

10<sup>th</sup> July 2017

Design Quintessence Pty Ltd  
Unit 25, 7-9 Percy Street  
Auburn NSW 2144



**Attention: Mr Ian Wood**

## STRUCTURAL DESIGN CERTIFICATE

**Project Description: Design Quintessence Boom Arms**

We, Partridge Structural Pty Limited, being Professional Structural Engineers, within the meaning of the Building Code of Australia, hereby certify that we have carried out a design review of the proof load testing carried out on the Design Quintessence Boom Arms and confirm that the following working load limits may be assumed:

- |                             |                 |
|-----------------------------|-----------------|
| 1. 50 x 4 1000 mm Boom Arm: | 0.5 kN (50 kg)  |
| 2. 50 x 4 500 mm Boom Arm:  | 1.0 kN (100 kg) |
| 3. 50 x 3 1000 mm Boom Arm: | 0.5 kN (50 kg)  |
| 4. 50 x 3 500 mm Boom Arm:  | 0.5 kN (50 kg)  |

Assumptions:

- The values are based on the Load Test Reports provided by Global Truss, dated 22/06/2016 for items 1 to 3, dated 28/05/2015 for item 4 and are appended to this certificate.
- One load test was performed on each Design Quintessence Boom Arm. The capacity was derived by manipulating the results in accordance with the guidelines outlined in Section 8 of AS/NZS 1664.1-1997.
- These loads are to be considered as individual load cases and may not be combined
- This certification is to only be read in conjunction with all relevant technical drawings, including attached drawings 417/036 and 417/317 both dated 6/7/17, manuals, and the abovementioned Load Test Reports.

Prepared by:

A handwritten signature in black ink, appearing to read 'Isaac Beton'.

**Isaac Beton**  
BE(Hons 1) BDesArch GradIEAust\_  
Design Engineer

Reviewed by:

A handwritten signature in black ink, appearing to read 'T. Walford'.

**Tadd Walford**  
BE(Hons) MIEAust Dip. PM  
Senior Engineer

For and on behalf of:  
Partridge Structural Pty Limited

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Partridge Event Pty Ltd – 50 139 601 433

Partridge Remedial Pty Ltd – 89 145 990 521

Partridge Hydraulic Services Pty Ltd – 11 608 027 578

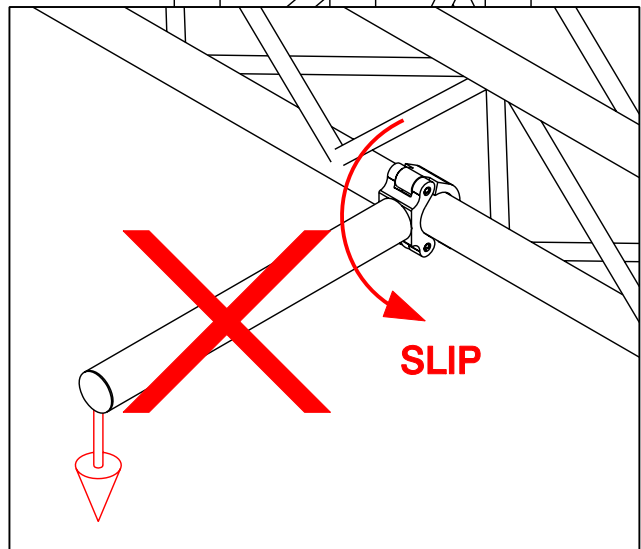
2015S0958.006-ib-des cert

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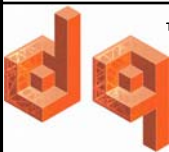
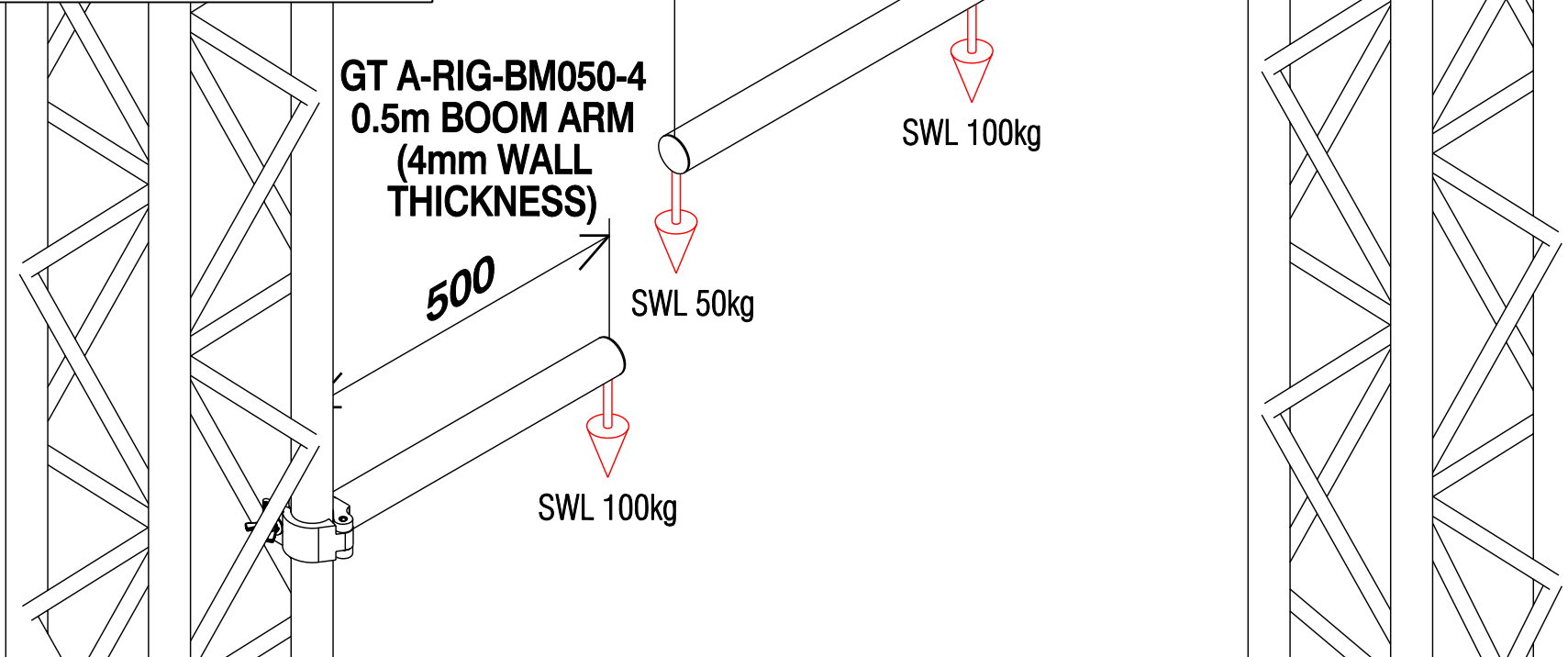
# APPENDIX A

## LOAD TEST REPORTS

**GT A-RIG-MB100-4  
1.0m BOOM ARM  
(4mm WALL THICKNESS)**



**GT A-RIG-BM050-4  
0.5m BOOM ARM  
(4mm WALL THICKNESS)**

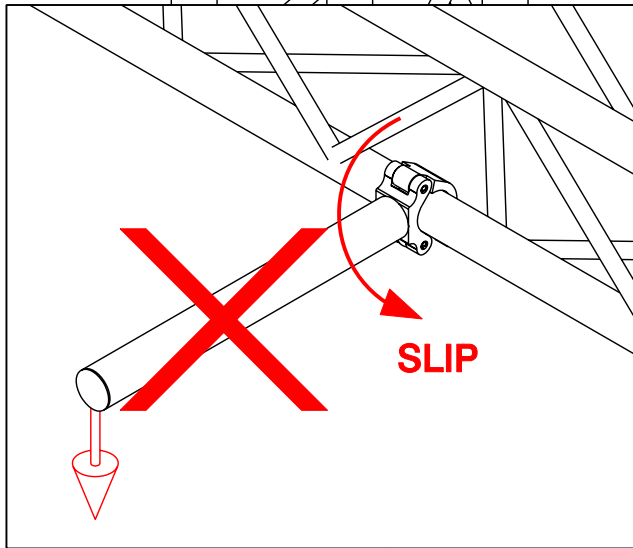


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CLIENT:

