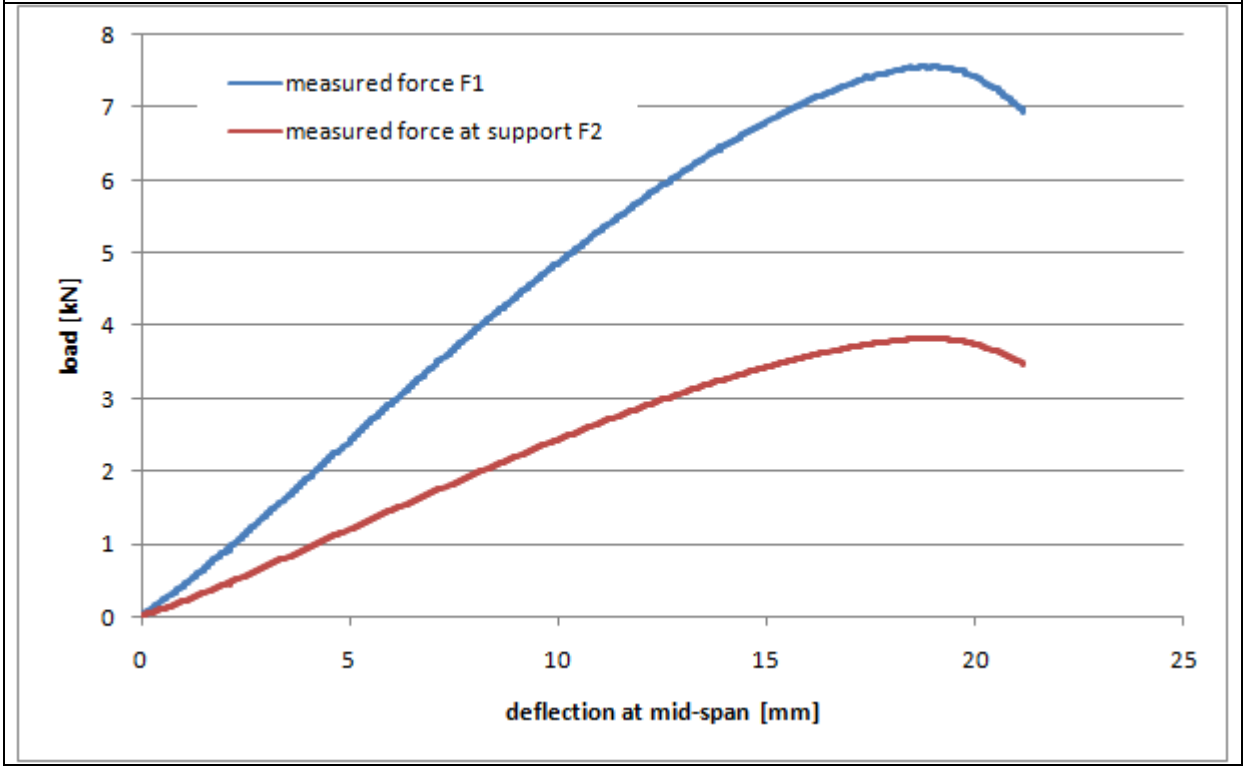
Test No.		**IIIa-D-2**
type of test	single span test with glued corner detail	
introduction of load	two line loads	
type of panel	D	
faces	1,8mm GFRP	
core	100 mm EPS	
stressed face	top side of production	

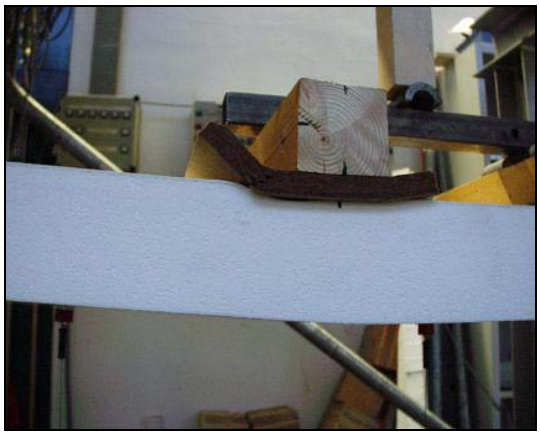
Measured dimensions of the wall panel:			Measured dimensions of the ceiling panel:		
width b	298	mm	length l	1499	mm
height h_1	299	mm	with b	379	mm
thickness D	102	mm	thickness D	102	mm
height of cutting h_2	99	mm			
thickness of cutting d_2	70	mm			

ultimate load F_1	7,56	kN
ultimate load at support F_2	3,83	kN

Failure mode: failure of the ceiling panel at load introduction

Remarks



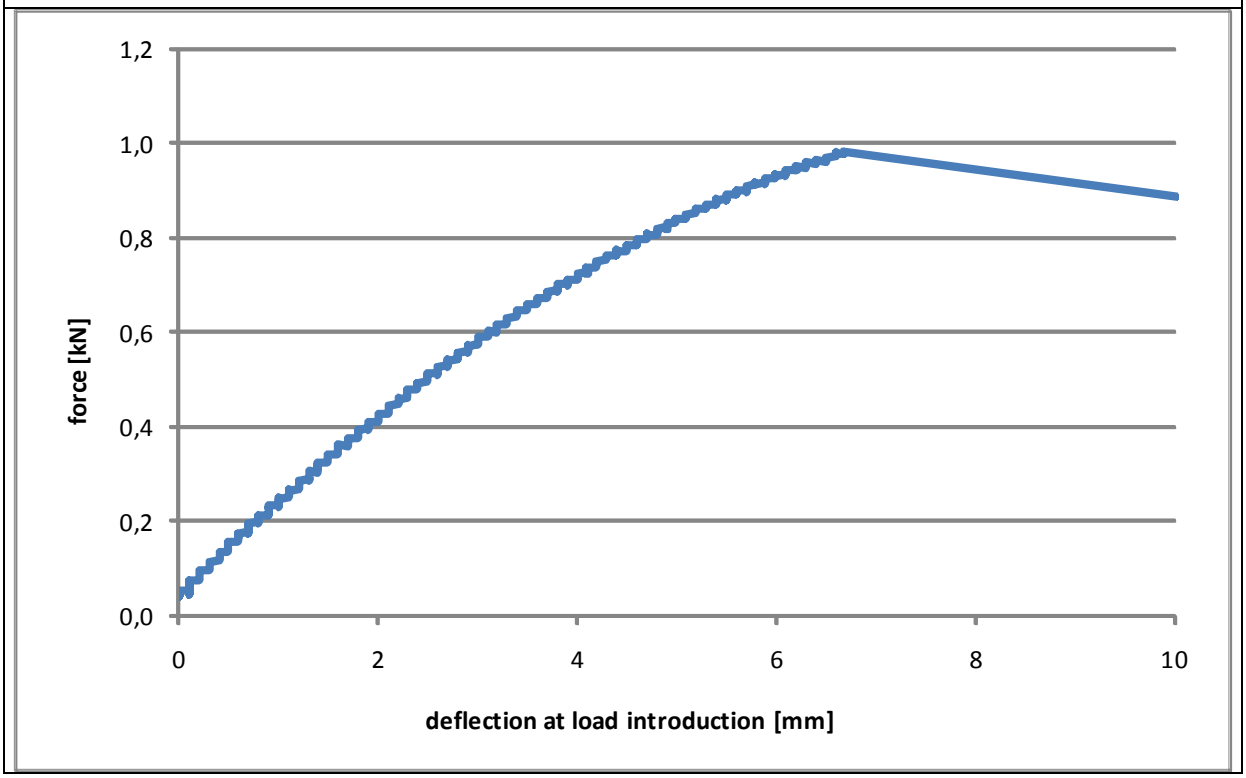
Test No.	**IIIa-D-2**
	
failure at load introduction	

Test No.			**IIIb-A-1**
type of test	cantilever test with glued corner detail		
type of panel	A		
faces	0,50 mm steel		
core	100 mm PU		
stressed face	top side of production		
distance between load and compressed face of the wall panel	100 mm		

Measured dimensions of the wall panel:			Measured dimensions of the ceiling panel:		
width b	397	mm	length l	752	mm
height h_1	304	mm	width b	400	mm
thickness D	95	mm	thickness D	96	mm
height of cutting h_2	101	mm			
thickness of cutting d_2	49	mm			

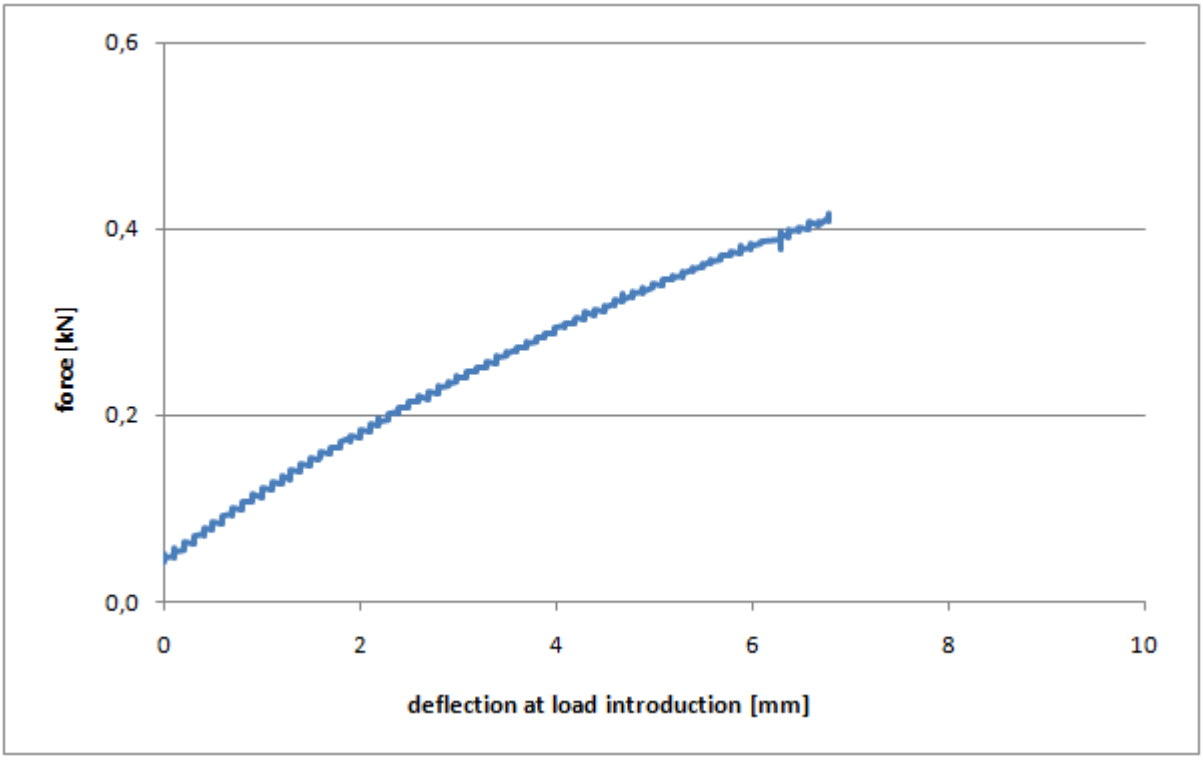
ultimate load	0,986	kN
ultimate moment (inkl. self weight of ceiling panel)	0,11	kNm

Failure mode	failure of glue
Remarks	



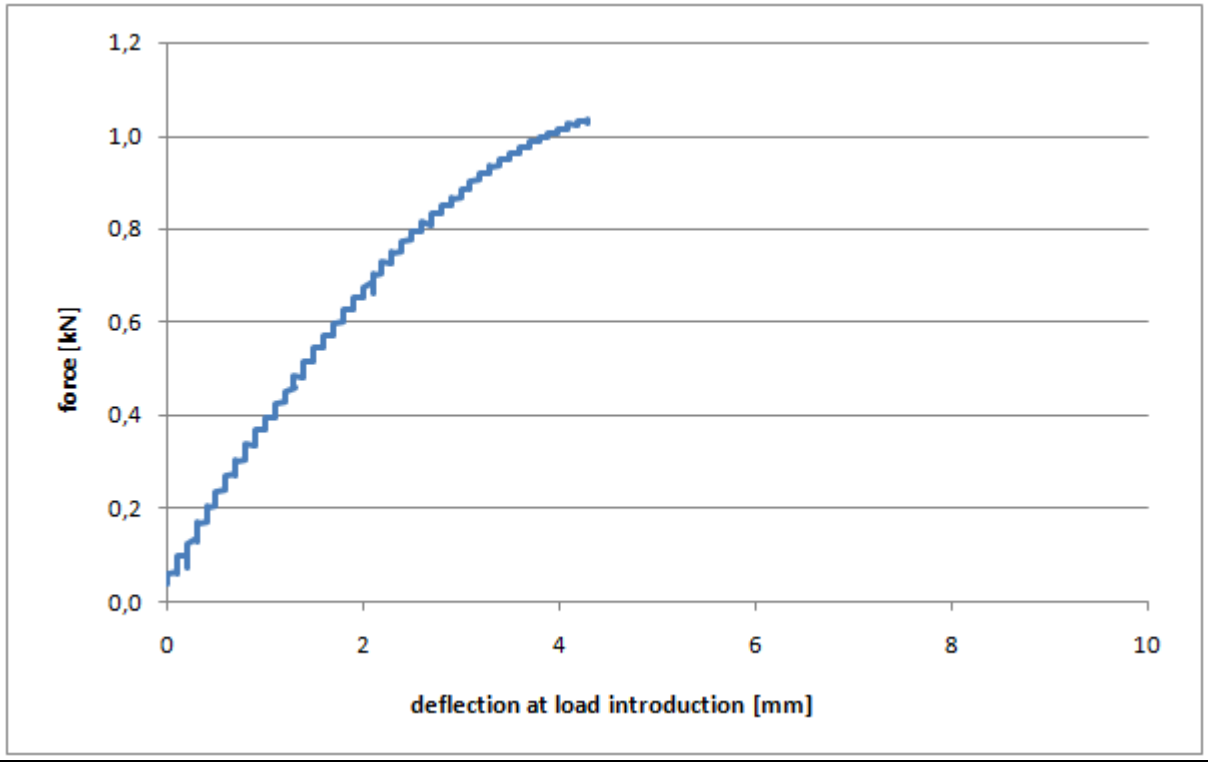
Test No.	**IIIb-A-1**
	
failure of glue	

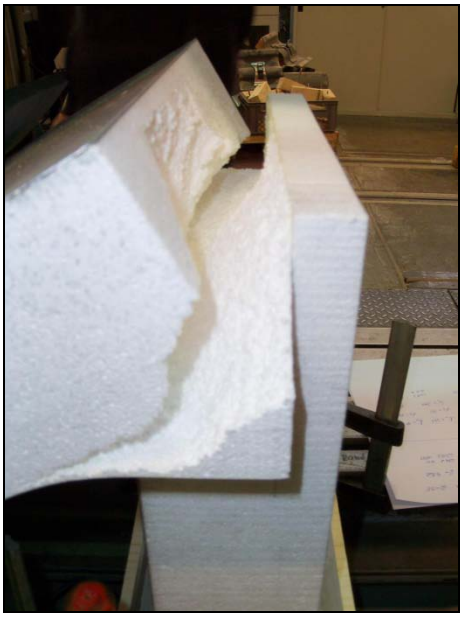
Test No.			**IIIb-A-2**
type of test	cantilever test with glued corner detail		
type of panel	A		
faces	0,50 mm steel		
core	100 mm PU		
stressed face	top side of production		
distance between load and compressed face of the wall panel	200 mm		
Measured dimensions of the wall panel:		Measured dimensions of the ceiling panel:	
width b	396 mm	length l	1496 mm
height h_1	297 mm	width b	400 mm
thickness D	97 mm	thickness D	96 mm
height of cutting h_2	102 mm		
thickness of cutting d_2	49 mm		
ultimate load	0,416 kN		
ultimate moment	0,13 kNm		
Failure mode	failure of glue		
Remarks			



Test No.	**IIIb-A-2**
 failure of glue	

Test No.			**IIIb-C-2**
type of test	cantilever test with glued corner detail		
type of panel	C		
faces	0,60 mm steel		
core	100 mm EPS		
stressed face	top side of production		
distance between load and compressed face of the wall panel	100 mm		
Measured dimensions of the wall panel:		Measured dimensions of the ceiling panel:	
width b	299 mm	length l	752 mm
height h_1	295 mm	width b	399 mm
thickness D	99 mm	thickness D	100 mm
height of cutting h_2	85 mm		
thickness of cutting d_2	70 mm		
ultimate load	1,035 kN		
ultimate moment	0,12 kNm		
Failure mode	failure of core material and glue		
Remarks			



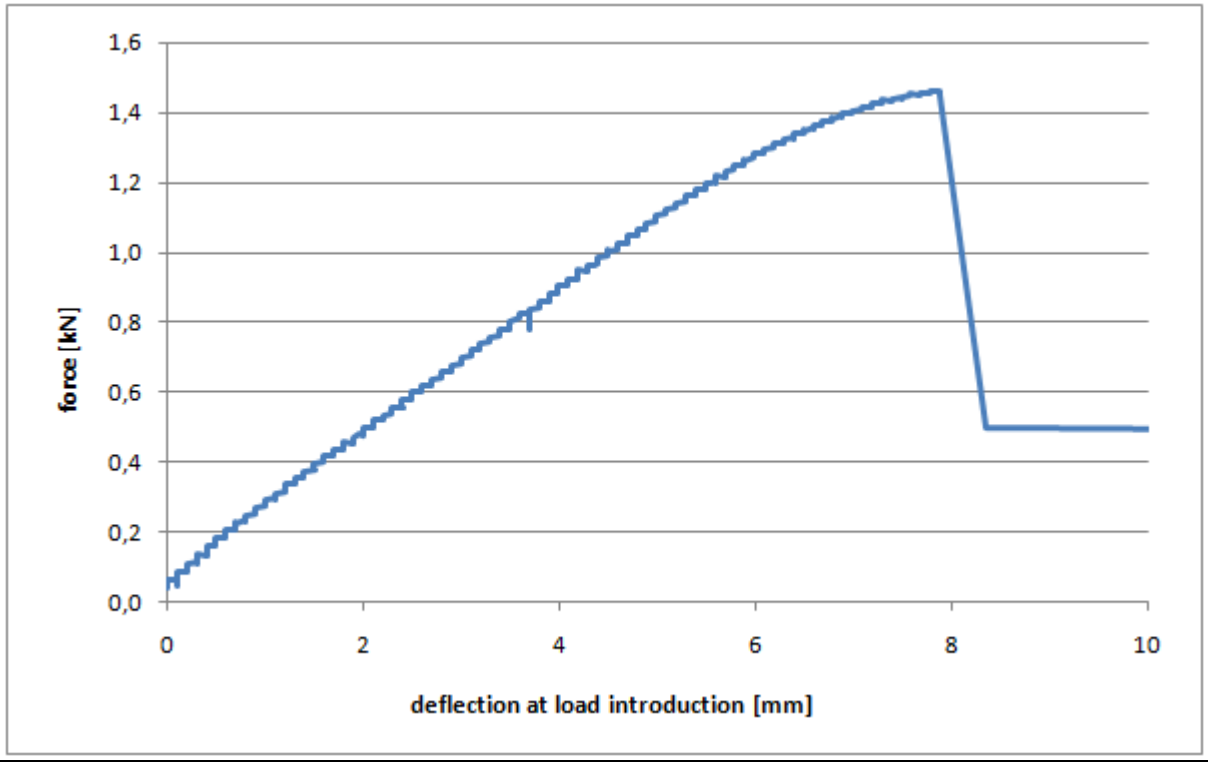
Test No.	**IIIb-C-2**
	
failure of core material and glue	

Test No.			**IIIb-C-3**
type of test	cantilever test with glued corner detail		
type of panel	C		
faces	0,60 mm steel		
core	100 mm EPS		
stressed face	top side of production		
distance between load and compressed face of the wall panel	100 mm		

Measured dimensions of the wall panel:			Measured dimensions of the ceiling panel:		
width b	299	mm	length l	1498	mm
height h_1	281	mm	width b	399	mm
thickness D	99	mm	thickness D	100	mm
height of cutting h_2	101	mm			
thickness of cutting d_2	69	mm			

ultimate load	1,459	kN
ultimate moment	0,20	kNm

Failure mode	failure of core material
Remarks	



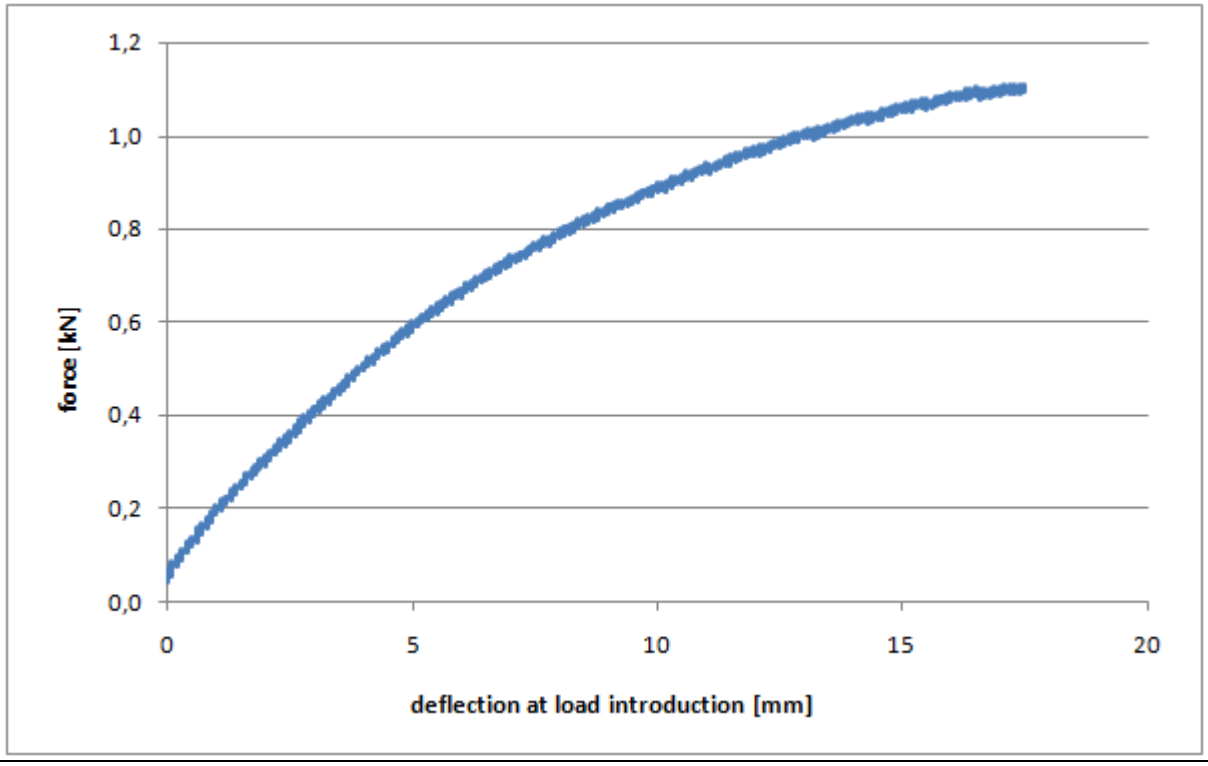
Test No.	**IIIb-C-3**
	
failure of core material	

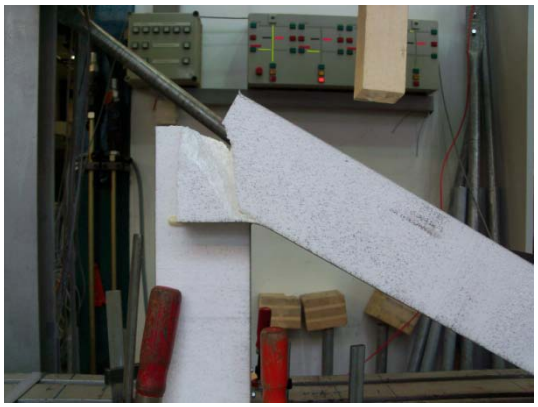
Test No.			**IIIb-C-4**
type of test	cantilever test with glued corner detail		
type of panel	C		
faces	0,60 mm steel		
core	100 mm EPS		
stressed face	top side of production		
distance between load and compressed face of the wall panel	200 mm		

