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LINIAN
FASTER. SAFER. SIMPLER.

Technical Data & Certification

MADE IN BRITAIN

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Certificate of approval ISO 9001.2008

LINIAN

FIRE CLIP | FASTER. SAFER. SIMPLER.

CERTIFICATE OF APPROVAL

This is to certify that the "Linian Fire Clip" is manufactured in accordance with:

ISO 9001:2008.

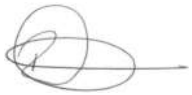
The Quality Management System is applicable to:

Manufacture of presswork, Laser Cut Parts, U-bolts, Wire & Rod Forms, machined Components, Washers, Spring Clips and Welded Fabrications.

ISSUED BY: IAN ARBUCKLE **TECHNICAL DIRECTOR**

34-38 Payne Street , Port Dundas Trading Estate , Glasgow , G4 0LF
Tel: 0141 332 5734 (+44 141 332 5734) Fax: 0141 332 7629 (+44 141 332 7629)

Pull out Certificate R000410.01

	Prepared by	Checked by	Approved by	
evolution				UKAS TESTING 7485 Evolution Fasteners (UK) Ltd
	Mr Barry Cowan	Mr Ryan Murphy	Mr Ryan Murphy	
	Snr Lab Technician	**Technical Manager**	**Technical Manager**	

CONTROL INFORMATION	
Unique Identification Number	R000410
Creation Date	10th October 2018
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Controlled Copy	No
Distribution	MASTER FILE, External release.

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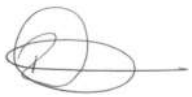
evolution				UKAS TESTING 7485 Evolution Fasteners (UK) Ltd
	Mr Barry Cowan	Mr Ryan Murphy	Mr Ryan Murphy	
	Snr Lab Technician	**Technical Manager**	**Technical Manager**	

1.0 – Customer and Laboratory Details

Customer: Linian Supply Company Ltd.
34 Payne Street
Port Dundas Trading Estate
Glasgow
G4 0LF

Contact: Mr. Ian Arbuckle (Managing Director)

Laboratory: Evolution Technical and Analytical Services
Units 2A & 2B Clyde Gateway Trade Park

Dalmarnock Road
Rutherglen
Glasgow
G73 1AN
Contact: Mr. Barry Cowan (Senior Laboratory Technician)

2.0 – Job Details, Specifications and Scope

Order Number: 537

Report number: R000410

Description: Withdrawal force (pull out resistance) testing.

Test standard(s): BS 5080-1: 1993
"Structural fixings in concrete and masonry. Method of test for tensile loading."

3.0 – Sample Details and Sampling Plan

Sample Details: Client provided samples in finished form.

Sample Inspection: Visual inspection upon arrival

Sampling Plan: Not applicable.

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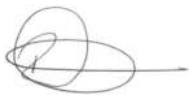
evolution				UKAS TESTING 7485 Evolution Fasteners (UK) Ltd
	Mr Barry Cowan	Mr Ryan Murphy	Mr Ryan Murphy	
	Snr Lab Technician	**Technical Manager**	**Technical Manager**	

4.0 – Test Procedure

Test Standard: BS 5080-1: 1993

Procedure:
1. Insert sample into pre-drilled hole of substrate
2. Insert substrate into Shimadzu AGS-X 10kN universal testing machine
3. Attach sample to grips
4. Start-up TrapeziumX software and choose program
5. Calibrate software
6. Begin testing and record results at test end.

4.1 - Test Conditions

Test speed: 1mm/min
Temperature: 19.8 °C

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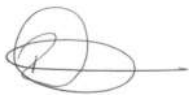
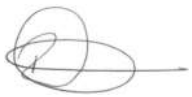
evolution				UKAS TESTING 7485 Evolution Fasteners (UK) Ltd
	Mr Barry Cowan	Mr Ryan Murphy	Mr Ryan Murphy	
	Snr Lab Technician	Technical Manager	Technical Manager	

5.0 Results

Part number	Test I.D.	Substrate	Embedment depth (mm)	Hole diameter (mm)	Result (N)	Average (N)	Standard deviation (N)
Linian clip single	01	C35 grade concrete	Full embedment	5.5	237.76	271.54	37.88
	02				211.55		
	03				230.74		
	04				270.54		
	05				308.20		
	06				337.17		
	07				274.24		
	08				285.19		
	09				296.15		
	10				263.81		

Part number	Test I.D.	Substrate	Embedment depth (mm)	Hole diameter (mm)	Result (N)	Average (N)	Standard deviation (N)
Linian clip double	01	C35 grade concrete	Full embedment	5.5	187.81	194.88	21.04
	02				184.49		
	03				185.12		
	04				191.54		
	05				221.65		
	06				166.49		
	07				208.85		
	08				235.07		
	09				192.36		
	10				175.42		

	Prepared by	Checked by	Approved by	
evolution				UKAS TESTING 7485 Evolution Fasteners (UK) Ltd
	Mr Barry Cowan	Mr Ryan Murphy	Mr Ryan Murphy	
	Snr Lab Technician	**Technical Manager**	**Technical Manager**	

6.0 Revision history

Revision history (R.000410.01)		
Revision number	**Changes made by**	**Details of change**
01	BC	Original issue

[END OF REPORT]

Test Report No. R000410

Pull out test data R000231

	Prepared by	Checked by	Approved by	
				7485 Evolution Fasteners (UK) Ltd
	Mr. B. Cowan	Mr. Ryan Murphy	Mr. Ryan Murphy	
	Snr. Lab. Technician	**Associate Director**	**Associate Director**	

CONTROL INFORMATION	
Unique Identification Number	R000231
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TEST REPORT No. R000231

1.0 – Customer and Laboratory Details

Customer: Linian Supply Company Ltd.
34 Payne Street
Port Dundas Trading Estate
Glasgow
G4 0LF

Contact: Mr. Ian Arbuckle

Laboratory: Evolution Technical and Analytical Services
Units 2A & 2B Clyde Gateway Trade Park
Dalmarnock Road
Rutherglen
Glasgow
G73 1AN

Contact: Mr. Barry Cowan (Senior Laboratory Technician)

2.0 – Job Details, Specifications and Scope

Order Number: 37

Report number: R000231

Description: Withdrawal force (pull out resistance) testing.