DRAWING:  
**4mm WALL BOOM ARM LOAD POINT INFORMATION**

0 m  
  
 SCALE N/A  
 DRAWN: 6/7/17  
 DRAWING No.: 417/317



**GT A-RIG-BM100**  
**1.0m BOOM ARM**  
**(3mm WALL THICKNESS)**

1000

**GT A-RIG-BM050**  
**0.5m BOOM ARM**  
**(3mm WALL THICKNESS)**

500

SWL 50kg

SWL 50kg



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CLIENT:

DRAWING:

**3mm WALL BOOM ARM LOAD POINT INFORMATION**



SCALE N/A

DRAWN:  
6/7/17

DRAWING No.:  
417/036

## TEST REPORT FOR 1.0m(4mm) Boom Arm

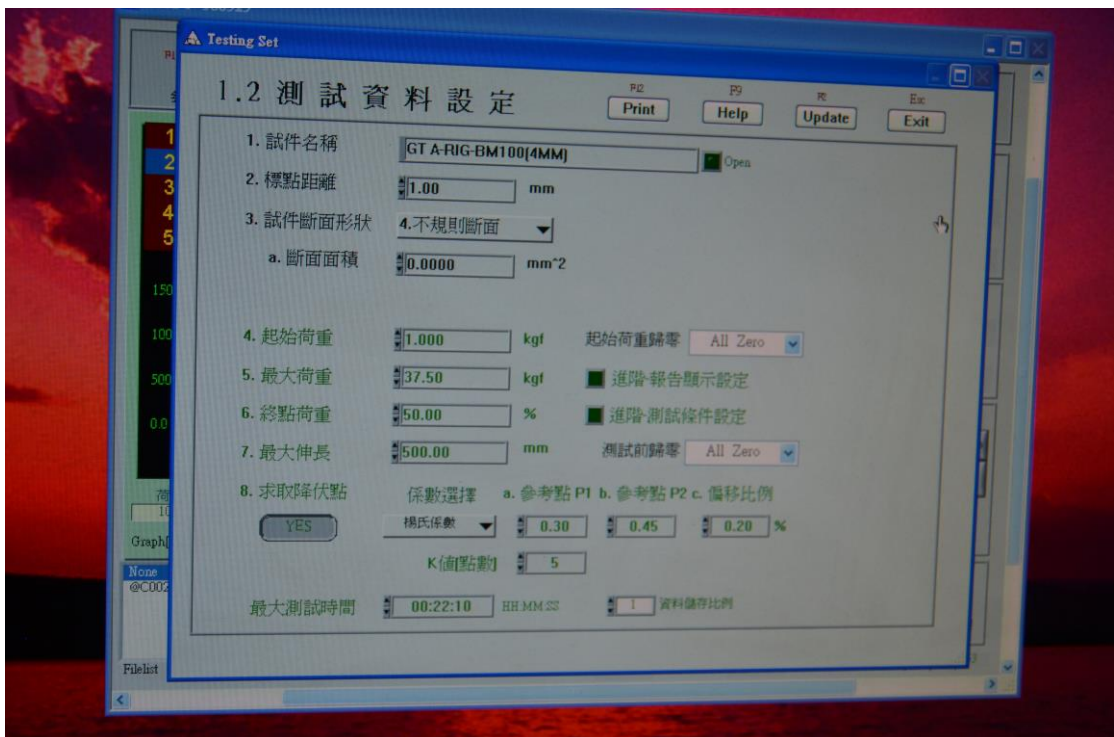
Below picture for show the statement of the conditions of testing





Before apply a test load, distance between plate and the end of tube is 211.5mm

the test results for specimen as described above in the testing procedure pictures





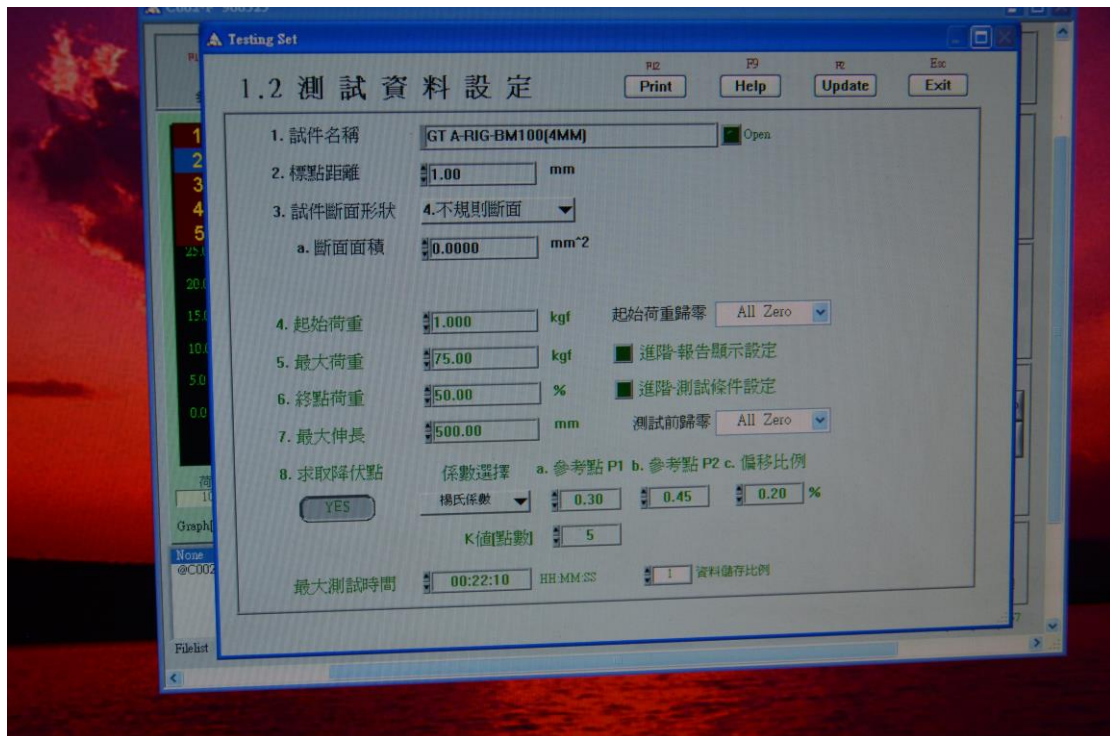
Apply a test load of 37.5kg



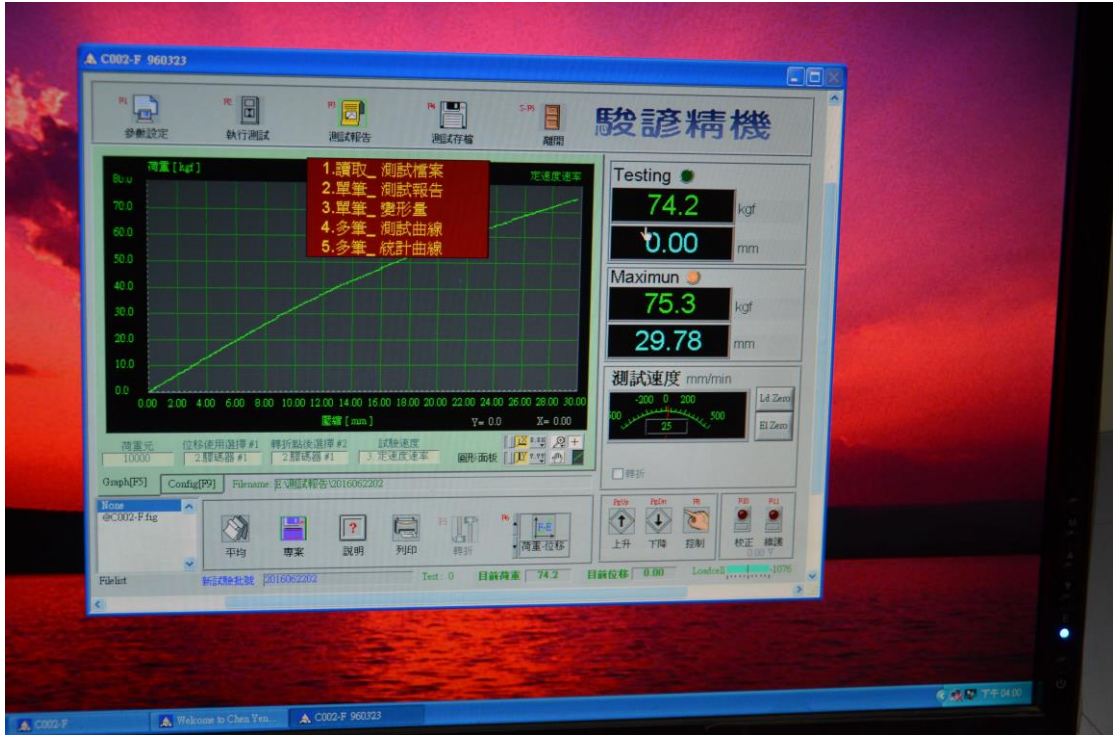
Distance is 198.75mm after loaded deformation of the specimen at five minutes