Measured dimensions of the wall panel:			Measured dimensions of the ceiling panel:		
width b	299	mm	length l	747	mm
height h_1	282	mm	width b	398	mm
thickness D	100	mm	thickness D	99	mm
height of cutting h_2	99	mm			
thickness of cutting d_2	71	mm			

ultimate load	1,108	kN
ultimate moment	0,23	kNm

Failure mode	failure of core material
Remarks	



Test No.	**IIIb-C-4**
 test set-up	 failure of core material
 failure of core material	

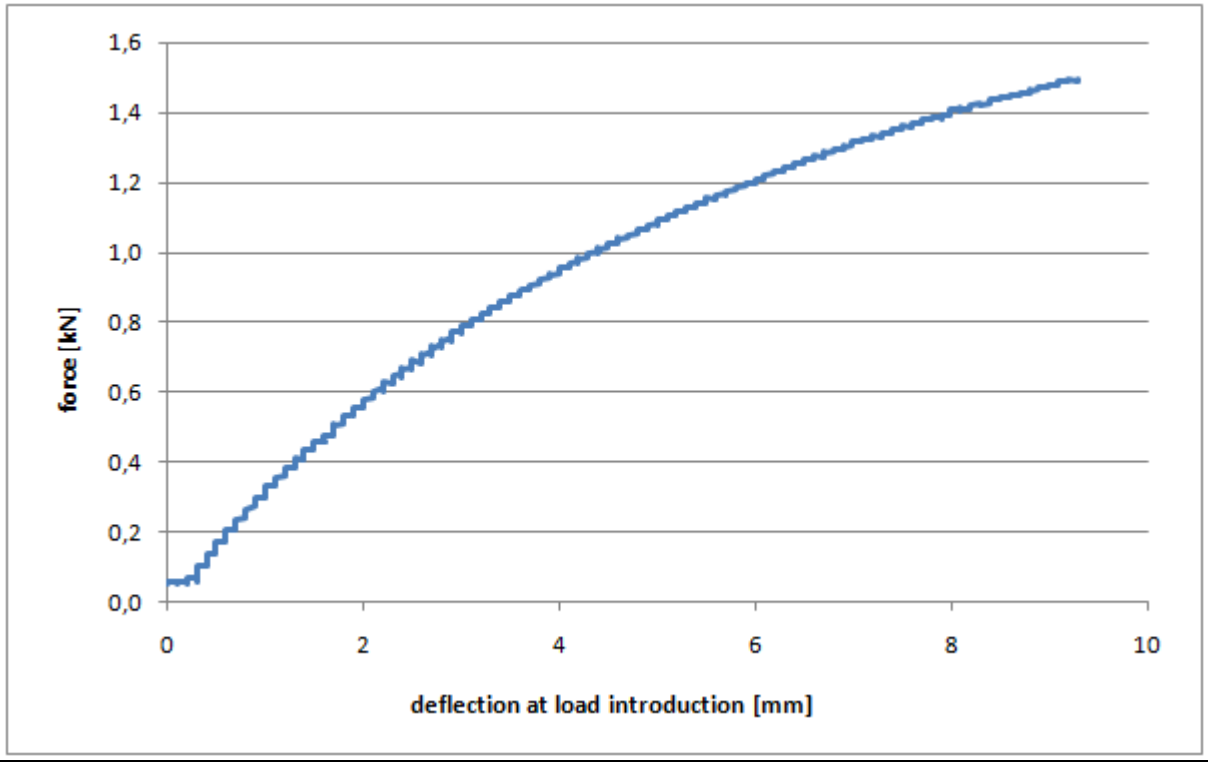
Test No.			**IIIb-D-2**
type of test	cantilever test with glued corner detail		
type of panel	D		
faces	1,8mm GFRP		
core	100 mm EPS		
stressed face	top side of production		
distance between load and compressed face of the wall panel	100 mm		

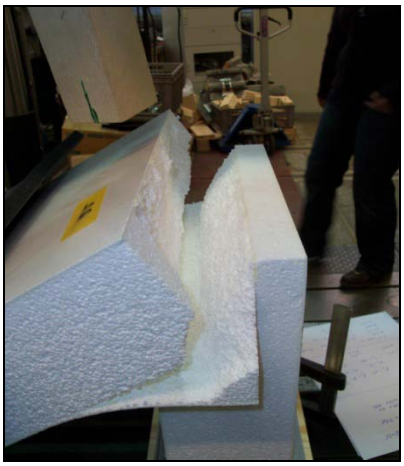
Measured dimensions of the wall panel:			Measured dimensions of the ceiling panel:		
width b	297	mm	length l	748	mm
height h_1	300	mm	width b	380	mm
thickness D	102	mm	thickness D	102	mm
height of cutting h_2	100	mm			
thickness of cutting d_2	70	mm			

ultimate load	1,493	kN
ultimate moment	0,16	kNm

Failure mode: failure of core material

Remarks



Test No.	**IIIb-D-2**
 failure of core material	
 failure of core material	

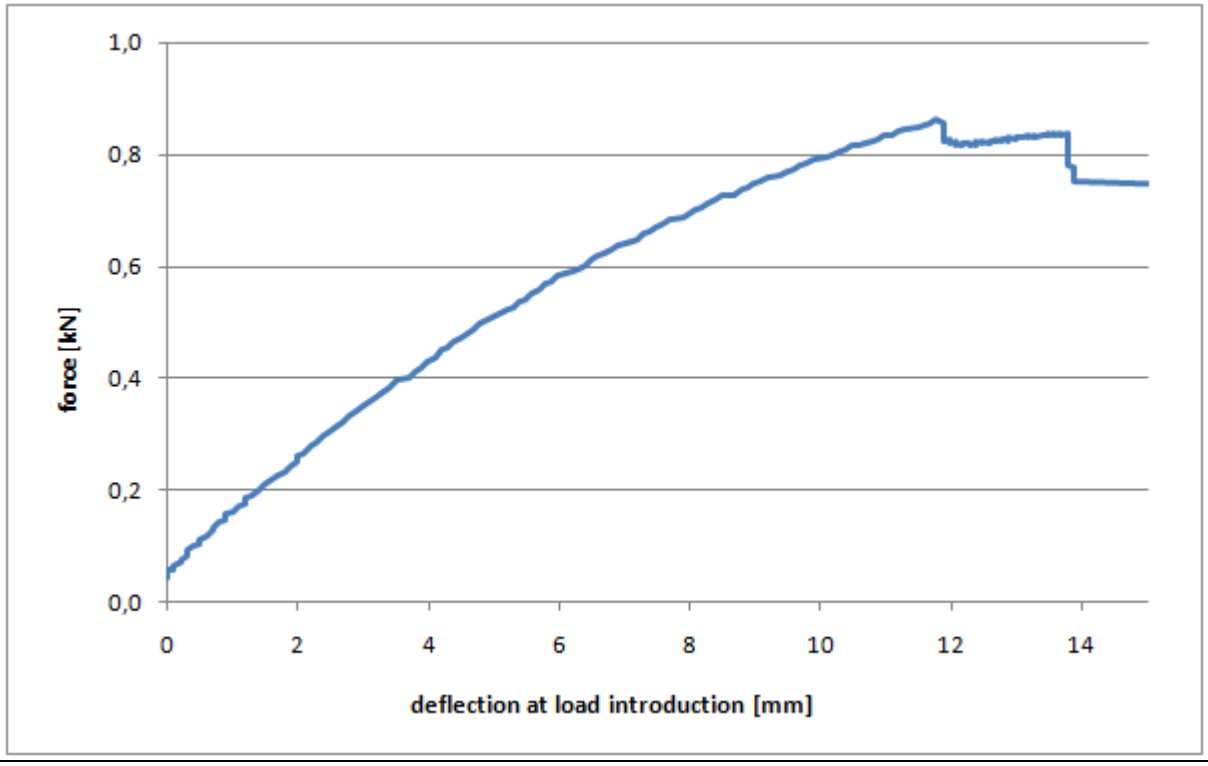
Test No.			**IIIb-D-3**
type of test	cantilever test with glued corner detail		
type of panel	D		
faces	1,8mm GFRP		
core	100 mm EPS		
stressed face	top side of production		
distance between load and compressed face of the wall panel	200 mm		

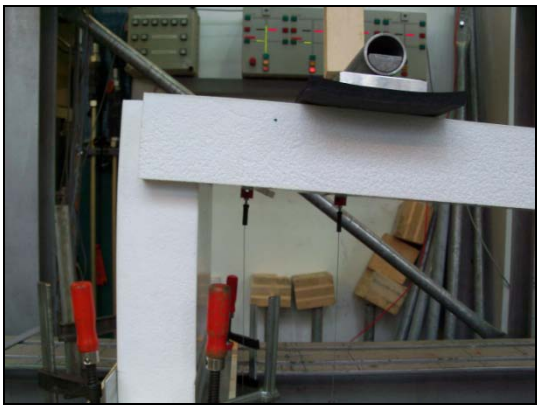
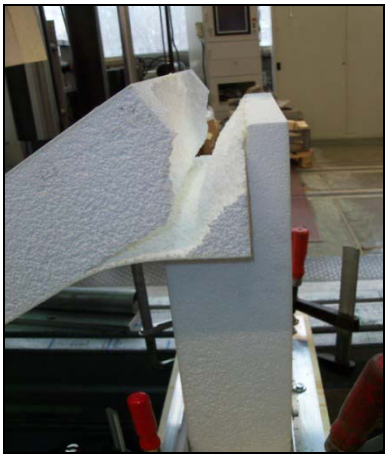
Measured dimensions of the wall panel:			Measured dimensions of the ceiling panel:		
width b	299	mm	length l	749	mm
height h_1	300	mm	width b	379	mm
thickness D	102	mm	thickness D	101	mm
height of cutting h_2	100	mm			
thickness of cutting d_2	70	mm			

ultimate load	0,862	kN
ultimate moment	0,18	kNm

Failure mode: failure of core material

Remarks



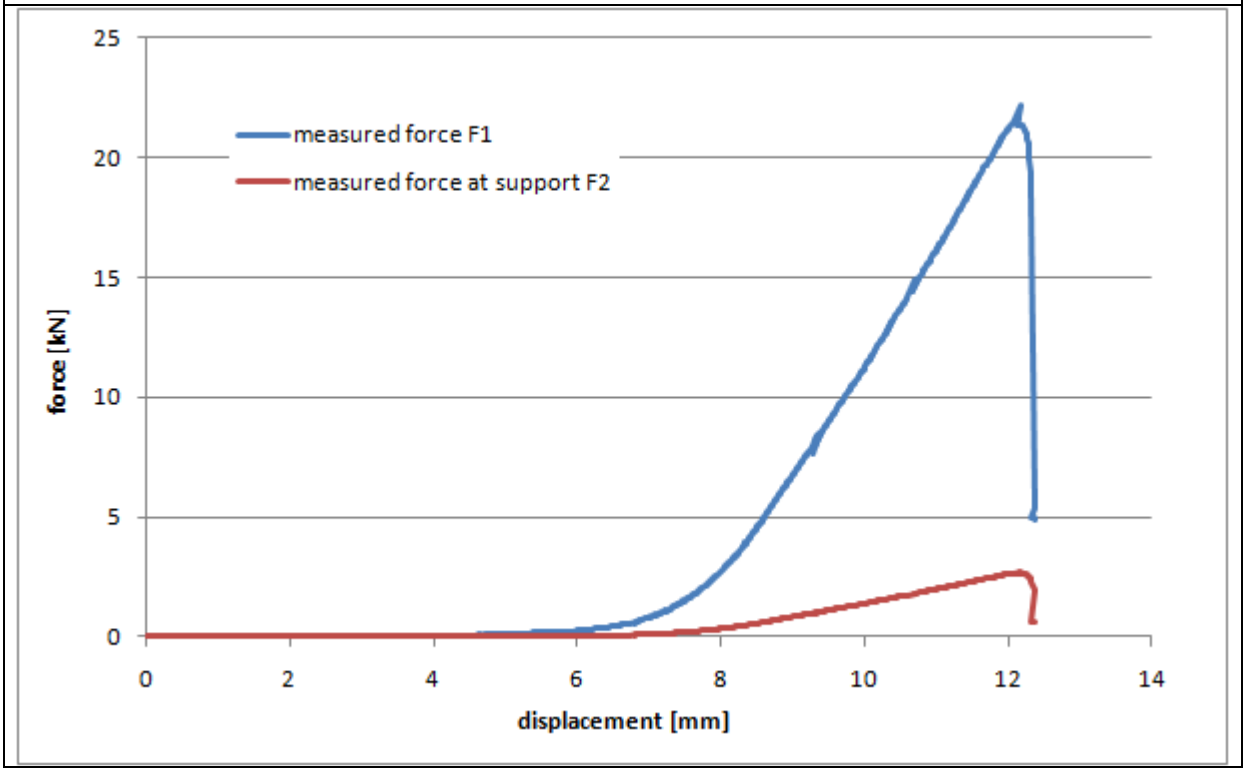
Test No.	**IIIb-D-3**
 test set-up	 failure of core material
 failure of core material	

Test No.	**IVa-A-1**
type of test	test with improved corner detail
introduction of load	steel sheet
type of improvement	glued aluminium angel
type of panel	A
faces	0,50 mm steel
core	100 mm PU
stressed face	-

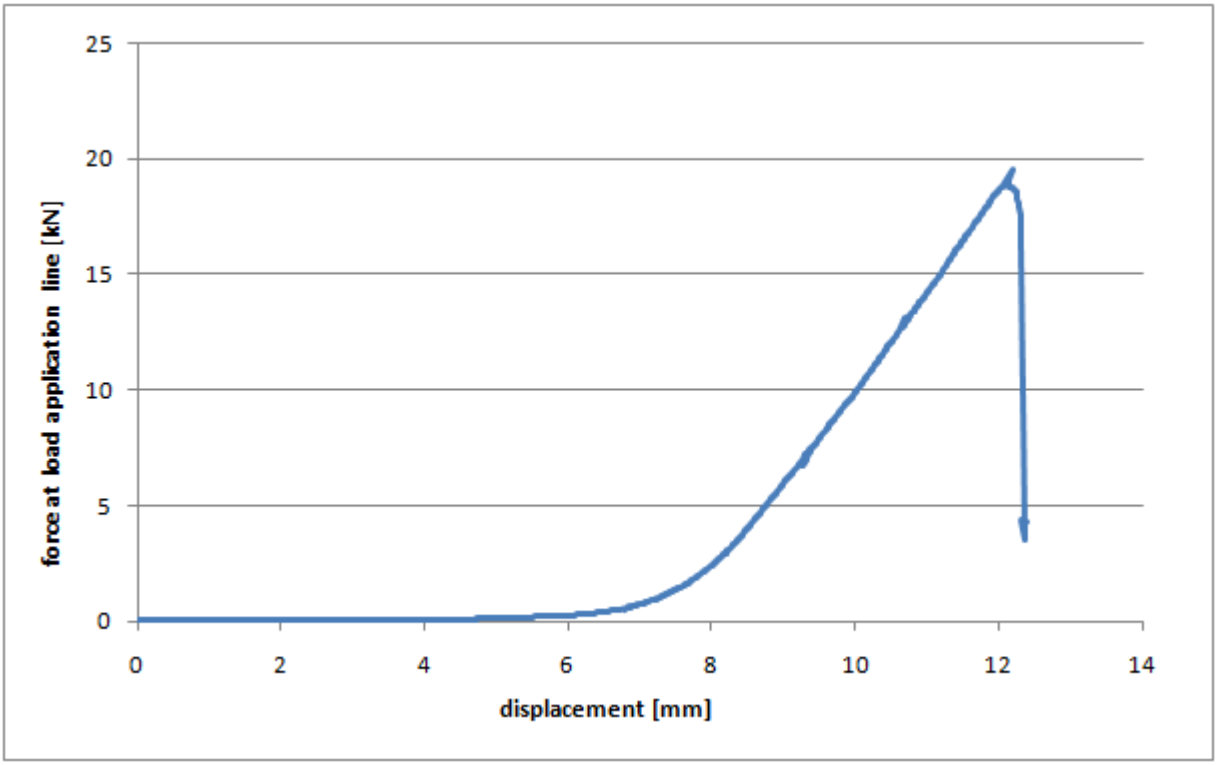
Measured dimensions of the wall panel:

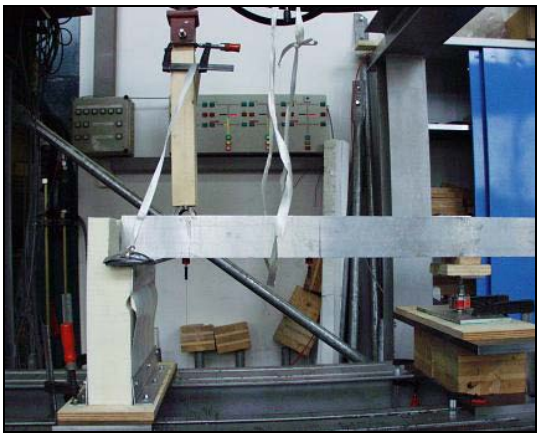
width b	399	mm
height h_1	302	mm
thickness D	95	mm
height of cutting h_2	99	mm
thickness of cutting d_2	49	mm

ultimate load at line of load application	19,55	kN
ultimate stress of the compressed face	103,4	N/mm^2
Failure mode	buckling of the compressed face	
Remarks		



Test No.	**IVa-A-1**





test set-up

buckling of the compressed face

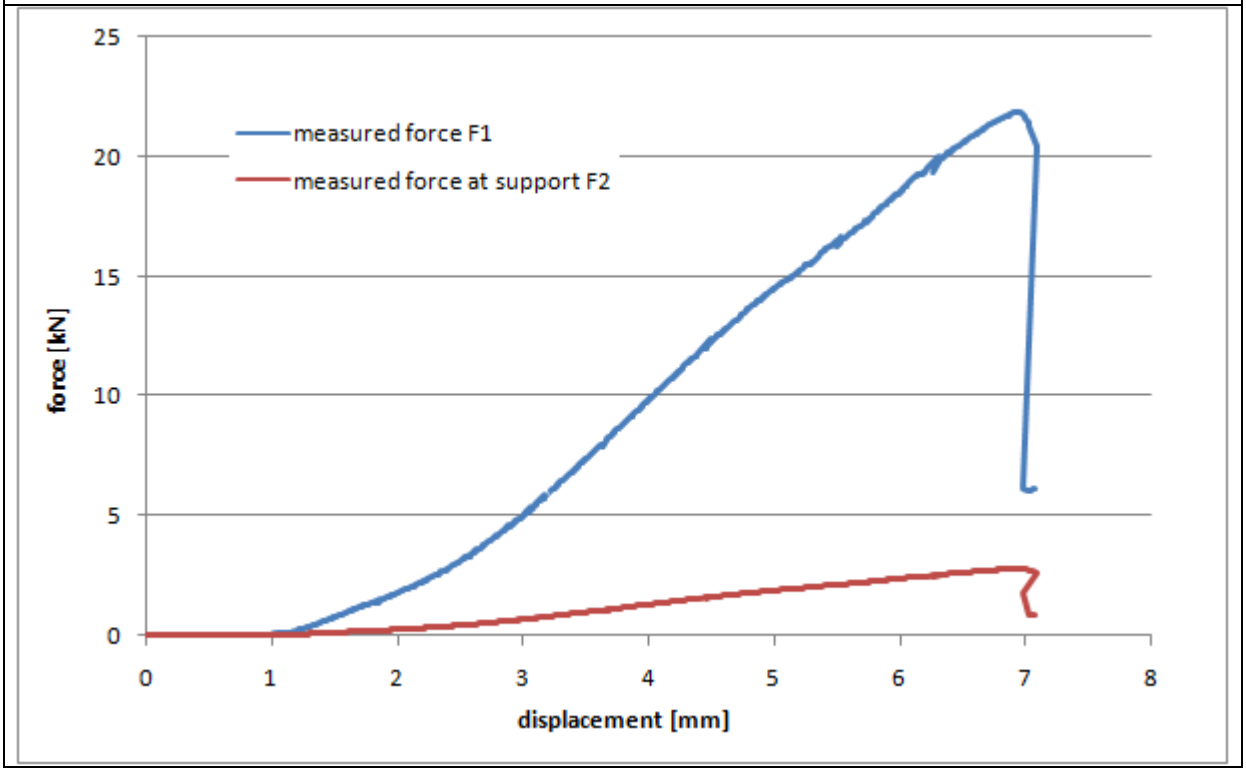
buckling of the compressed face

Test No.		**IVa-A-2**
type of test	test with improved corner detail	
introduction of load	steel sheet	
type of improvement	glued aluminium angel	
type of panel	A	
faces	0,50 mm steel	
core	100 mm PU	
stressed face	-	

