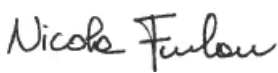
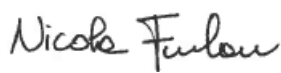


	Product design and development	Format RP Rev. C Date: 06/02/08
	TEST REPORT	Doc. n. RP 026-13 Rev. 1 Page 1 of 28
Subject: ISOTEX® products load bearing tests.		

1. DESCRIPTION	2
2. TESTED SAMPLES AND TEST CONDITIONS	3
2.1. ANCHORING SYSTEMS	3
2.2. SUPPORTS	6
2.3. TEST DIAGRAM AND EQUIPMENT	8
3. TEST DATA.....	9
3.1. PULL LOAD	9
3.2. SHEAR LOAD	15
4. FISCHER FASTGRIP800 POLYURETHANE FOAM PULL RESISTANCE.....	27
5. DATA SUMMARY.....	28

	Processing	Check	Approval
Signature:	Nicola Furlan 	Stefano Bolzonella 	Nicola Furlan 
Function:	S.T.	S.T.	S.T.
Date	29/08/2013	28/08/2013	28/08/2013

fischer 	Product design and development	Format RP Rev. C Date: 06/02/08
	TEST REPORT	Doc. n. RP 026-13 Rev. 1 Page 2 of 28
Subject: ISOTEX® products load bearing tests.		

1. Description

Pull and shear loading tests on fischer anchoring systems installed on ISOTEX® wood cement supports



fischer 	Product design and development	Format RP Rev. C Date: 06/02/08
	TEST REPORT	Doc. n. RP 026-13 Rev. 1 Page 3 of 28
Subject: ISOTEX® products load bearing tests.		

2. Tested samples and test conditions

2.1. Anchoring systems



Anchoring system
fischer UX . Universal nylon plug.

Type of anchoring: not pass-through

Tested plug	Ø x drilling depth (mm)	Ø x length of screw (mm)	Anchoring thickness (mm)	Type of test	Test number
UX 6 x 35 RS/10 Code 71548	6 x 55	4.5 x 50	5	single pull load perpendicular to the wall (pull load)	5
				single pull load parallel to the wall (shear/bending load)	5
UX 8 x 50 R S/10 Code 71550	8 x 70	5 x 65	5	single pull load perpendicular to the wall (pull load)	5
				single pull load parallel to the wall (shear/bending load)	5
UX 10 x 60 R S/15 Code 71550	10 x 85	7 x 80	5	single pull load perpendicular to the wall (pull load)	5
				single pull load parallel to the wall (shear/bending load)	5

fischer 	Product design and development	Format RP Rev. C Date: 06/02/08
	TEST REPORT	Doc. n. RP 026-13 Rev. 1 Page 4 of 28
Subject: ISOTEX® products load bearing tests.		



Anchoring system: **fischer SXR** . Long-length nylon plug for windows and carpentry Type of anchoring: pass-through

Tested plug	Ø x drilling depth (mm)	Ø screw (mm)	Anchored thickness (mm)	Type of test	Test number
SXR 8 x 80 WT code 506474	8 x 90	6	30	single pull load perpendicular to the wall (pull load)	5
				single pull load parallel to the wall (shear/bending load)	5
SXR 10 x 80 WT code 506477	10 x 90	8	30	single pull load perpendicular to the wall (pull load)	5
				single pull load parallel to the wall (shear/bending load)	5



Anchoring system: **fischer FFS** . Stainless steel screw for walls.

Anchoring type: pass-through

Tested plug	Ø x drilling depth (mm)	Ø screw (mm)	Anchored thickness (mm)	Type of test	Test number
FFS 7.5x 102 SK Code 68956	8 x 90	6	30	single pull load perpendicular to the wall (pull load)	5
				single pull load parallel to the wall (shear/bending load)	5

fischer 	Product design and development	Format RP Rev. C Date: 06/02/08
	TEST REPORT	Doc. n. RP 026-13 Rev. 1 Page 5 of 28
Subject: ISOTEX® products load bearing tests.		



Anchoring system:
fischer FBN II. Stainless steel
screw for walls.

Anchoring type: pass-through

Tested plug	Ø drilling depth (mm)	Minimum anchoring depth. ⁽¹⁾ (mm)	Anchored thickness (mm)	Type of test	Tightening torque (Nm)	Test number
10/140 Code 40944	10	50	140	single pull load parallel to the wall (shear/bending load)	30	5
FBN II 12/120 code 45267	12	65	120	single pull load parallel to the wall (shear/bending load)	50	5

- (1) The minimum anchoring depth is measured only in the concrete core of the tested support. The thickness of the insulation and the wall of the concrete wood block are therefore to be considered part of the anchored thickness.



Anchoring system
fischer V-Bond. Hybrid vinyl
ester resin for walls.

Type of anchoring: not pass-through



Resins	Ø bar used	Ø drilling depth (mm)	Minimum anchoring depth ⁽²⁾ (mm)	Type of test	Test number
fischer V-Bond code 516352	Threaded bar M12x1000 cl8.8 code 71502	14	90	single pull load parallel to the wall (shear/bending load)	5
	M16x1000 threaded bar cl8.8 Code 557329	18	110		5

- (2) The minimum anchoring depth is measured only in the concrete core of the tested support.

fischer 	Product design and development	Format RP Rev. C Date: 06/02/08
	TEST REPORT	Doc. n. RP 026-13 Rev. 1 Page 6 of 28
Subject: ISOTEX® products load bearing tests.		



Anchoring system
fischer FIS Super Bond 390 S
Professional resin for concrete.
Type of anchoring: not pass-through



Resins	Ø bar used	Ø drilling depth (mm)	Minimum anchoring depth (2)(mm)	Type of test	Test number
fischer FIS SB 390 S code 519450	Threaded bar M12x1000 cl8.8 code 71502	14	90	single pull load parallel to the wall (shear/bending load)	5
	M16x1000 threaded bar cl8.8 code 557329	18	110		5

2.2. Supports

Rest supports made by ISOTEX and tested in 'as-are' condition.

Supports made up of ISOTEX blocks wall surrounds as per indications of the constructor. Frame core in reinforced concrete without plaster

Support	Sizes (cm)	Type of block	Dimensions of block (cm)	Notes
A	125 x 75 x 30	HD III 30/7	50 x 30 x 25	
B	125 x 75 x 44	HD III 44/18	50 x 44 x 25	
C	50 x 30 x 25	HD III 30/7	50 x 30 x 25	
D	50 x 44 x 25	HD III 44/18	50 x 44 x 25	

- Pull tested plugs on A-type support
- Chemical shear tested plugs on B-type support
- Shear tested plugs on C- and D-type support
- Heavy mechanical plugs (FBN II) tested on A-type frame

fischer 	Product design and development	Format RP Rev. C Date: 06/02/08
	TEST REPORT	Doc. n. RP 026-13 Rev. 1 Page 7 of 28
Subject: ISOTEX® products load bearing tests.		



A-type support



B-type support



C-type support



D-type support

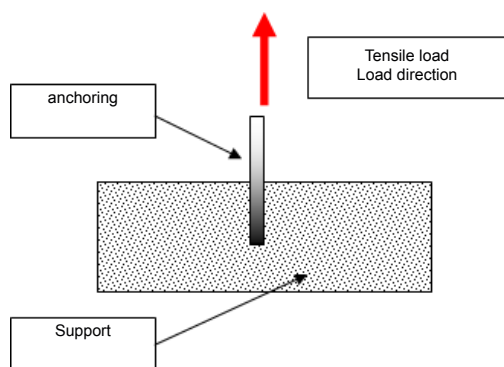
- Plugs on side with insulation
- Test on chemical anchorings performed 24 hours after application

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	TEST REPORT	Doc. n. RP 026-13 Rev. 1 Page 8 of 28
Subject: ISOTEX® products load bearing tests.		

2.3. Test diagrams and equipment

Pull loads

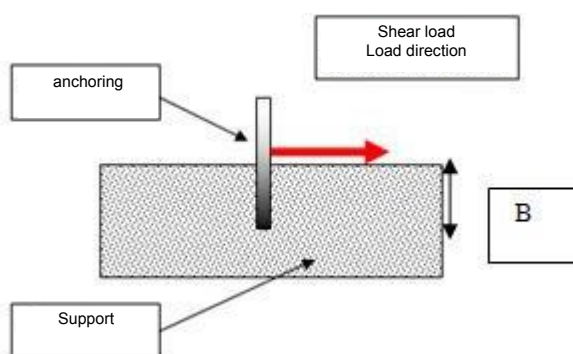
Load bearing tests performed with Spider BEAM testing machine 5 kN load cell calibration certificate n. 27887 issued by TMT and valid until 25/02/14



Shear load

Load bearing tests performed with

- Spider BEAM testing machine 5 kN load cell calibration certificate n. 27885 issued by TMT and valid until 25/02/14
- Zwick Roell 250 kN load cell n. 27879 issued by TMT and valid until 25/02/14.



B = Lever arm: distance of application of the load measured from the surface line of the concrete in which the anchorage is inserted, therefore equal to the thickness of the insulation and the cement wood wall.