Distance is 210.6mm Unload the specimen







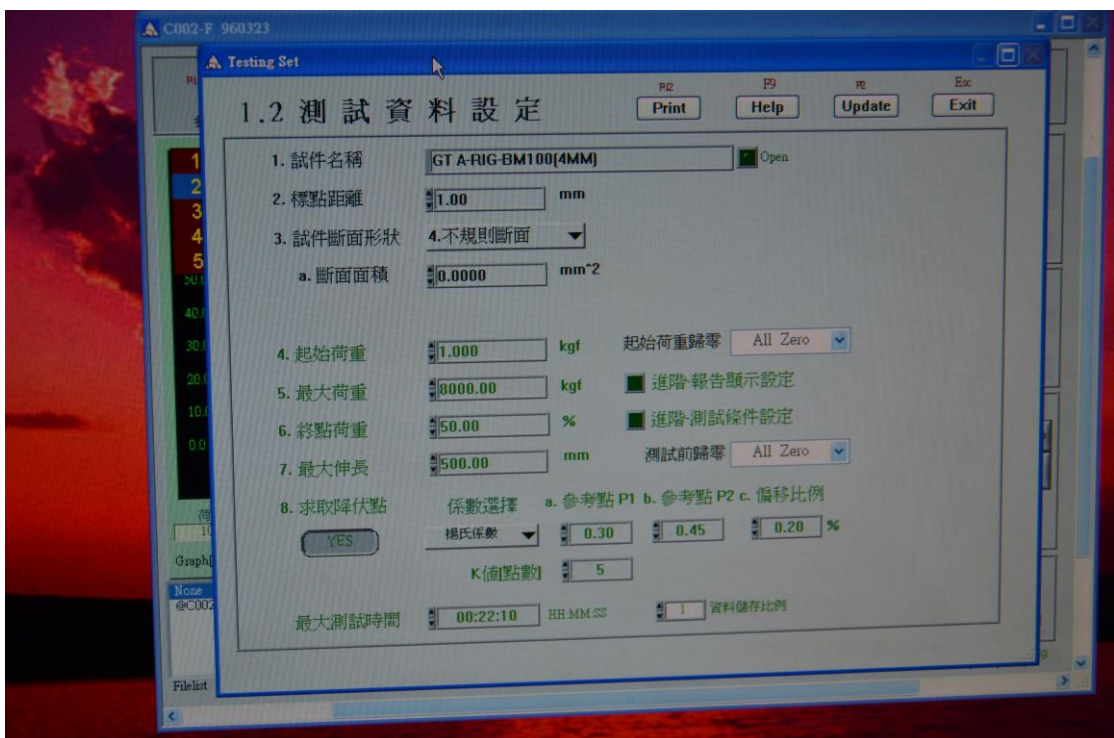
Apply a test load of 75kg



Distance is 181.5mm after loaded deformation of the specimen at five minutes

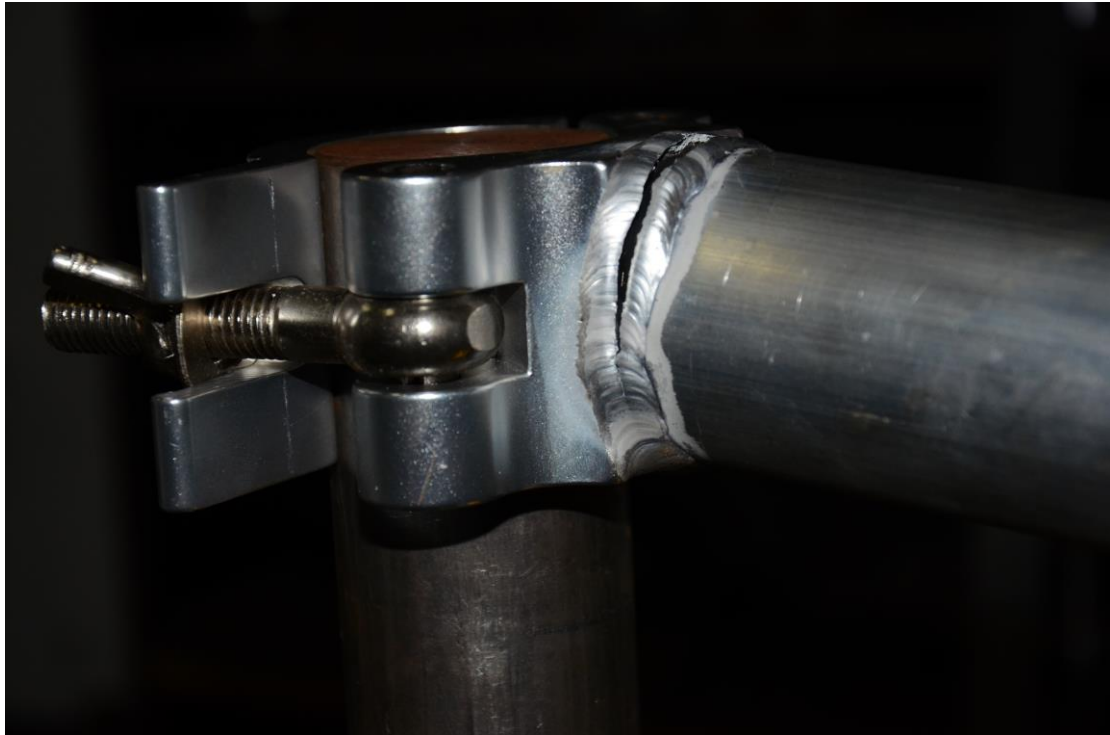


Distance is 210.5mm Unload the specimen



Apply a test load of 8000kg , the tube broken once at 202.1kg.





