



# Test Report

Report No.: 838420T

- Assignor:** Nordic Build A/S  
Bjernermarksvej 54  
DK-5700 Svendborg
- Subject:** **Test specimens according to NB-1, for the determination of shear strength of glue lines – see appendix 1.**
- Sampling:** The test material was prepared by the assignor and received at the Danish Technological Institute, Taastrup, on 01-11-2018.
- Method:** NB-1 Bestemmelse af korttidsforskydningsstyrken af limede samlinger mellem kroplade og flanger i et I-profil :2018 (Determination of short time shear strength of glued joints between board material and metal plate flanges of an I-profile)
- Due to the lack of parallelity in the test specimens, a pivot bearing had to be built into the test set-up – see photo in Appendix 1.
- Dimensions of shear lines were measured for all specimens.
- The test material was stored at 20°C/65 % RH prior to testing.
- Equipment:** Load cell: 100 kN Instron, IDD 80578  
Calipers, EQP 881
- Period:** November 2018
- Result:** Appendix 2: Summary of test results, Appendix 3: Individual test results.
- Note:** -
- Storage:** The test material will be destroyed after 1 month, unless otherwise agreed.
- Terms:** The test has been performed according the general terms and conditions of The Danish Technological Institute. The results from DTI's work in this report, i.e. analyses, assessments and instructions may only be used or reported in their entirety. The customer may not mention or refer to DTI or DTI's employees for advertising or marketing purposes unless the DTI has granted its written consent in each case.
- Date/place:** 09-11-2018, Danish Technological Institute, Wood and Biomaterials, Taastrup

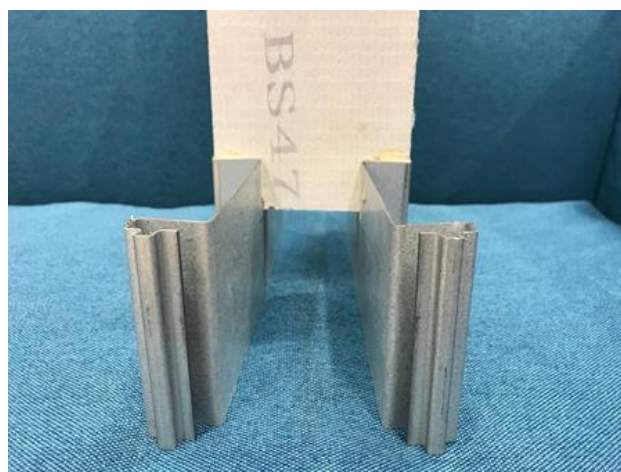
**Signature:** Test responsible

Co-signatory

## Materials

Report no.: 838420T  
Appendix: 1  
Page: 1 of 2  
Initials: Jlj/pfy/hbs

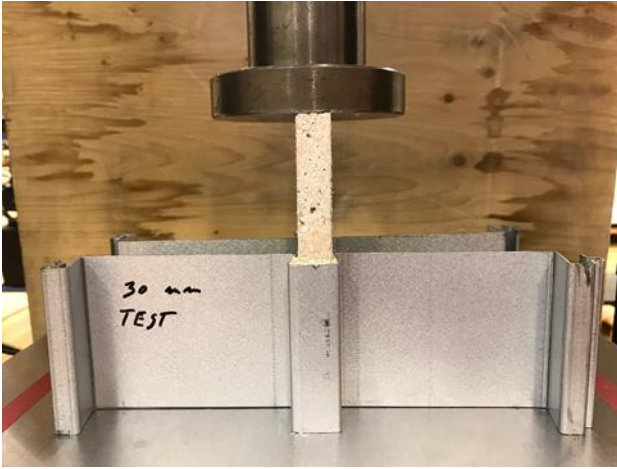
Material	Description
Steel plate Swallow tail profile	0,9 mm DX51 D + AZ 150 AS  DX51 D = Standard steel, with tension strength 500 MPa AZ 150 AS = Surface treatment, AluZink minimum 150 g/m <sup>2</sup> , Normal appearance (A), Anti Fingerprint surface (S)
Panel	15 mm MAGPLY Magnesium Oxide Board with glass fibre mesh webbing. One side smooth. White
Glue	Base: Kestopur PL 5 - 10 <a href="https://pim.kiilto.com/kiilto-pim-api/api/pdf/download/5b11bbaee4b08a98c0299467">https://pim.kiilto.com/kiilto-pim-api/api/pdf/download/5b11bbaee4b08a98c0299467</a>  Hardener: Profect 91102 <a href="http://pki.dk/handler/download/PT91102_DK_SDS.pdf">http://pki.dk/handler/download/PT91102_DK_SDS.pdf</a>
	All descriptions are given by the assignor