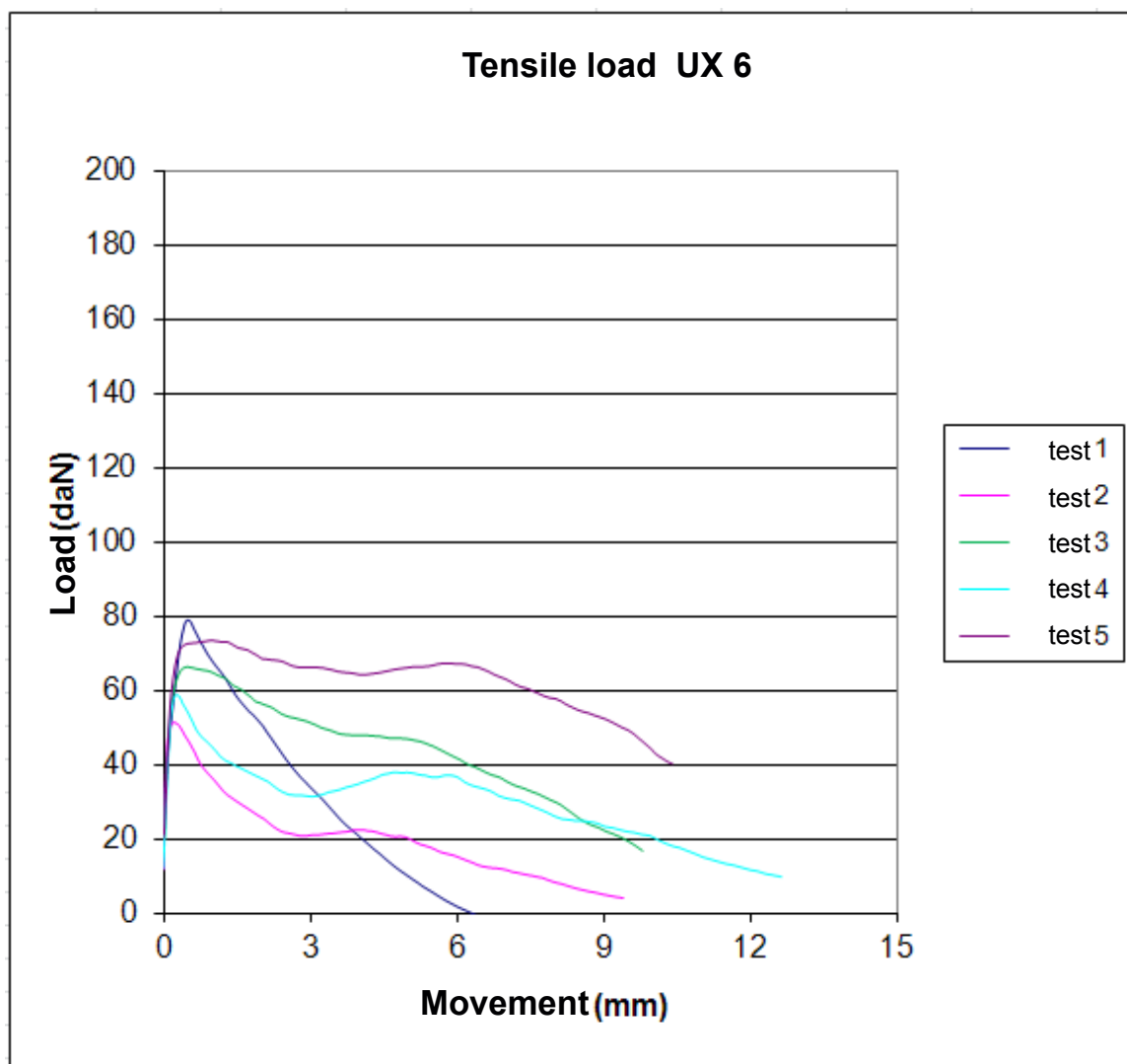
fischer 	Product design and development	Format RP Rev. C Date: 06/02/08
	TEST REPORT	Doc. n. RP 026-13 Rev. 1 Page 9 of 28
Subject: ISOTEX® products load bearing tests.		

3. Testdata

3.1. Pull load

UX 6 plug

Load bearing test	(daN)	Movement (mm)	Result
1	78.6	0.54	Plug removal
2	51.2	0.24	
3	66.2	0.51	
4	58.7	0.26	
5	73.3	0.93	
average	65.6		

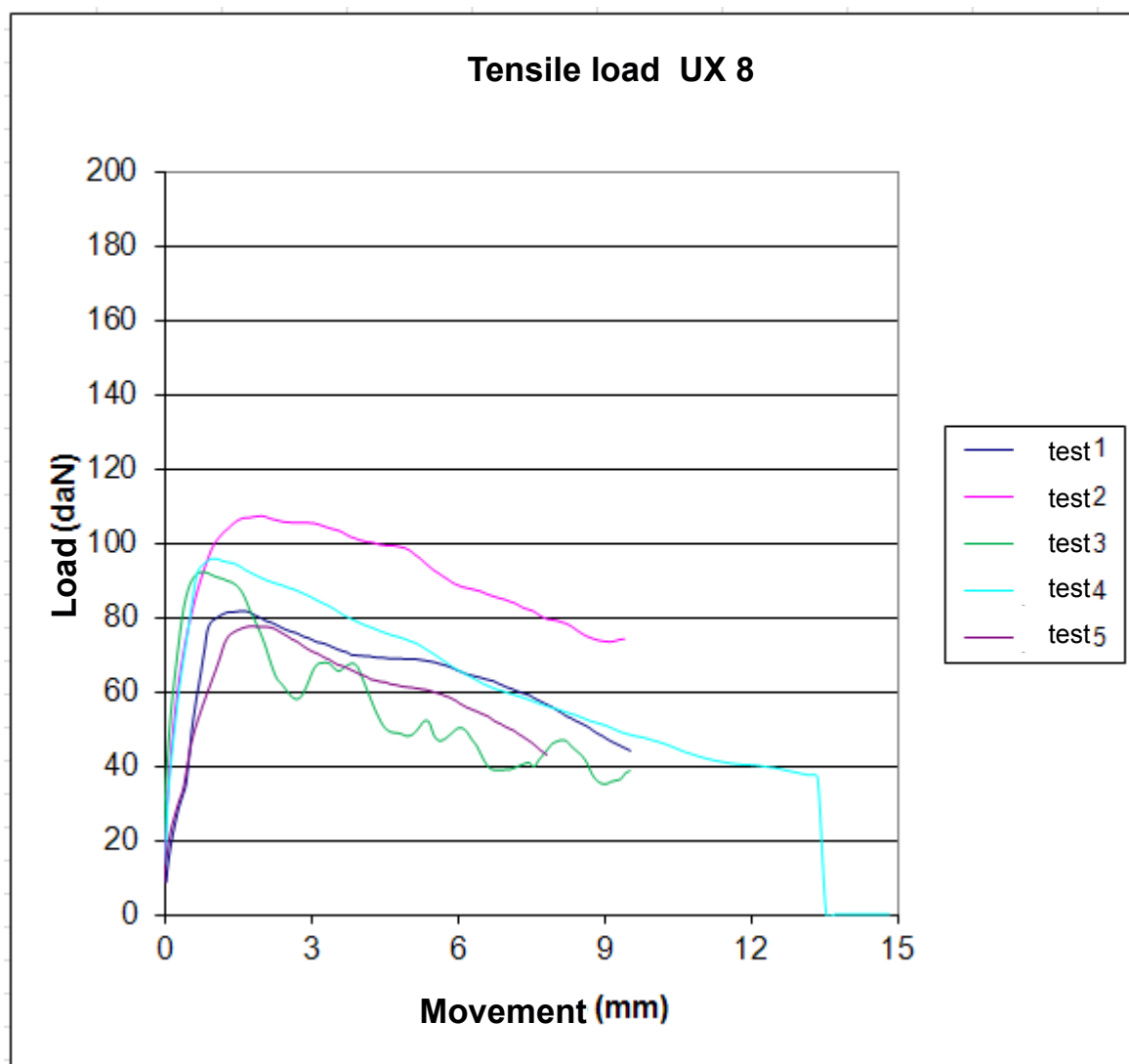


TEST REPORT

Subject: ISOTEX® products load bearing tests.

UX 8 plug

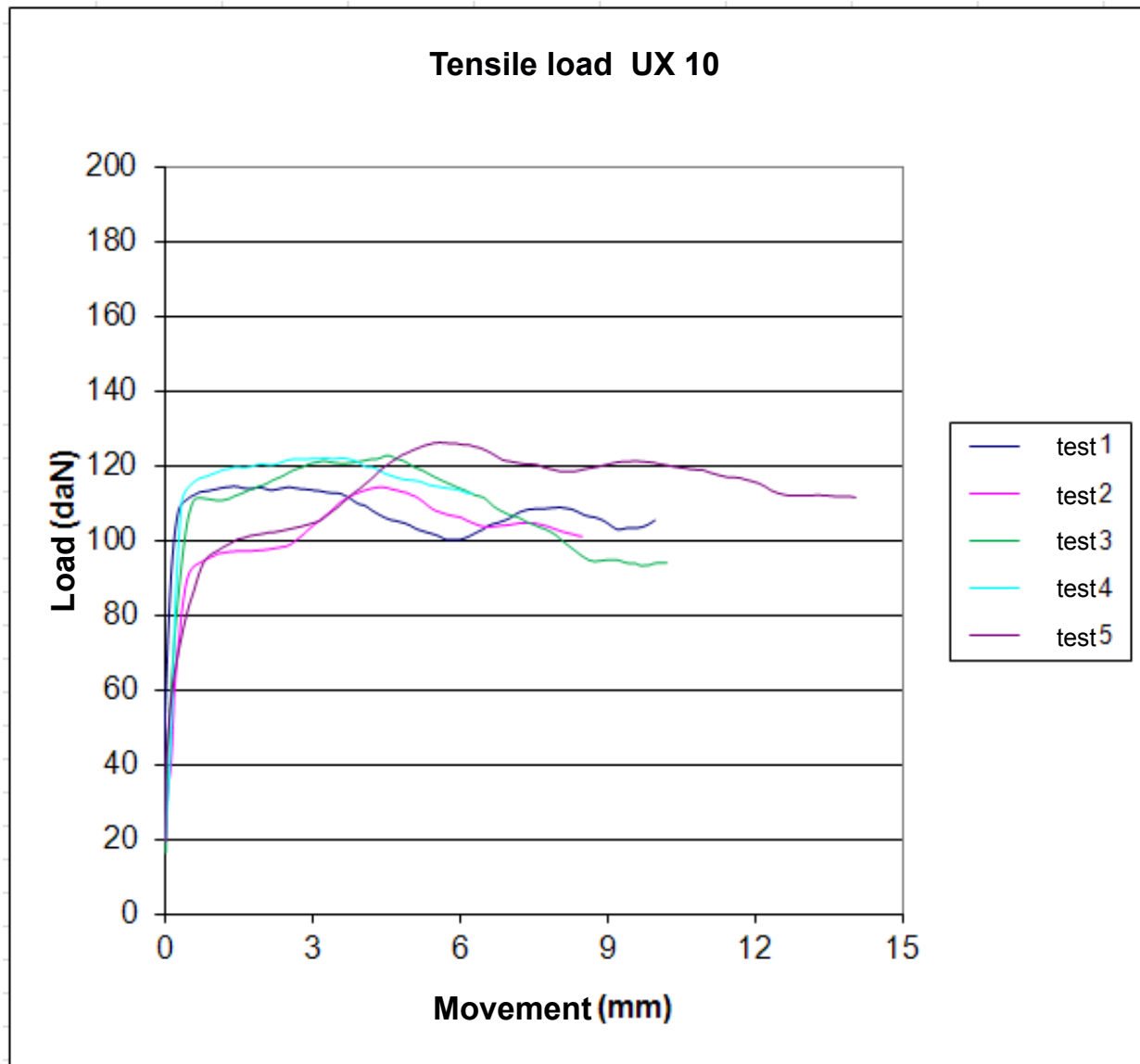
Load bearing test	(daN)	Movement (mm)	Result
1	81.7	1.22	Plug removal
2	107.3	1.8	
3	92.2	0.73	
4	95.8	1.01	
5	77.6	1.86	
Average	90.92		



fischer 	Product design and development	Format RP Rev. C Date: 06/02/08
	TEST REPORT	Doc. n. RP 026-13 Rev. 1 Page 11 of 28
Subject: ISOTEX® products load bearing tests.		