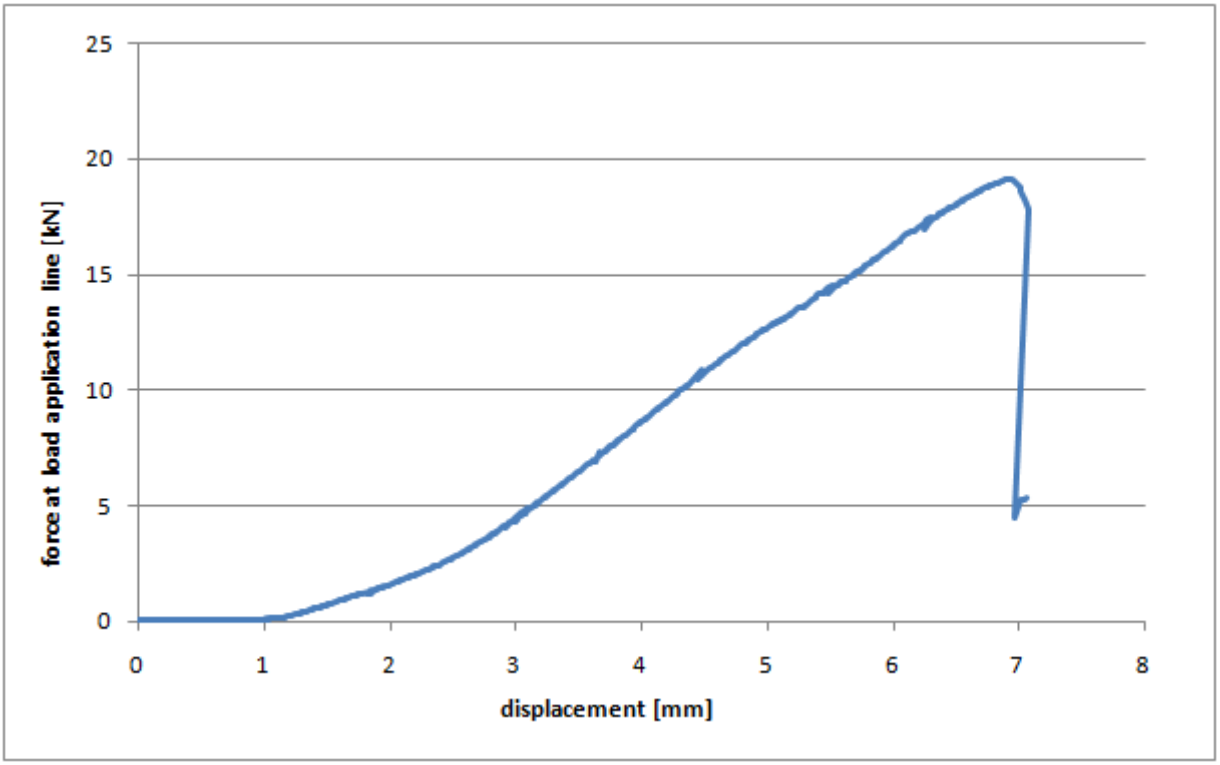
Measured dimensions of the wall panel:

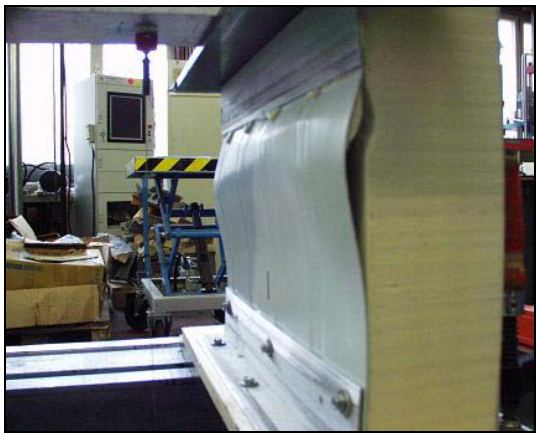
width b	401	mm
height h_1	302	mm
thickness D	95	mm
height of cutting h_2	99	mm
thickness of cutting d_2	47	mm

ultimate load at line of load application	19,08	kN
ultimate stress of the compressed face	100,4	N/mm^2
Failure mode	buckling of the compressed face	
Remarks		



Test No.	**IVa-A-2**





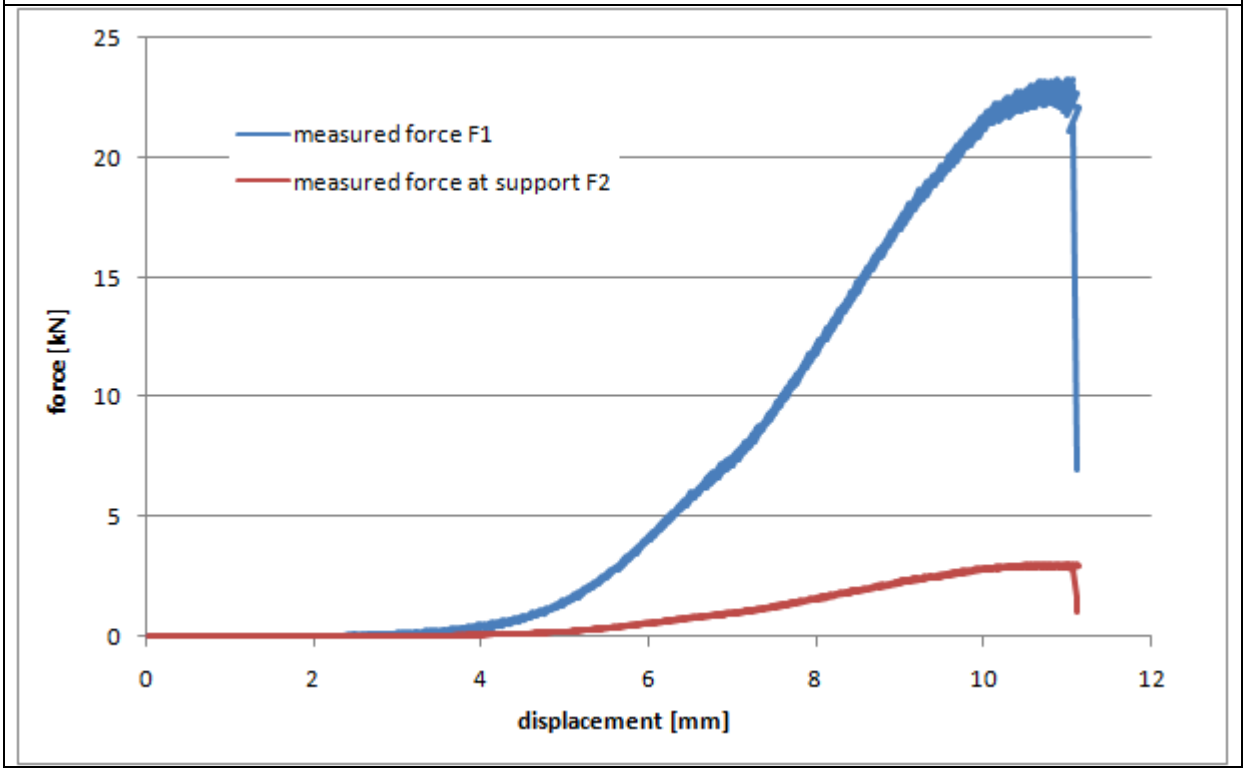
failure of the compressed face

Test No.		**IVa-A-3**
type of test	test with improved corner detail	
introduction of load	steel sheet	
type of improvement	glued aluminium angel	
type of panel	A	
faces	0,50 mm steel	
core	100 mm PU	
stressed face	-	

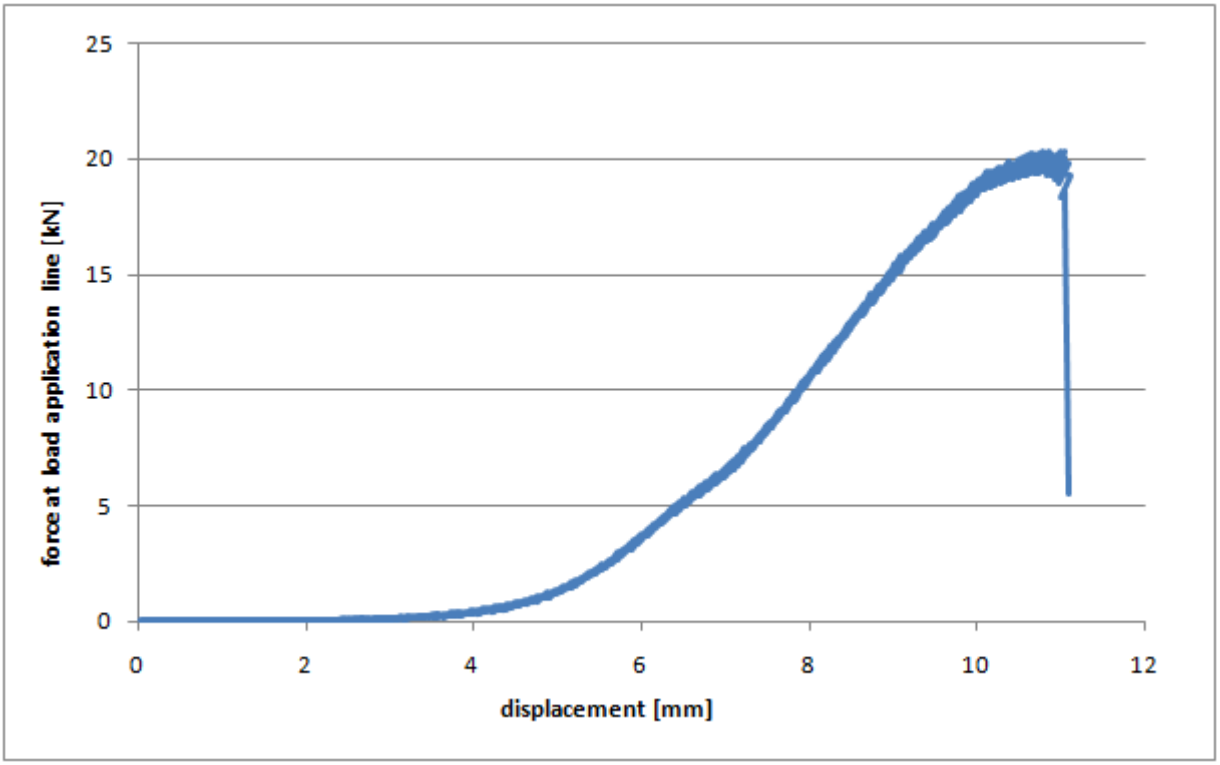
Measured dimensions of the wall panel:

width b	400	mm
height h_1	303	mm
thickness D	94	mm
height of cutting h_2	100	mm
thickness of cutting d_2	46	mm

ultimate load at line of load application	20,32	kN
ultimate stress of the compressed face	107,2	N/mm^2
Failure mode	buckling of the compressed face	
Remarks		



Test No.	**IVa-A-3**



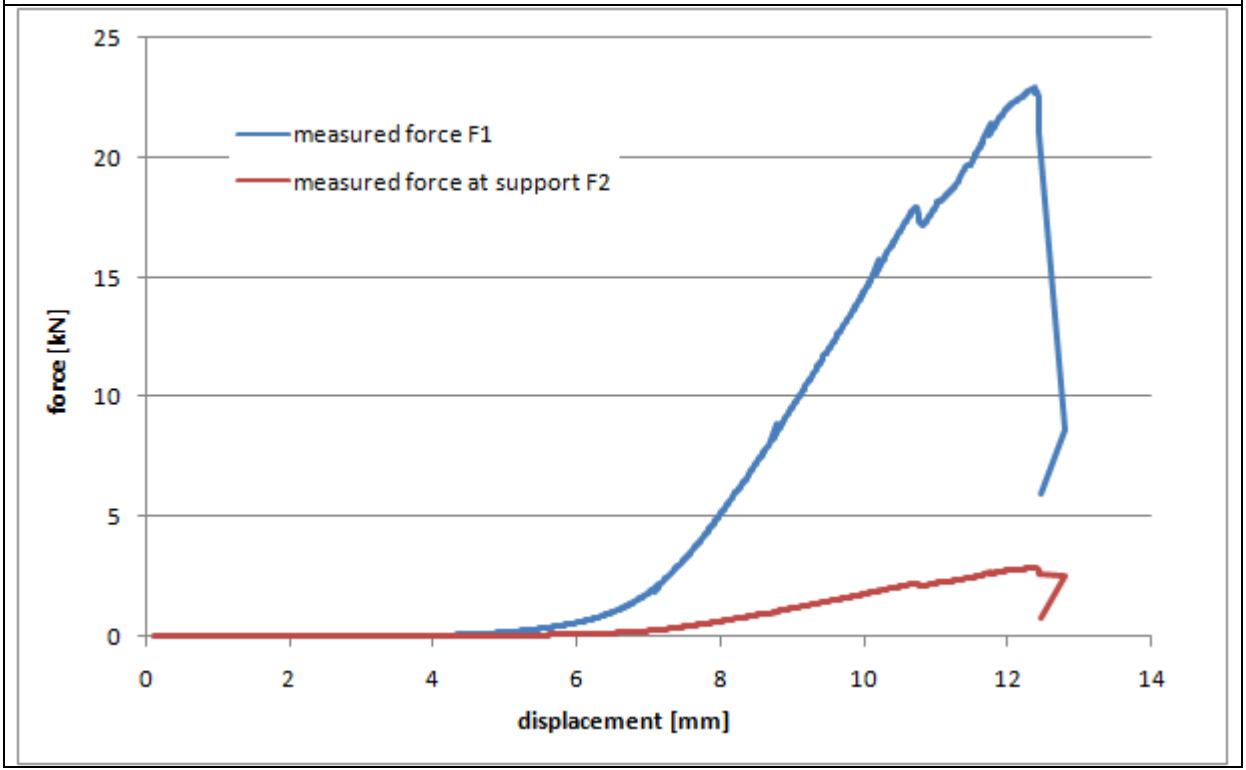
failure of the compressed face

Test No.		**IVa-A-4**
type of test	test with improved corner detail	
introduction of load	steel sheet	
type of improvement	glued aluminium angel	
type of panel	A	
faces	0,50 mm steel	
core	100 mm PU	
stressed face	-	

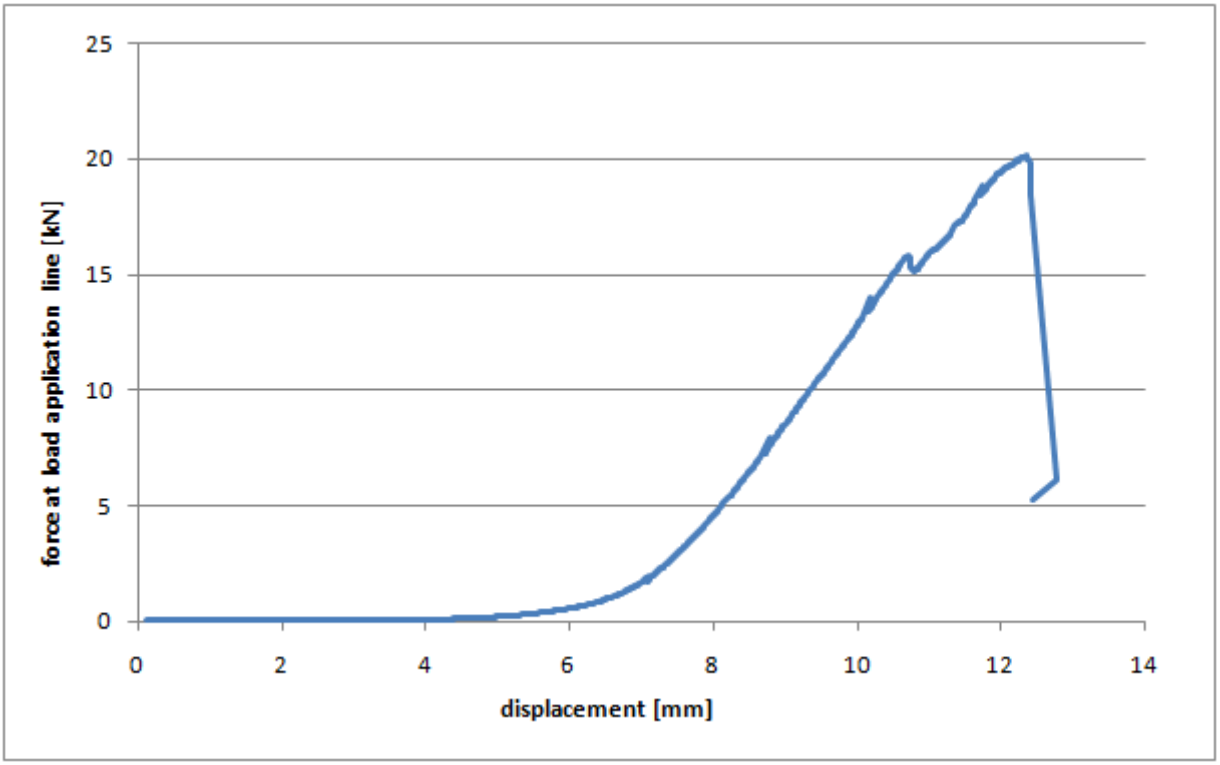
Measured dimensions of the wall panel:

width b	401	mm
height h_1	-	mm
thickness D	-	mm
height of cutting h_2	-	mm
thickness of cutting d_2	-	mm

ultimate load at line of load application	20,10	kN
ultimate stress of the compressed face	105,7	N/mm^2
Failure mode	buckling of the compressed face	
Remarks		



Test No.	**IVa-A-4**



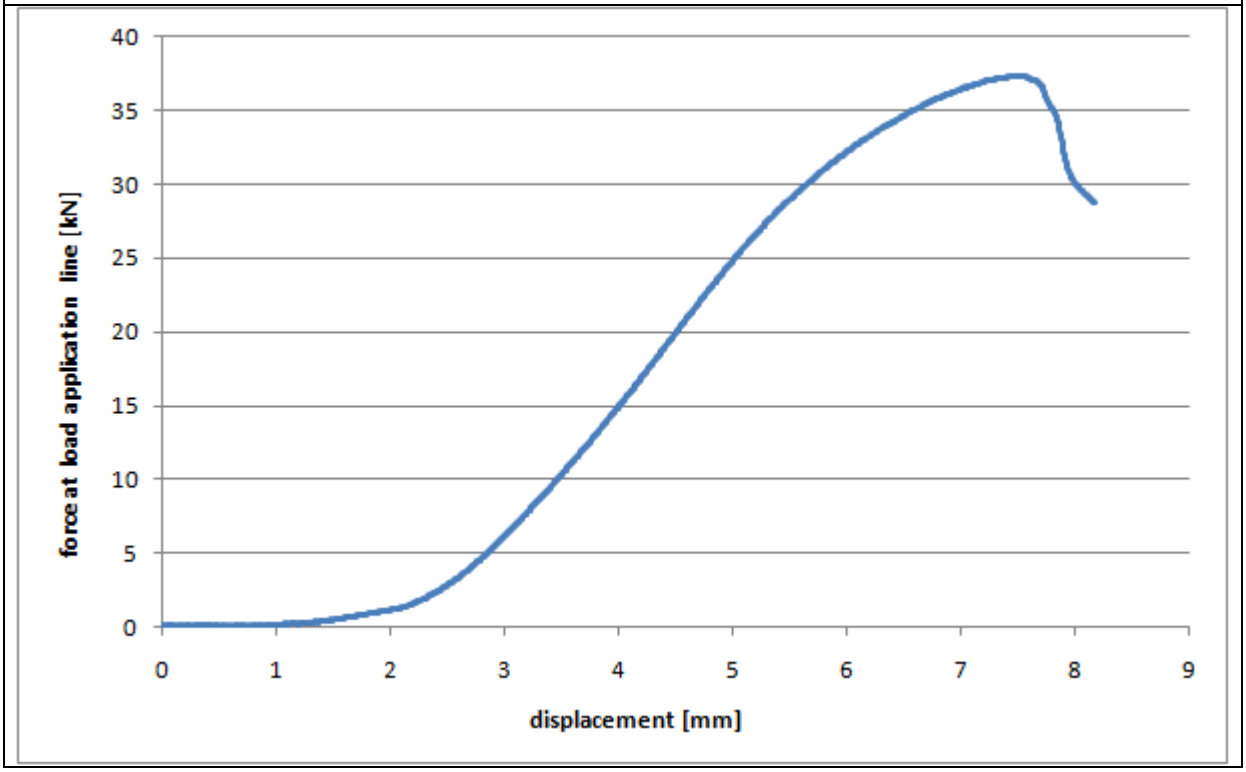
failure of the compressed face

Test No.		**IVa-B-1**
type of test	test with improved corner detail	
introduction of load	steel sheet	
type of improvement	glued aluminium angel	
type of panel	B	
faces	0,75 mm steel	
core	100 mm PU	
stressed face	-	

Measured dimensions of the wall panel:

width b	399	mm
height h_1	297	mm
thickness D	99	mm
height of cutting h_2	103	mm
thickness of cutting d_2	52	mm

ultimate load at line of load application	37,34	kN
ultimate stress of the compressed face	122,8	N/mm^2
Failure mode	failure of the lower end	
Remarks		