The tube fracture at weld, others No obvious deformation

### Testing Tables

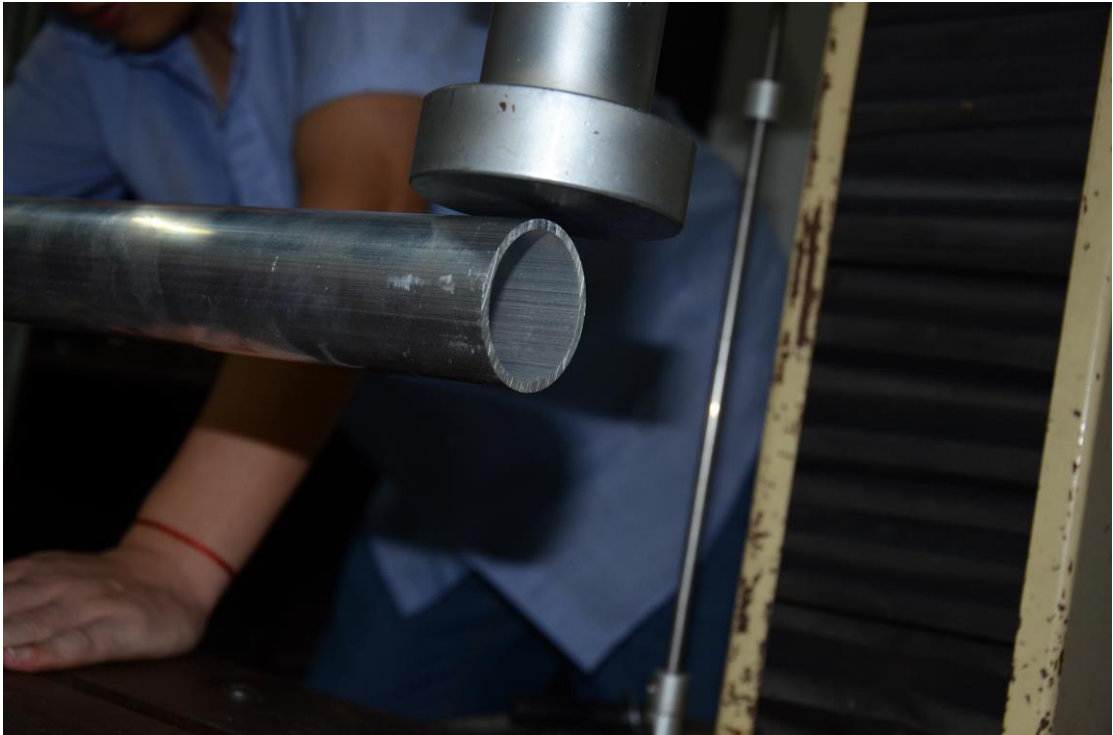
Load Step	Load(N)	Loaded Deformation(mm)	Time Held(s)	Pass/Fail	Unloaded Deformation
1	375	12.75	300	Pass	No obvious deformation
2	750	30	300	Pass	No obvious deformation
Test until failure	80000	78.1	300	Fail	Tube fracture deformation

2016.06.22

## TEST REPORT FOR 0.5m(4mm) Boom Arm

Below picture for show the statement of the conditions of testing

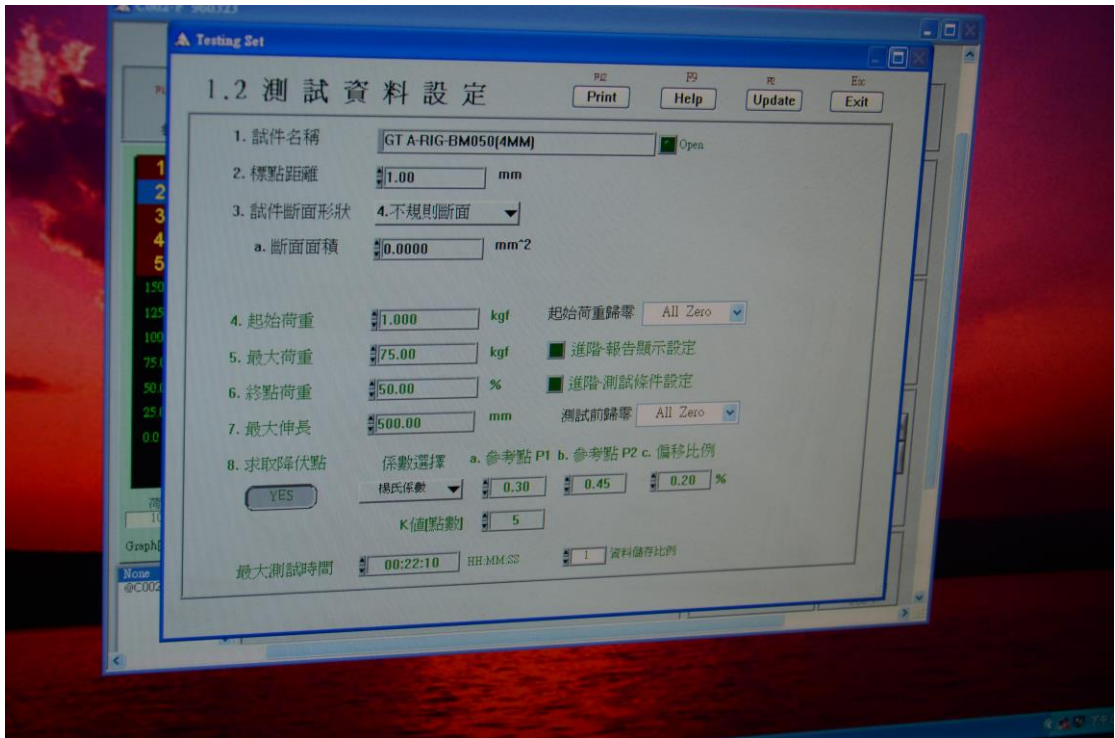




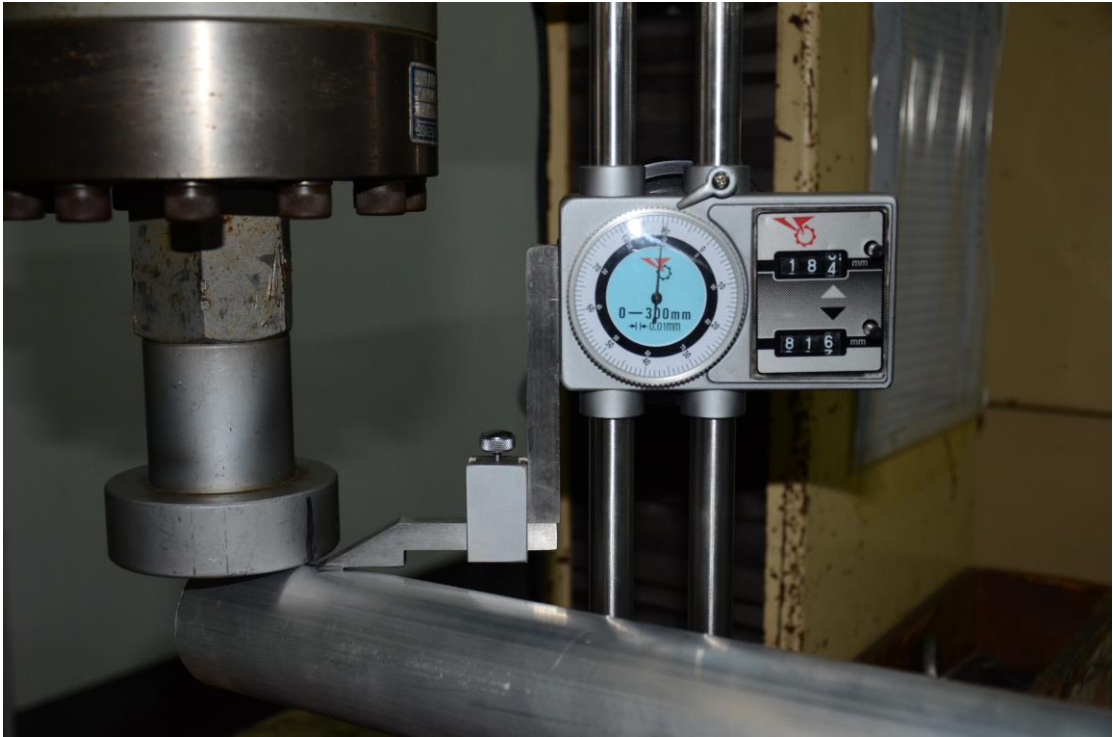
**Before apply a test load, distance between plate and the end of tube is 190.9mm**