UX 10 plug

Load bearing test	(daN)	Movement (mm)	Result
1	114.4	1.4	Plug removal
2	114.2	4.38	
3	122.6	4.5	
4	122	3.27	
5	126.1	5.6	
average	119.86		

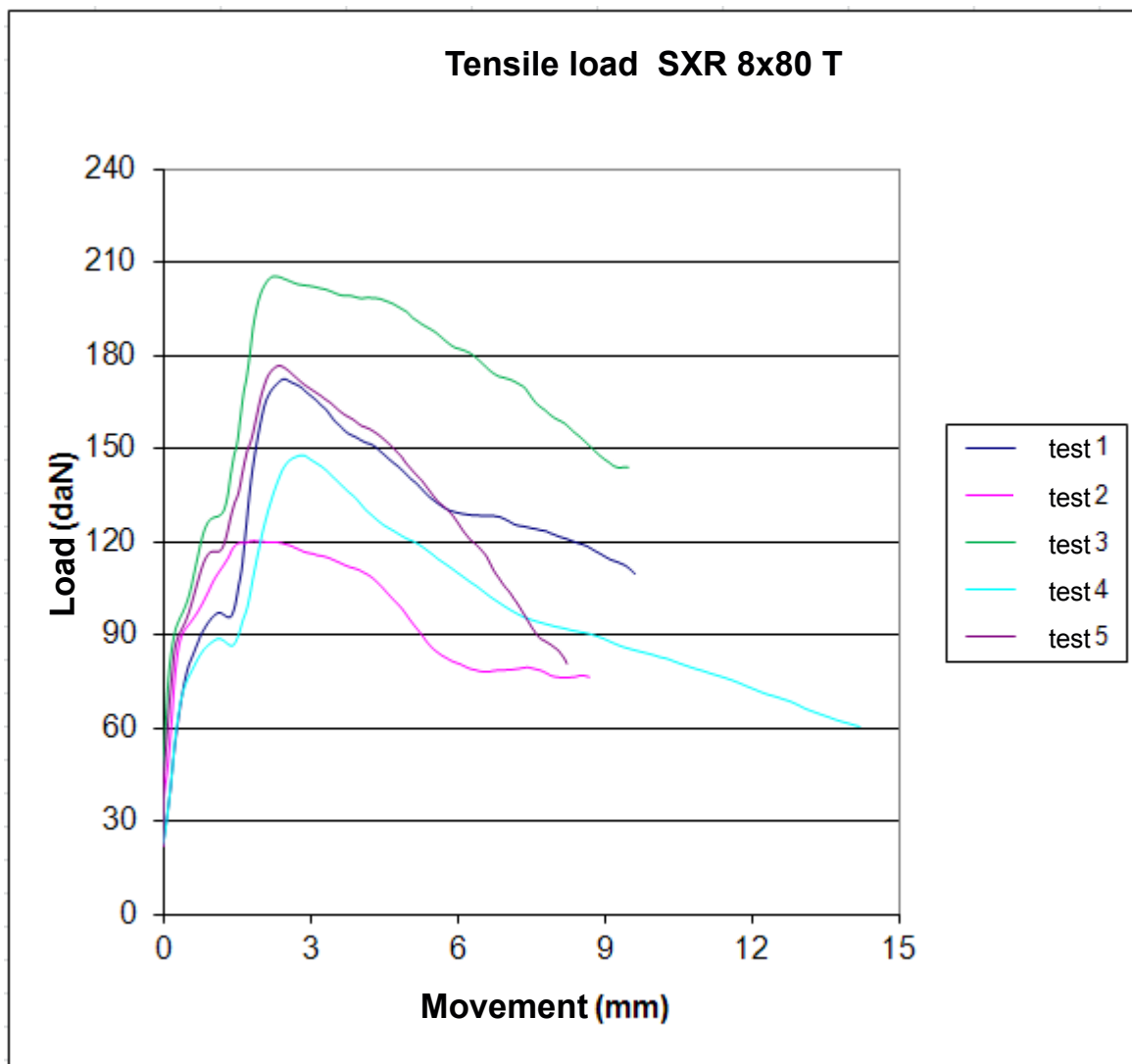


TEST REPORT

Subject: ISOTEX® products load bearing tests.

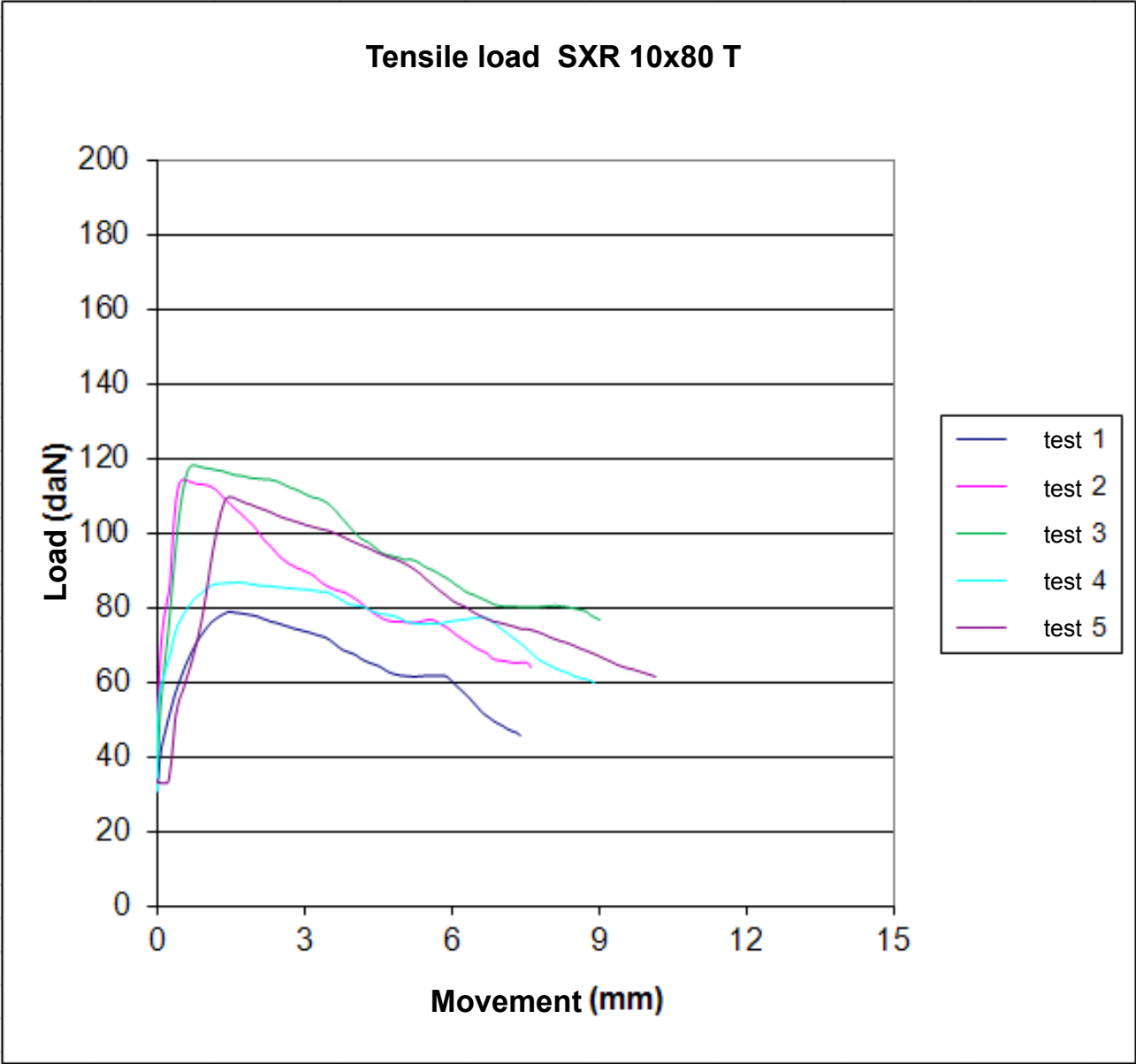
SXR 8 plug

Load bearing test	(daN)	Movement (mm)	Result
1	172.4	2.47	Plug removal
2	120.2	1.86	
3	205.4	2.22	
4	147.7	2.78	
5	176.6	2.39	
average	164.46		



SXR 10 plug

Load bearing test	(daN)	Movement (mm)	Result
1	78.7	1.45	Plug removal
2	114.3	0.54	
3	118.1	0.73	
4	86.6	1.61	
5	109.6	1.51	
average	101.46		

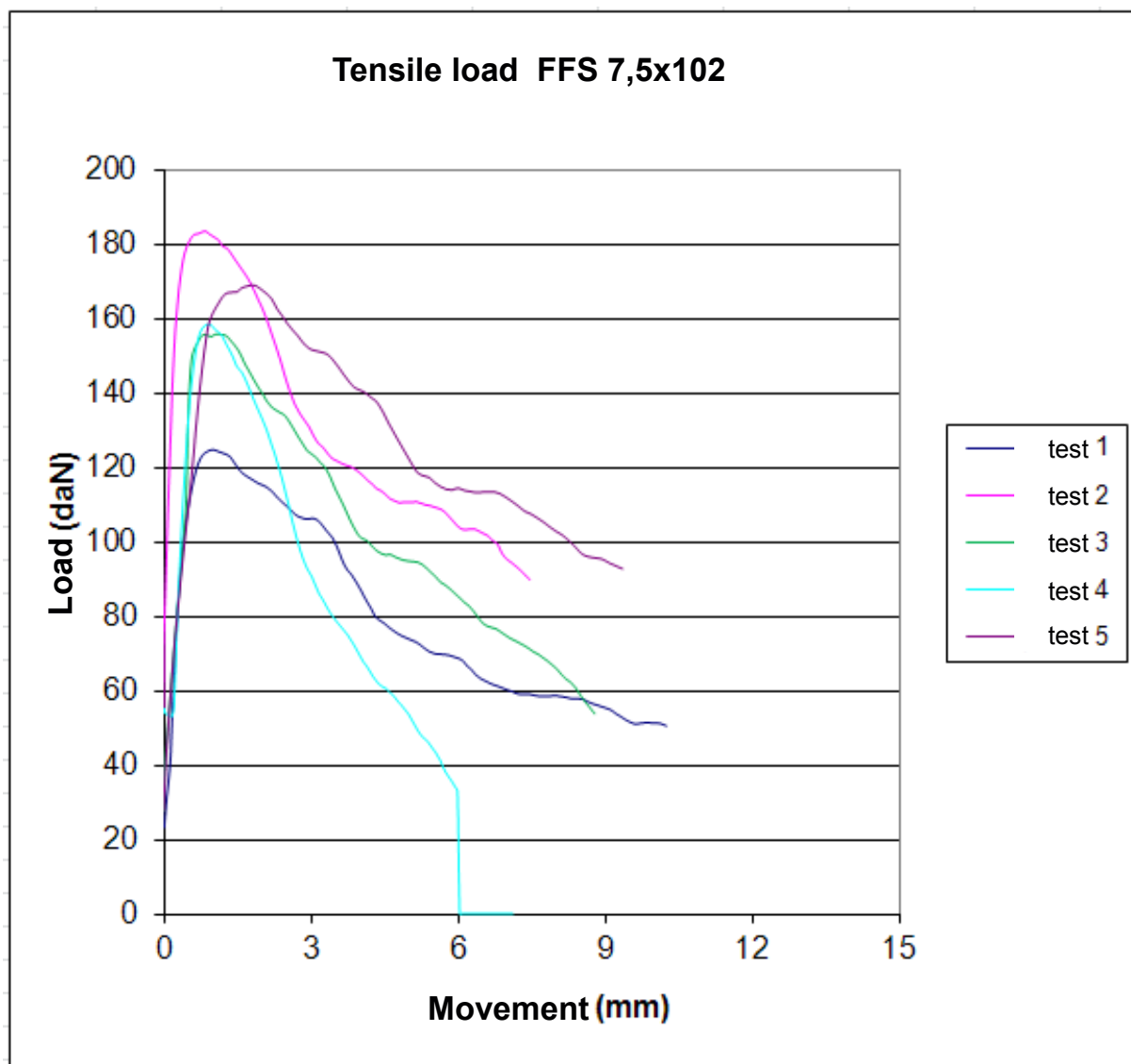


TEST REPORT

Subject: ISOTEX® products load bearing tests.