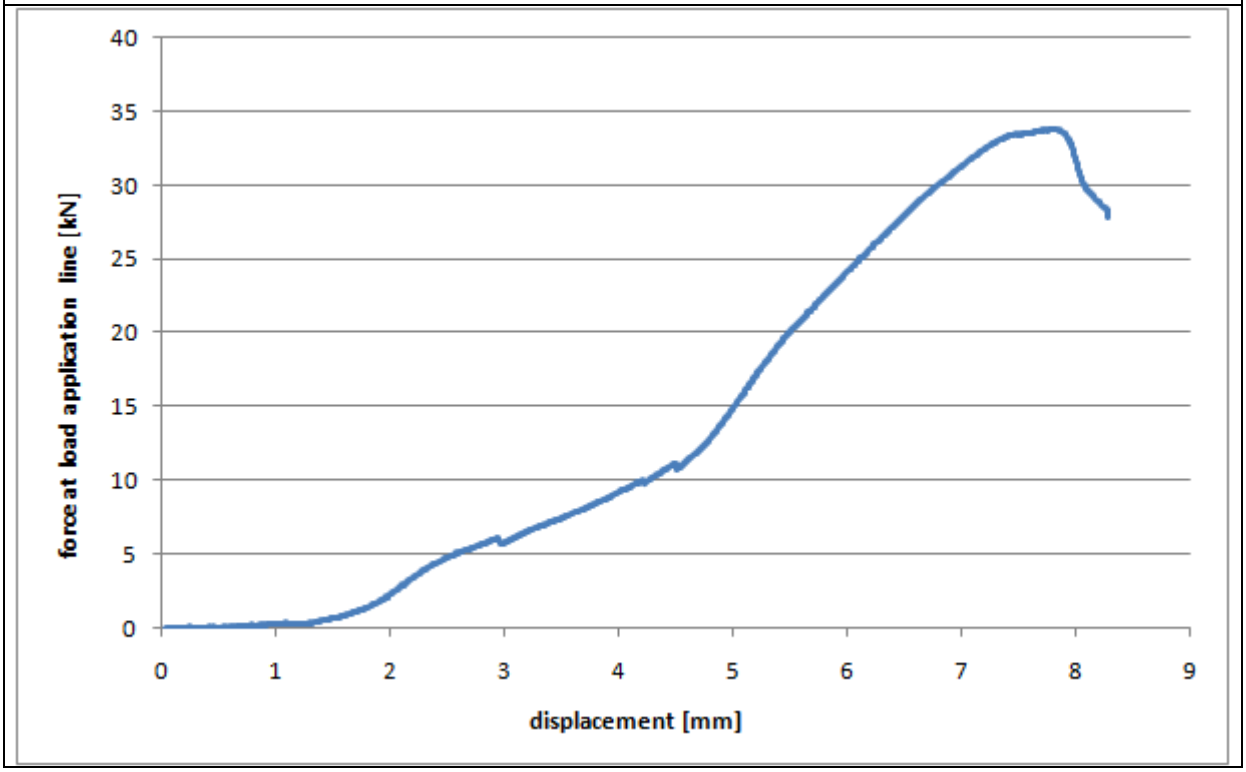
Test No.	**IVa-B-1**
	
test set-up	deformation prior to failure
	
failure at the lower end	bond between face and core

Test No.		**IVa-B-2**
type of test	test with improved corner detail	
introduction of load	steel sheet	
type of improvement	glued aluminium angel	
type of panel	B	
faces	0,75 mm steel	
core	100 mm PU	
stressed face		

Measured dimensions of the wall panel:

width b	399	mm
height h_1	299	mm
thickness D	99	mm
height of cutting h_2	101	mm
thickness of cutting d_2	50	mm

ultimate load at line of load application	33,84	kN
ultimate stress of the compressed face	111,3	N/mm^2
Failure mode	failure of the lower end	
Remarks		



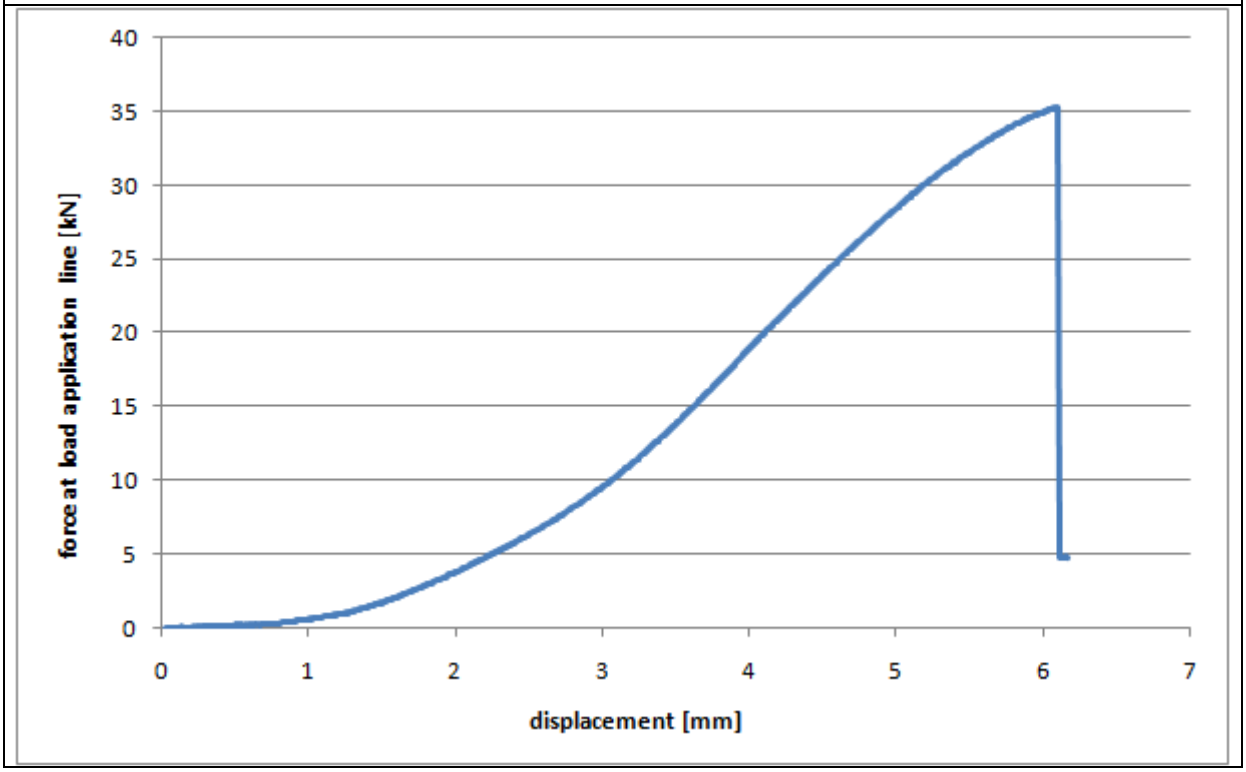
Test No.	**IVa-B-2**
 failure at the lower end	
 failure at the lower end	 bond between face and core

Test No.		**IVa-B-3**
type of test	test with improved corner detail	
introduction of load	steel sheet	
type of improvement	glued aluminium angel	
type of panel	B	
faces	0,75 mm steel	
core	100 mm PU	
stressed face		

Measured dimensions of the wall panel:

width b	400	mm
height h_1	301	mm
thickness D	99	mm
height of cutting h_2	103	mm
thickness of cutting d_2	50	mm

ultimate load at line of load application	35,29	kN
ultimate stress of the compressed face	115,8	N/mm^2
Failure mode	buckling of the compressed face	
Remarks		



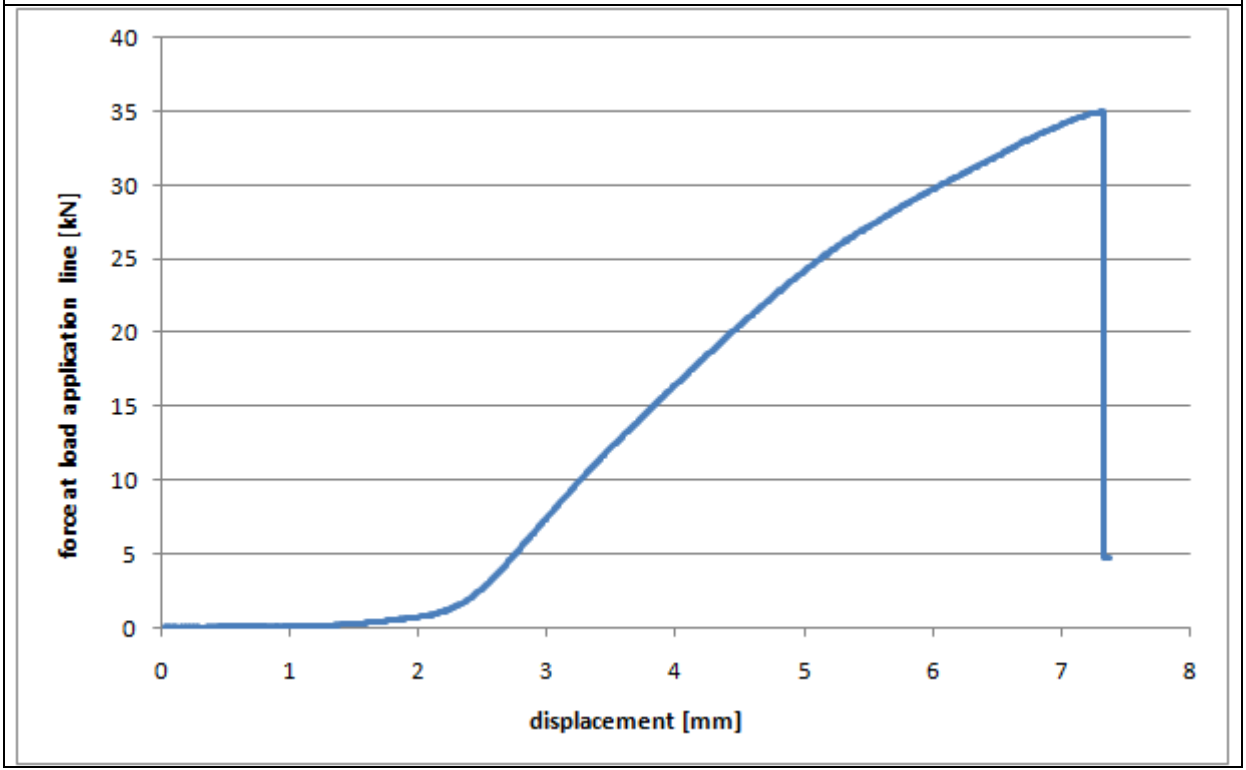
Test No.	**IVa-B-3**
	
deformation prior to failure	failure of the compressed face
	
failure of the compressed face	bond between face and core

Test No.		**IVa-B-4**
type of test	test with improved corner detail	
introduction of load	steel sheet	
type of improvement	glued aluminium angel	
type of panel	B	
faces	0,75 mm steel	
core	100 mm PU	
stressed face		

Measured dimensions of the wall panel:

width b	400	mm
height h_1	301	mm
thickness D	99	mm
height of cutting h_2	101	mm
thickness of cutting d_2	54	mm

ultimate load at line of load application	34,98	kN
ultimate stress of the compressed face	114,8	N/mm^2
Failure mode	buckling of the compressed face	
Remarks		



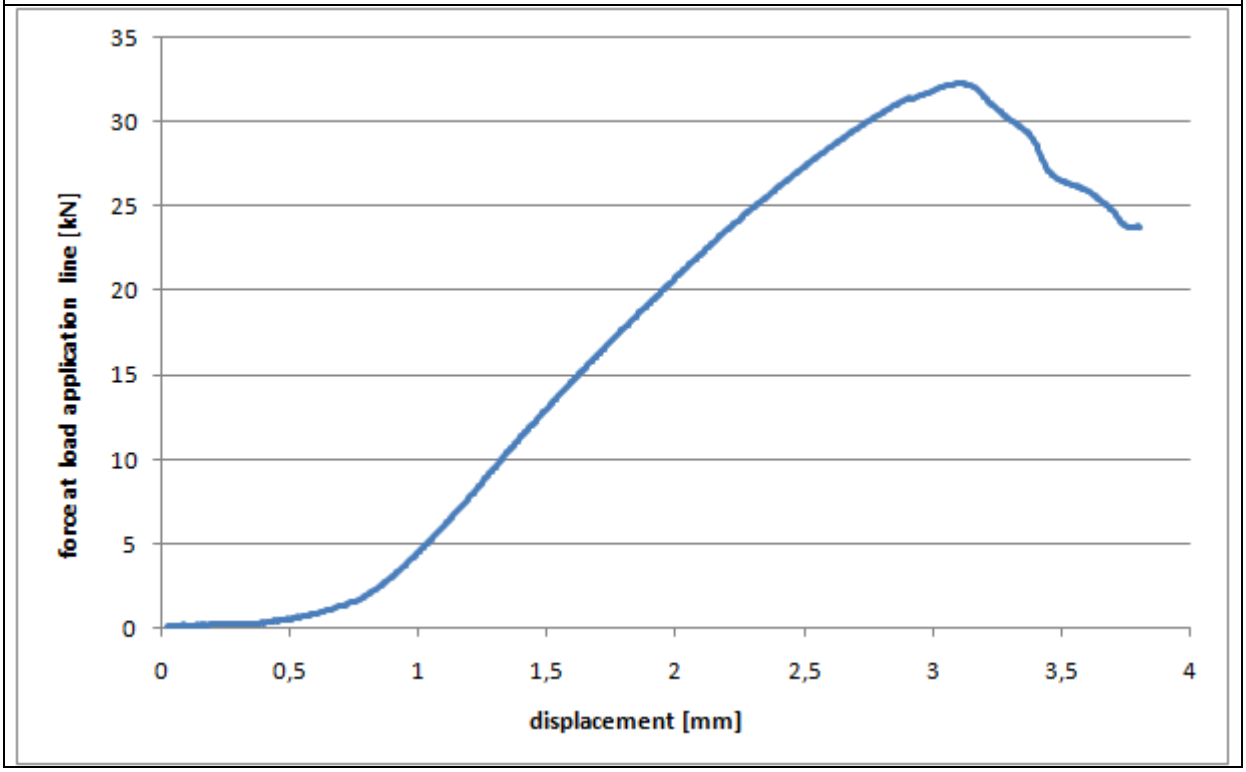
Test No.	**IVa-B-4**
 deformation prior to failure	 failure of the compressed face
 failure of the compressed face	 bond between face and core

Test No.		**IVa-B-5**
type of test	test with improved corner detail	
introduction of load	steel sheet	
type of improvement	glued aluminium angel	
type of panel	B	
faces	0,75 mm steel	
core	100 mm PU	
stressed face		

Measured dimensions of the wall panel:

width b	400	mm
height h_1	302	mm
thickness D	99	mm
height of cutting h_2	103	mm
thickness of cutting d_2	50	mm

ultimate load at line of load application	32,29	kN
ultimate stress of the compressed face	105,9	N/mm^2
Failure mode	failure of the lower end	
Remarks		



Test No.	**IVa-B-5**
 failure at the lower end	 failure at the lower end
 bond between face and core	

Test No.		**IVa-E-1**
type of test	test with improved corner detail	
introduction of load	steel sheet	
type of improvement	glued aluminium angel	
type of panel	E	
faces	0,50 mm steel	
core	100 mm Mineral wool	
stressed face	-	

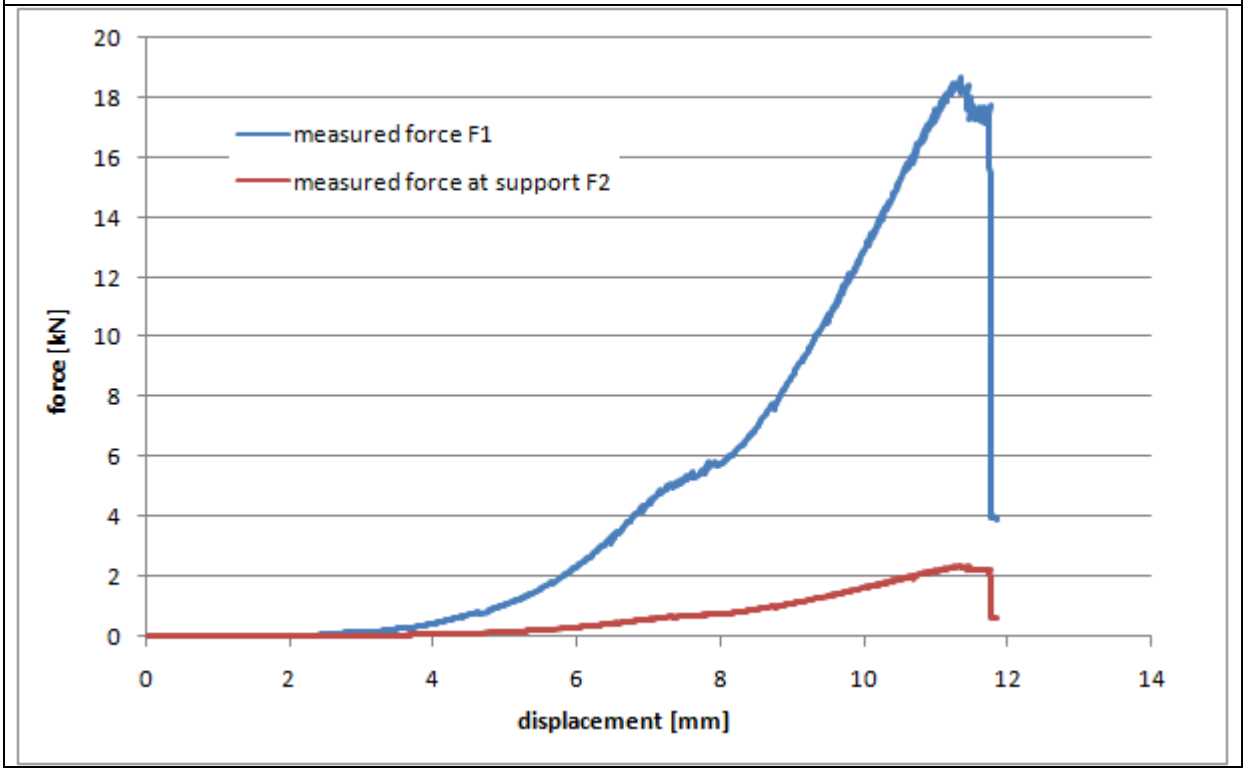
Measured dimensions of the wall panel:

width b	400	mm
height h_1	303	mm
thickness D	100	mm
height of cutting h_2	2,5	mm
thickness of cutting d_2	2,5	mm

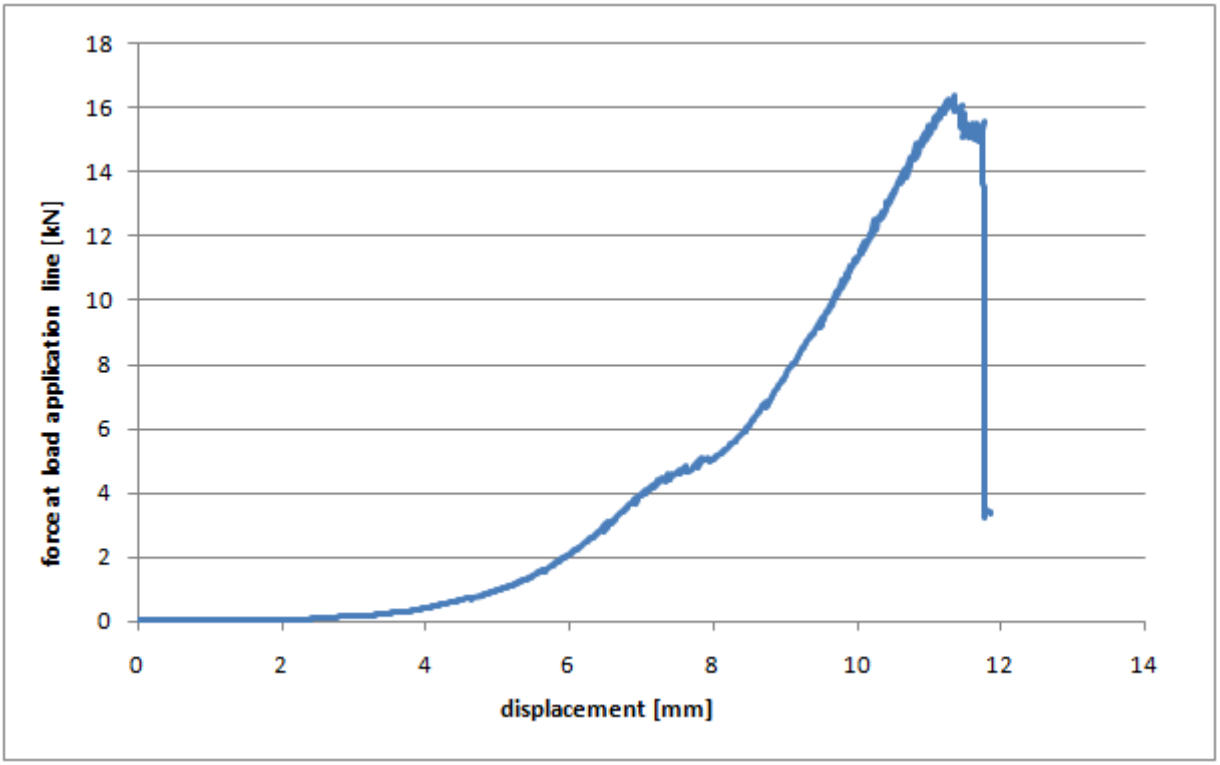
ultimate load at line of load application	16,37	kN
ultimate stress of the compressed face	86,2	N/mm^2

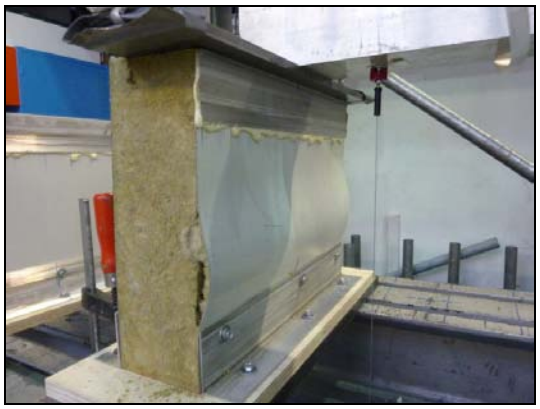
Failure mode: buckling of the compressed face