**the test results for specimen as described above in the testing procedure pictures**



Apply a test load of 75kg

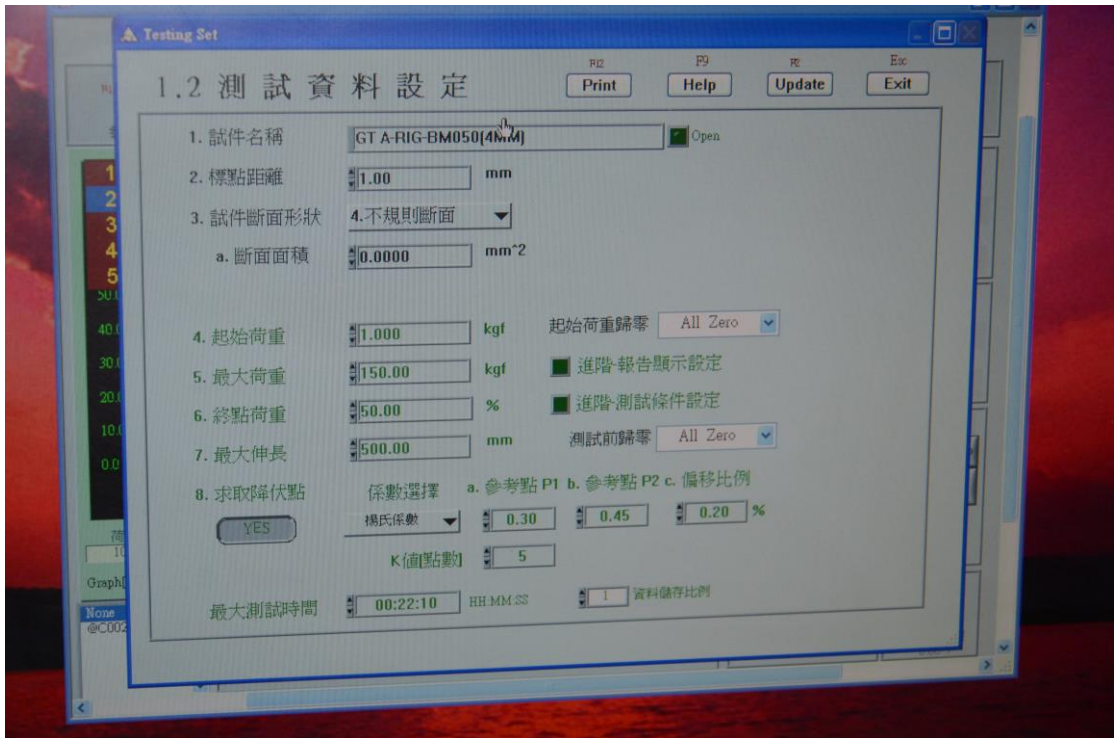


**Distance is 183.9mm after loaded deformation of the specimen at five minutes**

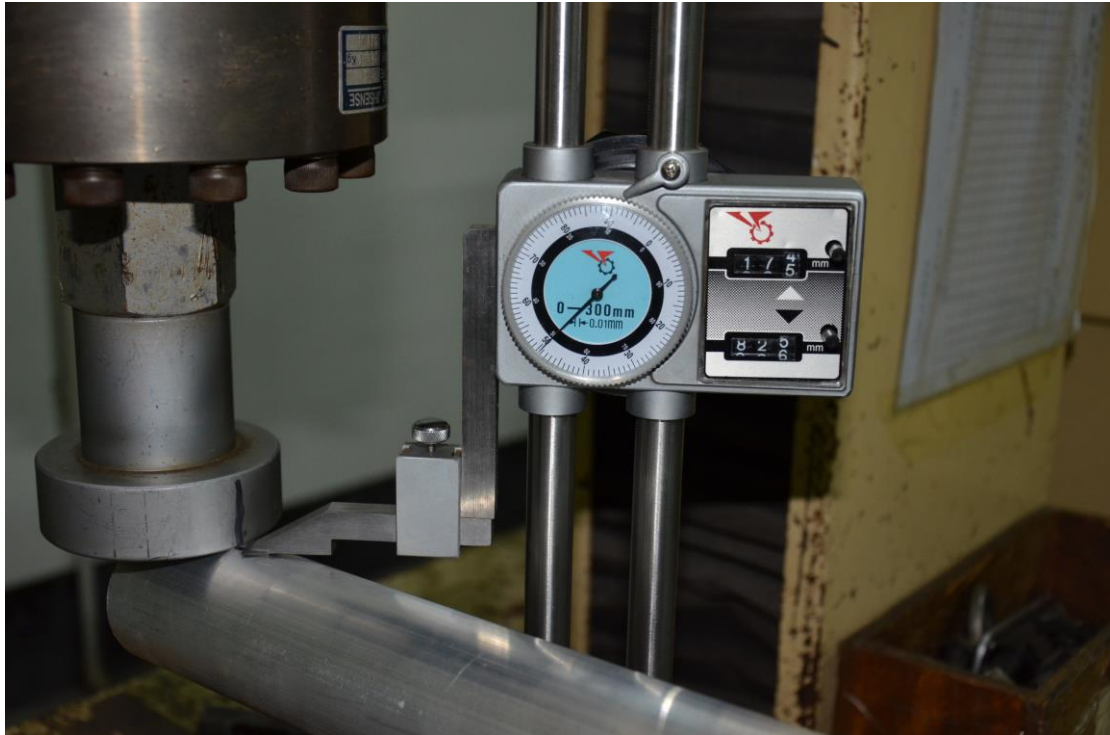


**Distance is 189.2mm Unload the specimen**

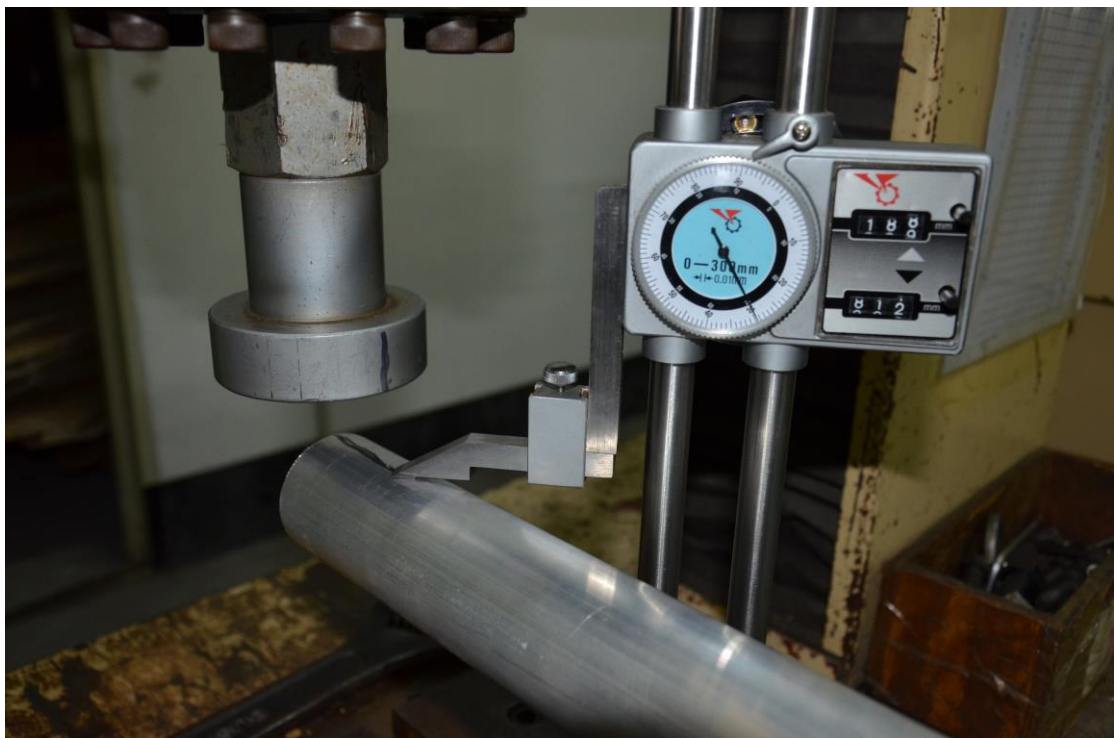




Apply a test load of 150kg



**Distance is 174.5mm after loaded deformation of the specimen at five minutes**



**Distance is 188.7mm Unload the specimen**

**Apply a test load of 8000kg , the tube broken once at 221.3kg.**





The tube fracture at weld, others No obvious deformation

### Testing Tables

Load Step	Load(N)	Loaded Deformation(mm)	Time Held(s)	Pass/Fail	Unloaded Deformation
1	750	7.0	300	Pass	No obvious deformation
2	1500	16.4	300	Pass	No obvious deformation
Test until failure	80000	33.2	300	Fail	Tube fracture deformation