Test standard(s): BS 5080-1: 1993
"Structural fixings in concrete and masonry. Method of test for tensile loading."

Note(s): Not UKAS accredited test

3.0 – Sample Details and Sampling Plan

Sample Details: Client provided samples in finished form.

Sample Inspection: Not performed.

Sampling Plan: Not applicable.

4.0 – Test Procedure

Test Standard: BS 5080-1: 1993

Procedure:
1. Insert sample into pre-drilled hole of specified diameter in substrate
2. Insert substrate block into Shimadzu AGS-X 10kN universal testing machine
3. Attach sample to grips
4. Start up TrapeziumX software and choose program
5. Calibrate software
6. Begin testing and record results at test end.

4.1 - Test Conditions

Test speed: 1mm/min

Temperature: 17.2°C

5.0 – Test Results

Table 1: Pull out from concrete						
Product code/description	**Test I.D. number**	**Substrate**	**Embedment depth (mm)**	**Hole diameter (mm)**	**Record result (N)**	**Mean load (N)**
Linian clip (single)	01	C35 grade concrete	30.0	5.5	184.525	**215.432**
	02				301.097	
	03				211.470	
	04				178.857	
	05				240.134	
	06				285.522	
	07				211.797	
	08				175.679	
	09				205.266	
	10				215.432	

Table 2: Pull out from precon concrete block						
Product code/description	**Test I.D. number**	**Substrate**	**Embedment depth (mm)**	**Hole diameter (mm)**	**Record result (N)**	**Mean load (N)**
Linian clip (single)	11	Precon concrete block (density 11N/mm²)	30.0	5.5	149.907	**179.225**
	12				193.642	
	13				206.008	
	14				224.134	
	15				166.613	
	16				176.619	
	17				209.363	
	18				197.791	
	19				131.410	
	20				136.762	

Table 3: Pull out from C16 grade timber						
Product code/description	**Test I.D. number**	**Substrate**	**Embedment depth (mm)**	**Hole diameter (mm)**	**Record result (N)**	**Mean load (N)**
Linian clip (single)	21	C16 grade timber	30.0	5.5	438.731	**391.347**
	22				375.471	
	23				379.509	
	24				386.615	
	25				383.995	
	26				304.729	
	27				429.885	
	28				373.296	
	29				457.939	
	30				383.302	

TEST REPORT No. R000231

6.0 – Revision History

Revision history (R.000231)		
Revision number	**Changes made by**	**Details of change**
01	BC	Original issue

[END OF DOCUMENT]

TEST REPORT No. R000231

Smoke Emission Test

Our Ref. 4RS-SF-050864-K36755rev

Your Ref.

10th March 2006

Scientific Services
for Transport & Industry
4-RAIL Services Ltd

Unit 11, Ironbridge Close, Great Central Way
London NW10 0UF

Telephone: 020 8955 1700
Facsimile: 020 8830 1003
Email: enquiries@4-rail.com

Mr. Wes Arbuckle,
The Linian Supply Company Limited,
34-38 Payne Street,
Port Dundas Trading Estate,
Glasgow,
G4 0LF

Dear Mr. Arbuckle,

Re. Toxicity Testing of One Coating Sample Applied to

Cable Clips Supplied by The Linian Supply Company Limited

The toxic fume emission requirements detailed in London Underground Limited Standard Number 2-01001-002 Fire safety performance of materials, Section 5.2.3, deals with the chemical composition that is required for materials with respect to Toxic Fume Emission Requirements. This section states that for unrestricted use of a material, neither it nor its constituents shall have deliberately incorporated by selection, addition or modification any significant amounts of organically bound halogens, nitrogen sulphur or phosphorous.

Trace levels of such chemical groups are acceptable – the criterion for 'trace level' shall be that that the summation of the weight for weight percentage of the chemical group divided by the atomic weight for the group shall not exceed 0.015%.

Qualitative and quantitative analysis of the red coating system applied to the cable clip showed that it contained 1.07% nitrogen and 0.31% sulphur; which produced a summation value of 0.086 which is greater than the limit in the standard.

Information supplied by BRE confirms that the other fire performance requirements detailed within LUL Engineering Standard 2-01001-002 Fire safety performance of materials, have been met, indicating that the cable clips possess good fire safety performance.

Information supplied by the client indicates that the cable clips are intended to be used in stations and will spaced at 300mm intervals along the cable.

It is therefore 4-RAIL Services opinion that although the coating system does not fulfil the requirements for 'trace level', the good reaction to fire performance and small amount of coating material applied to each clip would mean that in the event of a fire, the applied coating would have an negligible contribution to any toxic fumes emitted.

However, it should be noted that final approval of a material can only be made by the regulating departments of the rail service operating company concerned.

I hope that this information is sufficient, but if you require any further information please let me know.

Yours sincerely,

Sara Finch

Sara Finch
Materials Consultant

Enc.