FFS screw

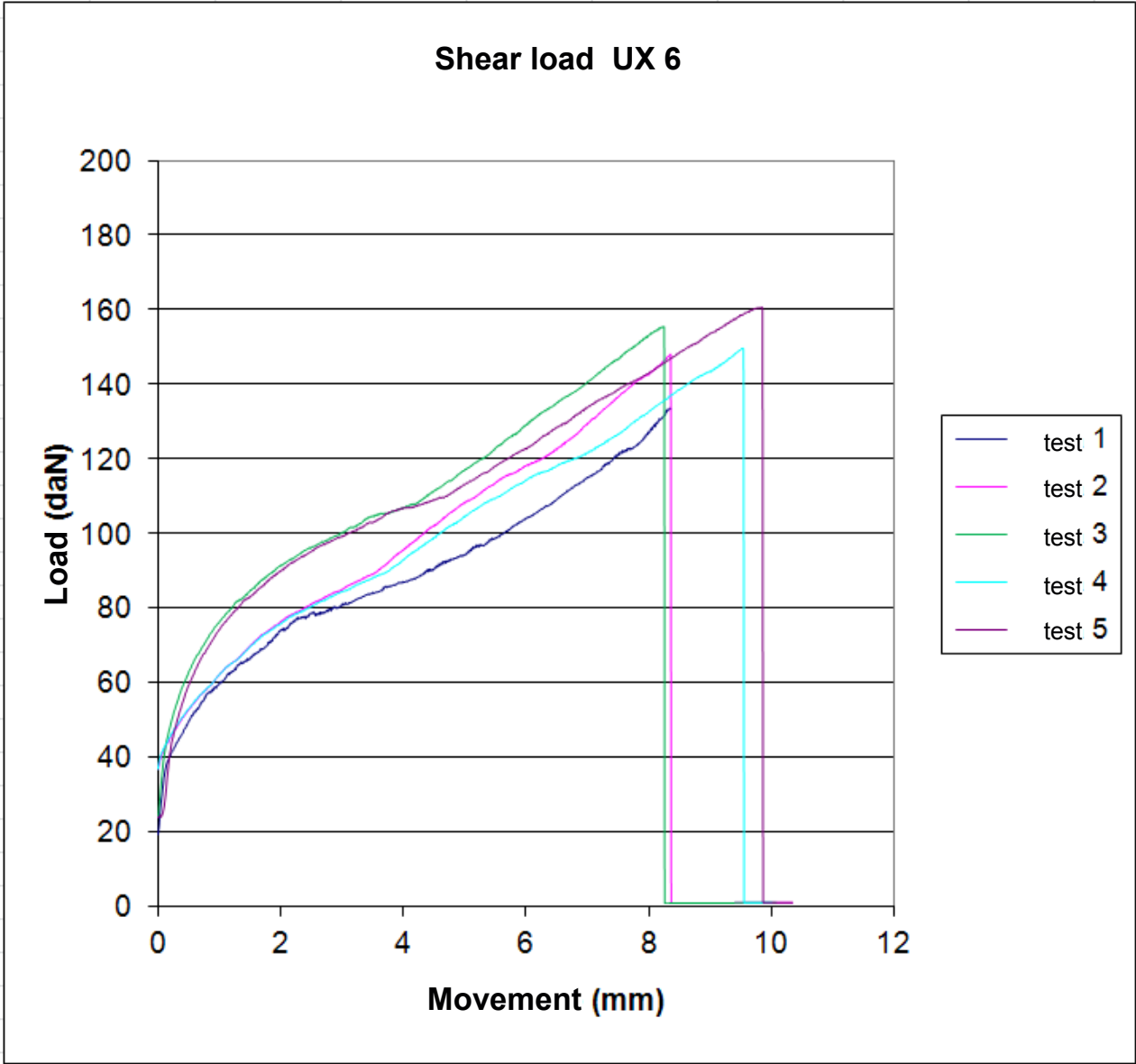
Load bearing test	(daN)	Movement (mm)	Result
1	124.7	1.01	Plug removal
2	183.4	0.85	
3	155.7	1.04	
4	158.3	0.89	
5	168.9	1.79	
average	158.2		



3.2. Shear load

UX 6 plug

Load bearing test	(daN)	Movement (mm)	Result
1	133.68	8.34	Screw bending
2	148.11	8.36	
3	155.45	8.24	
4	149.69	9.51	
5	160.70	9.8	
average	149.53		

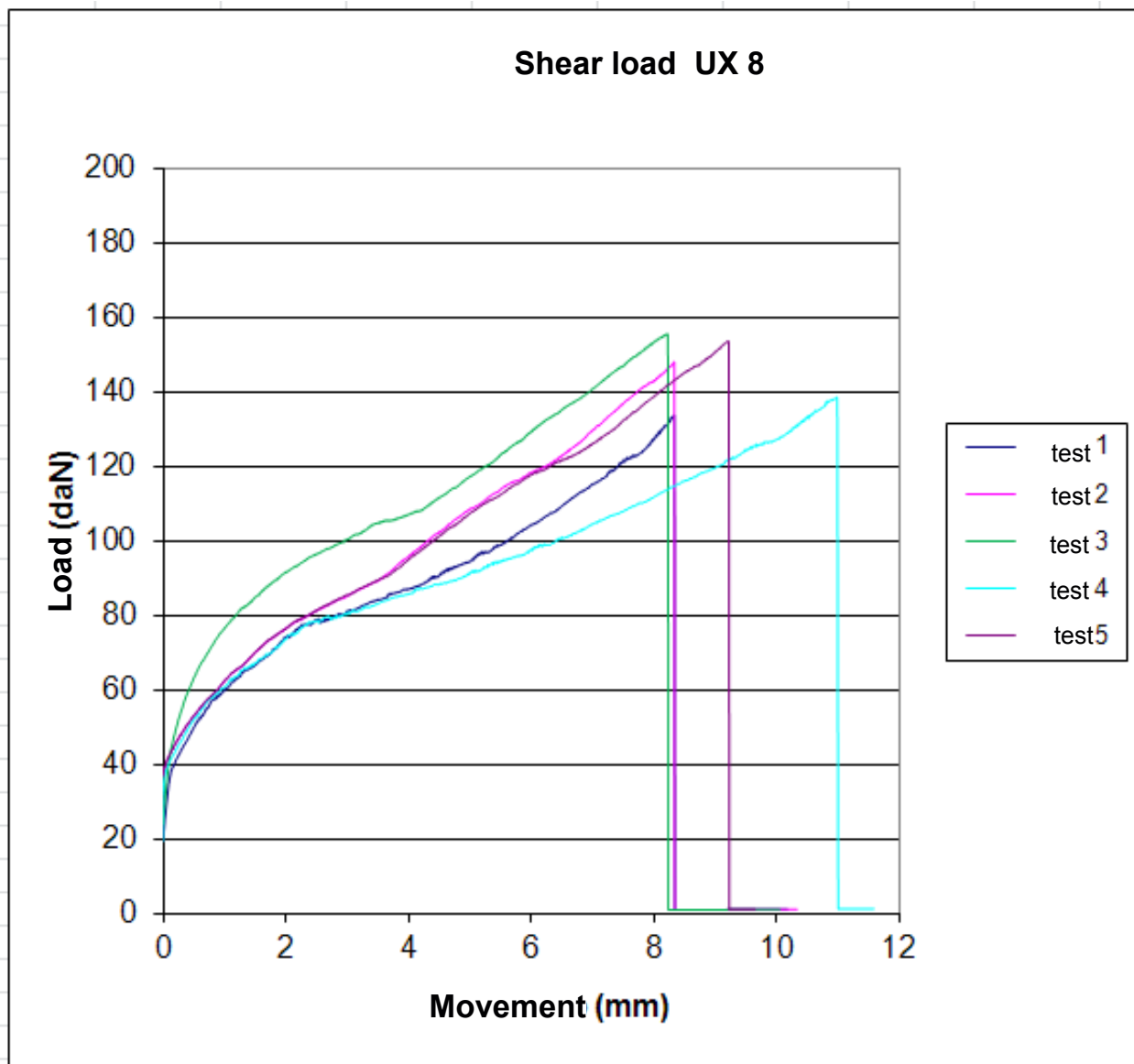


TEST REPORT

Subject: ISOTEX® products load bearing tests.

