Test of tags at 80 or 55 $^{\circ}$C

Internal document of
the ICAR SC for Animal Identification

Introduction

At the ICAR SC meeting in Krakow in June 2015 it was discussed whether the 80 °C pull test used in the preliminary assessment procedure was really relevant.

The test is supposed to give an indication of possible fraudulent use of tags pulled open at high temperatures and then afterwards closed again using the original or a new male tag part.

However, there may be other ways to fraudulently open the tags, and it was decided to compare tags tested at 80 and 55 °C to get an impression of which change in failure rate was to be expected.

Because the transverse pull has the highest failure rate it was decided to use this test at the said temperatures. However, it turned out almost impossible to mount the button tags into the grips for transverse pull, so for the button tags axial pull was used.

Where possible the tests were done not only at 55 and 80 °C but also at ambient temperature. Tags were kept in a heat chamber at the said temperature for a period of minimum 180 minutes. Tags were taken directly from the heat chamber and tested immediately one by one.

Tests were performed at using a programmable automatic tensile test device. The pull speed was 100 mm/min until a force of 20 N and 500 mm/min after that. Tags were pulled until they broke or opened. The break force is the highest force applied during the test.

RYK is part of ICAR ring test for this kind of test.

Tags in test

At the RYK test center a number of tag types which had not passed the 80 °C were available in numbers that would allow for genuine test results.

- Six of the tag types had been tested before and failed the 80 °C transverse pull test.
  (tags A, B, C, E, F and G)

- One tag type was part of "tag family" that passed the 80 °C transverse pull test. This tag is the only one in this test with a metal ring in the female locking mechanism.
  (tag D)

- Two tag types were tags not previously tested.
  (tags H and I)

For tag types previously tested results from the original tests are also presented with the results from the present test.
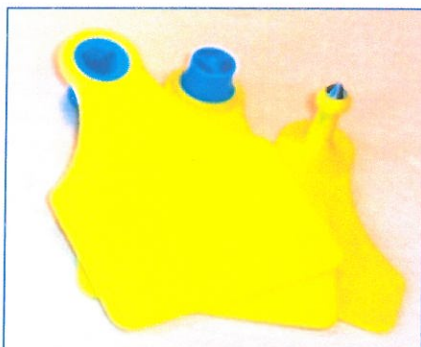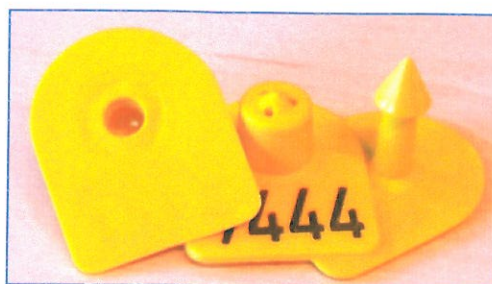
Materials tested

Figur 1: Tag A

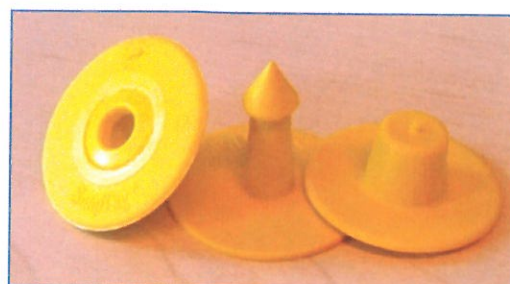Figur 2: Tag B

Figur 3: Tag C

Figur 4: Tag D

Figur 5: Tag E

Figur 6: Tag F

Figur 7: Tag G

Figur 8: Tag H

Figur 9: Tag I

Results

Break forces

The break force is automatically recorded during the pull test. For information also break forces from previous tests on same types of tags are included. In addition results from preliminary assessments during 2015 (until mid-July) are shown.

Break force (peak force) at different temperature and pull directions

Tag	Ambient temperature			55 °C		80 °C			
	Previous test	Present test						Previous test	
	axial	axial	transverse	axial	transverse	axial	transverse	axial	transverse
A	379,6		355,8	239,2	191,6		128,9	231,3	150,8
B				223,1	208,1		149,2		
C					206,1		150,4		
D			437,1	379,2	334,4		246,3		
E	427,2				132,6		102,0	199,6	110,5
F	415,9	392,0		267,8		188,2		187,2	120,5
G	399,7	403,1		271,3		195,0		191,9	107,2
H		290,1		248,7		194,1			
I		382,2		272,7		195,7			

Break force levels from same procedures in previous tests and present test are at pretty well same levels. So in some cases we can use experience from previous tests in conjunction with data from the present test.

Results show that at least for heated tags the transverse pull causes tag to open or break at lower forces than axial pull at same temperature. This is probably because with axial pull the male head can place equal pressure on the female locking mechanism in full circle whereas the transverse pull means that the pressure is higher on one side of the locking mechanism than on the other side. This seems to make the tags open at lower forces.

Number of reusable tags

Break force is only decisive element in the axial pull test at ambient temperature. In all situations tags have to be not reusable after opening or breaking by pull test.

In the below table is shown how many individual tags were reusable after testing the different tag types at different temperatures and pull directions.

Tags reusable (with new male part) after pull test at different temperatures (reusable / total)

Tag	Ambient temperature			55 °C		80 °C			
	Previous test	Present test						Previous test	
	axial	axial	transverse	axial	transverse	axial	transverse	axial	transverse
A	0 / 20		0 / 19	0 / 14	14 / 14		19 / 19	14 / 20	20 / 20
B				5 / 7	5 / 8		15 / 15		
C					7 / 11		10 / 11		
D		0 / 20		0 / 11	0 / 9		0 / 20		
E	17 / 20				7 / 7		6 / 6	20 / 20	20 / 20
F	0 / 20	3 / 20		15 / 20		20 / 20		20 / 20	20 / 20
G	1 / 20	1 / 20		16 / 20		20 / 20		20 / 20	20 / 20
H		0 / 20		3 / 20		18 / 20			
I		0 / 20		1 / 20		13 / 20			

Again results from previous tests and the present test fit well together allowing us to use also the previous results in our considerations.

Except from tags D and E it is obvious that with higher the temperatures more individual tags fail. Tag D has a metal ring in the female locking mechanism ensuring that when breaking the tags are in fact not reusable. Tag E had a locking mechanism that even at ambient temperature opened in a way that nearly all tags were reusable.

There is only one tag type where change of temperature in combination with change of pull direction would have caused a different result of the total preliminary assessment and that is tag A. It passed the axial pull at 55 °C with flying colors but failed the transverse pull at 55 °C completely. In order to get a different result compared to the 80 °C transverse pull it was not only a change of temperature, but also a change of pull direction.

Be aware also that tags H and I, which were both button tags not previously tested, came very close to a pass with axial pull at 55 °C (very few reusable tags) compared to a very clear fail with axial pull at 80 °C (many reusable tags).

Total result of preliminary assessment

Comparing tests at 55 °C and 80 °C for most tags show more individual tags failing, but the criterion used in the preliminary assessments is that the tag type fails a test as soon as just one individual tag fails.

The following table shows pass or fail for a tag type after different pull test scenarios.

Tag	Ambient temperature			55 °C		80 °C			
	Previous test	Present test						Previous test	
	axial	axial	transverse	axial	transverse	axial	transverse	axial	transverse
A	Pass		Pass	Pass	Fail		Fail	Fail	Fail
B				Fail	Fail		Fail		
C					Fail		Fail		
D			Pass	Pass	Pass		Pass		
E	Fail				Fail		Fail	Fail	Fail
F	Pass	Fail		Fail		Fail		Fail	Fail
G	Fail	Fail		Fail		Fail		Fail	Fail
H		Pass		Fail		Fail			
I		Pass		Fail		Fail			

Based on testing of these nine tag types there would not have been any change in the result of the preliminary assessments in case the temperature of heated tags for transverse pull was reduced from 80 °C to 55 °C.

However, 2 tag types (H and I) came close to passing at 55 °C where they had many tags failing at 80 °C.

Documentation:

On the following pages you find photographs of tags after pull test. Each picture shows information about tag type and test temperature. At 55 °C some tag types were tested with both axial and transverse pull in which case the pull direction is also indicated.

After the photo section you will find the front pages of the test report from the tensile strength instrument. The graphs are not interesting for transverse pulls, but quite informative for axial pulls. For this experiment the most interesting information is the break force.

Experiment performed in July 2015

Pull tests at 80 °C

A 80

B 80

C 80

D 80

E 80

F 80

G 80

H 80

I 80

Pull tests at 55 °C

A 55 AXIAL

A 55 TRANSVERSE

B 55 AXIAL

B 55 TRANSVERSE

C 55 TRANSVERSE

D55 AXIAL

D55 TRANSVERSE

E 55

F 55

G 55

H 55

I 55

Pull tests at ambient temperature
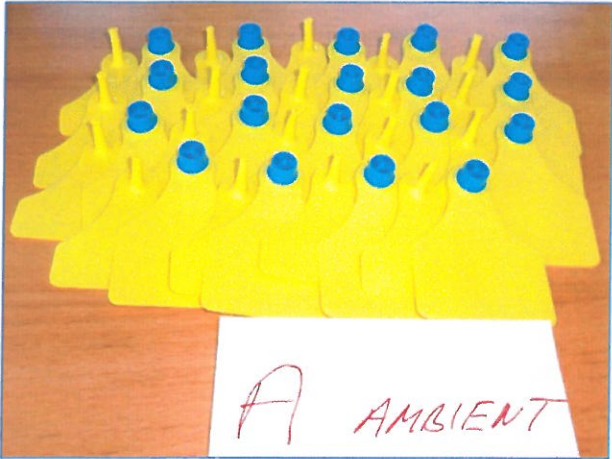
A AMBIENT

D AMBIENT

F AMBIENT

G AMBIENT

H AMBIENT

I AMBIENT

Customer Name	Service ICAR experiment	**BatchID**	Tag A
		Notes	Transverse pull at ambient temperature (23,5 C)
			Operator: Ole Klejs Hansen

Results

Calculation	Peak load	Test Started
Units	N	
Sample 1	344.7	14:56 15/07/2015
Sample 2	356.2	14:57 15/07/2015
Sample 3	363.7	14:58 15/07/2015
Sample 4	361.3	14:59 15/07/2015
Sample 5	349.5	14:59 15/07/2015
Sample 6	352.8	15:00 15/07/2015
Sample 7	341.0	15:01 15/07/2015
Sample 8	355.9	15:01 15/07/2015
Sample 9	350.5	15:02 15/07/2015
Sample 10	362.5	15:03 15/07/2015
Sample 11	352.5	15:03 15/07/2015
Sample 12	356.2	15:06 15/07/2015
Sample 13	374.6	15:07 15/07/2015
Sample 14	362.7	15:08 15/07/2015
Sample 15	377.8	15:08 15/07/2015
Sample 16	344.3	15:09 15/07/2015
Sample 17	353.7	15:10 15/07/2015
Sample 18	348.8	15:11 15/07/2015
Sample 19	350.8	15:11 15/07/2015
Minimum	341.0	N/A
Maximum	377.8	N/A
Mean	355.8	N/A
SD	9.62	N/A

Graphs
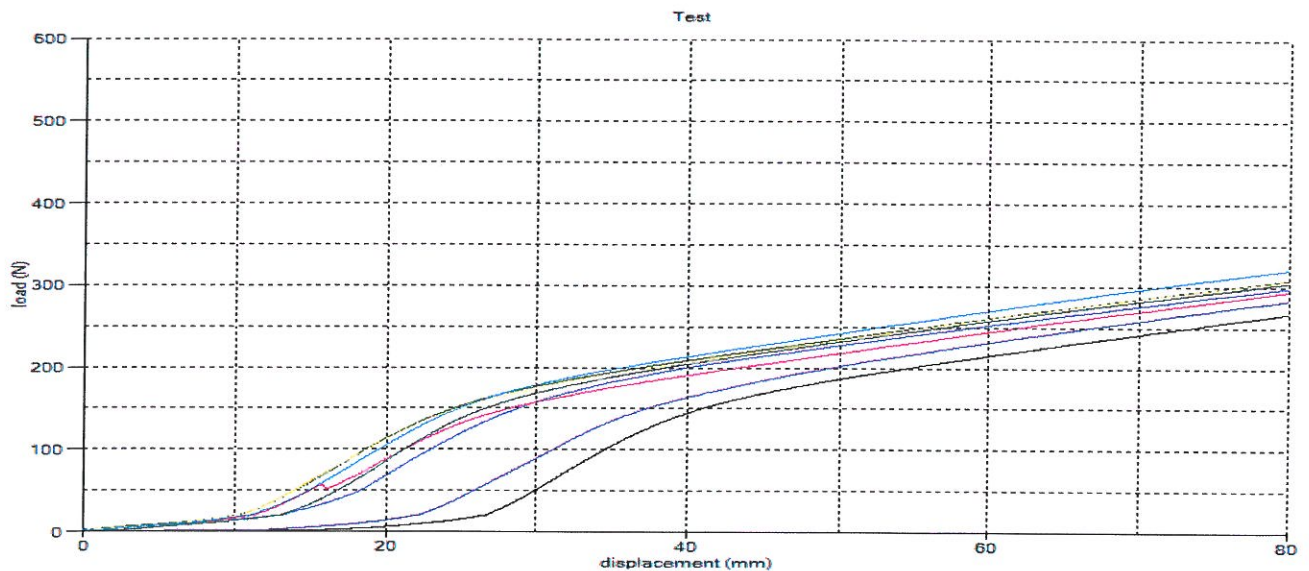
![RYK logo]