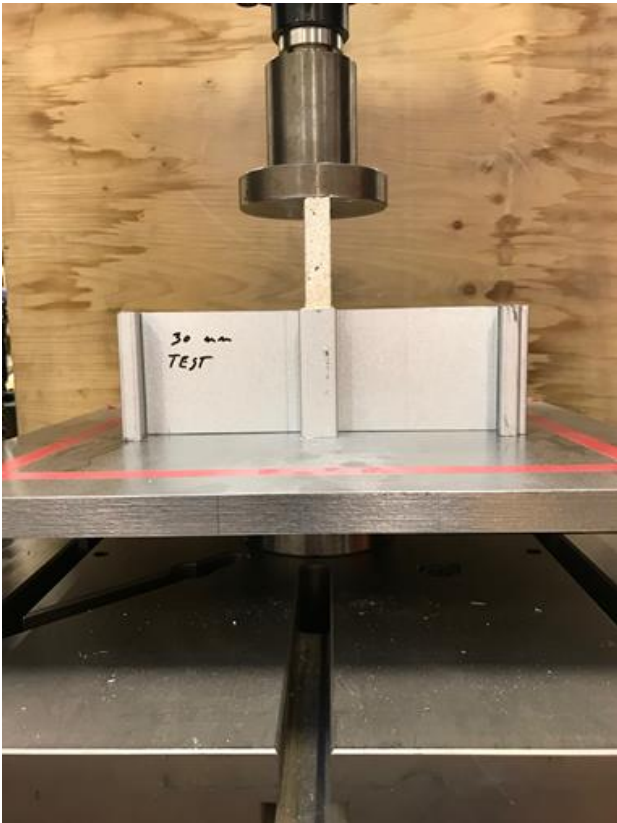
Test specimens – glue line length 20, 30 or 40 mm

Report no.: 838420T  
Appendix: 1  
Page: 2 of 2  
Initials: Jlj/pfy/hbs

## Materials



Test specimen in test machine



Test specimen in test machine

Report no.: 838420T  
 Appendix: 2  
 Page: 1 of 1  
 Initials: Jlj/pfy/hbs

## Summary of test results

<b>Sample dimension</b>	<b>Shear strength [N/mm]</b>	<b>Stiffness [N/mm]</b>
20 mm	Mean value: 118,13	Mean value: 7215
30 mm	Mean value: 141,38	Mean value: 11204
40 mm	Mean value: 115,17	Mean value: 12647