UX 8 plug

Load bearing test	(daN)	Movement (mm)	Result
1	133.68	8.34	Screw bending
2	147.94	8.31	
3	155.41	8.24	
4	138.44	10.99	
5	153.54	9.22	
average	155.41		

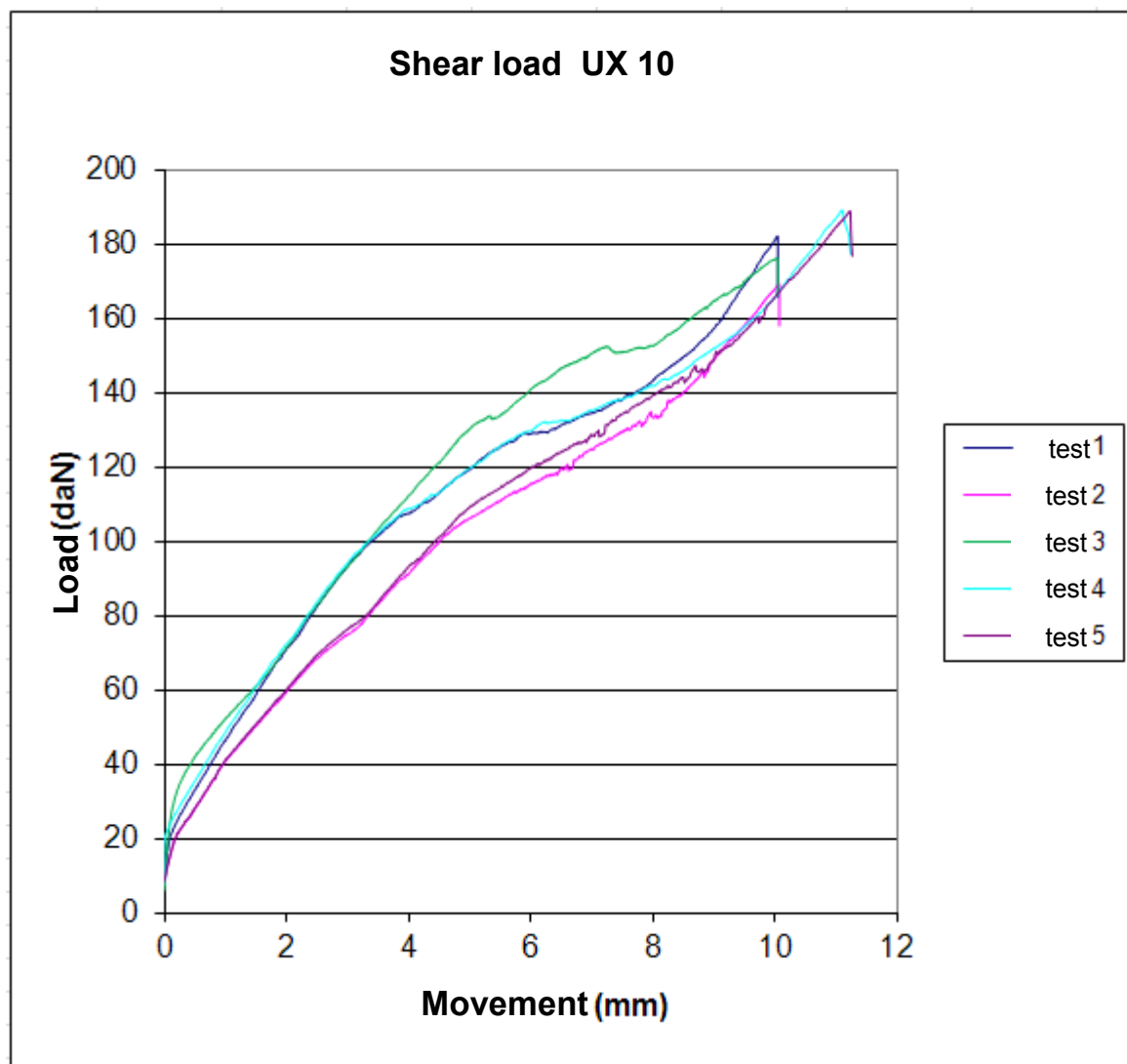


TEST REPORT

Subject: ISOTEX® products load bearing tests.

UX 10 plug

Load bearing test	(daN)	Movement (mm)	Result
1	182.13	10	Screw bending
2	169.21	10	
3	176.16	10	
4	189.11	11.1	
5	188.81	11.2	
average	181.08		

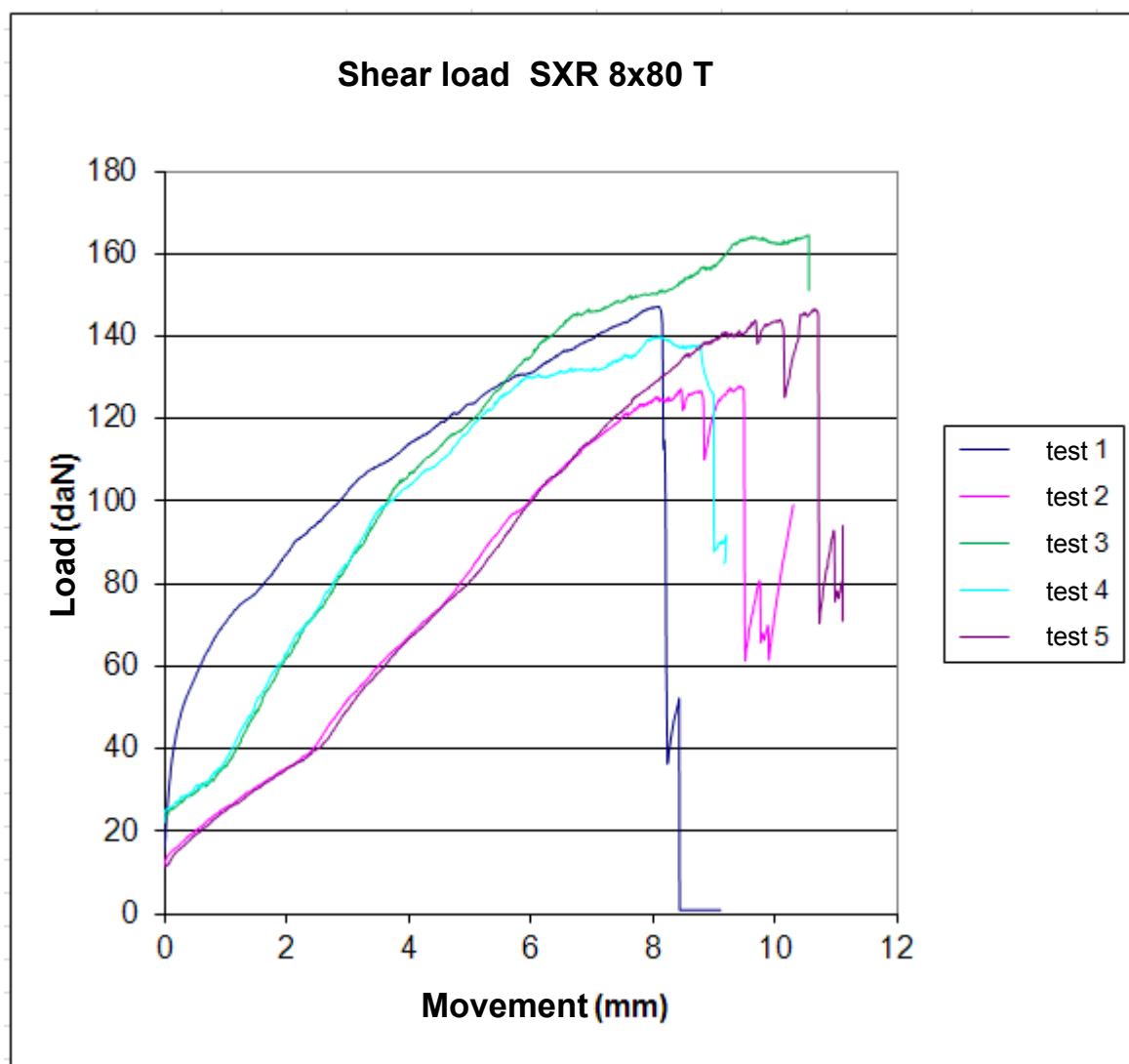


TEST REPORT

Subject: ISOTEX® products load bearing tests.

SXR 8 plug

Load bearing test	(daN)	Movement (mm)	Result
1	147.22	8.10	Block breakage
2	127.96	9.46	
3	164.59	10.56	
4	139.95	8.20	
5	146.62	10.67	
average	145.27		

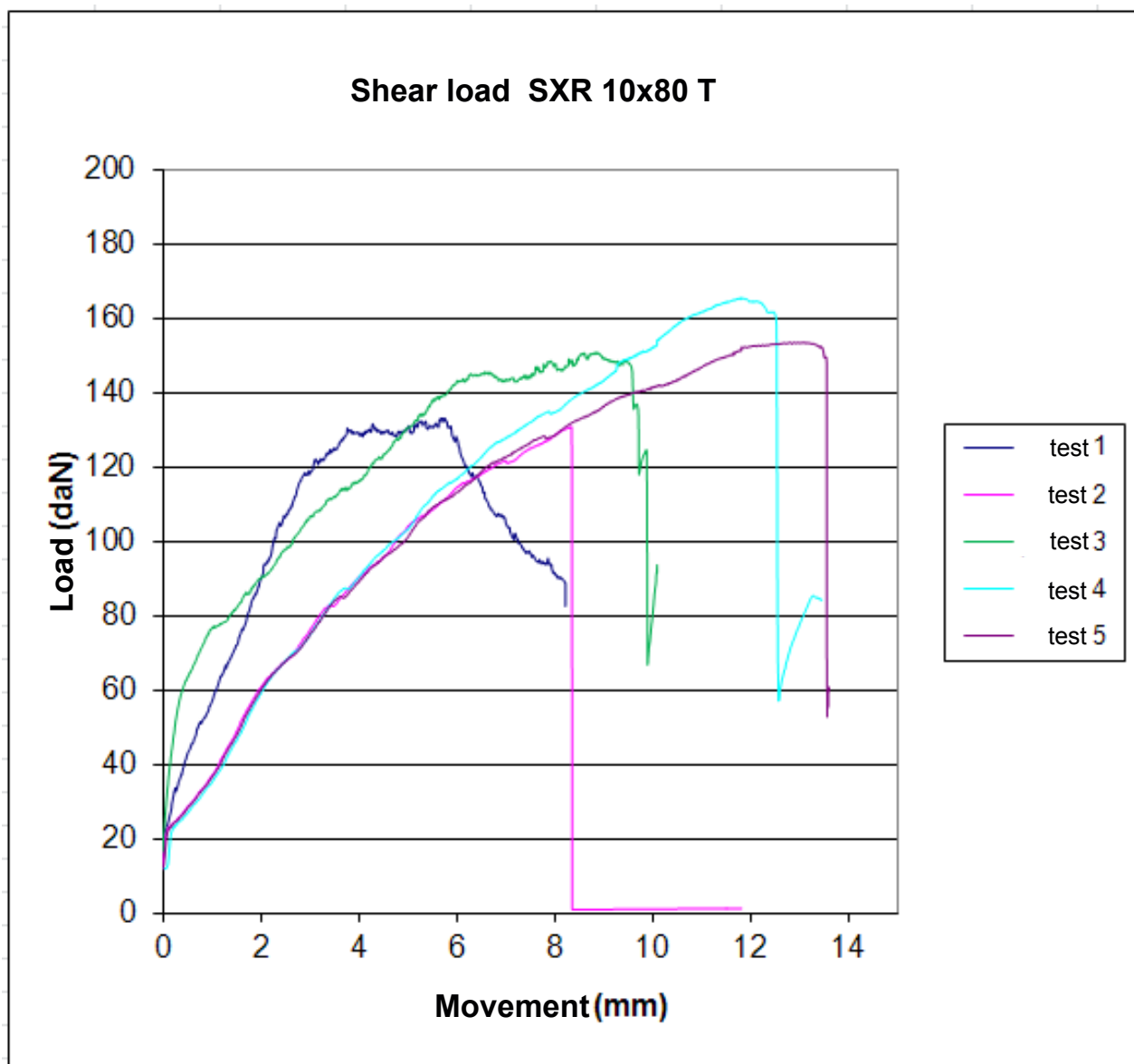


TEST REPORT

Subject: ISOTEX® products load bearing tests.