Customer Name	Service ICAR experiment	**BatchID**	Tag A
		Notes	Axial pull at 55 C

Operator: Ole Klejs Hansen

Results

Calculation	Peak load	Test Started	
Units	N		
Sample 1	237.8	13:52	16/07/2015
Sample 2	234.2	13:52	16/07/2015
Sample 3	228.3	13:53	16/07/2015
Sample 4	230.7	13:53	16/07/2015
Sample 5	234.2	13:54	16/07/2015
Sample 6	228.3	13:54	16/07/2015
Sample 7	249.2	13:55	16/07/2015
Sample 8	229.3	13:55	16/07/2015
Sample 9	240.5	13:56	16/07/2015
Sample 10	237.7	13:56	16/07/2015
Sample 11	260.7	13:57	16/07/2015
Sample 12	243.7	13:57	16/07/2015
Sample 13	248.8	13:58	16/07/2015
Sample 14	245.5	13:58	16/07/2015
Minimum	228.3	N/A	
Maximum	260.7	N/A	
Mean	239.2	N/A	
SD	9.53	N/A	

Graphs
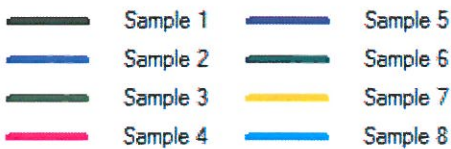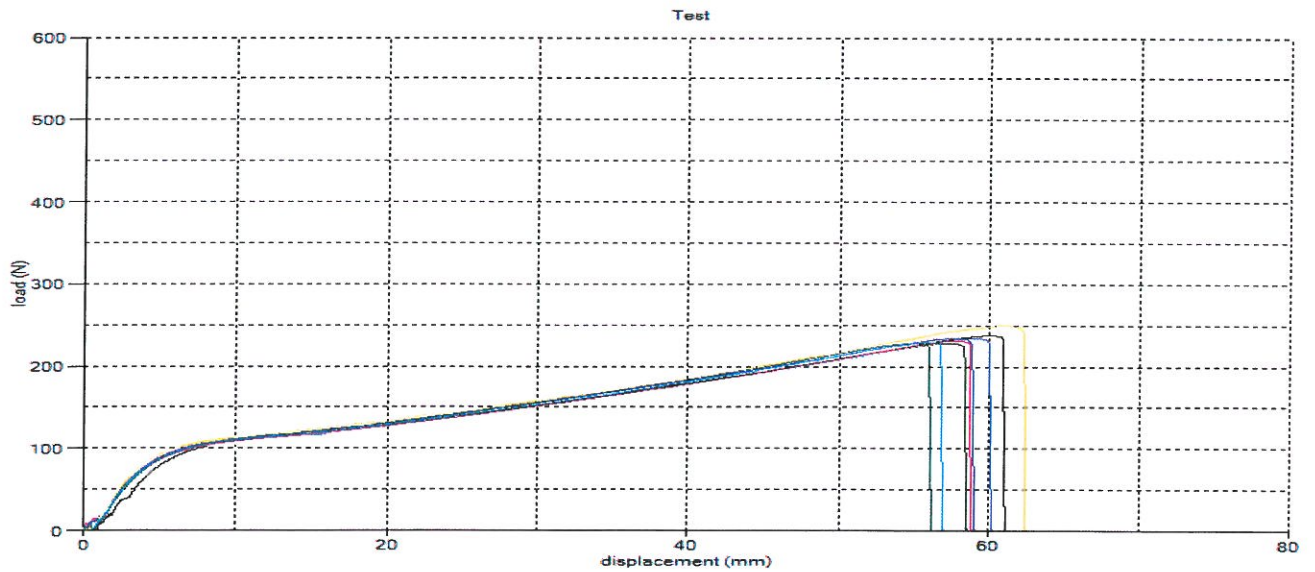
Test — load (N) vs displacement (mm)

Legend: Sample 1, Sample 2, Sample 3, Sample 4, Sample 5, Sample 6, Sample 7, Sample 8

| **Customer Name** | Service ICAR experiment | **BatchID** | Tag A |
| | | **Notes** | Transverse pull at 55 C |

Operator: Ole Klejs Hansen

Results

Calculation	Peak load	Test Started	
Units	N		
Sample 1	189.5	13:08	16/07/2015
Sample 2	192.6	13:09	16/07/2015
Sample 3	190.2	13:09	16/07/2015
Sample 4	185.3	13:10	16/07/2015
Sample 5	202.5	13:10	16/07/2015
Sample 6	183.4	13:11	16/07/2015
Sample 7	188.3	13:12	16/07/2015
Sample 8	186.9	13:12	16/07/2015
Sample 9	198.0	13:13	16/07/2015
Sample 10	199.8	13:14	16/07/2015
Sample 11	191.9	13:14	16/07/2015
Sample 12	190.8	13:15	16/07/2015
Sample 13	197.3	13:16	16/07/2015
Sample 14	186.0	13:16	16/07/2015
Minimum	183.4	N/A	
Maximum	202.5	N/A	
Mean	191.6	N/A	
SD	5.81	N/A	

Graphs
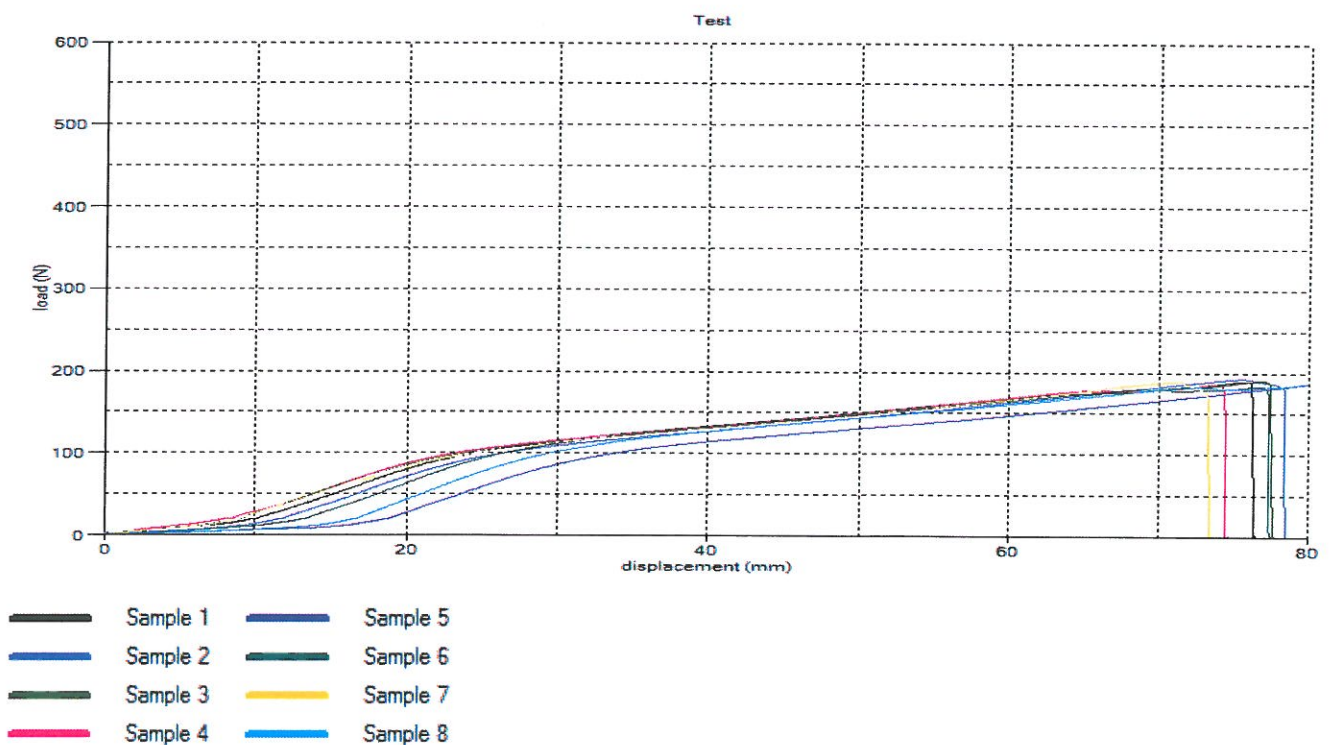
ICAR Pull-test of plastic ear tags

Customer Name   Service ICAR experiment
BatchID   Tag A
**Notes**   Transverse pull at 80 C

Operator: Ole Klejs Hansen

Results

Calculation	Test Started	Peak load
Units		N
Sample 1	13:02 13-07-2015	128,1
Sample 2	13:03 13-07-2015	133,7
Sample 3	13:03 13-07-2015	126,9
Sample 4	13:04 13-07-2015	128,9
Sample 5	13:05 13-07-2015	138,0
Sample 6	13:05 13-07-2015	137,0
Sample 7	13:06 13-07-2015	129,6
Sample 8	13:07 13-07-2015	121,5
Sample 9	13:08 13-07-2015	123,5
Sample 10	13:08 13-07-2015	130,7
Sample 11	13:09 13-07-2015	127,8
Sample 12	13:10 13-07-2015	138,6
Sample 13	13:11 13-07-2015	132,5
Sample 14	13:11 13-07-2015	119,9
Sample 15	13:12 13-07-2015	128,0
Sample 16	13:13 13-07-2015	126,6
Sample 17	13:14 13-07-2015	119,3
Sample 18	13:15 13-07-2015	125,3
Sample 19	13:15 13-07-2015	132,5
Minimum	N/A	119,3
Maximum	N/A	138,6
Mean	N/A	128,9
SD	N/A	5,65

Graphs
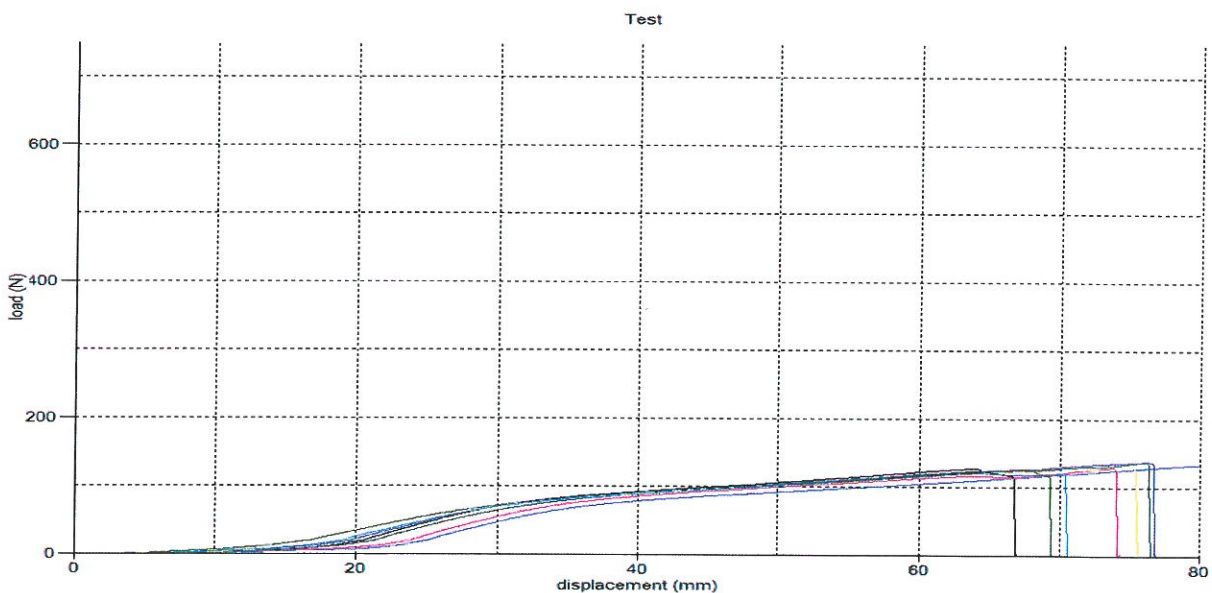
Results

Customer Name	Service ICAR experiment	BatchID	Tag B
		Notes	Axial pull at 55 C

Operator: Ole Klejs Hansen

Results

Calculation	Peak load	Test Started	
Units	N		
Sample 1	230.7	14:02	16/07/2015
Sample 2	228.9	14:02	16/07/2015
Sample 3	222.7	14:03	16/07/2015
Sample 4	229.5	14:03	16/07/2015
Sample 5	207.0	14:03	16/07/2015
Sample 6	204.3	14:04	16/07/2015
Sample 7	238.9	14:04	16/07/2015
Minimum	204.3	N/A	
Maximum	238.9	N/A	
Mean	223.1	N/A	
SD	12.9	N/A	