Remarks

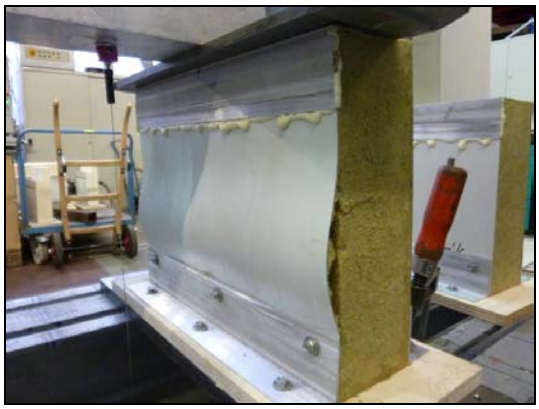


Test No.	**IVa-E-1**





buckling of the compressed face



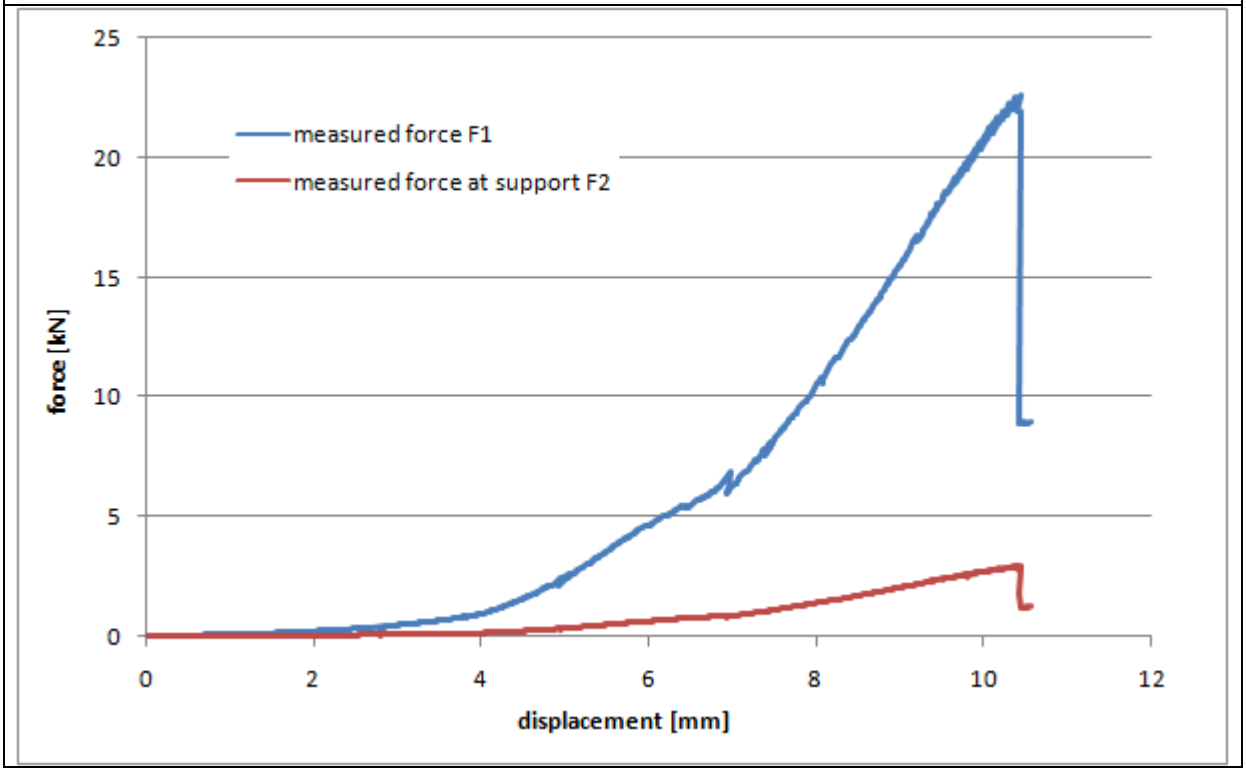
buckling of the compressed face

Test No.		**IVa-E-2**
type of test	test with improved corner detail	
introduction of load	steel sheet	
type of improvement	glued aluminium angel	
type of panel	E	
faces	0,50 mm steel	
core	100 mm Mineral wool	
stressed face	-	

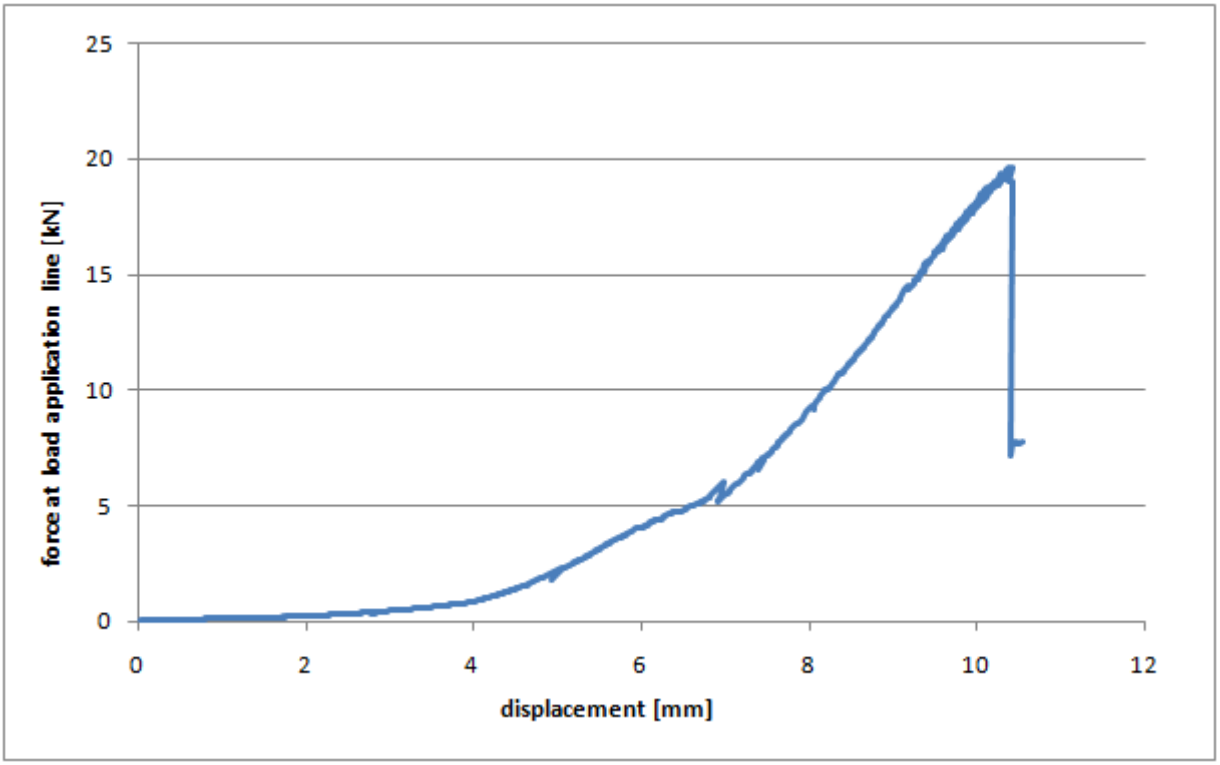
Measured dimensions of the wall panel:

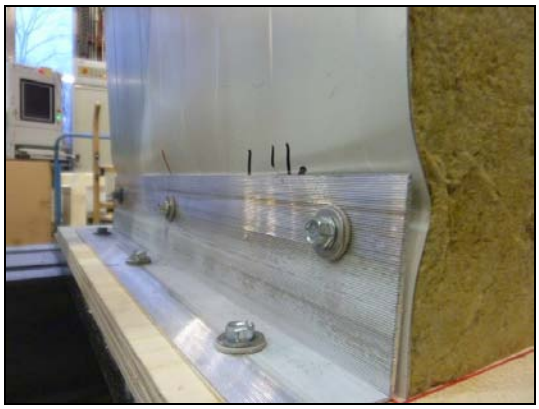
width b	400	mm
height h_1	301	mm
thickness D	100	mm
height of cutting h_2	3	mm
thickness of cutting d_2	2,5	mm

ultimate load at line of load application	19,66	kN
ultimate stress of the compressed face	103,5	N/mm^2
Failure mode	failure of the lower end	
Remarks		



Test No.	**IVa-E-2**





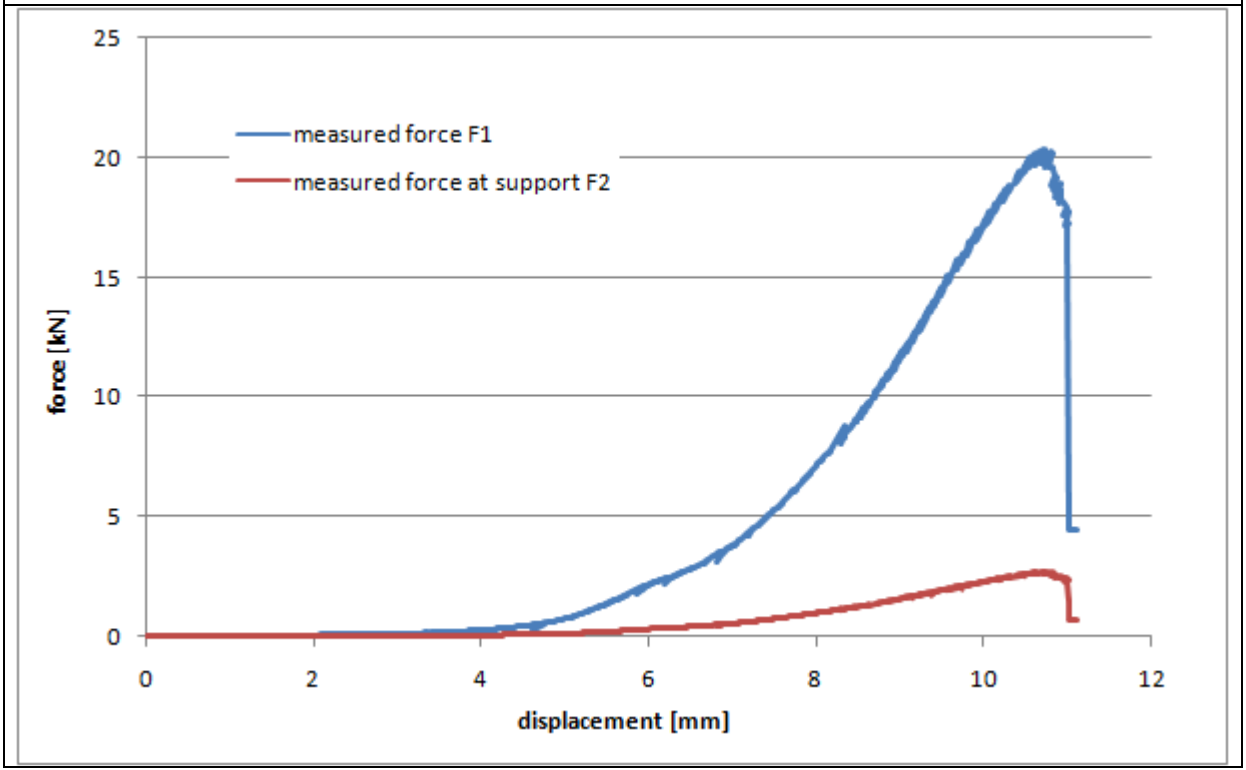
failure of the lower end

Test No.		**IVa-E-3**
type of test	test with improved corner detail	
introduction of load	steel sheet	
type of improvement	glued aluminium angel	
type of panel	E	
faces	0,50 mm steel	
core	100 mm Mineral wool	
stressed face	-	

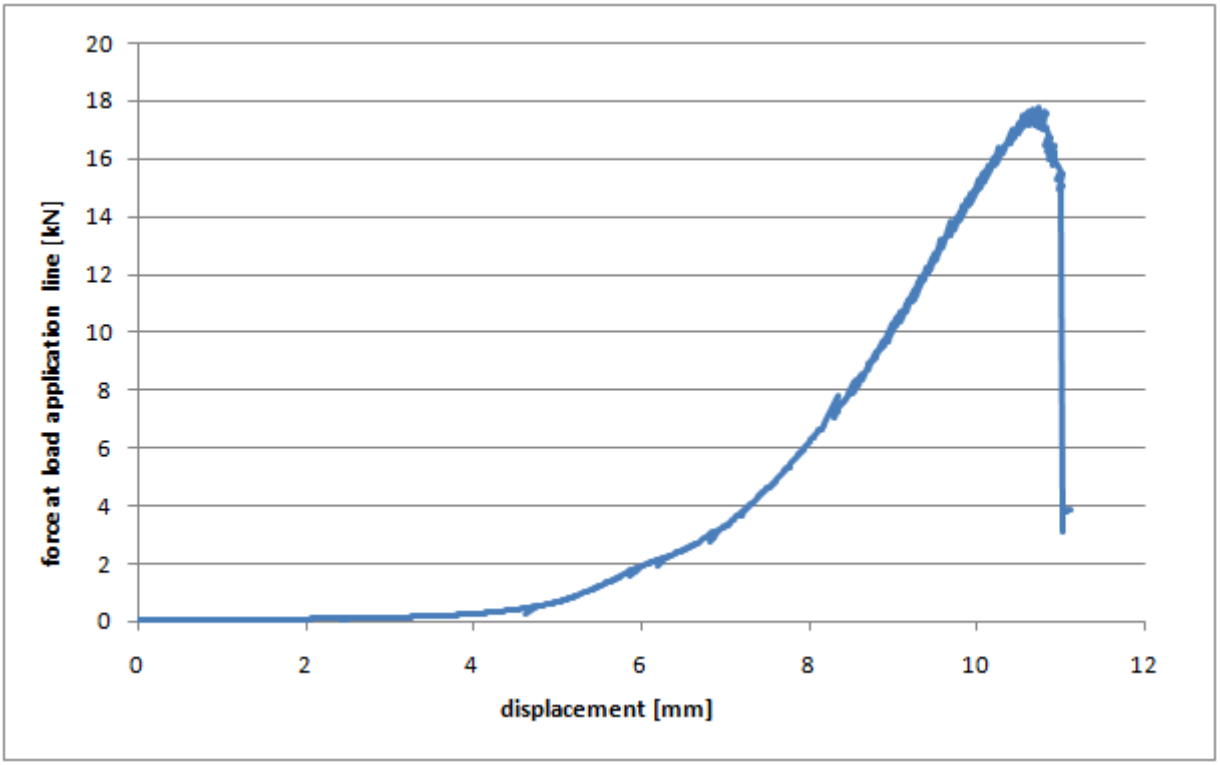
Measured dimensions of the wall panel:

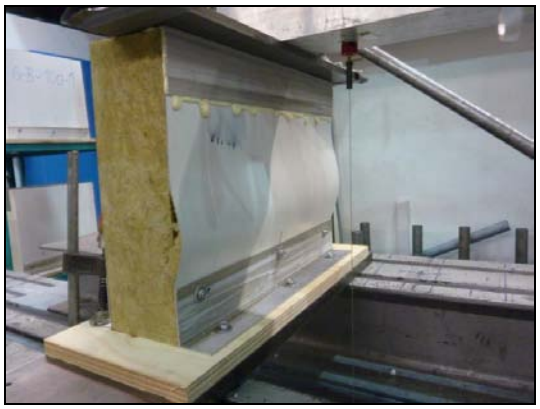
width b	400	mm
height h_1	302	mm
thickness D	100	mm
height of cutting h_2	2	mm
thickness of cutting d_2	2	mm

ultimate load at line of load application	17,76	kN
ultimate stress of the compressed face	93,5	N/mm^2
Failure mode	buckling of the compressed face	
Remarks		



Test No.	**IVa-E-3**





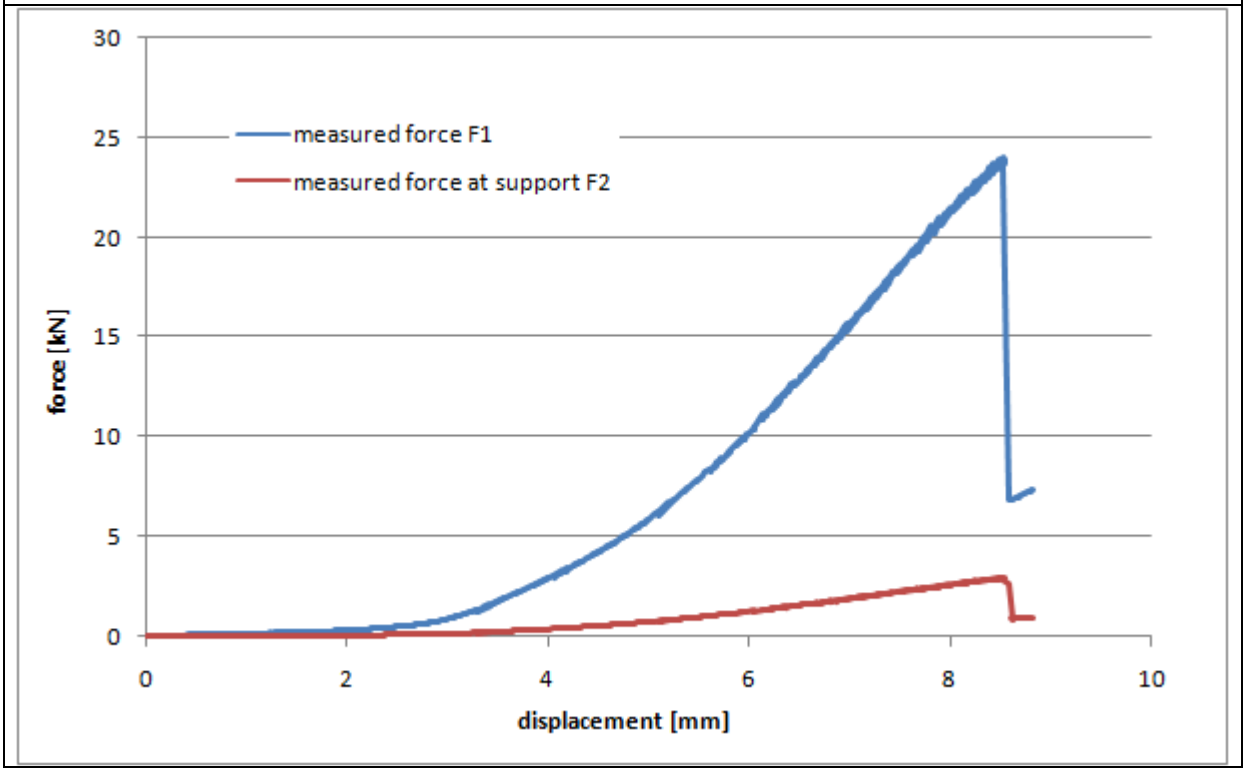
buckling of the compressed face

Test No.		**IVa-E-4**
type of test	test with improved corner detail	
introduction of load	steel sheet	
type of improvement	glued aluminium angel	
type of panel	E	
faces	0,50 mm steel	
core	100 mm Mineral wool	
stressed face	-	

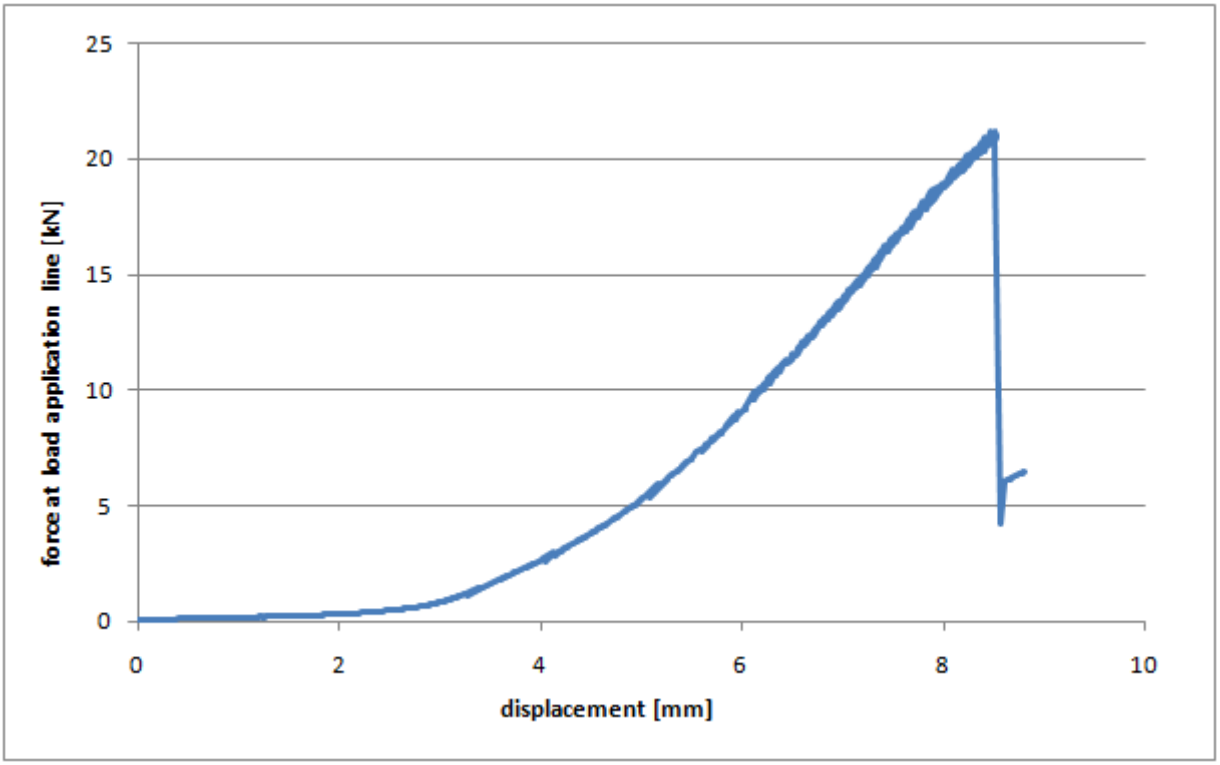
Measured dimensions of the wall panel:

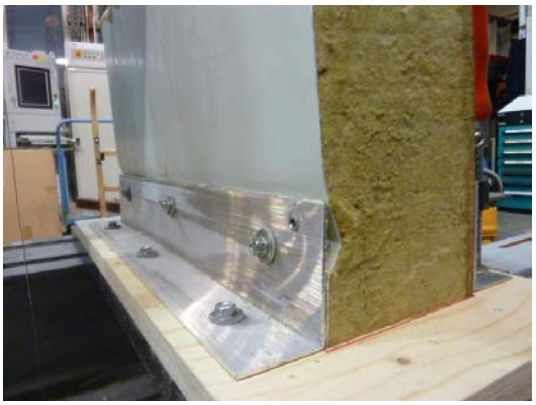
width b	400	mm
height h_1	300	mm
thickness D	99,5	mm
height of cutting h_2	2,5	mm
thickness of cutting d_2	2,5	mm

ultimate load at line of load application	21,15	kN
ultimate stress of the compressed face	111,3	N/mm^2
Failure mode	failure of the lower end	
Remarks		