SXR 10 plug

Load bearing test	(daN)	Movement (mm)	Result
1	133.05	5.69	Block breakage
2	130.74	8.34	
3	150.79	8.87	
4	165.48	11.83	
5	153.40	12.97	
Average	146.69		

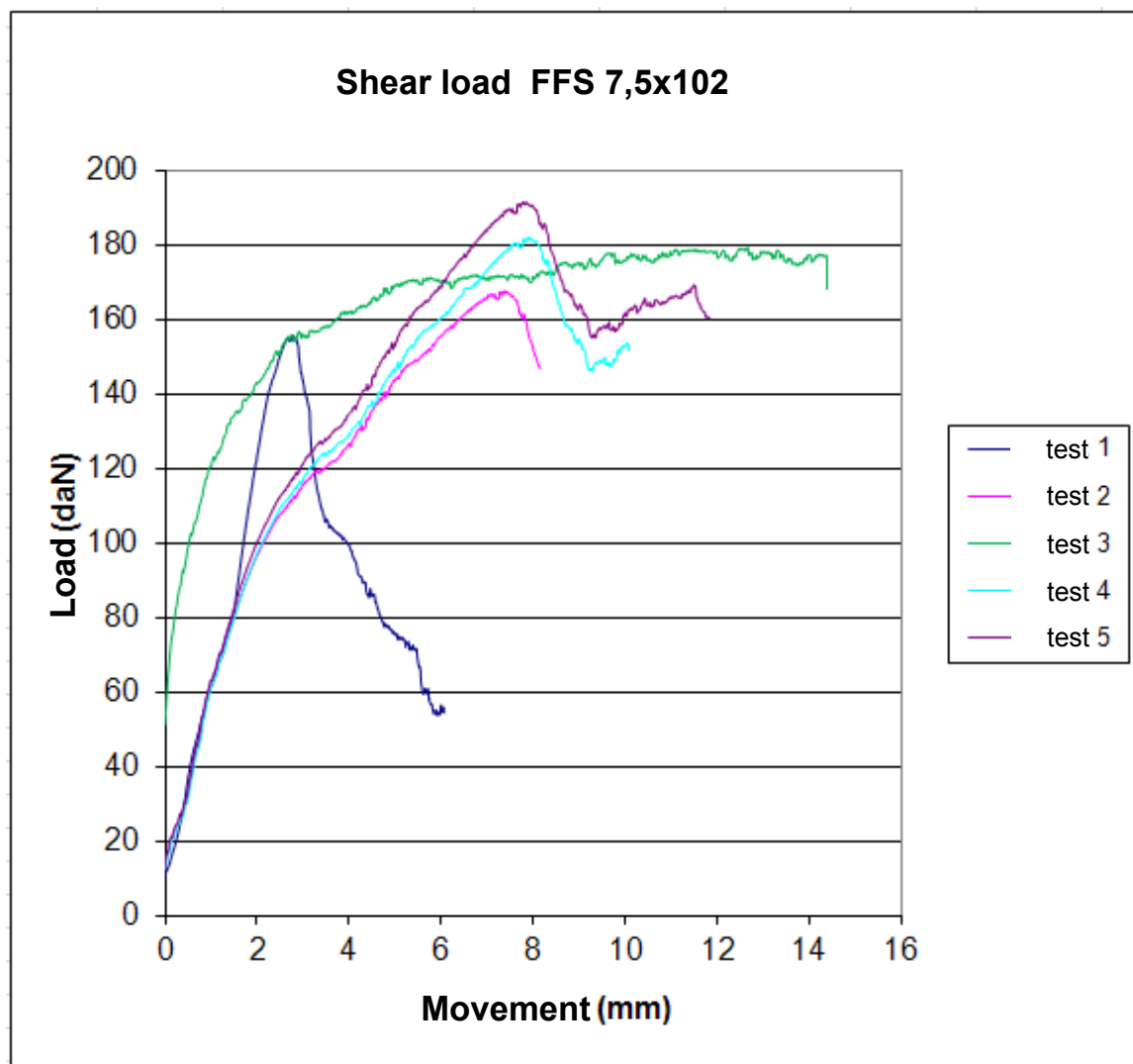


TEST REPORT

Subject: ISOTEX® products load bearing tests.

FFS screw

Load bearing test	(daN)	Movement (mm)	Result
1	155.57	2.8	Block breakage
2	167.59	7.39	
3	179.22	13	
4	181.91	7.96	
5	191.47	7.59	
average	175.15		



TEST REPORT

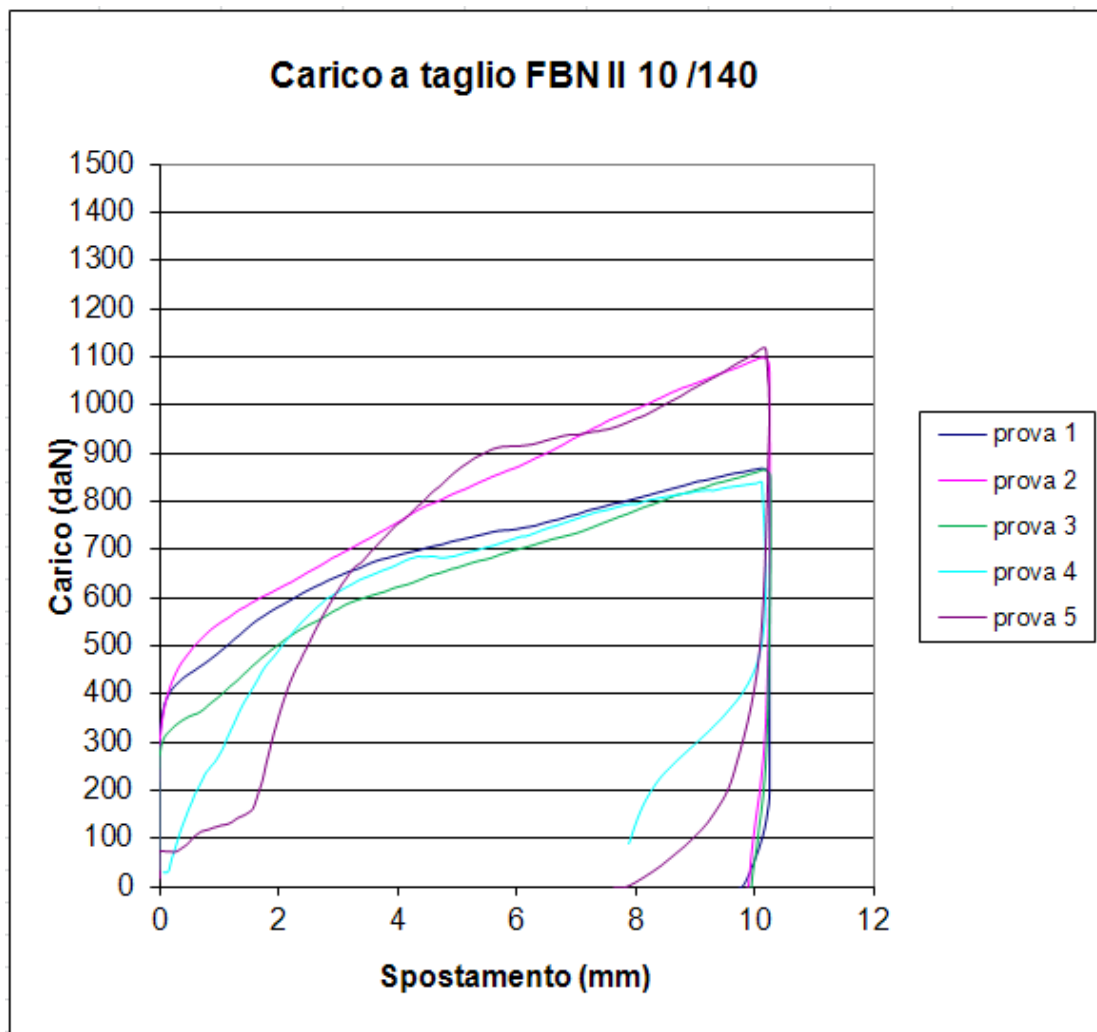
Subject: ISOTEX® products load bearing tests.

FBN II 10 plug

Load bearing test	(daN)	Maximum movement (3)(mm)	Result
1	868.2	10	Plug bending
2	1098.2	10	
3	864.6	10	
4	838.3	10	
5	1117.2	10	
average	957.3		