Graphs
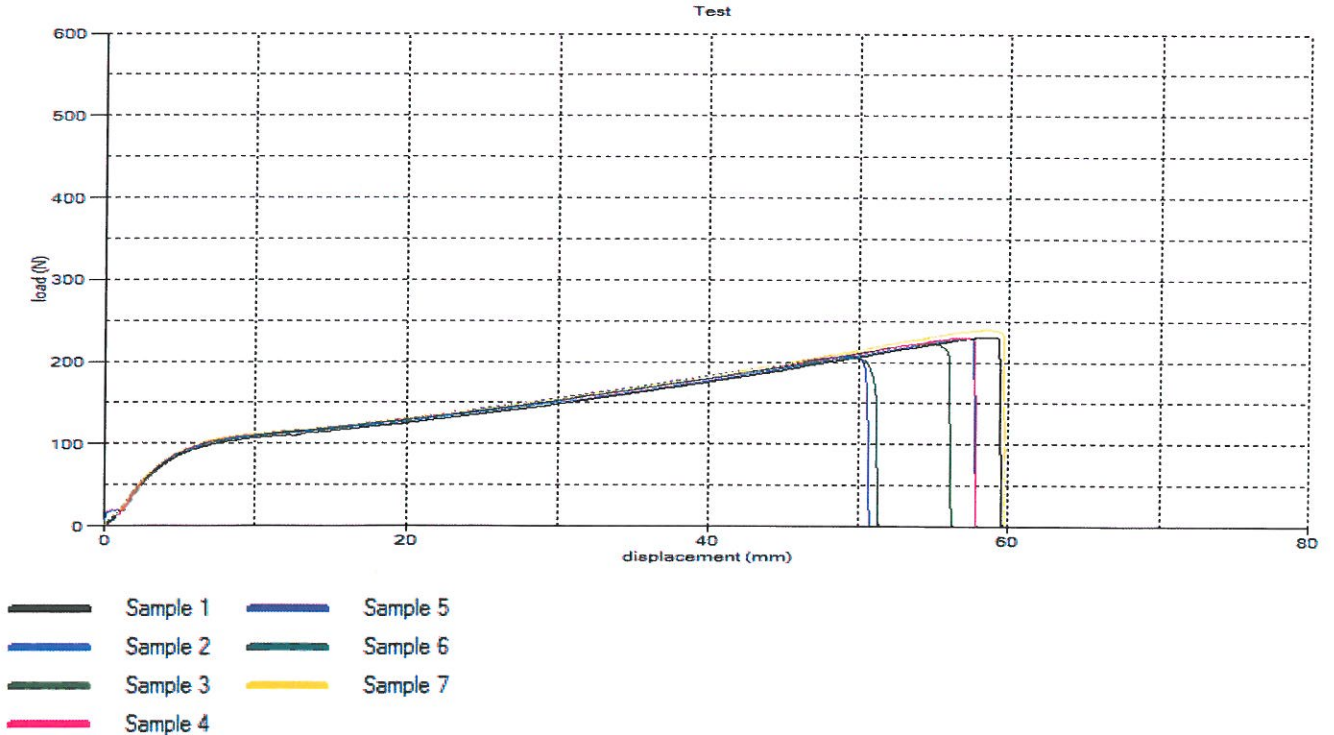
—— Sample 1	—— Sample 5		
—— Sample 2	—— Sample 6		
—— Sample 3	—— Sample 7		
—— Sample 4			

Customer Name	Service ICAR experiment	BatchID	Tag B
		Notes	Transverse pull at 55 C

Results

Calculation	Peak load	Test Started	
Units	N		
Sample 1	199.5	13:20	16/07/2015
Sample 2	212.2	13:21	16/07/2015
Sample 3	232.6	13:22	16/07/2015
Sample 4	204.8	13:23	16/07/2015
Sample 5	213.4	13:23	16/07/2015
Sample 6	193.8	13:24	16/07/2015
Sample 7	193.5	13:24	16/07/2015
Sample 8	214.6	13:25	16/07/2015
Minimum	193.5	N/A	
Maximum	232.6	N/A	
Mean	208.1	N/A	
SD	13.0	N/A	

Graphs
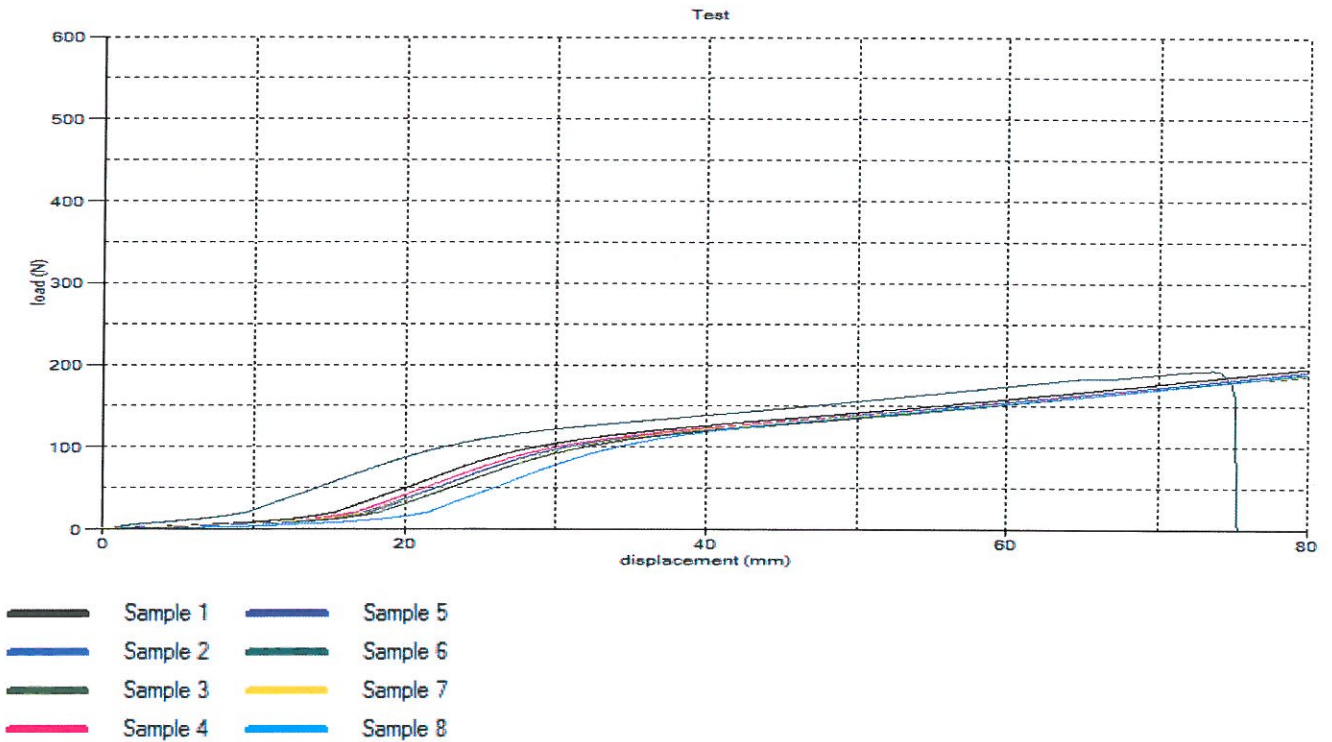
|			
——	Sample 1	——	Sample 5
——	Sample 2	——	Sample 6
——	Sample 3	——	Sample 7
——	Sample 4	——	Sample 8

ICAR Pull-test of plastic ear tags

Customer Name   Service ICAR experiment
BatchID   Tag B
Notes   Transverse pull at 80 C

Operator: Ole Klejs Hansen

Results

Calculation	Test Started	Peak load
Units		N
Sample 1	13:23 13-07-2015	148,6
Sample 2	13:24 13-07-2015	147,0
Sample 3	13:25 13-07-2015	149,2
Sample 4	13:26 13-07-2015	149,1
Sample 5	13:27 13-07-2015	146,5
Sample 6	13:27 13-07-2015	162,4
Sample 7	13:28 13-07-2015	144,4
Sample 8	13:29 13-07-2015	151,3
Sample 9	13:30 13-07-2015	151,6
Sample 10	13:31 13-07-2015	143,8
Sample 11	13:32 13-07-2015	153,4
Sample 12	13:32 13-07-2015	150,0
Sample 13	13:33 13-07-2015	138,3
Sample 14	13:34 13-07-2015	151,3
Sample 15	13:35 13-07-2015	153,7
Sample 16	13:36 13-07-2015	146,1
Minimum	N/A	138,3
Maximum	N/A	162,4
Mean	N/A	149,2
SD	N/A	5,29

Graphs
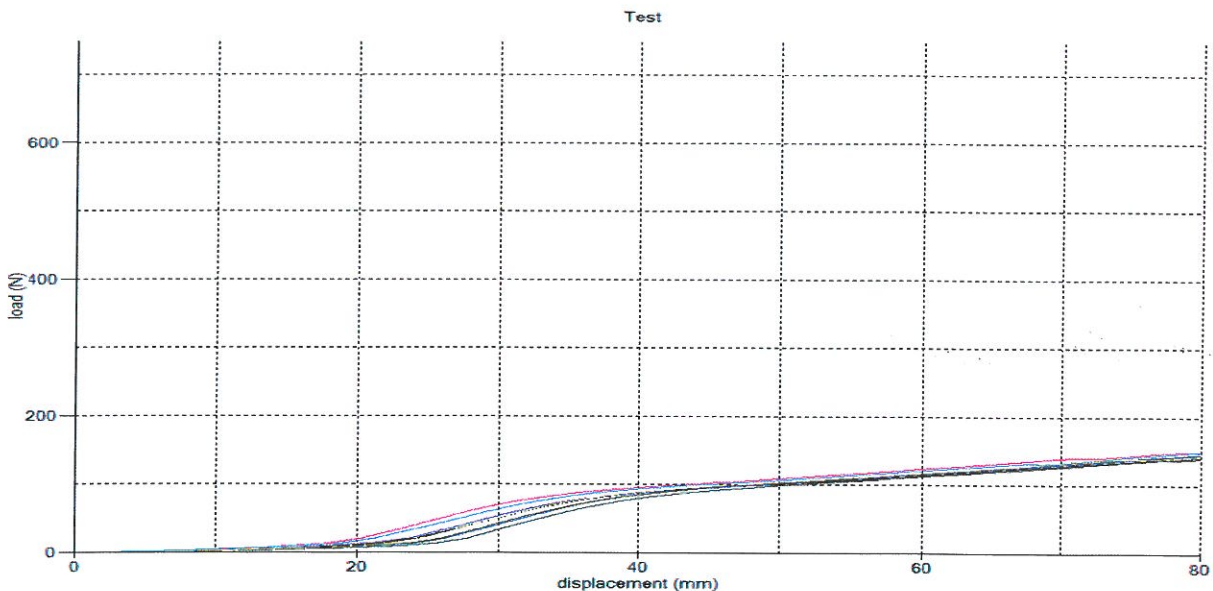
Customer Name Service ICAR experiment