Test No.	**IVa-E-4**





failure of the lower end

Test No.		**IVb-A-1**
type of test	test with improved corner detail	
introduction of load	steel sheet	
type of improvement	3 dowels FID 50	
type of panel	A	
faces	0,50 mm steel	
core	100 mm PU	
stressed face	top side of production	

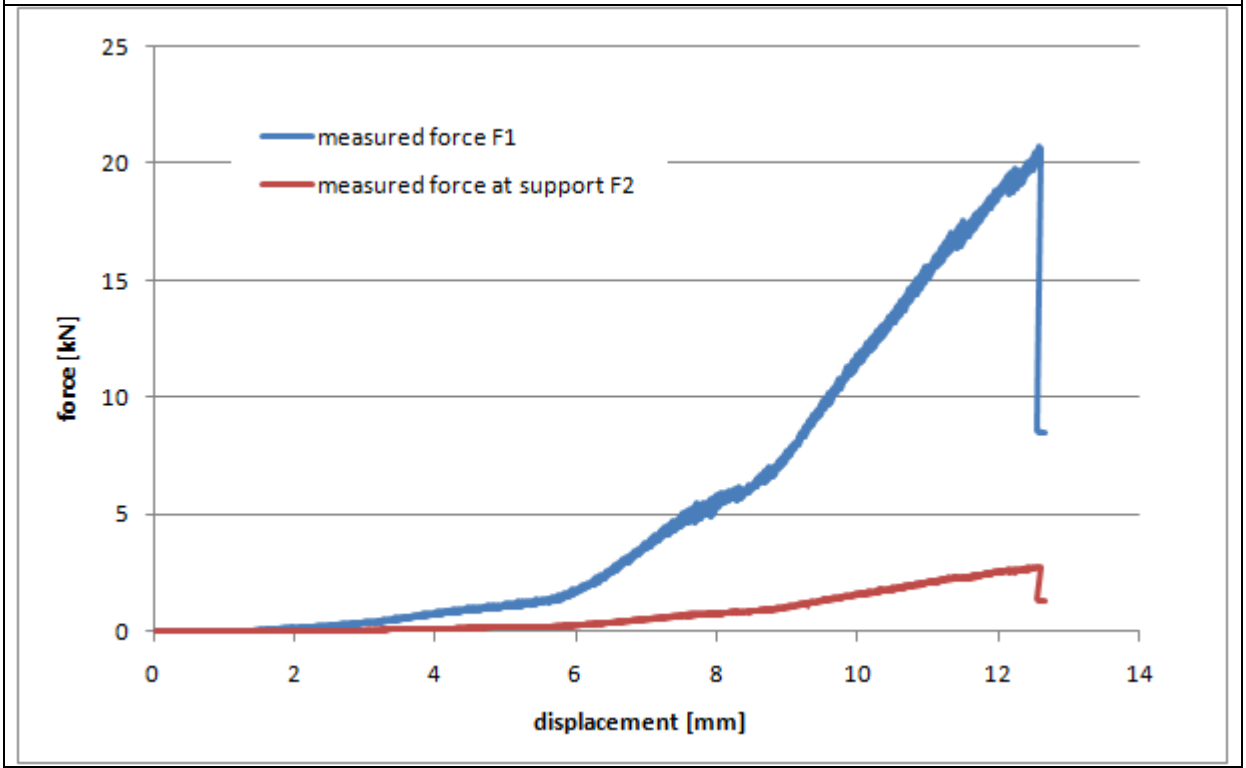
Measured dimensions of the wall panel:

width b	400	mm
height h_1	302	mm
thickness D	96	mm
height of cutting h_2	99	mm
thickness of cutting d_2	49	mm

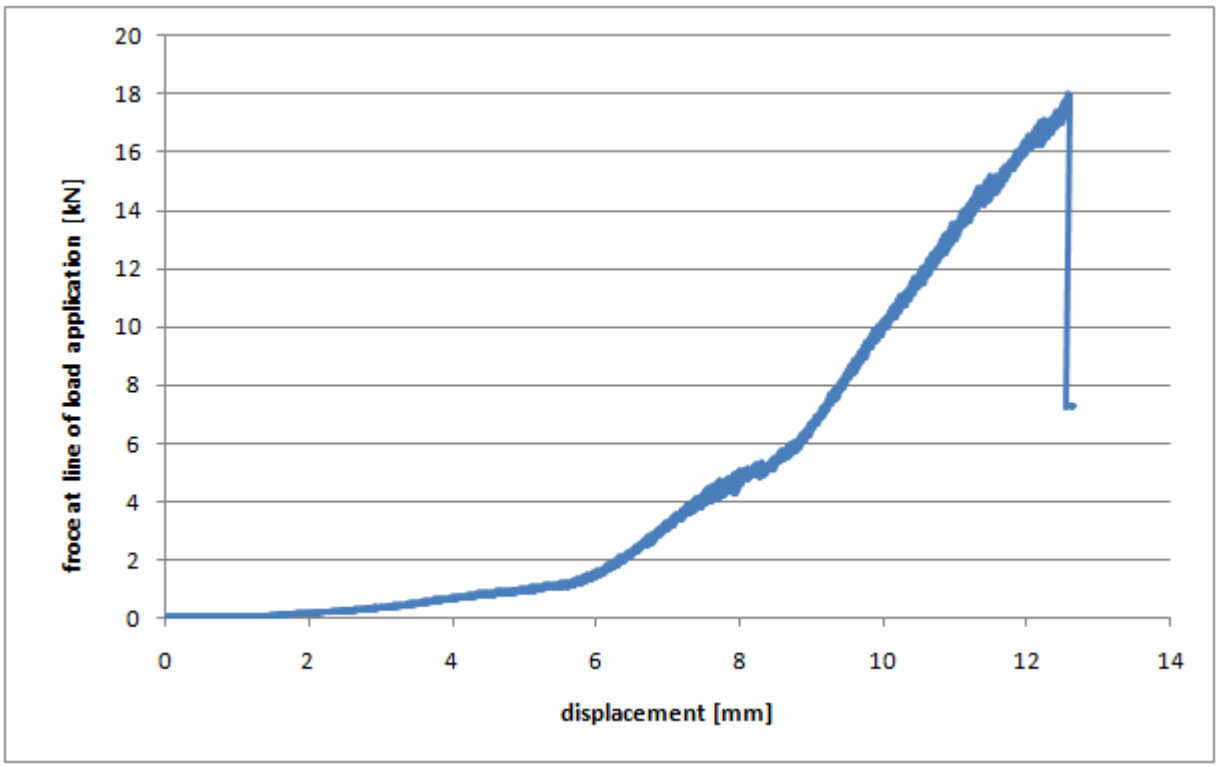
ultimate load at line of load application 18,02 kN

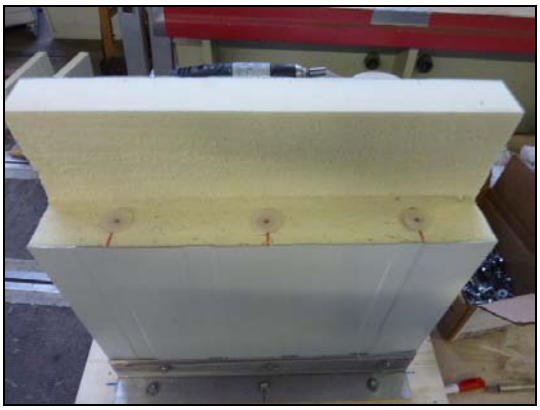
Failure mode crippling of the compressed face

Remarks



Test No.	**IVb-A-1**





arrangement of dowels

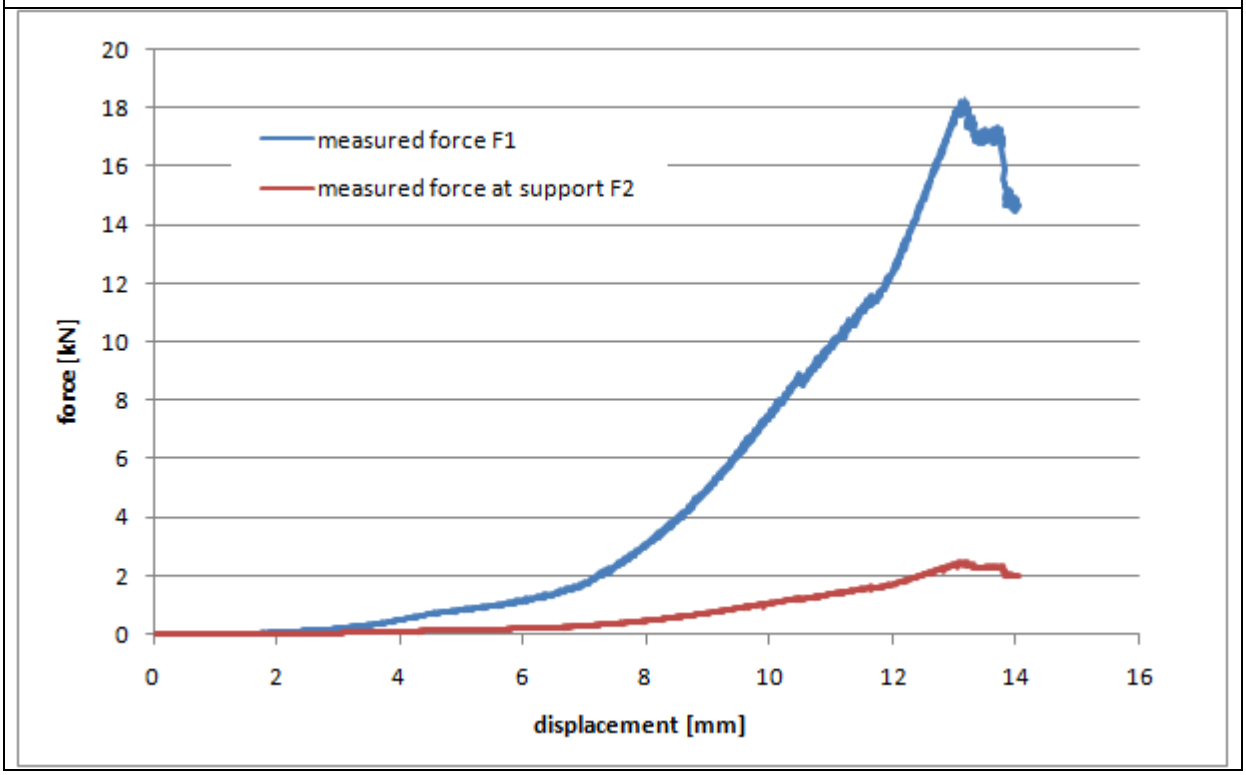
bond between face and core

failuer of the compressed face

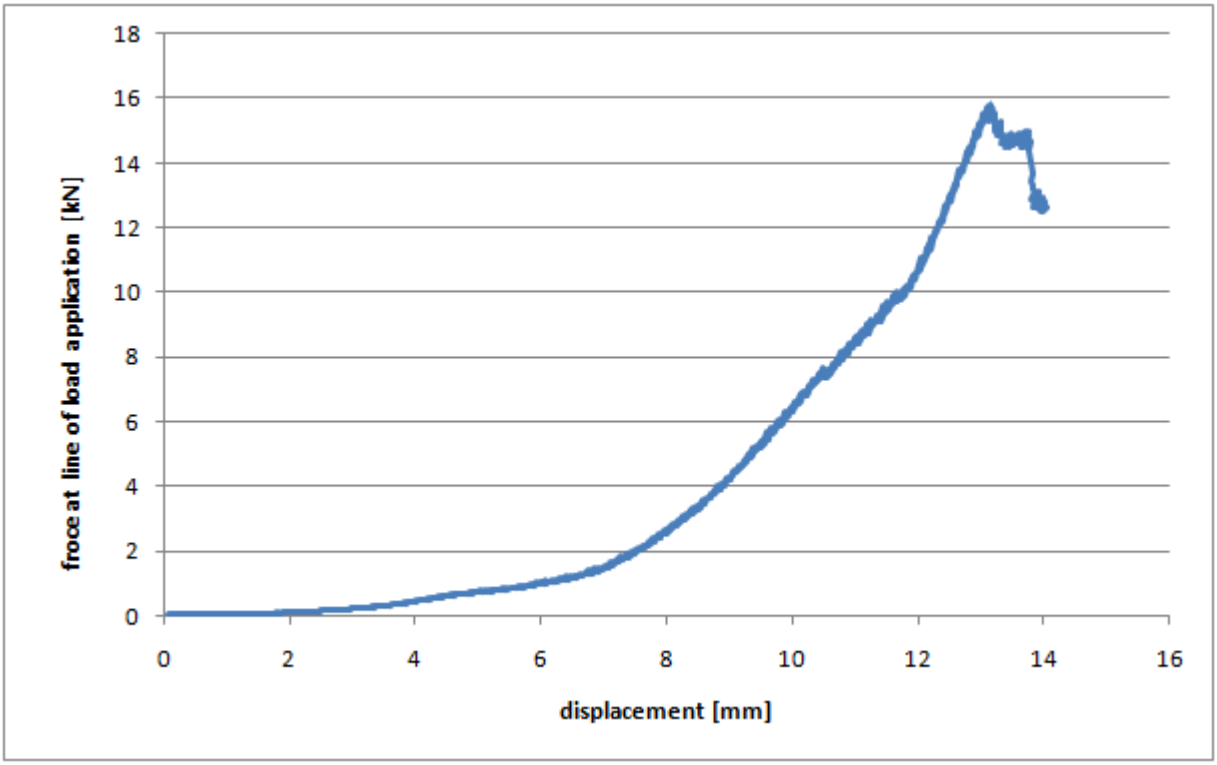
Test No.		**IVb-A-2**
type of test	test with improved corner detail	
introduction of load	steel sheet	
type of improvement	3 dowels FID 50	
type of panel	A	
faces	0,50 mm steel	
core	100 mm PU	
stressed face	top side of production	

Measured dimensions of the wall panel:		
width b	399	mm
height h_1	303	mm
thickness D	95	mm
height of cutting h_2	100	mm
thickness of cutting d_2	49	mm

ultimate load at line of load application	15,88	kN
Failure mode	failure of the lower end	
Remarks		



Test No.	**IVb-A-2**



arrangement of dowels

failure of the lower end

failure of the lower end

bond between face and core

Test No.		**IVb-A-3**
type of test	test with improved corner detail	
introduction of load	steel sheet	
type of improvement	3 dowels FID 50	
type of panel	A	
faces	0,50 mm steel	
core	100 mm PU	
stressed face	top side of production	

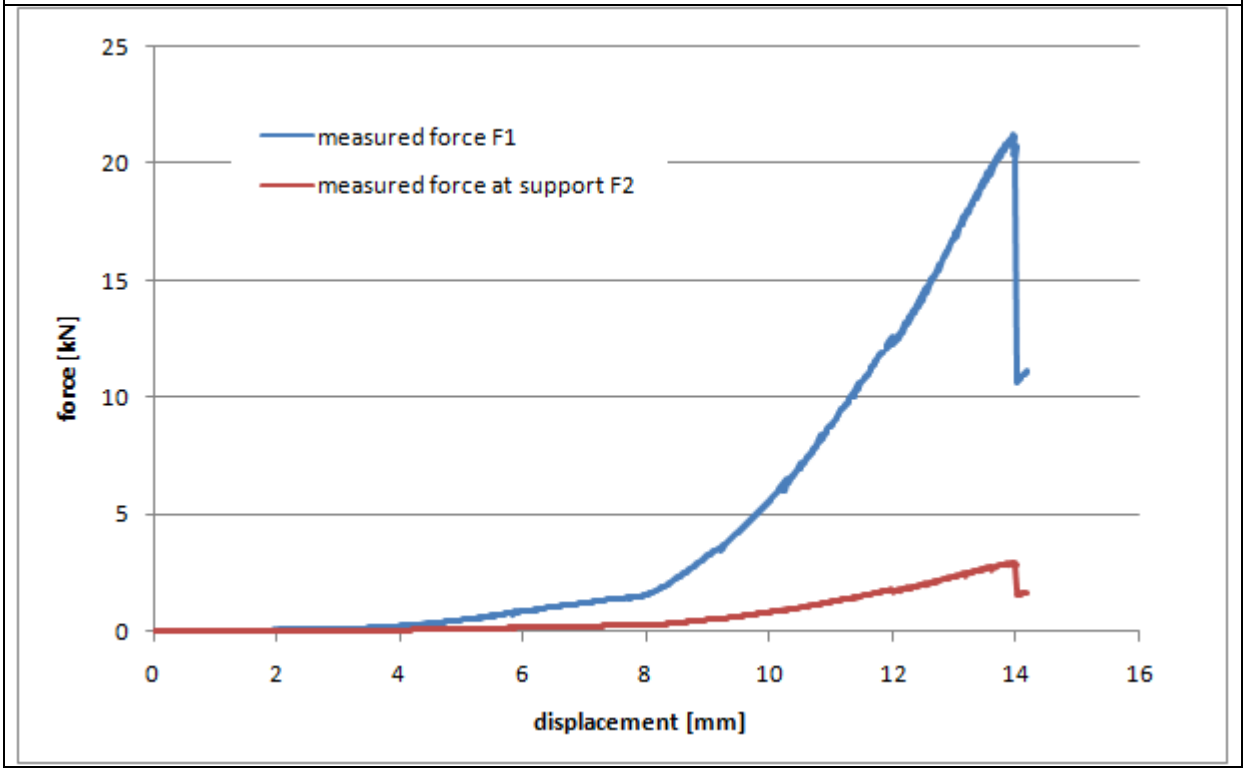
Measured dimensions of the wall panel:

width b	399	mm
height h_1	303	mm
thickness D	96	mm
height of cutting h_2	100	mm
thickness of cutting d_2	48	mm

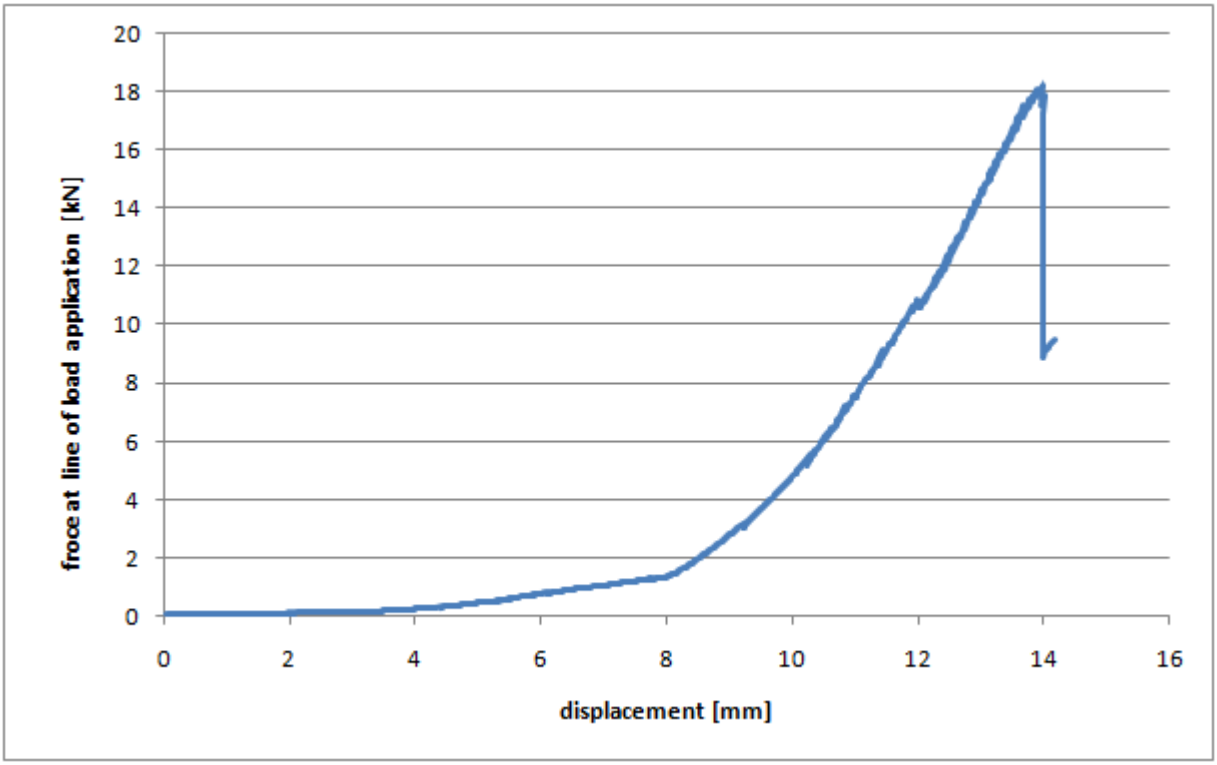
ultimate load at line of load application 18,30 kN

Failure mode crippling of the compressed face

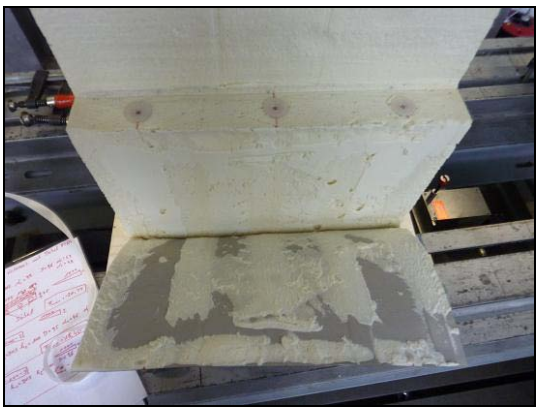
Remarks



Test No.	**IVb-A-3**



crippling of the compressed face



bond between face and core

Test No.		**IVb-A-4**
type of test	test with improved corner detail	
introduction of load	steel sheet	
type of improvement	3 dowels W-ID 95	
type of panel	A	
faces	0,5mm steel	
core	100 mm PU	
stressed face	top side of production	