(3)Maximum set value 10 mm

Lever arm B = 110 mm



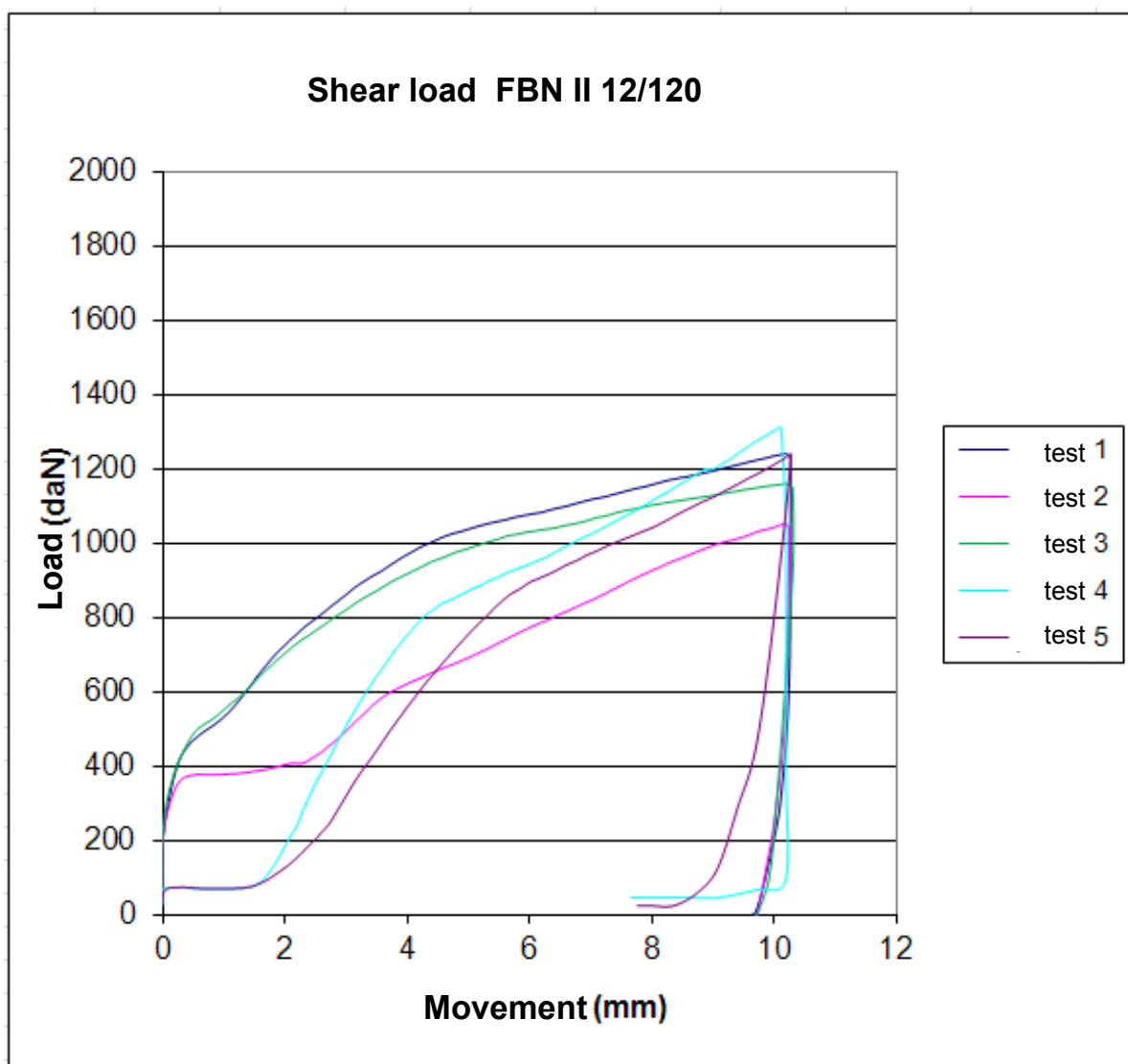
fischer 	Product design and development	Format RP Rev. C Date: 06/02/08
	TEST REPORT	Doc. n. RP 026-13 Rev. 1 Page 22 of 28
Subject: ISOTEX® products load bearing tests.		

FBN II 12 plug

Load bearing test	(daN)	Maximum movement (3)(mm)	Result
1	1238.7	10	Plug bending
2	1049.2	10	
3	1158.6	10	
4	1310.2	10	
5	1236.5	10	
average	1198.64		

(3)Maximum set value 10 mm

Lever arm B = 110 mm



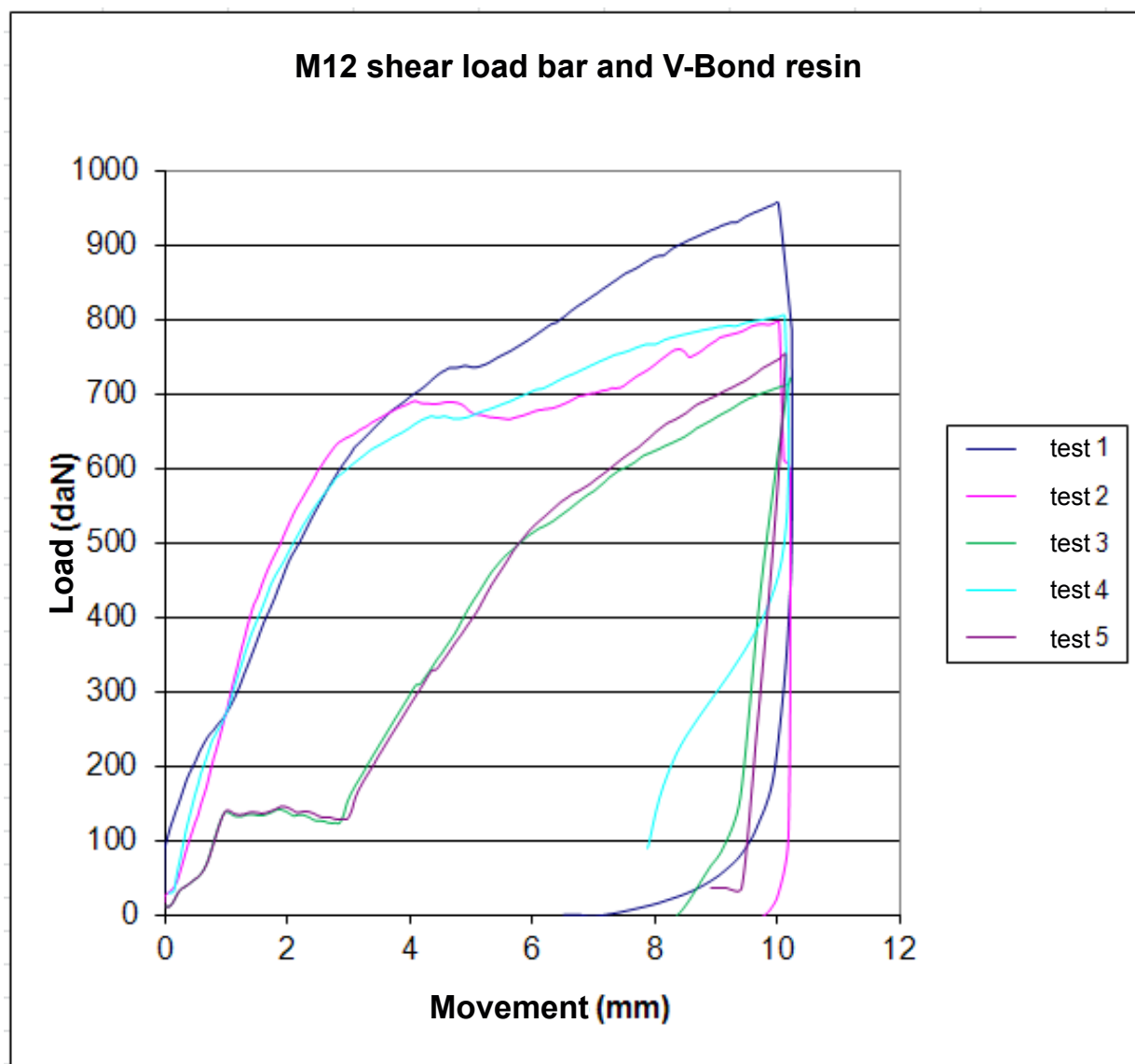
Subject: ISOTEX® products load bearing tests.

V-bond chemical anchoring/M 12 bar

Load bearing test	(daN)	Maximum movement (3)(mm)	Result
1	956.2	10	Bar bending
2	796.2	10	
3	721.2	10	
4	804.2	10	
5	752.3	10	
average	956.2		

(3)Maximum set value 10 mm

Lever arm B = 230 mm



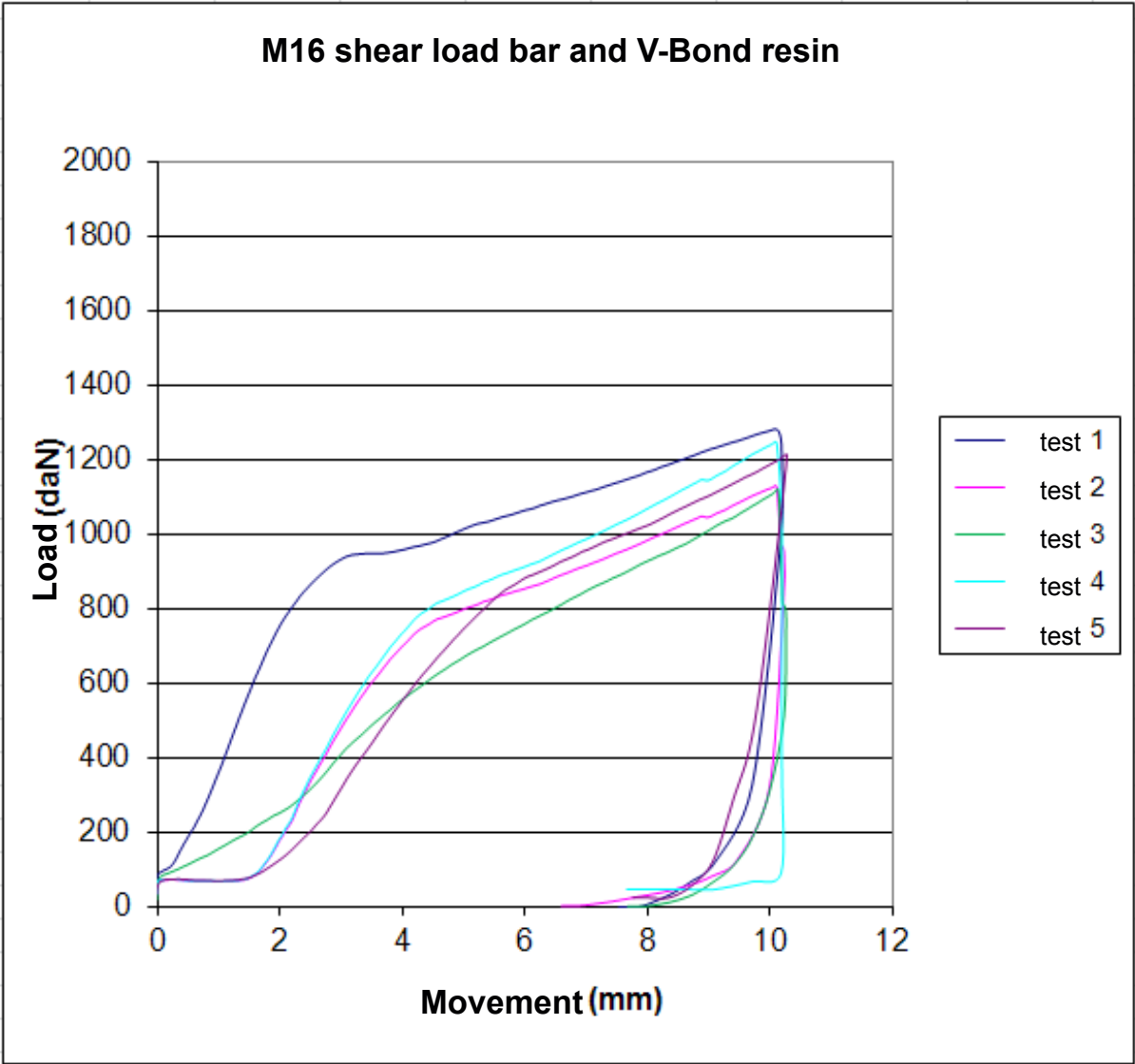
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	TEST REPORT	Doc. n. RP 026-13 Rev. 1 Page 24 of 28
Subject: ISOTEX® products load bearing tests.		