BatchID

Notes

Tag C

Transverse pull at 55 C

Operator: Ole Klejs Hansen

Results

Calculation	Peak load	Test Started
Units	N	
Sample 1	207.9	13:29 16/07/2015
Sample 2	218.5	13:30 16/07/2015
Sample 3	225.4	13:30 16/07/2015
Sample 4	215.7	13:31 16/07/2015
Sample 5	212.4	13:32 16/07/2015
Sample 6	216.6	13:32 16/07/2015
Sample 7	191.9	13:33 16/07/2015
Sample 8	166.4	13:34 16/07/2015
Sample 9	198.0	13:34 16/07/2015
Sample 10	204.0	13:35 16/07/2015
Sample 11	209.8	13:36 16/07/2015
Minimum	166.4	N/A
Maximum	225.4	N/A
Mean	206.1	N/A
SD	16.2	N/A

Graphs

Sample 1		Sample 5	
Sample 2		Sample 6	
Sample 3		Sample 7	
Sample 4		Sample 8	
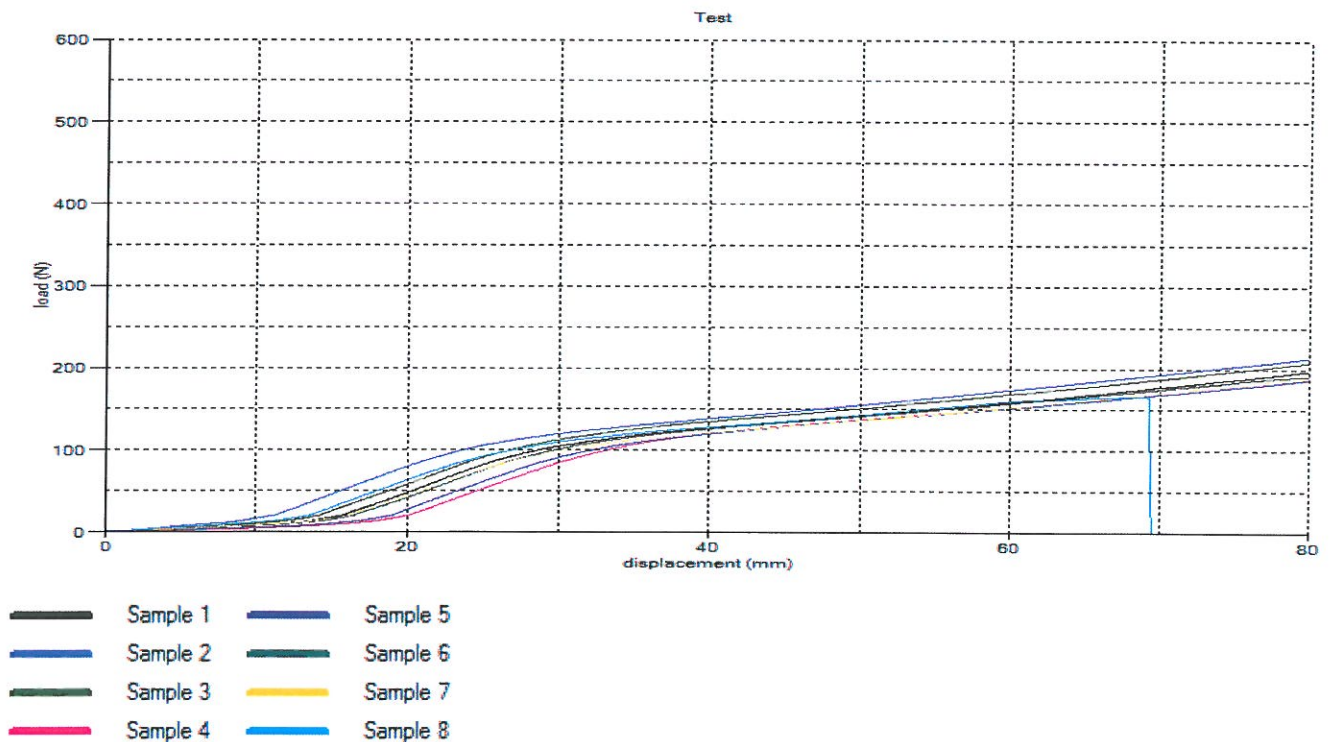
ICAR Pull-test of plastic ear tags
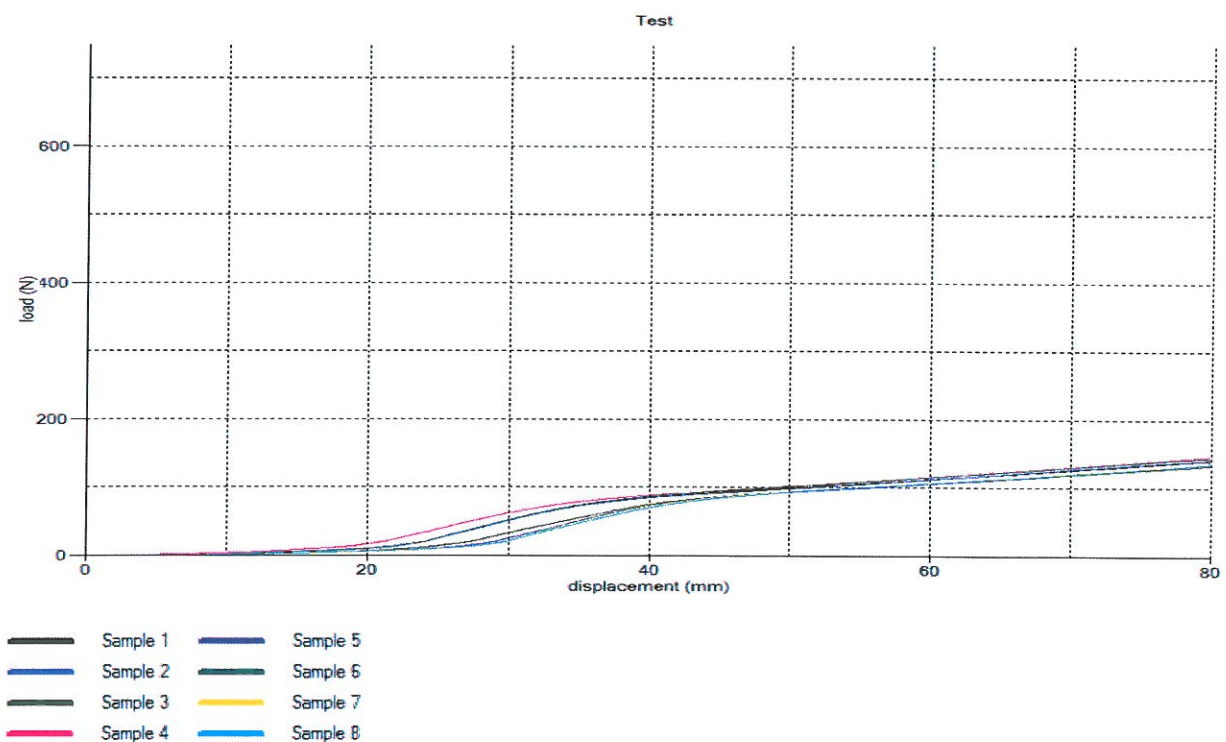
Customer Name   Service ICAR experiment
BatchID   Tag C
Notes   Transverse pull at 80 C

Operator: Ole Klejs Hansen

Results

Calculation	Test Started	Peak load
Units		N
Sample 1	13:40 13-07-2015	148,0
Sample 2	13:40 13-07-2015	139,8
Sample 3	13:41 13-07-2015	146,1
Sample 4	13:42 13-07-2015	147,3
Sample 5	13:43 13-07-2015	154,2
Sample 6	13:44 13-07-2015	144,0
Sample 7	13:44 13-07-2015	164,3
Sample 8	13:45 13-07-2015	156,6
Sample 9	13:46 13-07-2015	157,0
Sample 10	13:47 13-07-2015	146,4
Sample 11	13:48 13-07-2015	150,6
Minimum	N/A	139,8
Maximum	N/A	164,3
Mean	N/A	150,4
SD	N/A	7,03

Graphs

Test

Sample 1
Sample 2
Sample 3
Sample 4
Sample 5
Sample 6
Sample 7
Sample 8

Customer Name   Service ICAR experiment

BatchID
Notes

Tag D
Transverse pull at ambient
temperature (23,5 C)

Operator: Ole Klejs Hansen

Results

Calculation	Peak load	Test Started
Units	N	
Sample 1	446.5	14:27 15/07/2015
Sample 2	396.8	14:28 15/07/2015
Sample 3	466.4	14:29 15/07/2015
Sample 4	462.2	14:30 15/07/2015
Sample 5	435.6	14:31 15/07/2015
Sample 6	445.4	14:32 15/07/2015
Sample 8	465.1	14:34 15/07/2015
Sample 9	455.9	14:35 15/07/2015
Sample 10	444.7	14:36 15/07/2015
Sample 12	445.0	14:37 15/07/2015
Sample 13	428.1	14:38 15/07/2015
Sample 14	394.3	14:39 15/07/2015
Sample 15	301.9	14:40 15/07/2015
Sample 16	416.6	14:41 15/07/2015
Sample 17	459.5	14:41 15/07/2015
Sample 18	457.0	14:42 15/07/2015
Sample 20	483.6	14:44 15/07/2015
Sample 21	440.8	14:45 15/07/2015
Sample 23	456.4	14:47 15/07/2015
Sample 25	429.4	14:48 15/07/2015
Sample 27	423.4	14:50 15/07/2015
Sample 28	461.0	14:51 15/07/2015
Minimum	301.9	N/A
Maximum	483.6	N/A
Mean	437.1	N/A
SD	37.4	N/A

Graphs

Customer Name	Service ICAR experiment	BatchID	Tag D
		Notes	Axial pull at 55 C

Operator: Ole Klejs Hansen

Results

Calculation	Peak load	Test Started
Units	N	
Sample 2	383.3	14:09 16/07/2015
Sample 3	360.0	14:09 16/07/2015
Sample 4	407.9	14:10 16/07/2015
Sample 5	392.9	14:10 16/07/2015
Sample 6	344.4	14:11 16/07/2015
Sample 7	394.1	14:11 16/07/2015
Sample 8	347.9	14:11 16/07/2015
Sample 9	392.9	14:12 16/07/2015
Sample 10	387.5	14:12 16/07/2015
Sample 11	381.2	14:13 16/07/2015
Minimum	344.4	N/A
Maximum	407.9	N/A
Mean	379.2	N/A
SD	21.3	N/A

Graphs

RYK

DLBR

Customer Name	Service ICAR experiment	**BatchID**	Tag D
		Notes	Transverse pull at 55 C
			Operator: Ole Klejs Hansen

Results

Calculation	Peak load	Test Started	
Units	N		
Sample 1	304.9	13:40	16/07/2015
Sample 2	297.1	13:41	16/07/2015
Sample 3	318.7	13:41	16/07/2015
Sample 4	377.3	13:42	16/07/2015
Sample 5	360.1	13:43	16/07/2015
Sample 6	306.1	13:43	16/07/2015
Sample 7	366.4	13:44	16/07/2015
Sample 8	359.8	13:45	16/07/2015
Sample 9	318.8	13:46	16/07/2015
Minimum	297.1	N/A	
Maximum	377.3	N/A	
Mean	334.4	N/A	
SD	31.1	N/A	