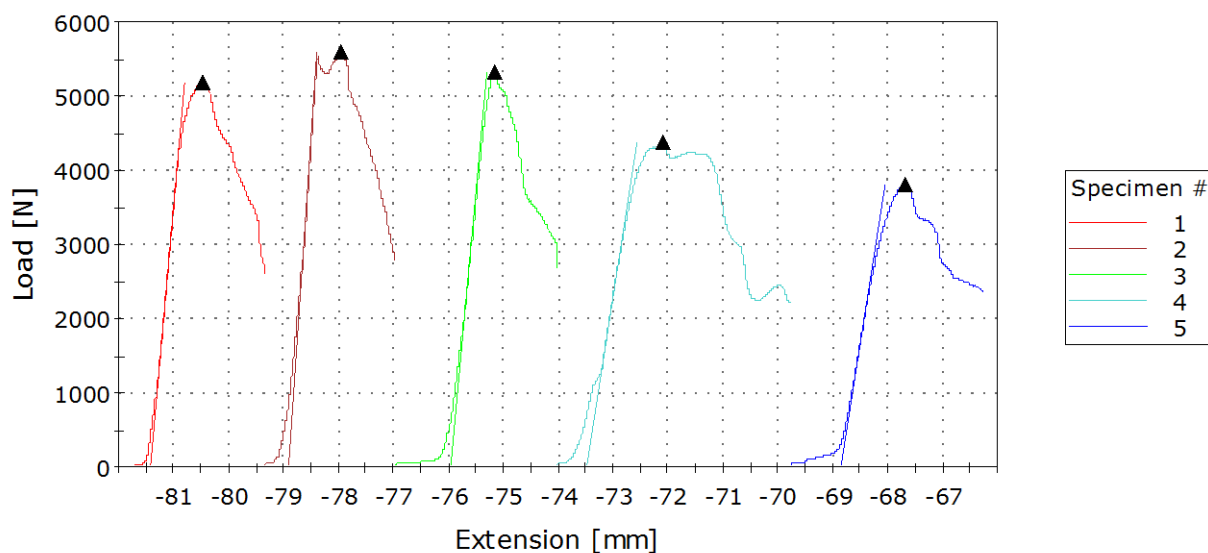
<b>All - 20 + 30 + 40 mm</b>		
	<b>Shear strength</b>	<b>Stiffness</b>
Mean value [N/mm]	126,24	10983
Standard deviation [N/mm]	24,88	3069
Coefficient of variation [%]	19,7	27,9
Characteristic value [N/mm]		10983
5 %-tile fraction according to EN 14358	83	

## Individual test results

Report no.: 838420T  
Appendix: 3  
Page: 1 of 4  
Initials: Jlj/pfy/hbs

Nordic Build - Shear test of glue line panel/metal plate

### Specimen 1 to 5



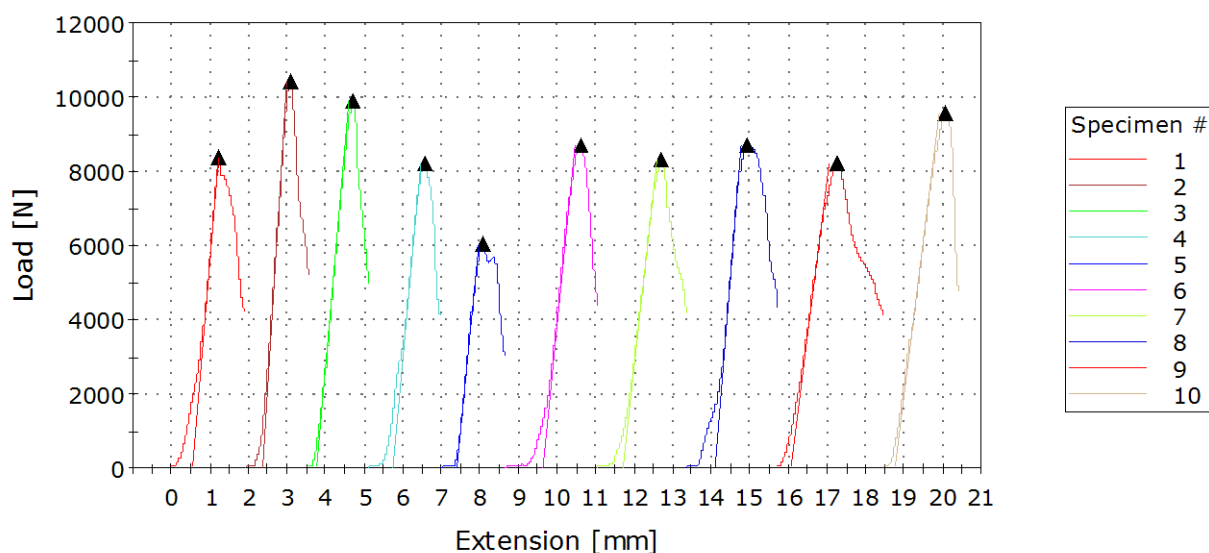
	Specimen label	Shear length side 1 [mm]	Shear length side 2 [mm]	Maximum Load [N]	Extension at Maximum Load [mm]	Shear strength [N/mm]	Maximum Slope (Automatic Young's) [N/mm]	Time at Maximum Load [s]
	1	20-1	21,7	5185	-80,464	124,34	8186	38
	2	20-2	19,3	5591	1,379	142,98	10551	42
	3	20-3	19,4	5324	1,797	135,48	8047	54
	4	20-4	22,0	4372	1,940	99,60	4672	58
	5	20-5	22,3	3812	2,090	88,24	4618	63
Mean		20,9	20,5	4857	-14,652	<b>118,13</b>	<b>7215</b>	51
Standard deviation		1,5	0,9	740	36,791	23,42	2548	11
Coefficient of variation		7,0	4,4	15	-251,104	19,82	35	21