2016.06.22

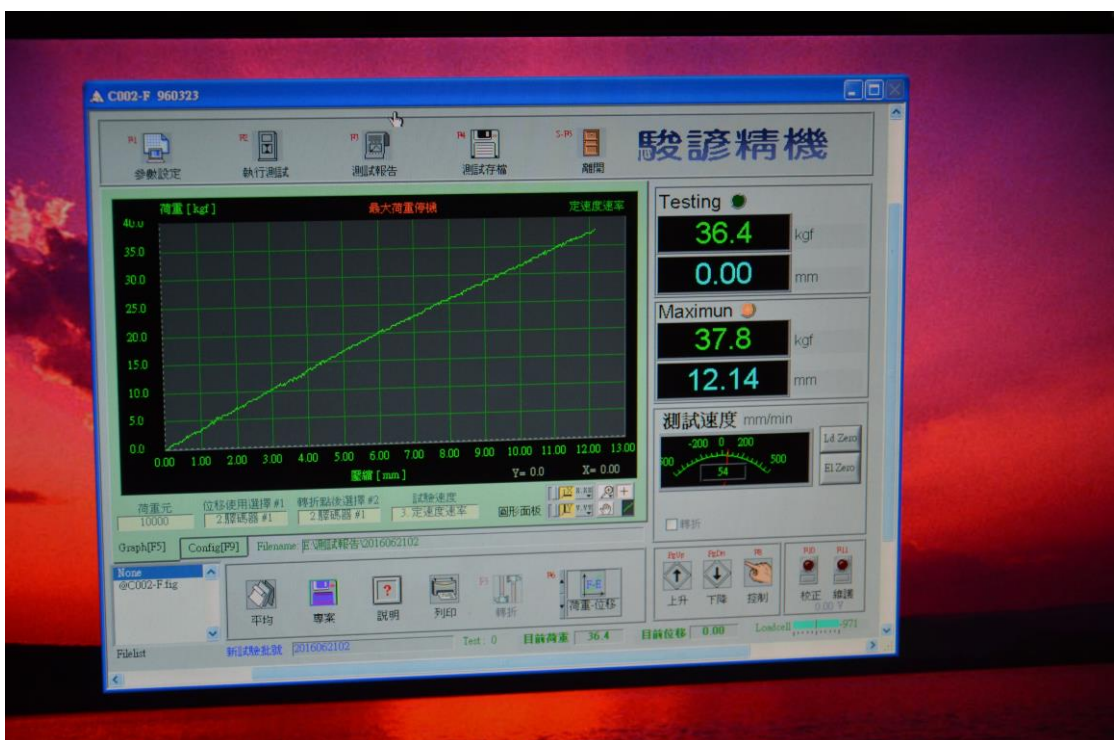
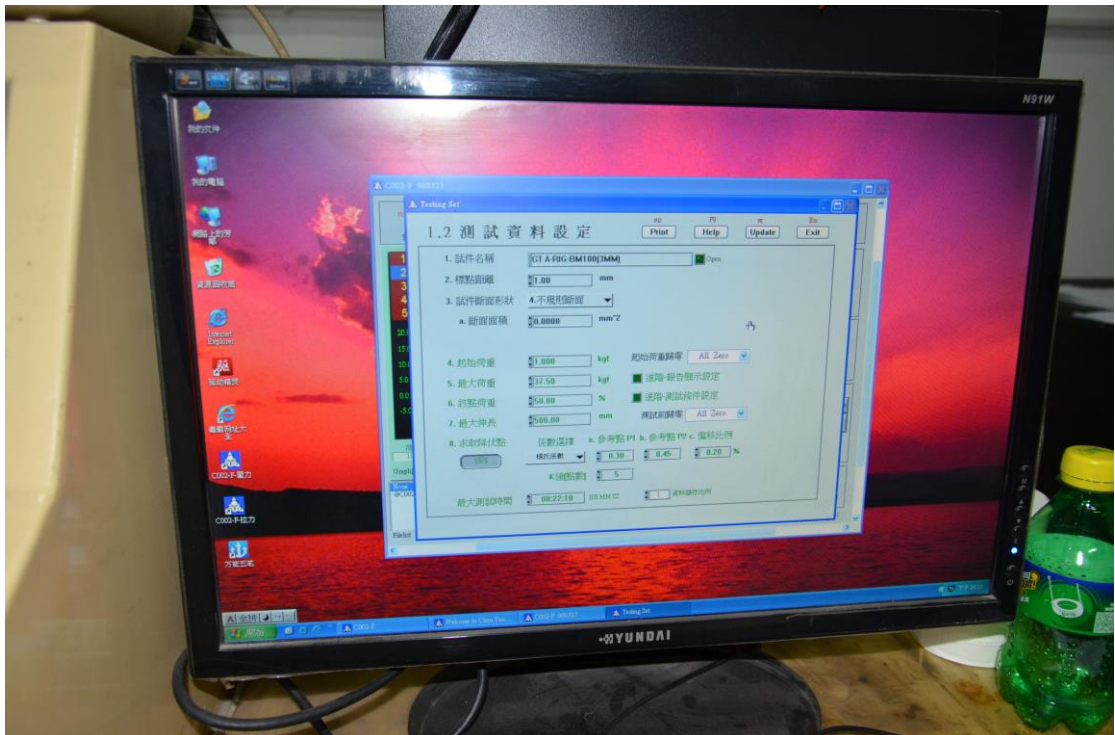
## TEST REPORT FOR 1.0m(3mm) Boom Arm

Below picture for show the statement of the conditions of testing



Before apply a test load, distance between plate and the end of tube is 210.6mm

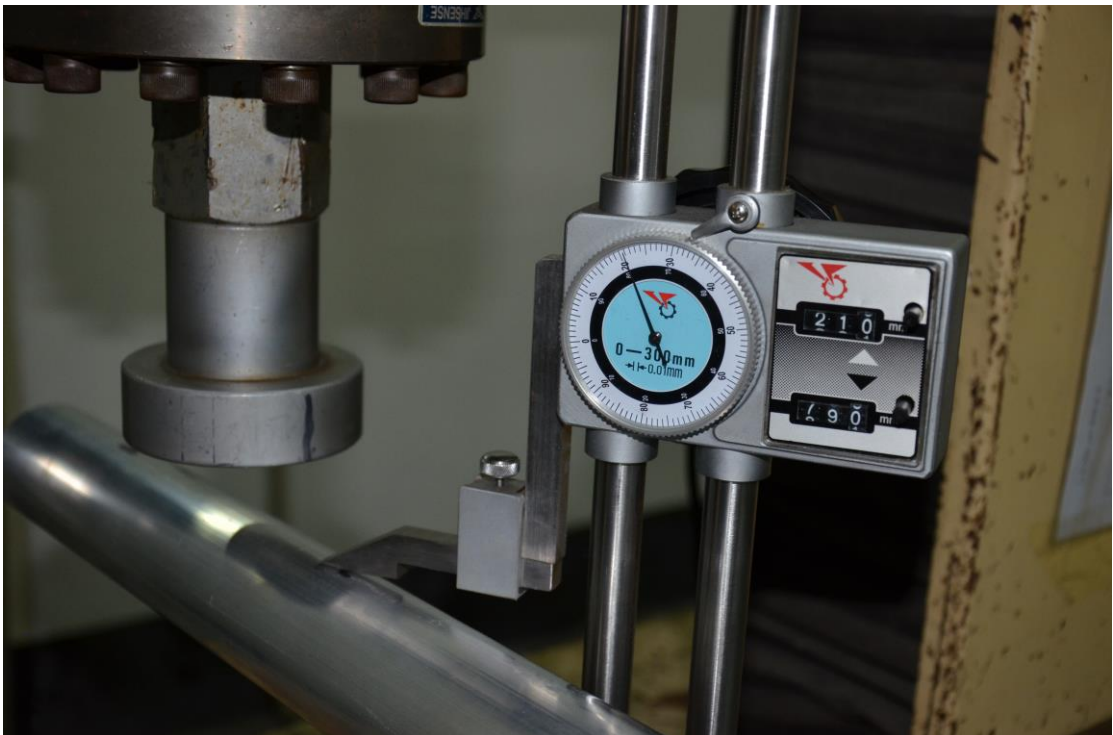
the test results for specimen as described above in the testing procedure pictures