Graphs
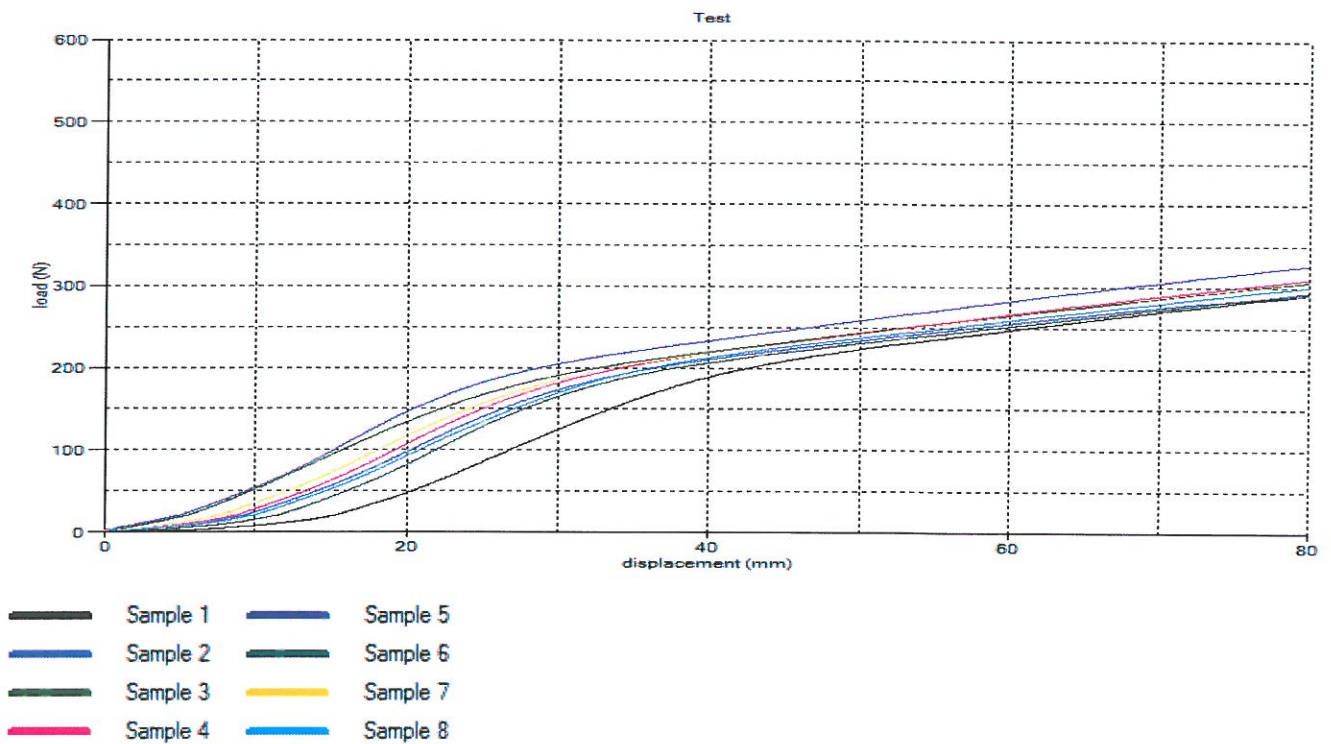
ICAR Pull-test of plastic ear tags

Customer Name	Service ICAR experiment
BatchID	Tag D
Notes	Transverse pull at 80 C

Operator: Ole Klejs Hansen

Results

Calculation	Test Started	Peak load
Units		N
Sample 1	13:51 13-07-2015	133,8
Sample 2	13:52 13-07-2015	212,2
Sample 3	13:53 13-07-2015	214,8
Sample 4	13:53 13-07-2015	238,4
Sample 5	13:54 13-07-2015	284,4
Sample 6	13:55 13-07-2015	270,3
Sample 7	13:55 13-07-2015	216,9
Sample 8	13:56 13-07-2015	260,1
Sample 9	13:57 13-07-2015	242,2
Sample 10	13:58 13-07-2015	290,7
Sample 11	13:58 13-07-2015	251,8
Sample 12	13:59 13-07-2015	285,0
Sample 13	14:00 13-07-2015	214,8
Sample 14	14:01 13-07-2015	198,6
Sample 15	14:01 13-07-2015	273,8
Sample 16	14:02 13-07-2015	254,0
Sample 17	14:03 13-07-2015	276,6
Sample 18	14:04 13-07-2015	270,5
Sample 19	14:04 13-07-2015	260,0
Sample 20	14:05 13-07-2015	276,9
Minimum	N/A	133,8
Maximum	N/A	290,7
Mean	N/A	246,3
SD	N/A	38,5

Graphs
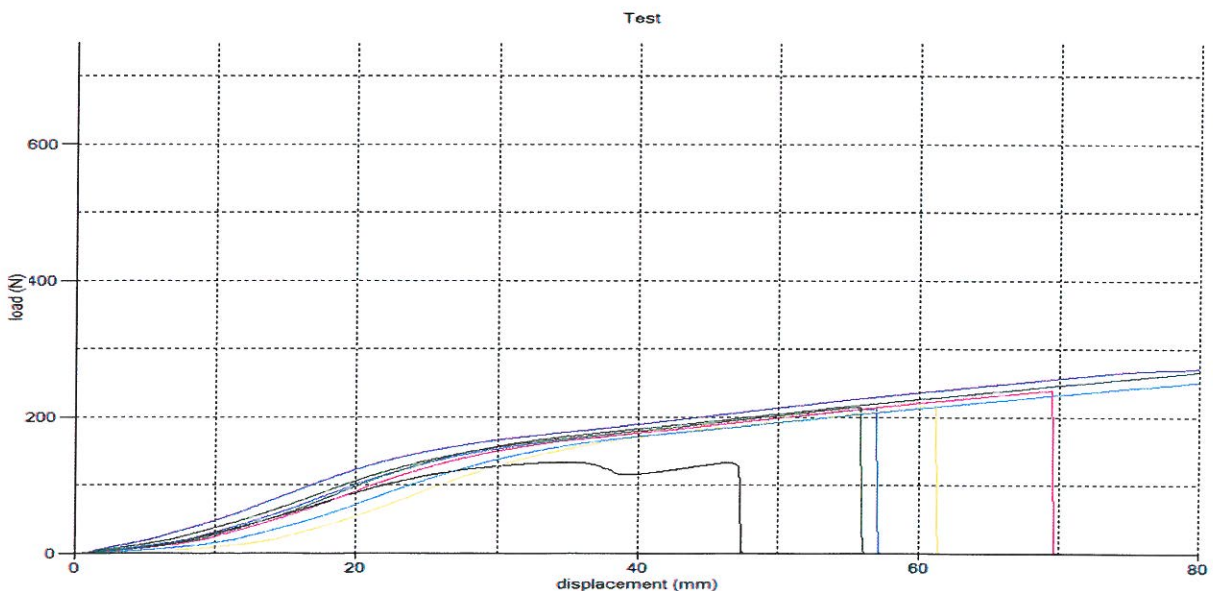
Customer Name	Service ICAR experiment	BatchID	Tag E
		Notes	Transverse pull at 55 C

Operator: Ole Klejs Hansen

Results

Calculation	Peak load	Test Started
Units	N	
Sample 1	131.4	14:19 15/07/2015
Sample 2	135.6	14:20 15/07/2015
Sample 3	128.0	14:21 15/07/2015
Sample 4	133.4	14:21 15/07/2015
Sample 5	137.7	14:22 15/07/2015
Sample 6	125.7	14:22 15/07/2015
Sample 7	136.7	14:23 15/07/2015
Minimum	125.7	N/A
Maximum	137.7	N/A
Mean	132.6	N/A
SD	4.51	N/A

Graphs

	Sample 1		Sample 5
	Sample 2		Sample 6
	Sample 3		Sample 7
	Sample 4		
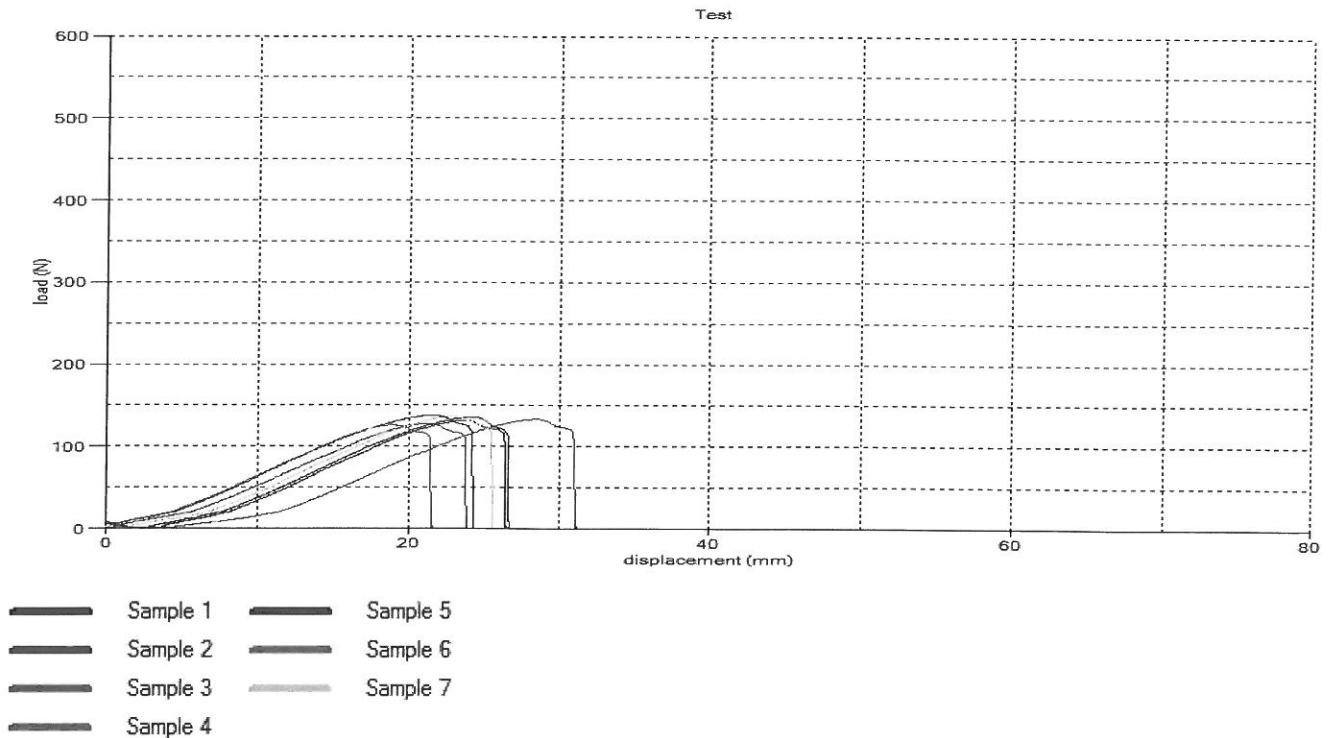
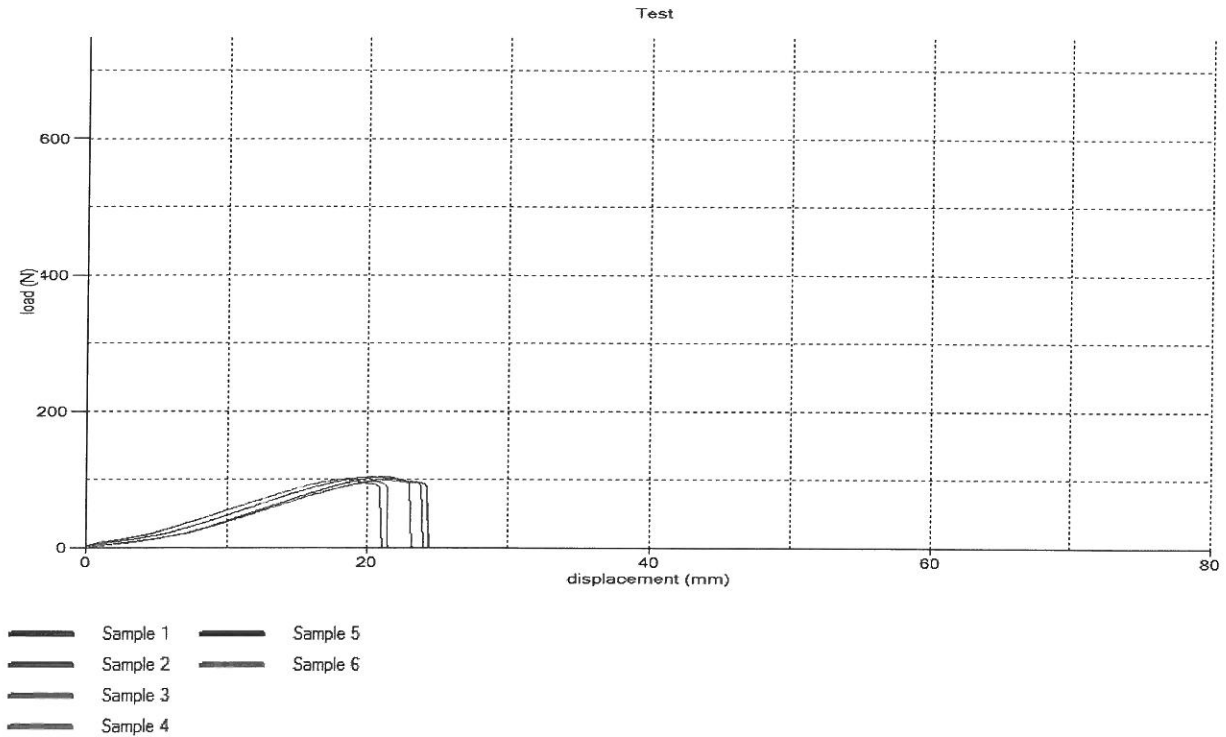| Customer Name	Service ICAR experiment	BatchID	Tag E