## Individual test results

Report no.: 838420T  
Appendix: 3  
Page: 2 of 4  
Initials: Jlj/pfy/hbs

Nordic Build - Shear test of glue line panel/metal plate

### Specimen 1 to 10



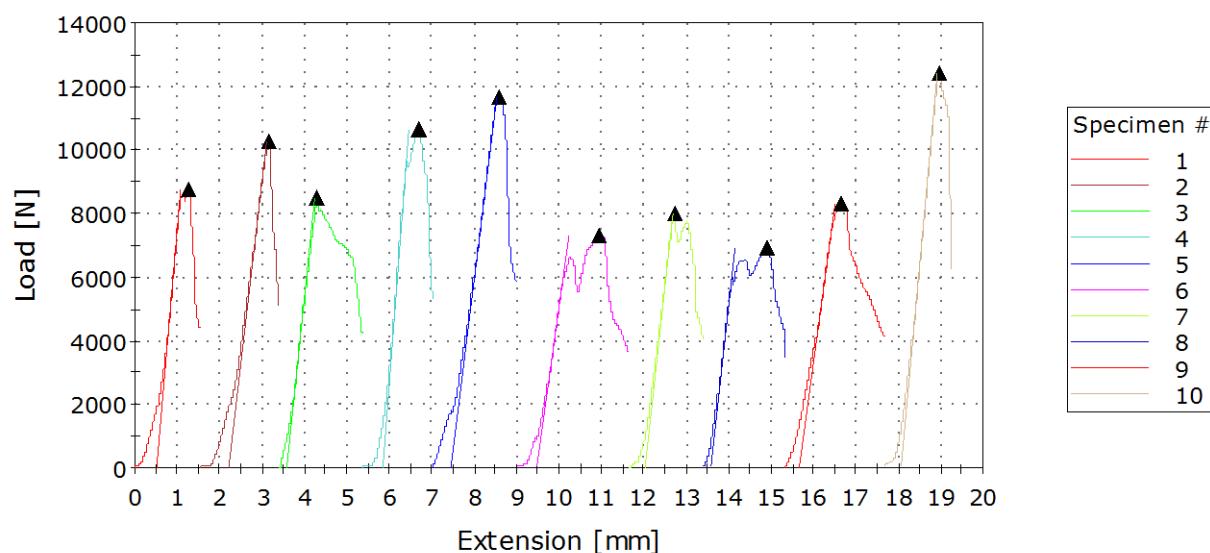
	Specimen label	Shear length side 1 [mm]	Shear length side 2 [mm]	Maximum Load [N]	Extension at Maximum Load [mm]	Shear strength [N/mm]	Maximum Slope (Automatic Young's) [N/mm]	Time at Maximum Load [s]
	1	30-1	26,7	8380	1,249	155,48	12370	38
	2	30-2	30,8	10416	1,159	165,86	15667	35
	3	30-3	31,7	9904	1,160	157,20	12130	35
	4	30-4	30,8	8227	1,428	133,76	10984	43
	5	30-5	32,0	6051	1,085	92,81	11296	33
	6	30-6	31,4	8719	1,979	136,65	10467	60
	7	30-7	30,7	8304	1,654	135,24	9682	50
	8	30-8	28,5	8683	1,578	152,86	13177	48
	9	30-9	30,9	8234	1,562	131,53	8188	47
	10	30-10	31,5	9557	1,587	152,42	8080	48
	Mean		30,5	8647	1,444	<b>141,38</b>	<b>11204</b>	43
	Standard deviation		1,6	1193	0,281	20,75	2305	8
	Coefficient of variation		5,4	14	19,472	14,68	21	19