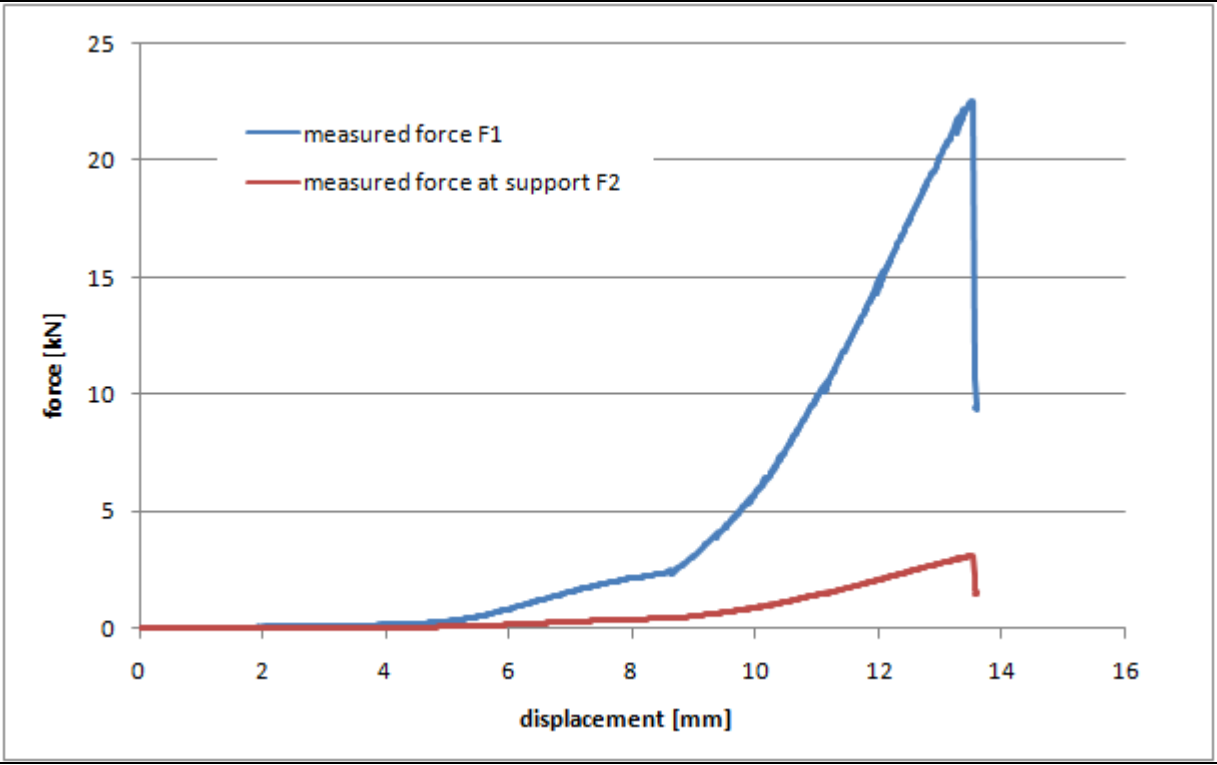
Measured dimensions of the wall panel:

width b	400	mm
height h_1	302	mm
thickness D	96	mm
height of cutting h_2	101	mm
thickness of cutting d_2	48	mm

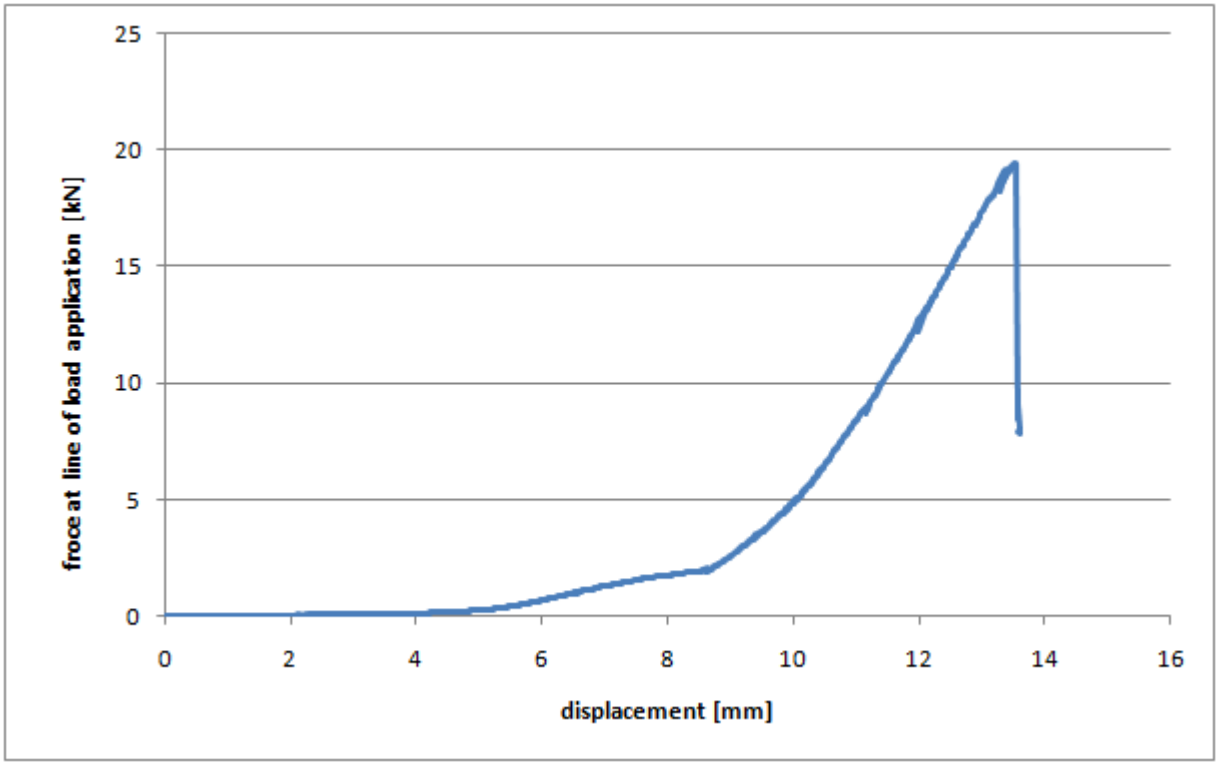
ultimate load at line of load application 19,43 kN

Failure mode crippling of the compressed face

Remarks



Test No.	**IVb-A-4**



arrangement of dowels

bond between face and core

failure of the compressed face

Test No.		**IVb-A-5**
type of test	test with improved corner detail	
introduction of load	steel sheet	
type of improvement	3 dowels W-ID 95	
type of panel	A	
faces	0,5mm steel	
core	100 mm PU	
stressed face	top side of production	

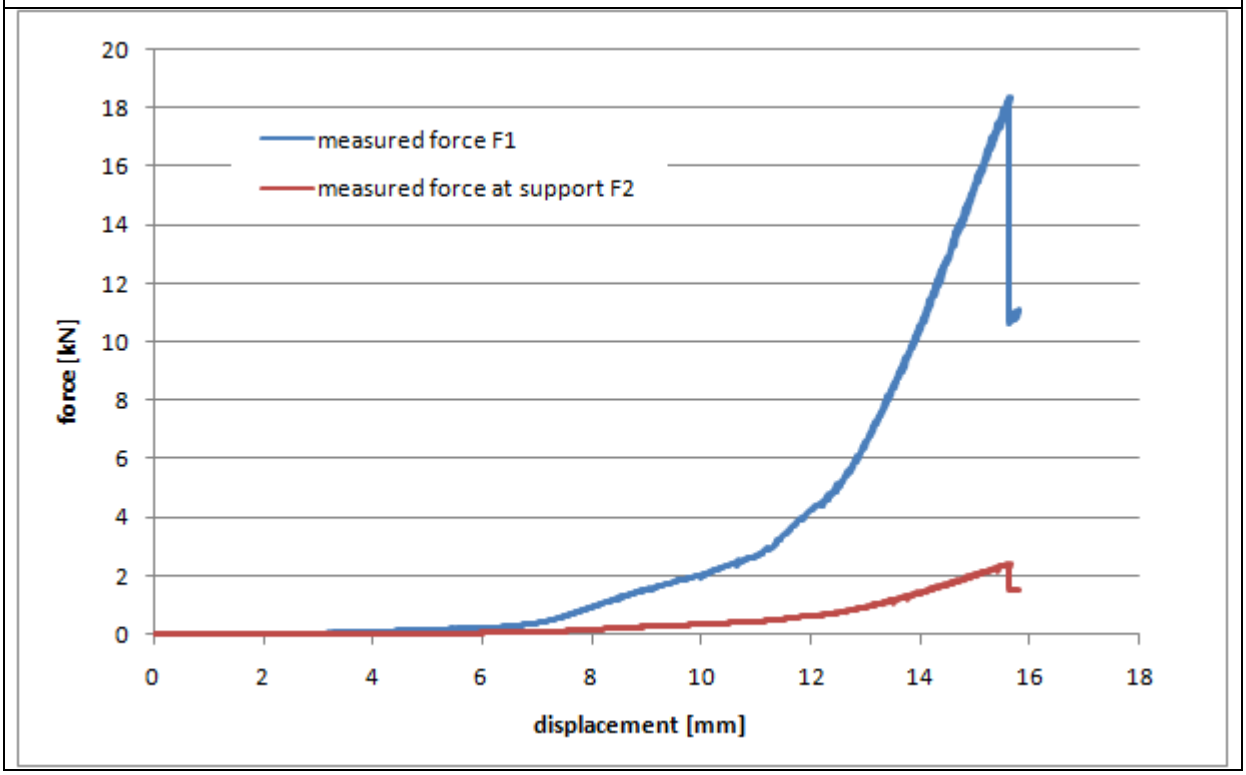
Measured dimensions of the wall panel:

width b	400	mm
height h_1	300	mm
thickness D	97	mm
height of cutting h_2	99	mm
thickness of cutting d_2	48	mm

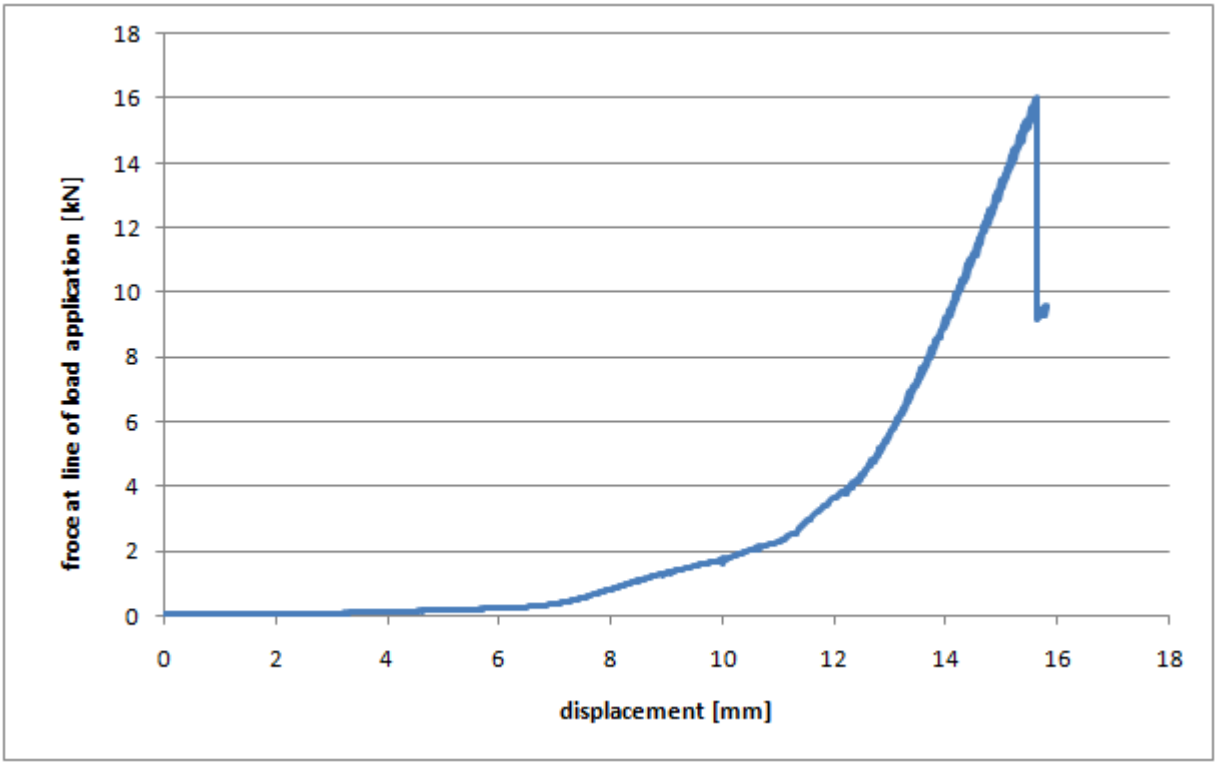
ultimate load at line of load application 16,02 kN

Failure mode crippling of the compressed face

Remarks



Test No.	**IVb-A-5**



arrangement of dowels

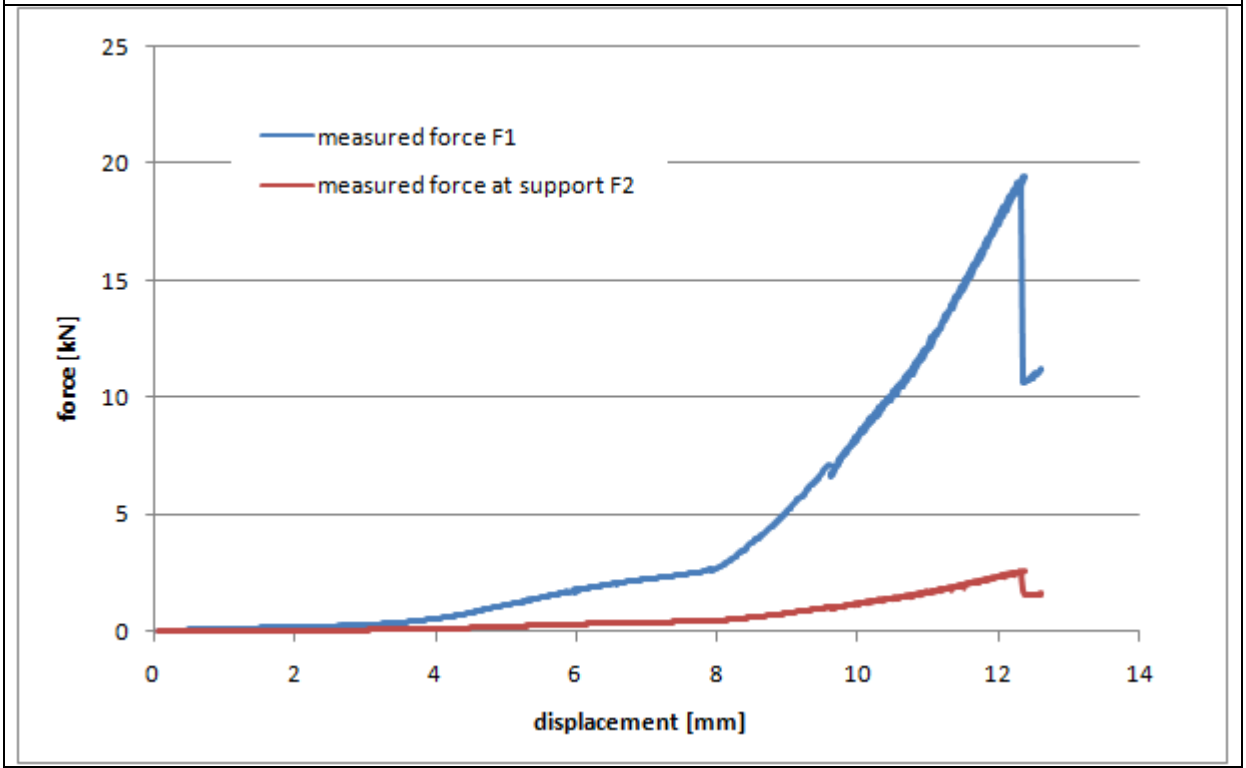
bond between face and core

failure of the compressed face

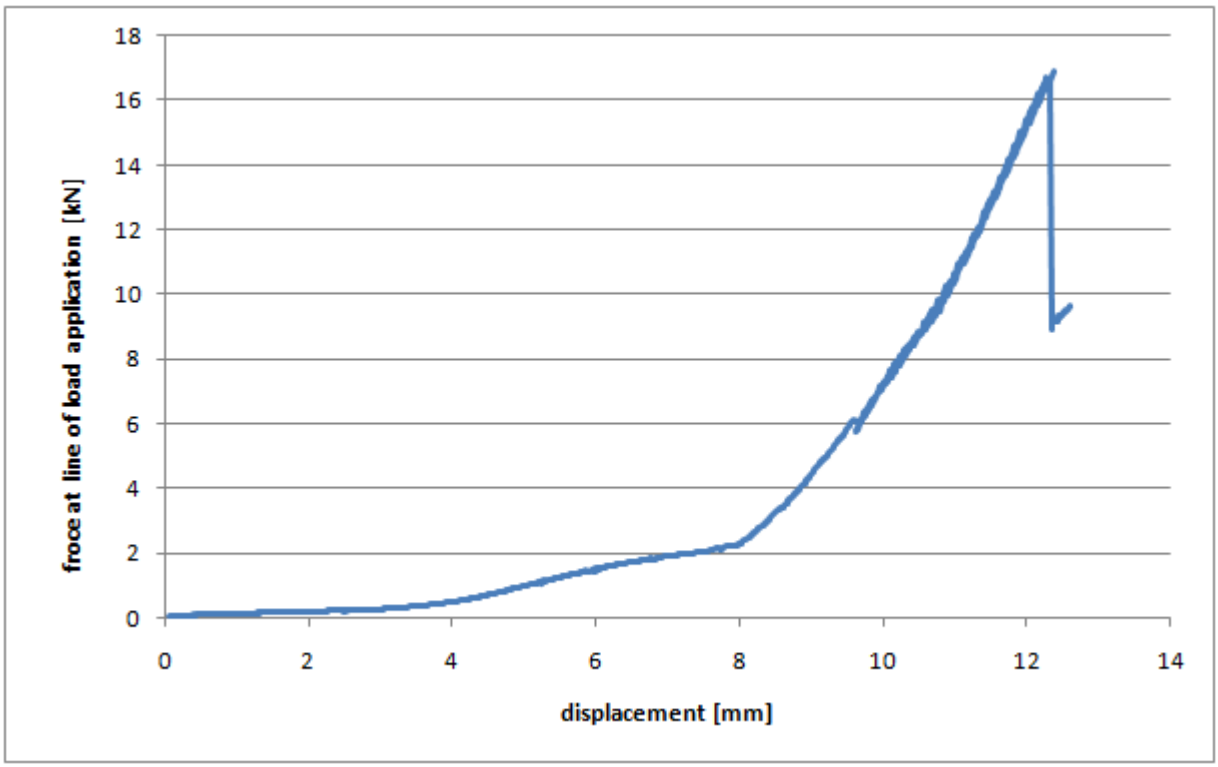
Test No.		**IVb-A-6**
type of test	test with improved corner detail	
introduction of load	steel sheet	
type of improvement	3 dowels W-ID 95	
type of panel	A	
faces	0,5mm steel	
core	100 mm PU	
stressed face	top side of production	

Measured dimensions of the wall panel:		
width b	399	mm
height h_1	296	mm
thickness D	96	mm
height of cutting h_2	100	mm
thickness of cutting d_2	50	mm

ultimate load at line of load application	16,91	kN
Failure mode	crippling of the compressed face	
Remarks		



Test No.	**IVb-A-6**



arrangement of dowels

bond between face and core

crippling of the compressed face

Test No.		**IVb-D-1**
type of test	test with improved corner detail	
introduction of load	steel sheet	
type of improvement	3 dowels FID 50	
type of panel	D	
faces	1,8 mm GFRP	
core	100 mm EPS	
stressed face	top side of production	

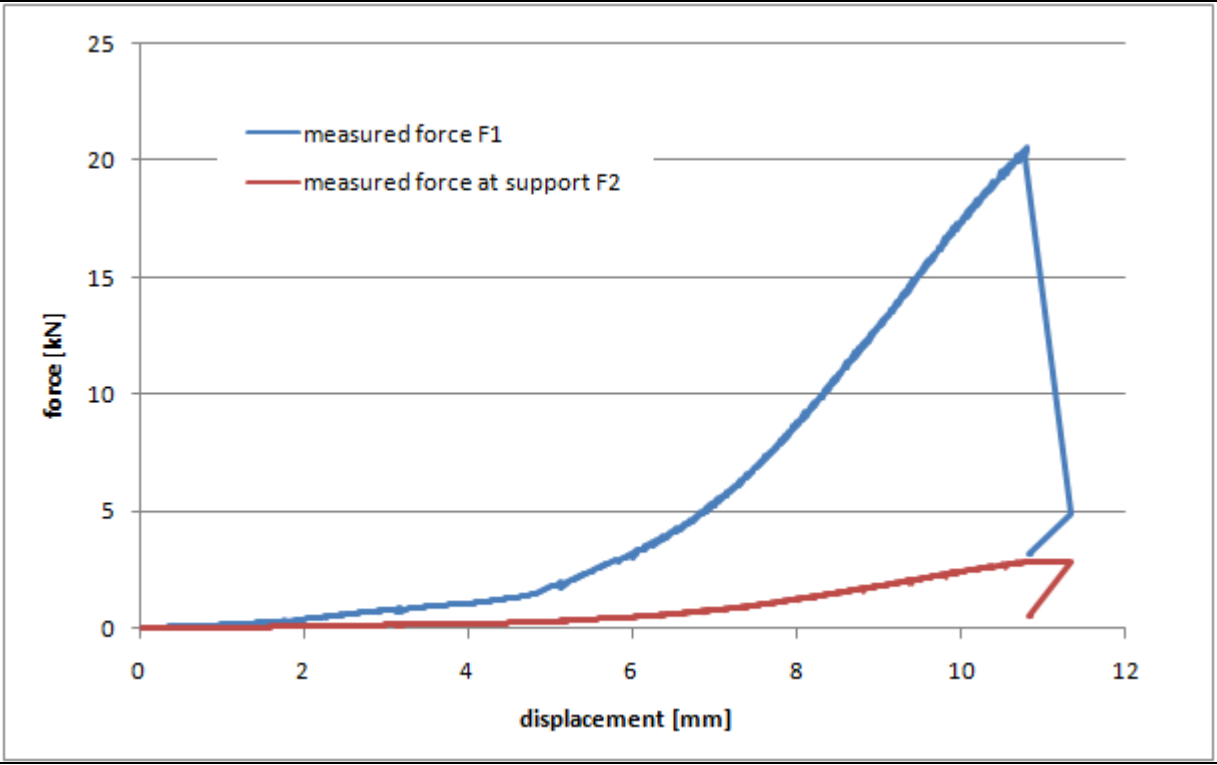
Measured dimensions of the wall panel:

width b	298	mm
height h_1	299	mm
thickness D	102	mm
height of cutting h_2	100	mm
thickness of cutting d_2	70	mm