ICAR Pull-test of plastic ear tags

Customer Name Service ICAR experiment
BatchID Tag E
Notes Transverse pull at 80 C

Operator: Ole Klejs Hansen

Results

Calculation	Test Started	Peak load
Units		N
Sample 1	12:59 14-07-2015	104,6
Sample 2	13:00 14-07-2015	100,3
Sample 3	13:00 14-07-2015	98,9
Sample 4	13:01 14-07-2015	102,1
Sample 5	13:02 14-07-2015	104,3
Sample 6	13:02 14-07-2015	101,8
Minimum	N/A	98,9
Maximum	N/A	104,6
Mean	N/A	102,0
SD	N/A	2,22

Graphs

Test

Sample 1
Sample 2
Sample 3
Sample 4
Sample 5
Sample 6

BatchID   Tag E

ICAR Pull-test of plastic ear tags

Customer Name	Service ICAR experiment
BatchID	Tag F
Notes	Axial pull at ambient temperature (26,3 C)

Operator: Ole Klejs Hansen

Results

Calculation	Test Started	Peak load
Units		N
Sample 1	14:49 14-07-2015	391,4
Sample 2	14:49 14-07-2015	414,6
Sample 3	14:50 14-07-2015	438,0
Sample 4	14:50 14-07-2015	412,2
Sample 5	14:50 14-07-2015	397,5
Sample 6	14:51 14-07-2015	359,7
Sample 7	14:51 14-07-2015	406,5
Sample 8	14:51 14-07-2015	337,5
Sample 9	14:52 14-07-2015	382,9
Sample 10	14:52 14-07-2015	403,1
Sample 11	14:52 14-07-2015	394,9
Sample 12	14:53 14-07-2015	405,3
Sample 13	14:53 14-07-2015	400,2
Sample 14	14:53 14-07-2015	398,3
Sample 15	14:53 14-07-2015	397,2
Sample 16	14:54 14-07-2015	395,7
Sample 17	14:54 14-07-2015	357,4
Sample 18	14:54 14-07-2015	360,7
Sample 19	14:55 14-07-2015	394,9
Minimum	N/A	337,5
Maximum	N/A	438,0
Mean	N/A	392,0
SD	N/A	23,6

Graphs
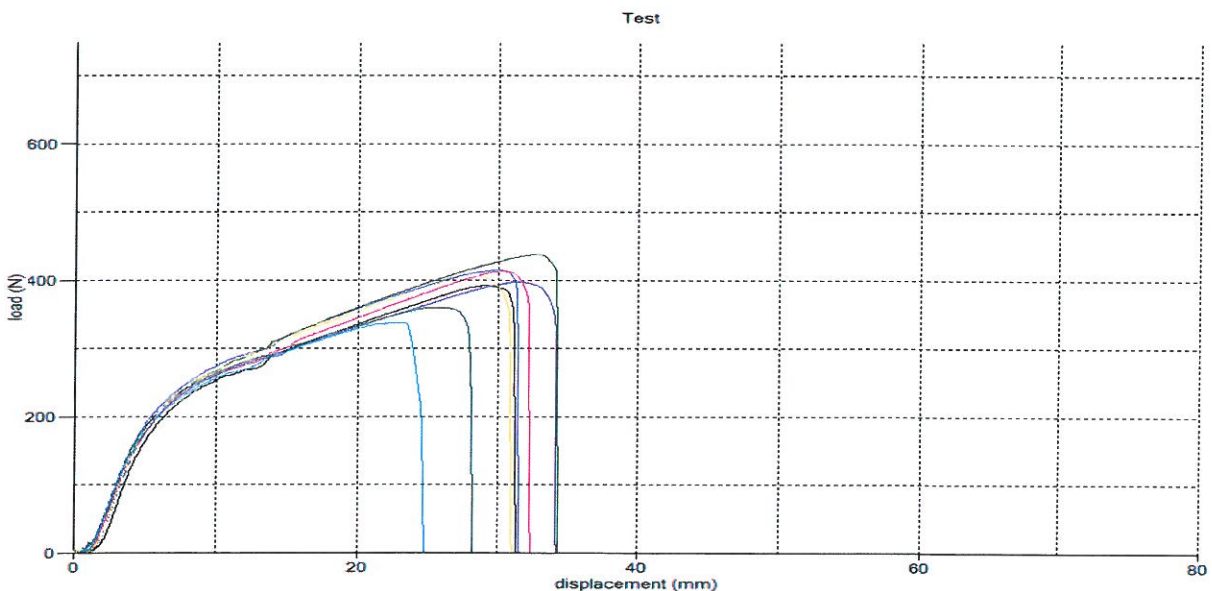
Customer Name Service ICAR experiment

BatchID

Notes Tag F

Axial pull at 55 C

Operator: Ole Klejs Hansen

Results

Calculation	Peak load	Test Started
Units	N	
Sample 1	283.9	13:28 15/07/2015
Sample 2	265.4	13:28 15/07/2015
Sample 3	259.1	13:29 15/07/2015
Sample 4	273.3	13:29 15/07/2015
Sample 5	250.7	13:29 15/07/2015
Sample 6	264.0	13:30 15/07/2015
Sample 7	294.7	13:30 15/07/2015
Sample 8	274.7	13:31 15/07/2015
Sample 9	288.7	13:31 15/07/2015
Sample 10	283.8	13:31 15/07/2015
Sample 11	258.8	13:32 15/07/2015
Sample 12	278.0	13:32 15/07/2015
Sample 13	258.8	13:33 15/07/2015
Sample 14	279.6	13:33 15/07/2015
Sample 15	256.5	13:34 15/07/2015
Sample 16	260.4	13:34 15/07/2015
Sample 17	250.4	13:35 15/07/2015
Sample 18	267.0	13:35 15/07/2015
Sample 19	252.5	13:36 15/07/2015
Sample 20	255.5	13:36 15/07/2015
Minimum	250.4	N/A
Maximum	294.7	N/A
Mean	267.8	N/A
SD	13.4	N/A

Graphs
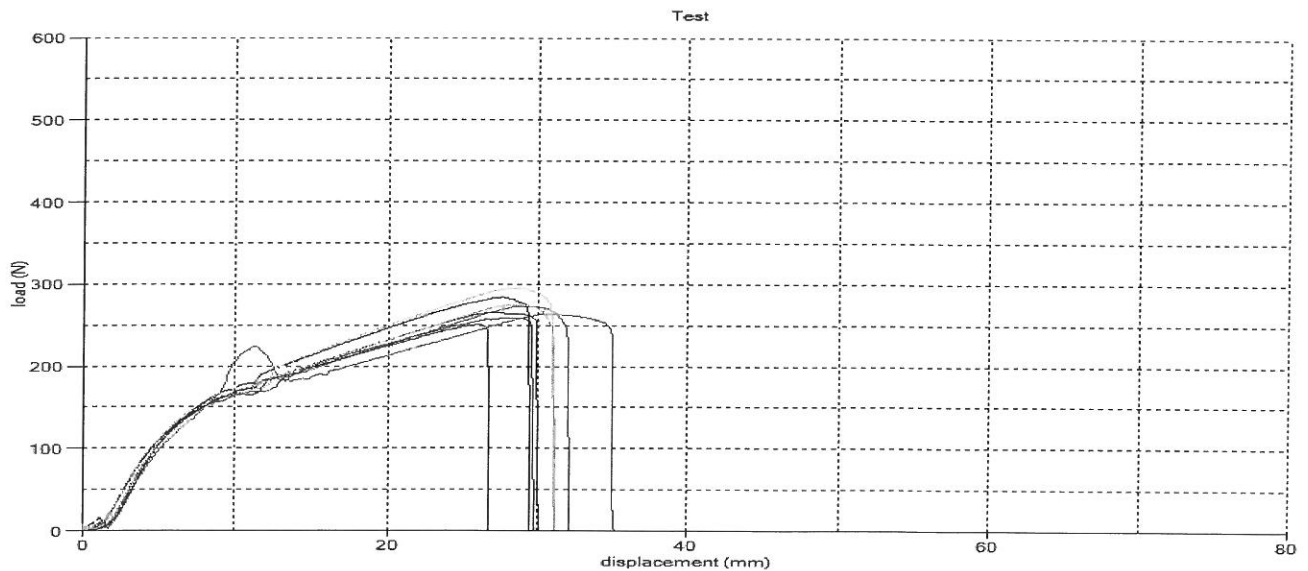
ICAR Pull-test of plastic ear tags
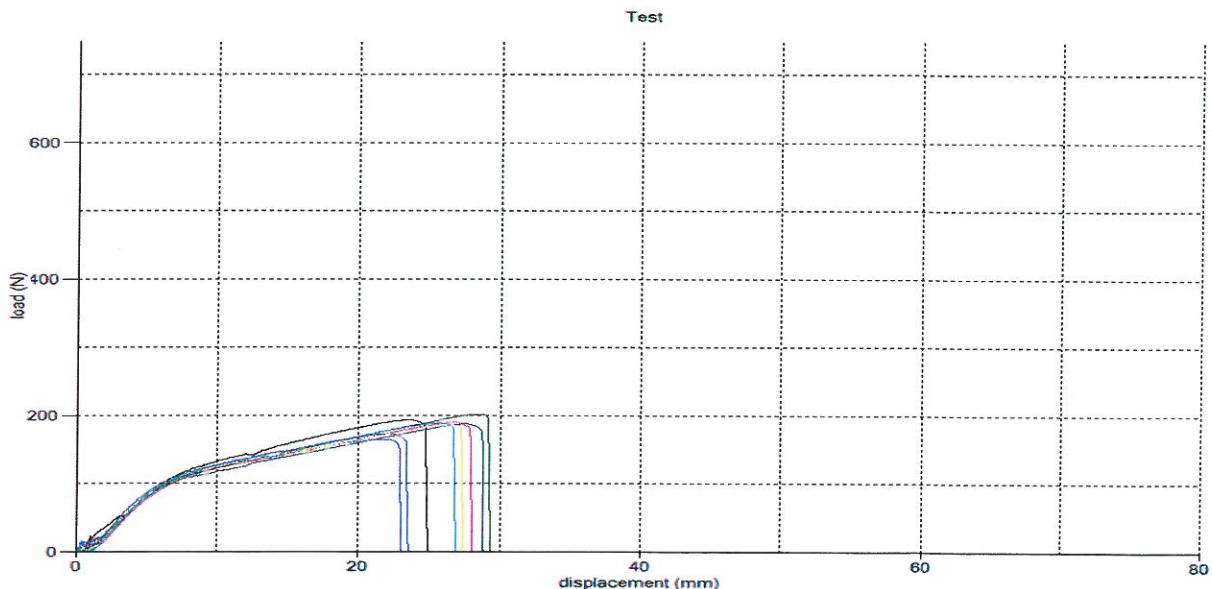
Customer Name   Service ICAR experiment
BatchID   Tag F
Notes   Axial pull at 80 C

Operator: Ole Klejs Hansen

Results

Calculation	Test Started	Peak load
Units		N
Sample 1	13:28 14-07-2015	192,9
Sample 2	13:29 14-07-2015	165,1
Sample 3	13:29 14-07-2015	201,5
Sample 4	13:29 14-07-2015	189,0
Sample 5	13:30 14-07-2015	173,0
Sample 6	13:30 14-07-2015	187,7
Sample 7	13:31 14-07-2015	186,5
Sample 8	13:31 14-07-2015	188,7
Sample 9	13:31 14-07-2015	204,9
Sample 10	13:32 14-07-2015	210,1
Sample 11	13:32 14-07-2015	185,5
Sample 12	13:33 14-07-2015	202,2
Sample 13	13:33 14-07-2015	160,9
Sample 14	13:34 14-07-2015	214,3
Sample 15	13:34 14-07-2015	209,8
Sample 16	13:34 14-07-2015	139,9
Sample 17	13:35 14-07-2015	195,0
Sample 18	13:35 14-07-2015	159,7
Sample 19	13:36 14-07-2015	202,8
Sample 20	13:37 14-07-2015	194,6
Minimum	N/A	139,9
Maximum	N/A	214,3
Mean	N/A	188,2
SD	N/A	19,6