V-bond chemical anchoring/M 16 bar

Load bearing test	(daN)	Maximum movement (3)(mm)	Result
1	1280.7	10	Bar bending
2	1127	10	
3	1117.4	10	
4	1245	10	
5	1210.3	10	
average	1196.08		

(3)Maximum set value 10 mm

Lever arm B = 230 mm



TEST REPORT

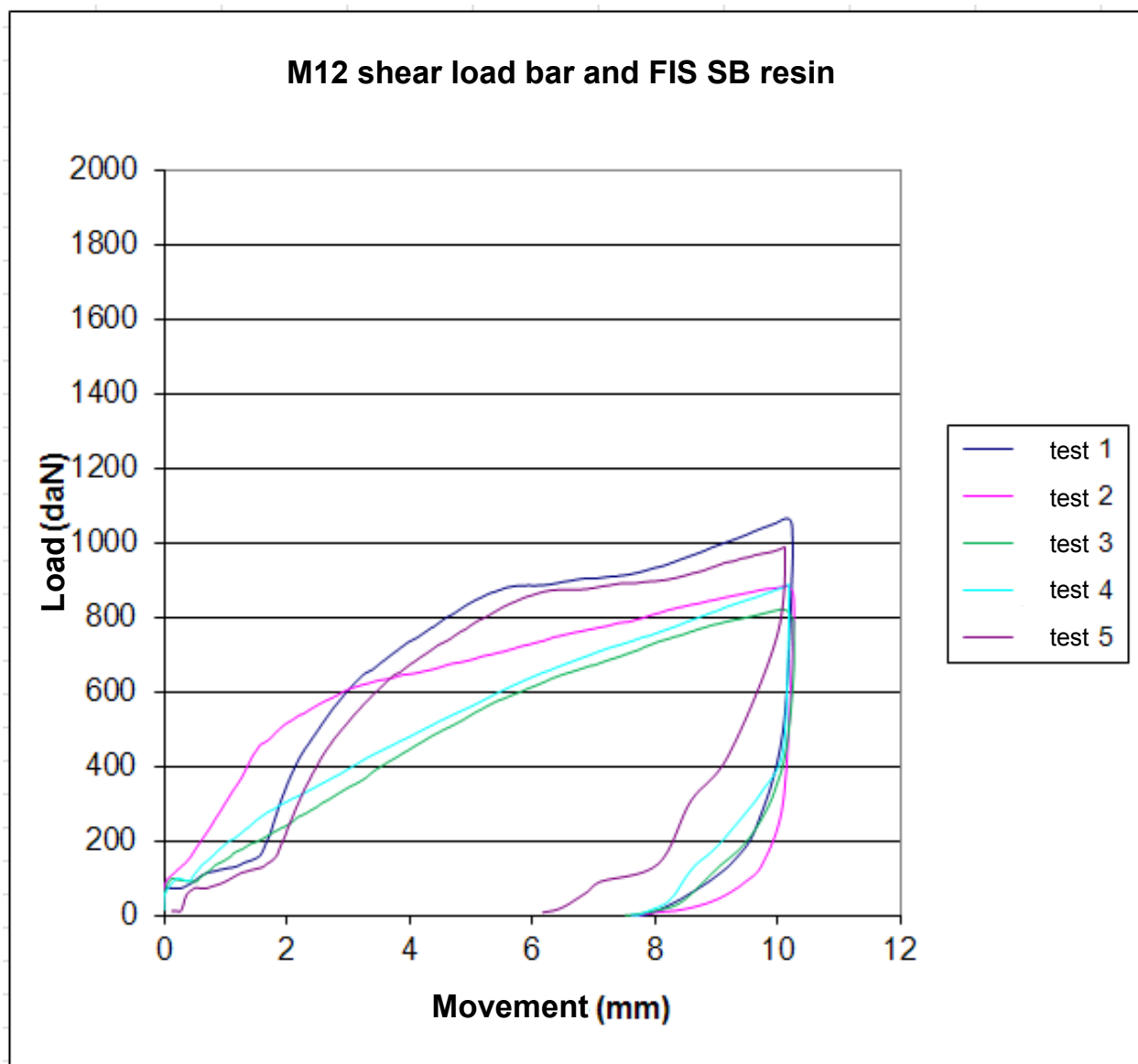
Subject: ISOTEX® products load bearing tests.

Super bond chemical anchoring/M 12 bar

Load bearing test	(daN)	Maximum movement (3)(mm)	Result
1	1063.6	10	Bar bending
2	882	10	
3	820.6	10	
4	884.3	10	
5	985.4	10	
average	1063.6		

(3)Maximum set value 10 mm

Lever arm B = 230 mm



TEST REPORT

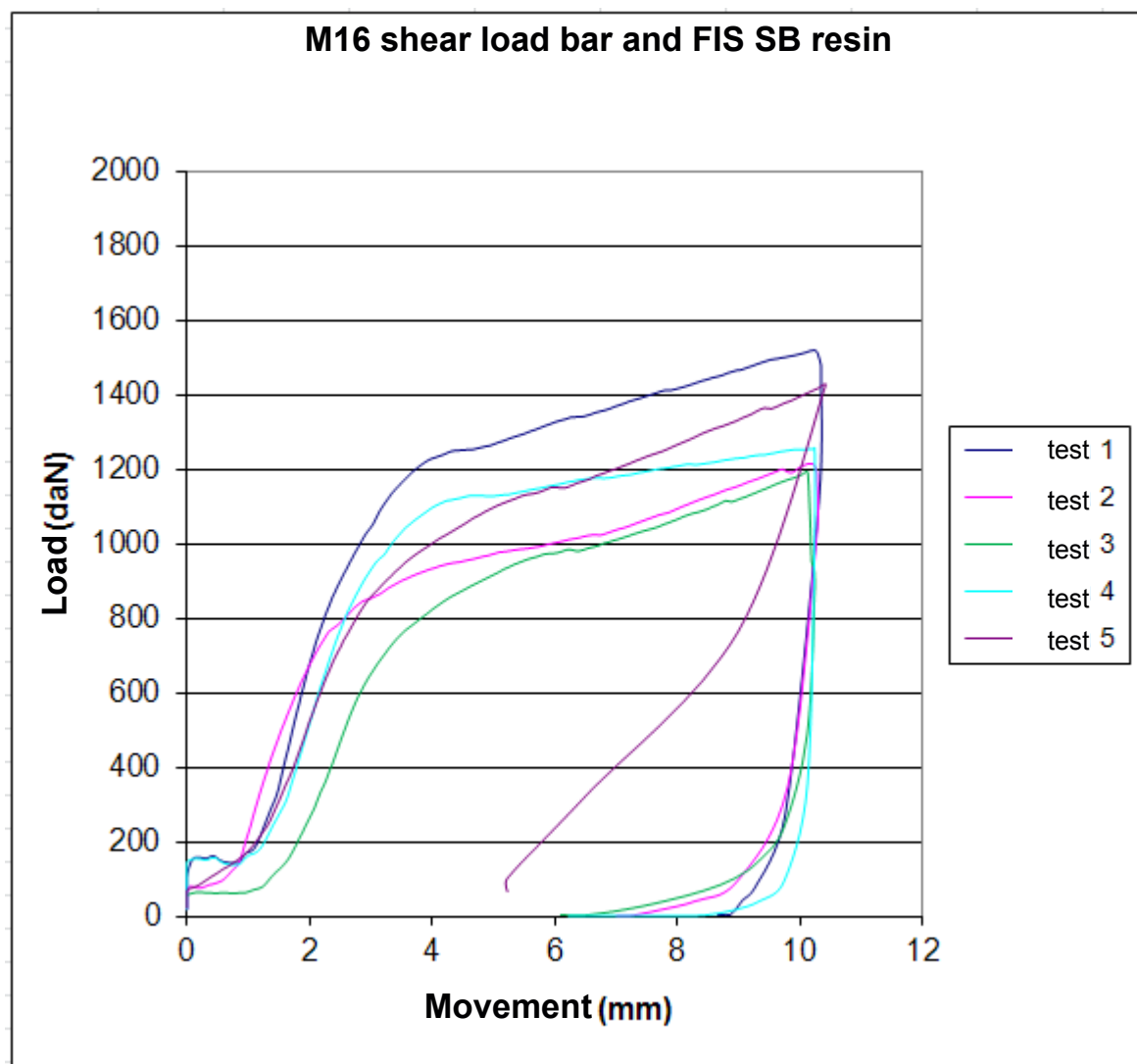
Subject: ISOTEX® products load bearing tests.

Super bond chemical anchoring/M 16 bar

Load bearing test	(daN)	Maximum movement (3)(mm)	Result
1	1518	10	Bar bending
2	1213.8	10	
3	1191.3	10	
4	1257.4	10	
5	1425.3	10	
average	1321.16		

(3)(3)Maximum set value 10 mm

Lever arm B = 230 mm



fischer 	Product design and development	Format RP Rev. C Date: 06/02/08
	TEST REPORT	Doc. n. RP 026-13 Rev. 1 Page 27 of 28
Subject: ISOTEX® products load bearing tests.		

4. Fischer FASTGRIP800 polyurethane foam pull strength



Fischer Fastgrip800 polyurethane foam pull test

Test performed by glueing ceramic tiles measuring 200 x 200 mm onto the surface of the Isotex block

Traction performed up to failure of the system.



Test data

Load bearing test	(daN)	Result
1	100	Tile breakage
2	100	
3	100	
4	110	
5	120	
average	106	

No failure linked to the surface of the block

fischer 	Product design and development	Format RP Rev. C Date: 06/02/08
	TEST REPORT	Doc. n. RP 026-13 Rev. 1 Page 28 of 28
Subject: ISOTEX® products load bearing tests.		

5. Datasummary

Plug/anchoring	Average pull load (daN)	Average shear load (daN)	NOTES
UX 6	65.6	149.53	
UX 8	90.92	155.41	
UX 10	119.86	181.08	
SXR 8	164.46	145.27	
SXR 10	101.46	146.69	
FFS screw	158.2	175.15	
FBN II 10	-	957.3	(4)
FBN II 12	-	1198.64	(4)
V-Bond M12 Bar	-	956	(5)
V-Bond M16 Bar	-	1196.08	(5)
Fis SB 390 M12 Bar	-	1063.60	(5)
Fis SB 390 M16 Bar	-	1321.16	(5)

Adhesive	Adhesion area (cm ²)	Average pull load (daN)	
fischer FASTGRIP800	400 (20 x 20 tile)	106	(6)

(4) during the application of the tightening torque the loading plate crushes the cement wood wall.

(5) there are no substantial differences in the load between the resins since part of the load value is related to the bar diameter. The cement wood wall deforms with shear loading.

(6) failure of the ceramic tile around the screw passage hole: no failure of the adhesive foam system - cement wood wall.