## Individual test results

Report no.: 838420T  
Appendix: 3  
Page: 3 of 4  
Initials: Jlj/pfy/hbs

Nordic Build - Shear test of glue line panel/metal plate

### Specimen 1 to 10



	Specimen label	Shear length side 1 [mm]	Shear length side 2 [mm]	Maximum Load [N]	Extension at Maximum Load [mm]	Shear strength [N/mm]	Maximum Slope (Automatic Young's) [N/mm]	Time at Maximum Load [s]
1	40-1	39,9	39,0	8788	1,293	111,38	14978	39
2	40-2	41,8	40,4	10268	1,607	124,91	11817	48
3	40-3	39,1	39,4	8511	0,893	108,42	13413	27
4	40-4	39,7	41,1	10656	1,325	131,88	17687	40
5	40-5	38,7	39,4	11665	1,549	149,36	10727	47
6	40-6	39,4	42,7	7303	1,934	88,95	9976	58
7	40-7	39,4	41,4	8037	1,087	99,47	11676	33
8	40-8	39,2	42,2	6934	1,500	85,19	12189	45
9	40-9	40,0	42,6	8330	1,347	100,85	9972	40
10	40-10	41,7	40,5	12434	1,319	151,26	14031	40
Mean		39,9	40,9	9293	1,385	<b>115,17</b>	<b>12647</b>	42
Standard deviation		1,1	1,4	1862	0,287	23,44	2430	9
Coefficient of variation		2,6	3,3	20	20,691	20,35	19	21

## Individual test results

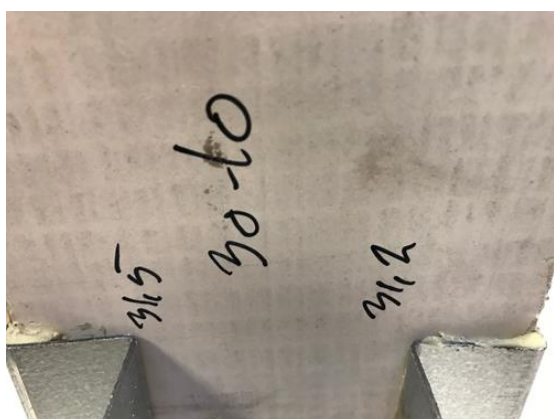
Report no.: 838420T  
Appendix: 3  
Page: 4 of 4  
Initials: Jlj/pfy/hbs

Failure modes			
Speciemn #	20 mm	30 mm	40 mm
1	2 x S	1 x S+ P	1 x S+ P
2	2 x S	1 x S	1 x S+ P
3	2 x S	1 x S	1 x S
4	1 x S	1 x S	1 x S
5	1 x S	1 x S	1 x S+ P
6	-	1 x S	1 x S
7	-	1 x S	1 x S + P
8	-	1 x S	1 x S + NG
9	-	1 x S + P	1 x S + P
10	-	1 x S +P + NG See photo below.	1 x S + P

S: Failure in board surface.

P: Failure in Board.

NG: Glue is missing in joint.



Lack of glue in specimen no. 30-10.