Graphs

1 / 2

ICAR Pull-test of plastic ear tags

Customer Name	Service ICAR experiment
BatchID	Tag G
Notes	Axial pull at ambient temperature (26,4 C)

Operator: Ole Klejs Hansen

Results

Calculation	Test Started	Peak load
Units		N
Sample 1	14:38 14-07-2015	431,5
Sample 2	14:38 14-07-2015	405,9
Sample 3	14:38 14-07-2015	418,1
Sample 4	14:39 14-07-2015	419,5
Sample 5	14:39 14-07-2015	410,0
Sample 6	14:39 14-07-2015	414,0
Sample 7	14:40 14-07-2015	402,0
Sample 8	14:40 14-07-2015	416,9
Sample 9	14:40 14-07-2015	414,6
Sample 10	14:41 14-07-2015	396,0
Sample 11	14:41 14-07-2015	411,3
Sample 12	14:42 14-07-2015	393,5
Sample 13	14:42 14-07-2015	425,4
Sample 14	14:43 14-07-2015	331,2
Sample 15	14:43 14-07-2015	371,4
Sample 16	14:43 14-07-2015	379,4
Sample 17	14:44 14-07-2015	428,5
Sample 18	14:44 14-07-2015	392,2
Sample 19	14:44 14-07-2015	410,0
Sample 20	14:45 14-07-2015	390,5
Minimum	N/A	331,2
Maximum	N/A	431,5
Mean	N/A	403,1
SD	N/A	23,2

Graphs

Results

Calculation	Peak load	Test Started
Units	N	
Sample 1	276.0	13:41 15/07/2015
Sample 2	250.4	13:41 15/07/2015
Sample 3	275.6	13:42 15/07/2015
Sample 4	264.9	13:42 15/07/2015
Sample 5	266.6	13:43 15/07/2015
Sample 6	265.8	13:43 15/07/2015
Sample 7	261.6	13:43 15/07/2015
Sample 8	266.3	13:44 15/07/2015
Sample 9	275.3	13:44 15/07/2015
Sample 10	258.3	13:45 15/07/2015
Sample 11	276.3	13:45 15/07/2015
Sample 12	260.7	13:45 15/07/2015
Sample 13	289.5	13:46 15/07/2015
Sample 14	278.0	13:47 15/07/2015
Sample 15	294.6	13:47 15/07/2015
Sample 16	279.7	13:48 15/07/2015
Sample 17	264.8	13:48 15/07/2015
Sample 18	278.9	13:49 15/07/2015
Sample 19	279.1	13:49 15/07/2015
Sample 20	264.5	13:50 15/07/2015
Minimum	250.4	N/A
Maximum	294.6	N/A
Mean	271.3	N/A
SD	10.8	N/A

Graphs
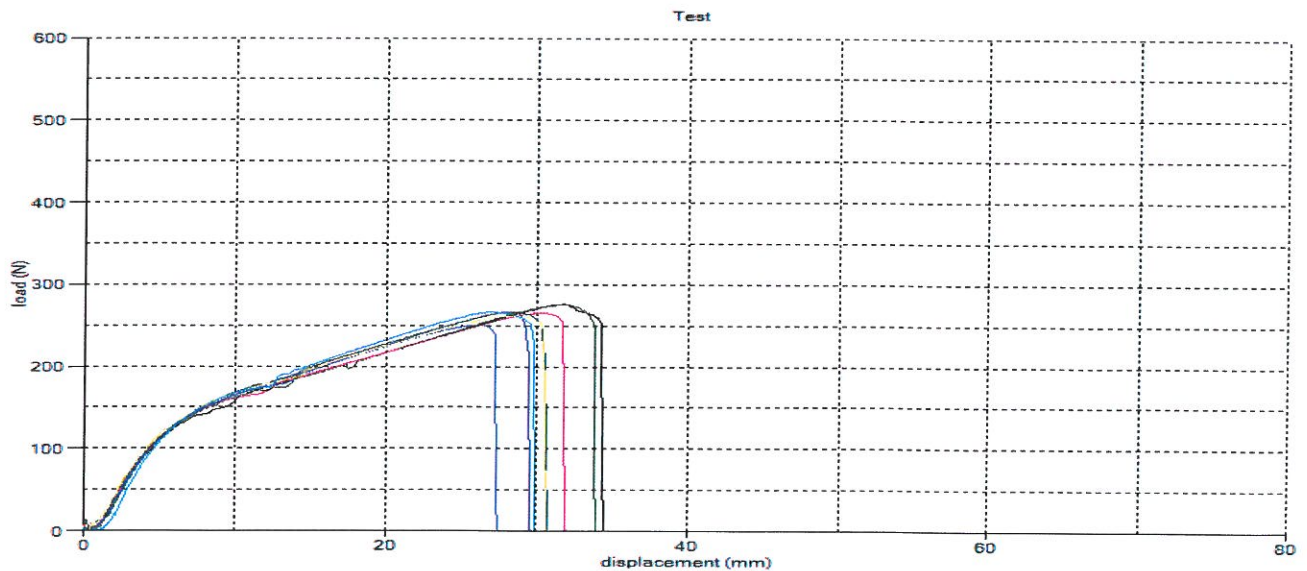
Customer Name   Service ICAR experiment

BatchID

Notes

Tag G

Axial pull at 55 C

Operator: Ole Klejs Hansen

ICAR Pull-test of plastic ear tags

Customer Name	Service ICAR experiment
BatchID	Tag G
Notes	Axial pull at 80 C

Operator: Ole Klejs Hansen

Results

Calculation	Test Started	Peak load
Units		N
Sample 1	13:41 14-07-2015	212,7
Sample 2	13:41 14-07-2015	186,6
Sample 3	13:42 14-07-2015	171,7
Sample 4	13:42 14-07-2015	190,8
Sample 5	13:43 14-07-2015	196,4
Sample 6	13:43 14-07-2015	204,3
Sample 7	13:43 14-07-2015	204,2
Sample 8	13:44 14-07-2015	199,8
Sample 9	13:44 14-07-2015	208,8
Sample 10	13:45 14-07-2015	189,0
Sample 11	13:45 14-07-2015	191,7
Sample 12	13:45 14-07-2015	202,1
Sample 13	13:46 14-07-2015	206,7
Sample 14	13:46 14-07-2015	201,8
Sample 15	13:47 14-07-2015	194,3
Sample 16	13:47 14-07-2015	209,8
Sample 17	13:47 14-07-2015	214,8
Sample 18	13:48 14-07-2015	118,4
Sample 19	13:48 14-07-2015	208,4
Sample 20	13:49 14-07-2015	188,4
Minimum	N/A	118,4
Maximum	N/A	214,8
Mean	N/A	195,0
SD	N/A	20,9

Graphs
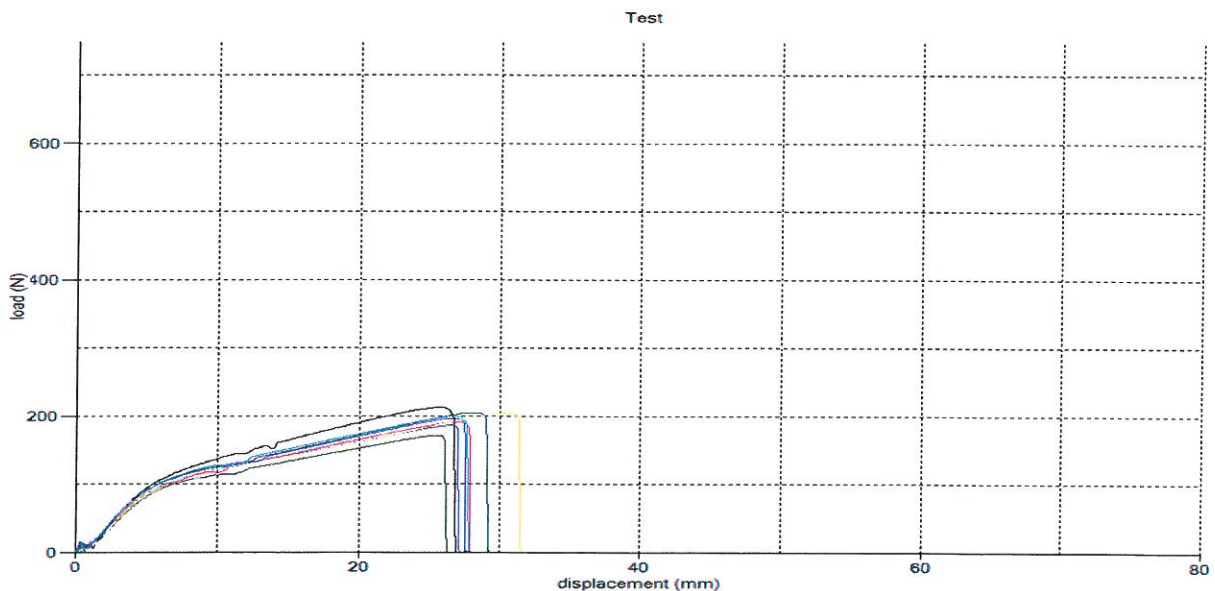
ICAR Pull-test of plastic ear tags

Customer Name   Service ICAR experiment
BatchID   Tag H
Notes   Axial pull at ambient
temperature (26,4 C)

Operator: Ole Klejs Hansen

Results

Calculation	Test Started	Peak load
Units		N
Sample 1	14:28 14-07-2015	282,6
Sample 2	14:28 14-07-2015	276,9
Sample 3	14:29 14-07-2015	286,0
Sample 4	14:29 14-07-2015	284,1
Sample 5	14:29 14-07-2015	291,9
Sample 6	14:30 14-07-2015	286,9
Sample 7	14:30 14-07-2015	285,1
Sample 8	14:30 14-07-2015	307,7
Sample 9	14:31 14-07-2015	293,8
Sample 10	14:31 14-07-2015	247,7
Sample 11	14:31 14-07-2015	308,2
Sample 12	14:32 14-07-2015	300,0
Sample 13	14:32 14-07-2015	300,7
Sample 14	14:32 14-07-2015	290,5
Sample 15	14:32 14-07-2015	293,4
Sample 16	14:33 14-07-2015	287,5
Sample 17	14:33 14-07-2015	283,6
Sample 18	14:33 14-07-2015	297,4
Sample 19	14:33 14-07-2015	306,8
Sample 20	14:34 14-07-2015	291,4
Minimum	N/A	247,7
Maximum	N/A	308,2
Mean	N/A	290,1
SD	N/A	13,3

Graphs

Customer Name	Service ICAR experiment	**BatchID**	Tag H
		Notes	Axial pull at 55 C
			Operator: Ole Klejs Hansen

Results

Calculation	Peak load	Test Started	
Units	N		
Sample 1	225.1	13:53	15/07/2015
Sample 2	244.1	13:54	15/07/2015
Sample 3	252.2	13:54	15/07/2015
Sample 4	237.5	13:55	15/07/2015
Sample 5	240.4	13:55	15/07/2015
Sample 6	243.8	13:55	15/07/2015
Sample 7	278.4	13:56	15/07/2015
Sample 8	236.3	13:56	15/07/2015
Sample 9	225.4	13:57	15/07/2015
Sample 10	284.1	13:57	15/07/2015
Sample 11	214.2	13:57	15/07/2015
Sample 12	250.9	13:58	15/07/2015
Sample 13	288.6	13:58	15/07/2015
Sample 14	274.5	13:59	15/07/2015
Sample 15	232.9	13:59	15/07/2015
Sample 16	252.7	13:59	15/07/2015
Sample 17	281.8	14:00	15/07/2015
Sample 18	238.6	14:00	15/07/2015
Sample 19	240.8	14:01	15/07/2015
Sample 20	231.6	14:01	15/07/2015
Minimum	214.2	N/A	
Maximum	288.6	N/A	
Mean	248.7	N/A	
SD	21.7	N/A	

