

Declaration of Conformity

In Accordance with ANSI/ISEA 125-2014 and ANSI/ASSP Z359.7-2019

Declaration #: DOC-UFL201701

Declaration Date: 04/25/2023

Item #: UFL201701

Description: KStrong® 6 ft. Arc Flash Rated Shock Absorbing Lanyard with Snap Hook and Rebar Hook (ANSI)

Brand Name: KStrong

Manufacturer: KStrong

Address: 18505 Intercontinental Crossing, Houston, TX 77073

**Additional Items Conforming
Under this Declaration (If Applicable):**

KStrong declares that the product(s) listed above is in conformity with the requirements of the following performance standard(s):

ASTM F887-20

Conformity Assessment Method in accordance with ANSI/ISEA 125-2014



Level 1:

KStrong Lab Outside the Scope of ISO/IEC Standard 17025:2017



Level 2:

KStrong Lab Within the Scope of ISO/IEC Standard 17025:2017



Level 3:

Independent 3rd Party Lab accredited to ISO/IEC Standard 17025:2017

Supporting Documentation: KS-Test-UFL201701.pdf

This Certificate is a guarantee that the above standard(s) was met by the requirements of such standard. Testing was performed under normal operation mode. The results of testing apply only to the particular sample tested and the specific test carried out. This Certificate is only issued for products which have passed the testing requirements of listed standard(s).

Authorized Signature:



Chad McBride
Chief Operating Officer - KStrong

ISO 17025 Accredited Test Laboratory

intertek
Total Quality. Assured.



Intertek Testing Services NA, Inc.
3933 US Rt. 11
Cortland, NY 13045
Tel: 1 607-753-6711
www.intertek.com

Test Verification of Conformity

Verification Number: 105403739CRT-002

On the basis of the referenced test report(s), sample(s) of the below product have been found to comply with the harmonized standards and Directives listed on this verification at the time the tests were carried out. Other standards and Directives may be relevant to the product. This verification is part of the full test report(s) and should be read in conjunction with it(them).

Applicant Name & Address: KStrong INC
150 N. Radnor Chester Rd.
Suite F200
Radnor, PA 19087
USA

Product Description: Energy Absorbing Lanyard (Arc Exposed)

Models/Type References: UFL201740 / UFL201750 / UFL201701 / UFL201721

Brand Name: KStrong INC

Relevant Standards: ASTM F887-20 Ed.

Verification Issuing Office Name & Address: Intertek Testing Services NA, Inc.
3933 US Rt-11
Cortland, NY 13045
USA

Date of Tests: 10/22/22 – 10/27/22

Test Report Number(s): 105403739CRT-001

Signature:



Name:

Matthew Stevens

Position:

Team Leader

Date:

4/25/23



KSTRONG INC.

TEST REPORT

SCOPE OF WORKS

ASTM F887-20 EAL for Arc Exposed Drops

REPORT NUMBER

105403739CRT-001

ORIGINAL REPORT NUMBER

105209511CRT-001

ISSUE DATE

4/25/2023

PAGES

5

DOCUMENT CONTROL NUMBER

GFT-OP-10a (6-March-2017)

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3933 US Route 11
Cortland, New York ,USA
13045

TEST REPORT FOR KStrong Inc.

Report No.: 105403739CRT-001

Date: April 25th 2023

Telephone: 607-758-6246

Facsimile: None

www.intertek.com

KSTRONG INC.
150 N. Radnor Chester Rd.
Suite F200
Radnor, PA 19087
USA

PH: NONE

Report Number..... : 105403739CRT-001

Signed Quote Number..... : Qu-01344225

PO Number : NA

Name of Testing Laboratory
Preparing the Report : Intertek Testing Services NA Inc.

Test Specification:

Standard..... : ASTM F887-20

Date(s) of Testing..... : 10/21/2022-10/27/2022

Product Description:

Product Type: : EAL for ARC Exposed Drops 6ft.

Brand Name: : KStrong

Model Number(s): : UFL201740

Additional Models Covered: : UFL201750 / UFL201701 / UFL201721

Date(s) Samples Received : 9/21/2022

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Date: April 25th 2023

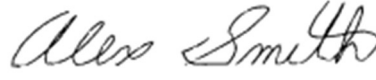

SECTION 1

SUMMARY OF TESTING

TESTS COMPLETED	ASTM F887 - 2020	STATUS
Dynamic Performance Post Arc Flash	25.6	PASS

SECTION 2

This test report concludes the work anticipated in the testing phase of your project. If there are any questions regarding this report please contact the undersigned at 607-753-6711.

WRITTEN BY:	Alex Smith	REVIEWED BY:	Matthew Stevens
TITLE:	Technician	TITLE:	Team Leader
SIGNATURE:		SIGNATURE:	
DATE:	4/25/2023	DATE:	4/25/2023

Please see attached test data for details.