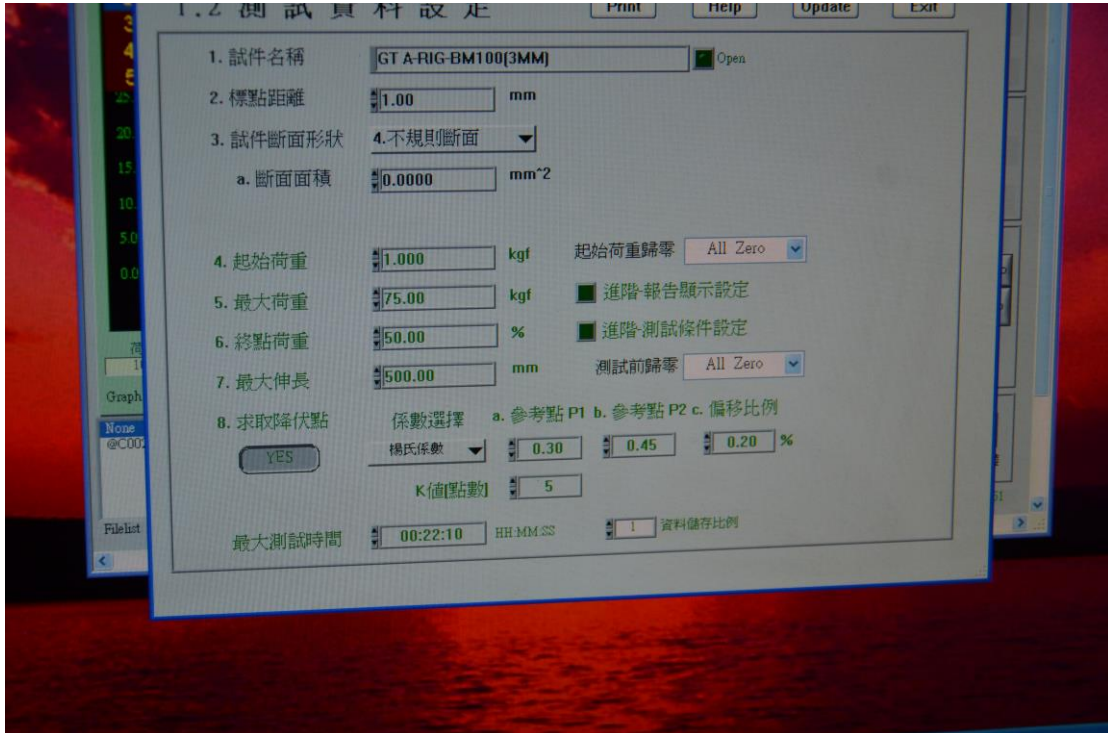
**Apply a test load of 37.5kg**



**Distance is 198.7mm after loaded deformation of the specimen at five minutes**



Distance is 210.2mm Unload the specimen



Apply a test load of 75kg

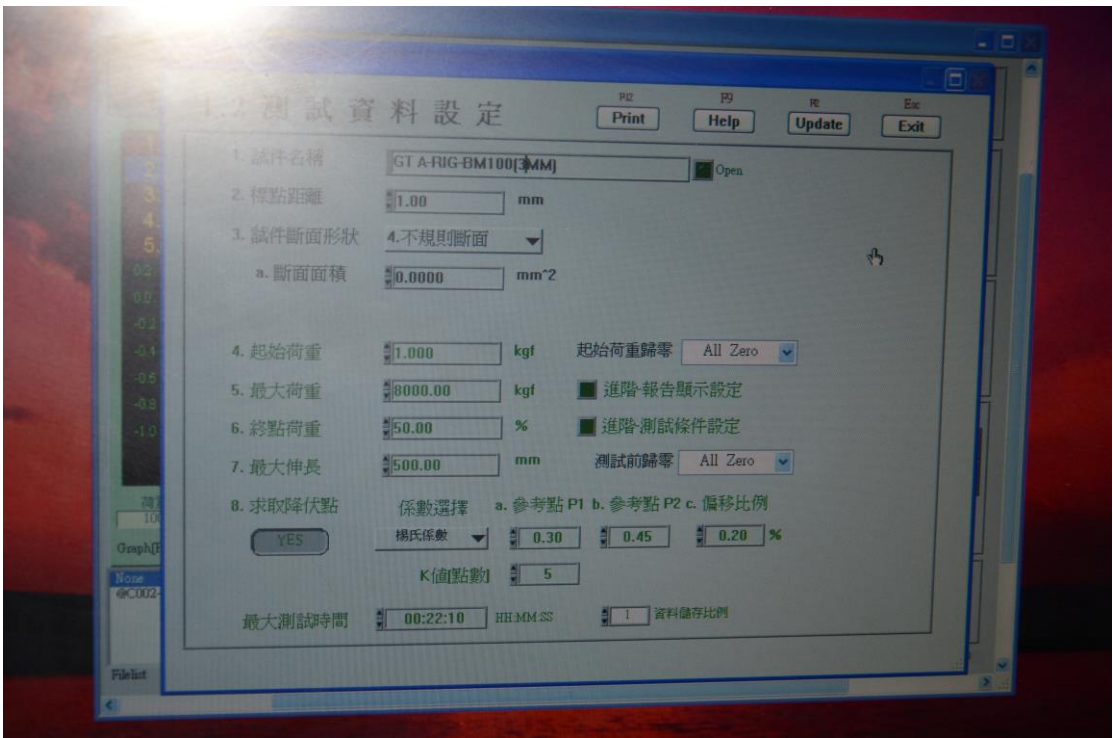


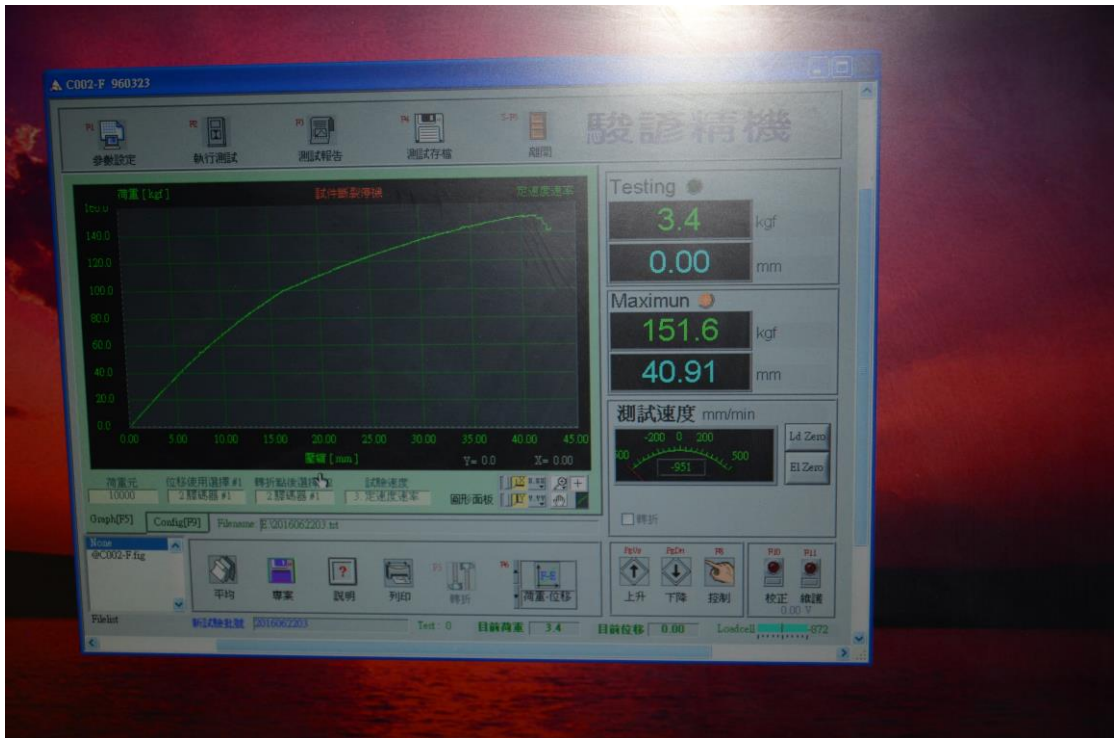


Distance is 184.3mm after loaded deformation of the specimen at five minutes



Distance is 209.7mm Unload the specimen





Apply a test load of 8000kg , the tube broken once at 151.6kg.