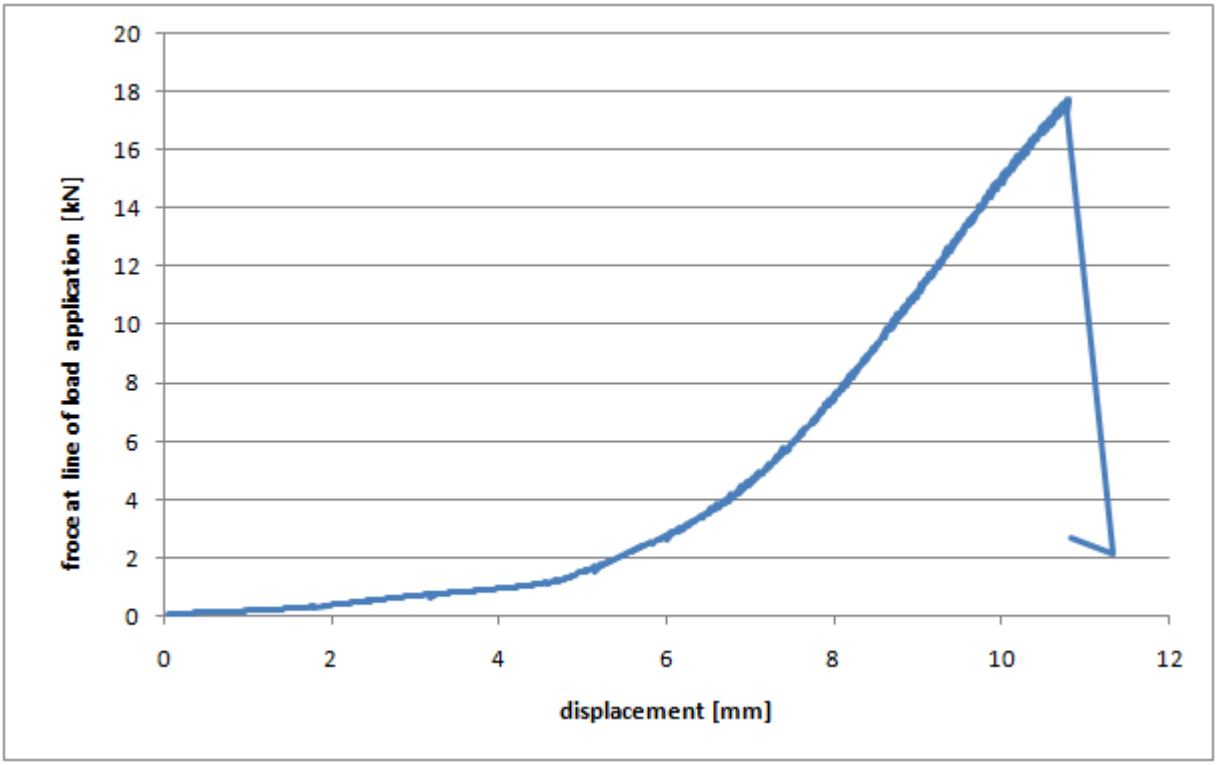
ultimate load at line of load application 17,75 kN

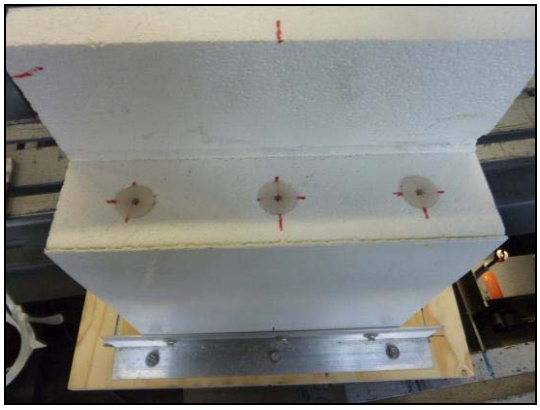
Failure mode buckling of the compressed face

Remarks



Test No.	**IVb-D-1**





arrangement of dowels

bond between face and core

failure of the compressed face

Test No.		**IVb-D-2**
type of test	test with improved corner detail	
introduction of load	steel sheet	
type of improvement	3 dowels FID 50	
type of panel	D	
faces	1,8 mm GFRP	
core	100 mm EPS	
stressed face	top side of production	

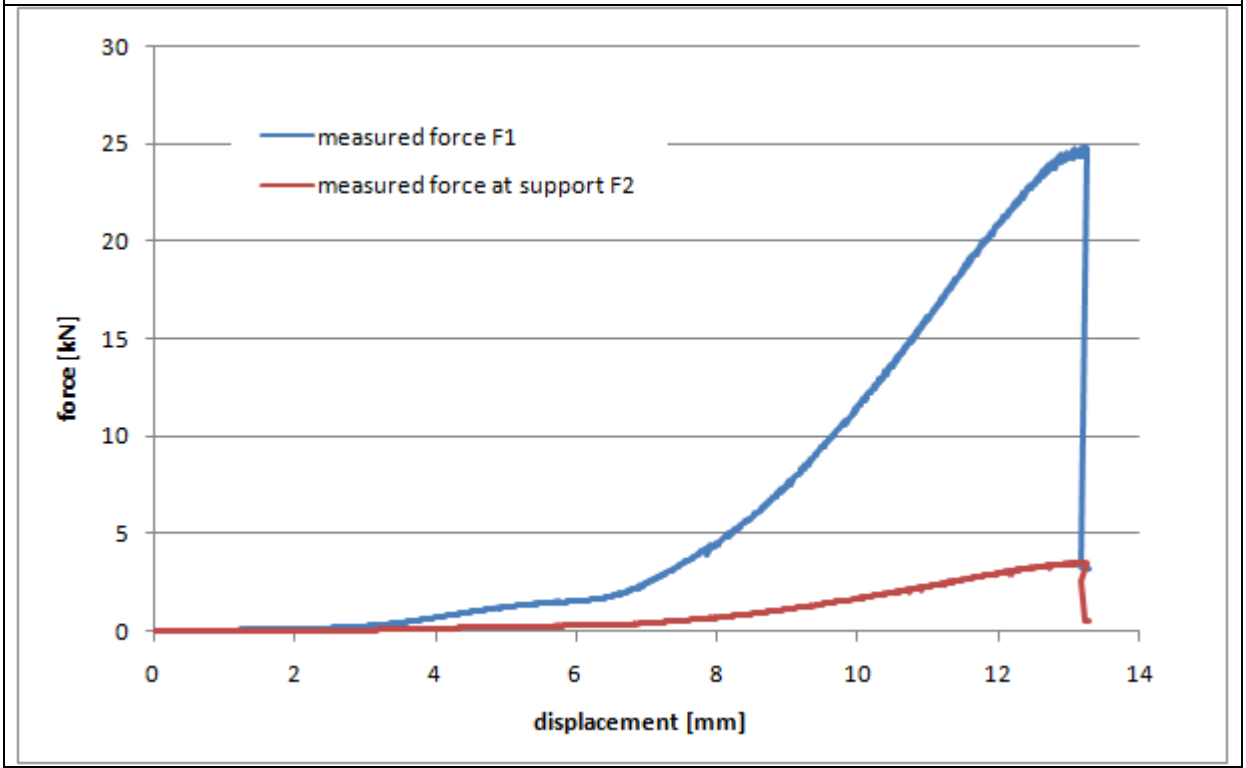
Measured dimensions of the wall panel:

width b	299	mm
height h_1	299	mm
thickness D	102	mm
height of cutting h_2	100	mm
thickness of cutting d_2	70	mm

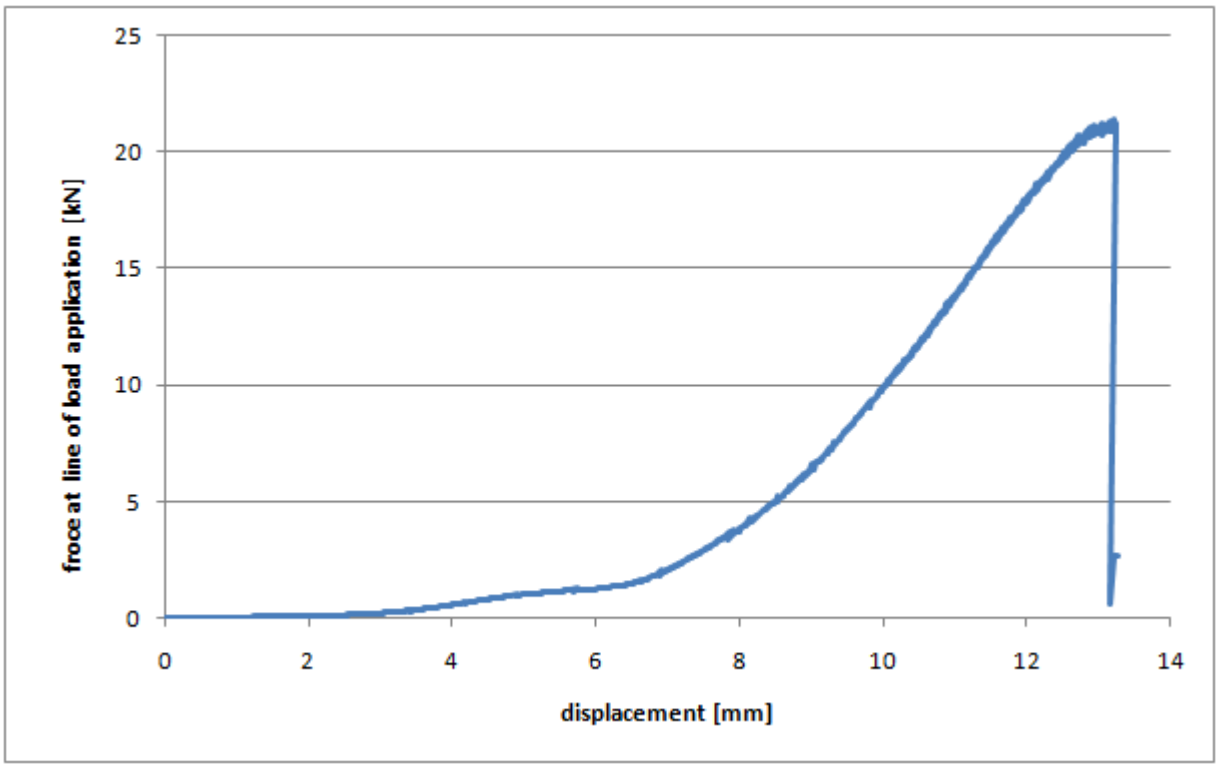
ultimate load at line of load application 21,41 kN

Failure mode buckling of the compressed face

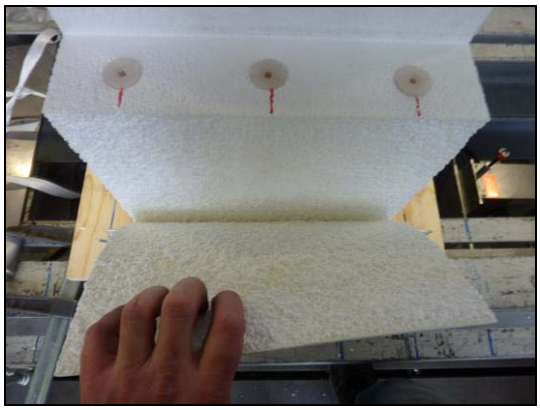
Remarks



Test No.	**IVb-D-2**



arrangement of dowels



bond between face and core

failure of the compressed face

Test No.		**IVb-D-3**
type of test	test with improved corner detail	
introduction of load	steel sheet	
type of improvement	3 dowels FID 50	
type of panel	D	
faces	1,8 mm GFRP	
core	100 mm EPS	
stressed face	top side of production	

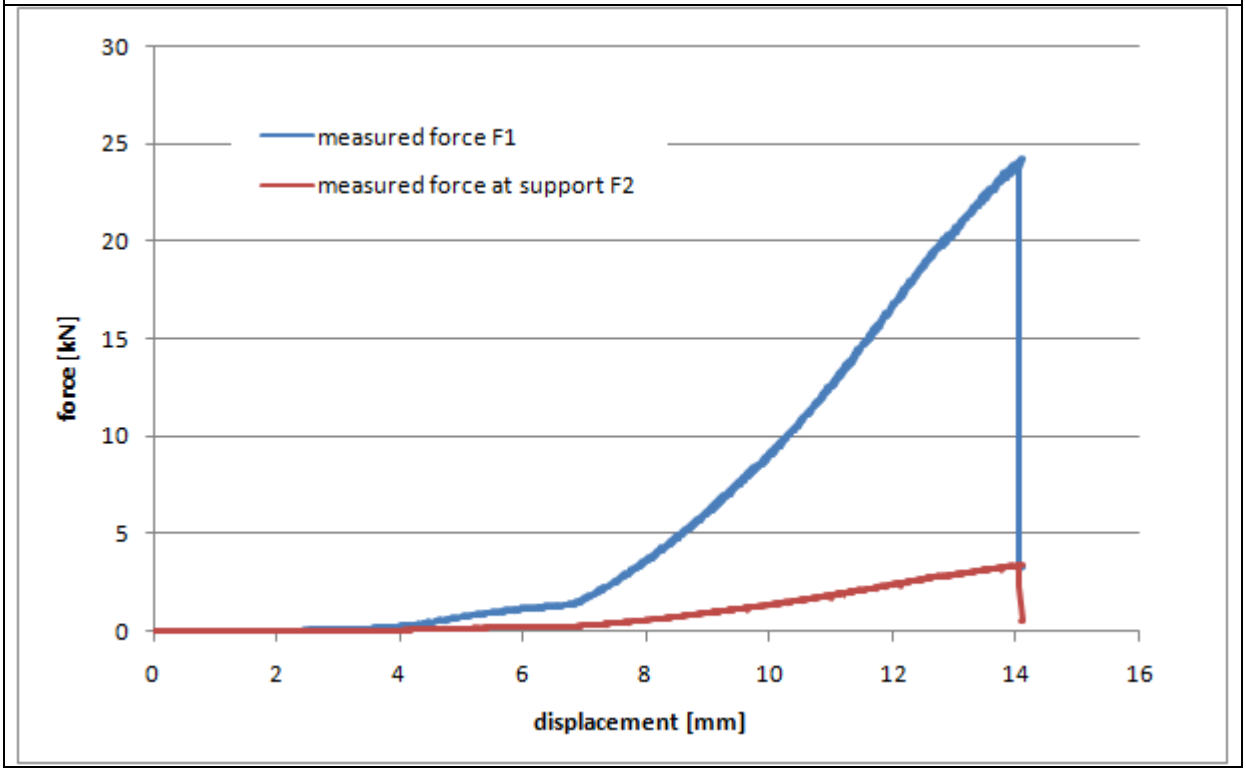
Measured dimensions of the wall panel:

width b	299	mm
height h_1	300	mm
thickness D	102	mm
height of cutting h_2	99	mm
thickness of cutting d_2	70	mm

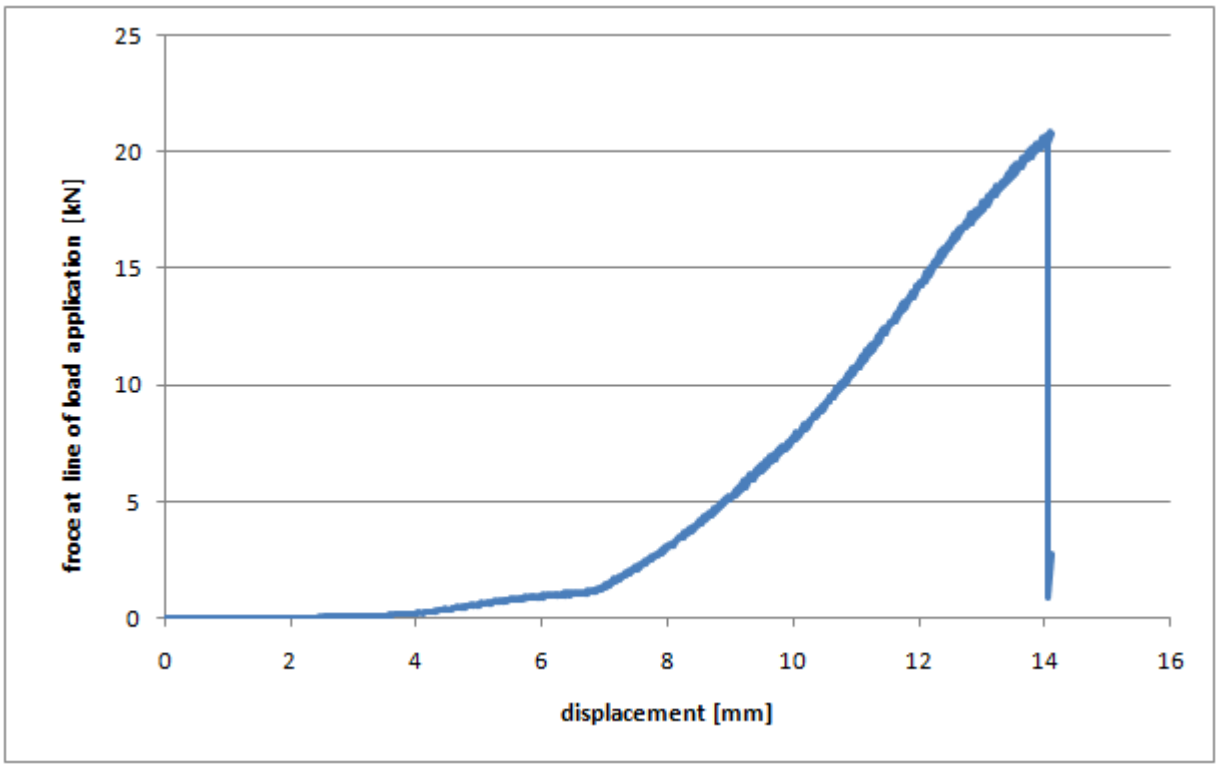
ultimate load at line of load application 20,91 kN

Failure mode buckling of the compressed face

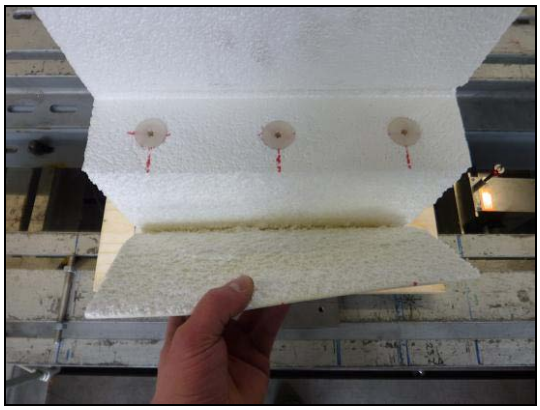
Remarks



Test No.	**IVb-D-3**

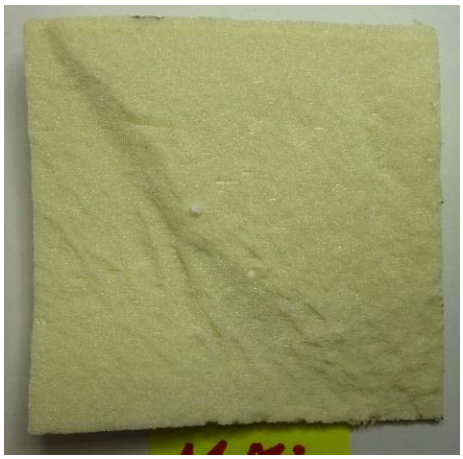


arrangement of dowels

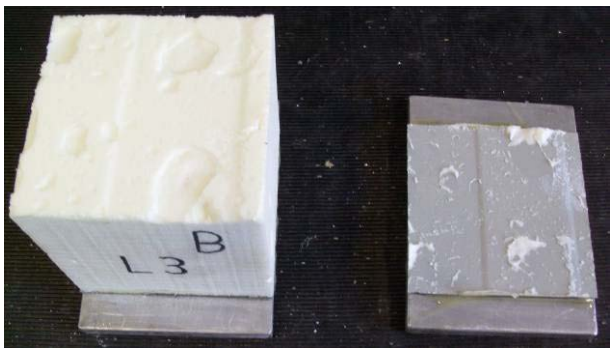
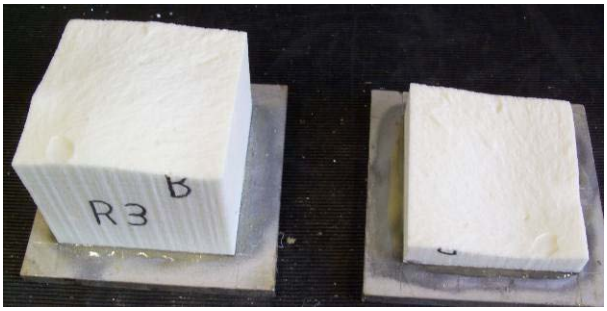
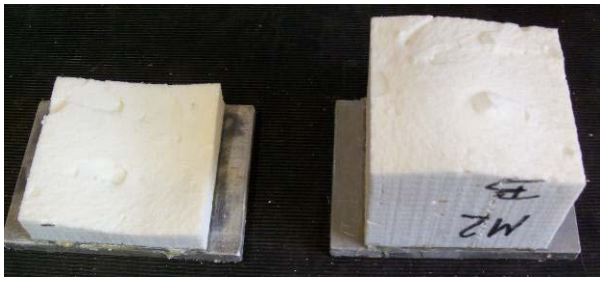


bond between face and core

failure of the compressed face

tensile test	**panel type A**
	
	
	




tensile test	**panel type B**
	
	
	

tensile test	**panel type C**
	
	
	

tensile test	**panel type D**
	
	

tensile test	**panel type E**