Graphs
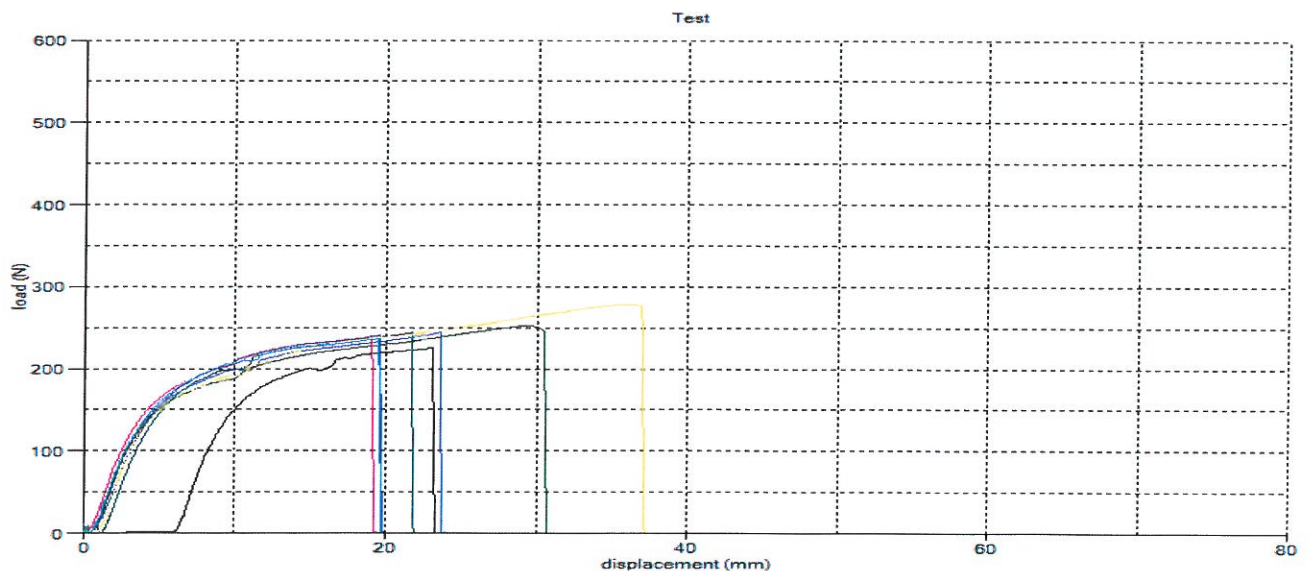
ICAR Pull-test of plastic ear tags

Customer Name	Service ICAR experiment
BatchID	Tag H
Notes	Axial pull at 80 C

Operator: Ole Klejs Hansen

Results

Calculation	Test Started	Peak load
Units		N
Sample 1	13:52 14-07-2015	190,2
Sample 2	13:53 14-07-2015	188,9
Sample 3	13:53 14-07-2015	175,9
Sample 4	13:54 14-07-2015	193,8
Sample 5	13:54 14-07-2015	204,8
Sample 6	13:55 14-07-2015	187,5
Sample 7	13:55 14-07-2015	182,0
Sample 8	13:55 14-07-2015	220,9
Sample 9	13:56 14-07-2015	182,0
Sample 10	13:56 14-07-2015	182,8
Sample 11	13:57 14-07-2015	198,5
Sample 12	13:57 14-07-2015	202,2
Sample 13	13:58 14-07-2015	199,7
Sample 14	13:58 14-07-2015	185,0
Sample 15	13:59 14-07-2015	209,4
Sample 16	13:59 14-07-2015	205,5
Sample 17	13:59 14-07-2015	177,7
Sample 18	14:00 14-07-2015	194,3
Sample 19	14:00 14-07-2015	206,0
Sample 20	14:01 14-07-2015	195,9
Minimum	N/A	175,9
Maximum	N/A	220,9
Mean	N/A	194,1
SD	N/A	11,8

Graphs
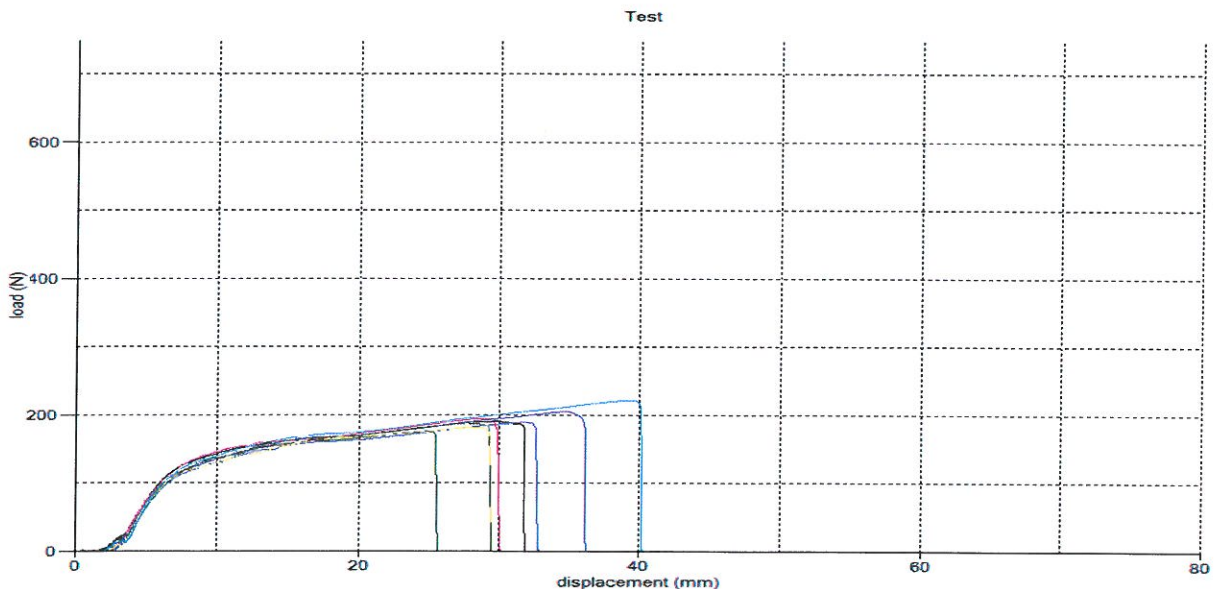
ICAR Pull-test of plastic ear tags

Customer Name   Service ICAR experiment
BatchID   Tag I
Notes   Axial pull at ambient
                    temperature (26,4 C)

Operator: Ole Klejs Hansen

Results

Calculation	Test Started	Peak load
Units		N
Sample 1	14:18 14-07-2015	378,8
Sample 2	14:18 14-07-2015	394,4
Sample 3	14:18 14-07-2015	388,9
Sample 4	14:19 14-07-2015	388,6
Sample 5	14:19 14-07-2015	388,3
Sample 6	14:19 14-07-2015	367,0
Sample 7	14:19 14-07-2015	370,0
Sample 8	14:20 14-07-2015	390,1
Sample 9	14:20 14-07-2015	380,0
Sample 10	14:20 14-07-2015	397,1
Sample 11	14:21 14-07-2015	377,9
Sample 12	14:21 14-07-2015	377,5
Sample 13	14:21 14-07-2015	397,4
Sample 14	14:22 14-07-2015	375,5
Sample 15	14:22 14-07-2015	377,2
Sample 16	14:22 14-07-2015	372,1
Sample 17	14:23 14-07-2015	387,5
Sample 18	14:23 14-07-2015	380,3
Sample 19	14:23 14-07-2015	359,7
Sample 20	14:23 14-07-2015	395,9
Minimum	N/A	359,7
Maximum	N/A	397,4
Mean	N/A	382,2
SD	N/A	10,6

Graphs

Customer Name	Service ICAR experiment	BatchID	Tag I
		Notes	Axial pull at 55 C

Operator: Ole Klejs Hansen

Results

Calculation	Peak load	Test Started
Units	N	
Sample 1	264.2	14:05 15/07/2015
Sample 2	247.6	14:05 15/07/2015
Sample 3	255.8	14:06 15/07/2015
Sample 4	278.4	14:06 15/07/2015
Sample 5	238.1	14:07 15/07/2015
Sample 6	273.6	14:07 15/07/2015
Sample 7	270.9	14:08 15/07/2015
Sample 8	283.8	14:08 15/07/2015
Sample 9	291.6	14:09 15/07/2015
Sample 10	273.8	14:09 15/07/2015
Sample 11	293.1	14:09 15/07/2015
Sample 12	289.8	14:10 15/07/2015
Sample 13	286.9	14:10 15/07/2015
Sample 14	277.7	14:11 15/07/2015
Sample 15	257.6	14:11 15/07/2015
Sample 16	284.4	14:11 15/07/2015
Sample 17	259.8	14:12 15/07/2015
Sample 18	277.5	14:12 15/07/2015
Sample 19	269.4	14:13 15/07/2015
Sample 20	279.9	14:13 15/07/2015
Minimum	238.1	N/A
Maximum	293.1	N/A
Mean	272.7	N/A
SD	15.0	N/A

Graphs
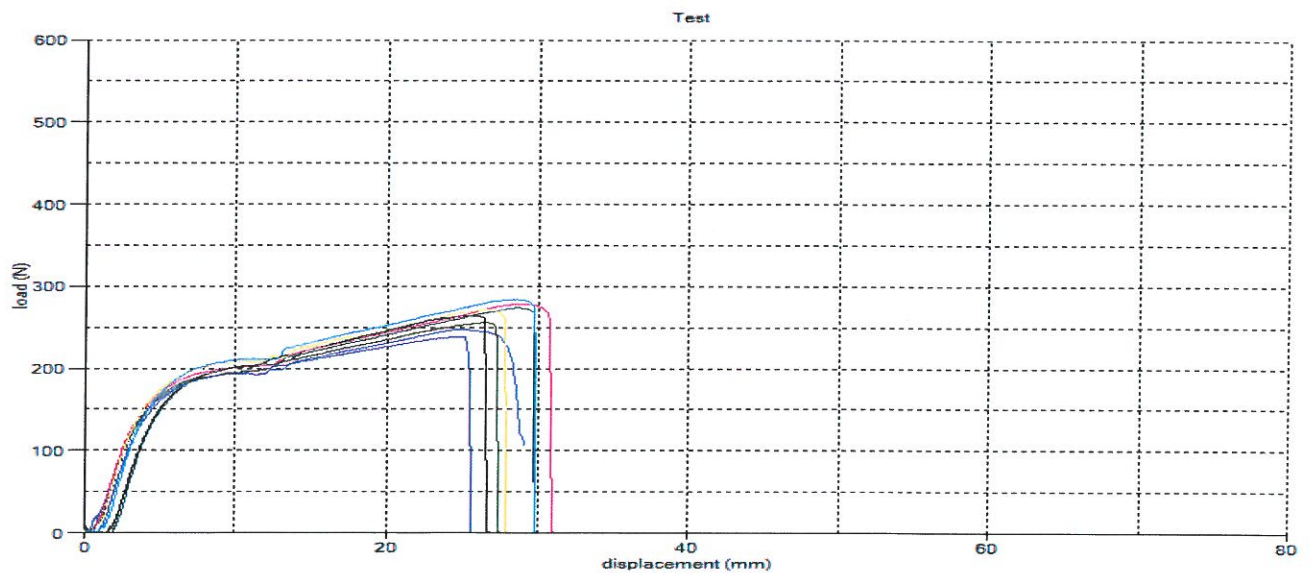
ICAR Pull-test of plastic ear tags

Customer Name   Service ICAR experiment
BatchID   Tag I
Notes   Axial pull at 80 C

Operator: Ole Klejs Hansen

Results

Calculation	Test Started	Peak load
Units		N
Sample 1	14:04 14-07-2015	173,5
Sample 2	14:05 14-07-2015	192,6
Sample 3	14:05 14-07-2015	168,2
Sample 4	14:06 14-07-2015	178,3
Sample 5	14:06 14-07-2015	206,1
Sample 6	14:06 14-07-2015	195,0
Sample 7	14:07 14-07-2015	188,9
Sample 8	14:08 14-07-2015	161,2
Sample 9	14:08 14-07-2015	227,7
Sample 10	14:09 14-07-2015	200,3
Sample 11	14:09 14-07-2015	201,3
Sample 12	14:09 14-07-2015	189,9
Sample 13	14:10 14-07-2015	196,2
Sample 14	14:10 14-07-2015	205,7
Sample 15	14:11 14-07-2015	211,2
Sample 16	14:11 14-07-2015	211,0
Sample 17	14:12 14-07-2015	204,0
Sample 18	14:12 14-07-2015	195,5
Sample 19	14:13 14-07-2015	196,4
Sample 20	14:13 14-07-2015	211,0
Minimum	N/A	161,2
Maximum	N/A	227,7
Mean	N/A	195,7
SD	N/A	16,0

Graphs