The tube fracture at weld, others No obvious deformation

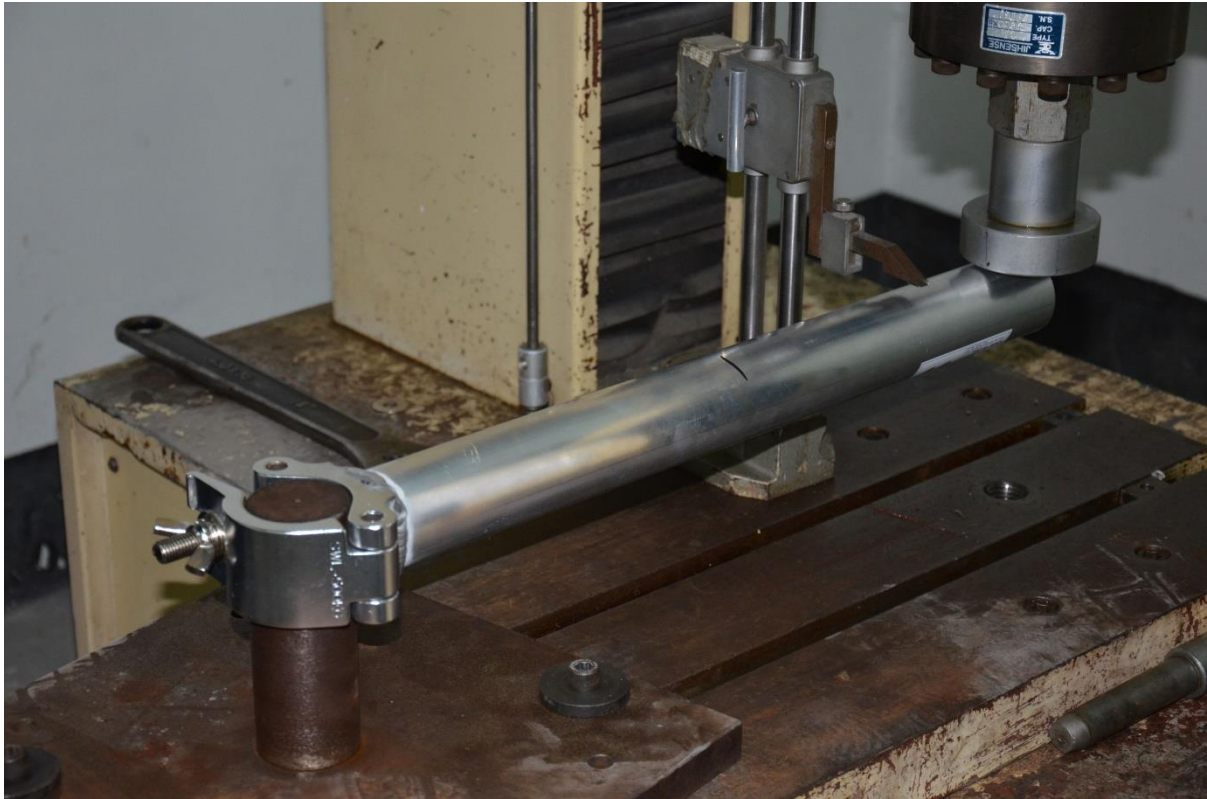
### Testing Tables

Load Step	Load(N)	Loaded Deformation(mm)	Time Held(s)	Pass/Fail	Unloaded Deformation
1	375	11.9	300	Pass	No obvious deformation
2	750	26.3	300	Pass	No obvious deformation
Test until failure	80000	41.67	300	Fail	Tube fracture deformation

2016.06.22

## TEST REPORT FOR 0.5m (3mm) Boom Arm

The below picture shows the conditions of testing



Results (see graphs overleaf):

Load (kg)	Load (kN)	Deflection (mm)
50	0.5	5.05
75	0.75	7.60

Apply a test load of 50kg

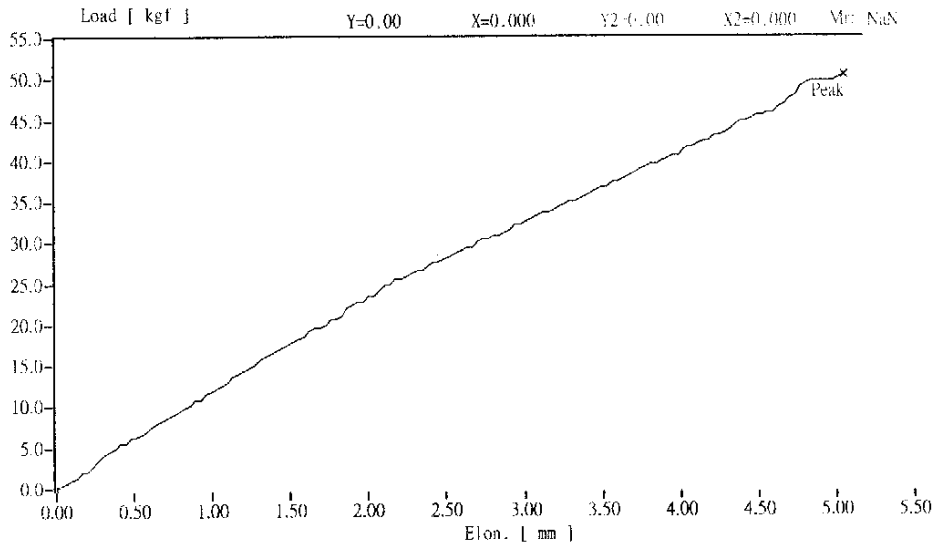
鑫源富金屬制品（深圳）有限公司  
ALUFORCE INDUSTRIAL CO.,LTD

廣東省深圳市寶安區沙井鎮芙蓉工業區  
TEL:86-755-27255905 FAX:86-755-27255907

材料測試 試驗報告

1.Customer : 10.Specimen : BOOM ARM-500  
2.Operator : 11.Spec.Length : 500.000mm  
3.Lot No. : 2015052808 12.Spec.Style : Random  
4.Date : 2016年5月28日 13.Spec.Area : 0.0000mm<sup>2</sup>  
5.Time : 上午 11:24:58 14.Total Energy: 137kgf · mm  
6.Temperature: 25C 15.Young's Modu. : NaNkgf/mm<sup>2</sup>  
7.Speed : 20.00mm/min 16.Notice :  
8.Test Style : Compression Test 17.FileName: E:\測試報告\2015052808  
9.Standard :

	Load(kgf)	Elong.(mm)	Stress(kgf/mm <sup>2</sup> )	Strain(%)
Peak	50.4	5.05	Inf	1.01
Break	50.4	5.05	Inf	1.01
Yield	0.0	0.00	NaN	0.00



Apply a test load of 75kg

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TEL:86-755-27255905 FAX:86-755-27255907

材料測試 試驗報告

1.Customer :  
2.Operator :  
3.Lot No. : 2015052809  
4.Date : 2015年5月28日  
5.Time : 上午 11:27:35  
6.Temperature: 25C  
7.Speed : 20.00mm/min  
8.Test Style : Compression Test  
9.Standard :  
10.Specimen : BOOM ARM-500\*1.5  
11.Spec.Length : 500.000mm  
12.Spec.Style : Random  
13.Spec.Area : 0.0000mm<sup>2</sup>  
14.Total Energy: 309kgf·mm  
15.Young's Modu. : NaNkgf/mm<sup>2</sup>  
16.Notice :  
17.FileName: E:\測試報告\2015052809

	Load(kgf)	Elon.(mm)	Stress(kgf/mm <sup>2</sup> )	Strain(%)
Peak	75.2	7.57	Inf	1.51
Break	75.2	7.60	Inf	1.52
Yield	0.0	0.00	NaN	0.00