Section	Requirement	Results	Compliance																																				
4.2.9	Dynamic Performance Test For (L + EA)																																						
	<ul style="list-style-type: none"> - Measure length from bearing point to bearing point under 10-lb. load. - 220 lb. test weight, 6-foot free fall - measure the MAF - Measure length from bearing point to bearing point under 220-lb. load. <p>Length not to exceed 42-inches MAF = 1,800 lbs. max. (ref 3.3.4)</p> <p>Notes:</p>	<table border="1"> <thead> <tr> <th>Sample # 1 22-01715A</th> <th>Post Arc Flash</th> </tr> </thead> <tbody> <tr> <td>Exposure Location</td> <td>User End</td> </tr> <tr> <td>Elongation (initial), inches</td> <td>109</td> </tr> <tr> <td>Elongation (final), inches</td> <td>138 ½</td> </tr> <tr> <td>E(fin)-E(in), inches</td> <td>29 ½</td> </tr> <tr> <td>MAF (lbs-f)</td> <td>1226</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Sample # 2 22-01715B</th> <th>Post Arc Flash</th> </tr> </thead> <tbody> <tr> <td>Exposure Location</td> <td>User End</td> </tr> <tr> <td>Elongation (initial), inches</td> <td>109</td> </tr> <tr> <td>Elongation (final), inches</td> <td>136 ¾</td> </tr> <tr> <td>E(fin)-E(in), inches</td> <td>27 ¾</td> </tr> <tr> <td>MAF (lbs-f)</td> <td>1105</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Sample # 3 22-01714A</th> <th>Post Arc Flash</th> </tr> </thead> <tbody> <tr> <td>Exposure Location</td> <td>Both Ends</td> </tr> <tr> <td>Elongation (initial), inches</td> <td>109</td> </tr> <tr> <td>Elongation (final), inches</td> <td>137 ½</td> </tr> <tr> <td>E(fin)-E(in), inches</td> <td>28 ½</td> </tr> <tr> <td>MAF (lbs-f)</td> <td>1074</td> </tr> </tbody> </table>	Sample # 1 22-01715A	Post Arc Flash	Exposure Location	User End	Elongation (initial), inches	109	Elongation (final), inches	138 ½	E(fin)-E(in), inches	29 ½	MAF (lbs-f)	1226	Sample # 2 22-01715B	Post Arc Flash	Exposure Location	User End	Elongation (initial), inches	109	Elongation (final), inches	136 ¾	E(fin)-E(in), inches	27 ¾	MAF (lbs-f)	1105	Sample # 3 22-01714A	Post Arc Flash	Exposure Location	Both Ends	Elongation (initial), inches	109	Elongation (final), inches	137 ½	E(fin)-E(in), inches	28 ½	MAF (lbs-f)	1074	PASS
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SECTION 5

REVISION HISTORY

REPORT NUMBER	DATE OF REVISION	DESCRIPTION OF CHANGE:	PROJECT OWNER	REVIEWED BY
105209511CRT-001	1/23/2023	Original Report	Steven Morey	Matthew Stevens
105403739CRT-001	4/25/2023	Report Extension	Alex Smith	Matthew Stevens



TEST SPECIMEN:

DIELECTRIC ARC FLASH SHOCK ABSORBING LANYARD

TEST STANDARD:

ELECTRIC ARC TESTS: ASTM F887-18

OBSERVATION OF PERSONAL CLIMBING EQUIPMENT EXPOSED TO AN ELECTRIC ARC

TEST REPORT: K-352152-1912H01-A -R00

Client

ArcWear

3018 Eastpoint Parkway

Louisville, KY 40223

Producer

KSTRONG LLC

17330 Preston Road #200 D

Dallas, TX 7525

USA

Sample Received
2019-Nov-18

Test Date
2019-Dec-19

Report Date
2020-Apr-07

Prepared by

Approved by

Yosbani Guerra
HCL Technologist
TD Technologies, Kinectrics
Ph: 416-207-6000

Andrew Haines
Supervising Technologist, HCL
TD Technologies, Kinectrics
Ph: 416-207-6000 x 6544

For questions on these test records, please contact HCL@Kinectrics.com



Revision History

Rev	Description		
00	Initial report creation		
	Issue Date	Prepared by	Approved by
	2020-Apr-07	Yosbani Guerra	Andrew Haines
Rev	Description		
	Issue Date	Prepared by	Verified by

DISCLAIMER

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QUALITY MANAGEMENT

The arc testing performed to the above mentioned Standard is accredited by the Standards Council of Canada (SCC) to conform to the requirements of CAN-P-4E (ISO/IEC 17025:2005). Accreditation by the Standards Council of Canada (SCC) is a mark of competence and reliability

- The test performed does not apply to electrical contact or electrical shock hazard.
- The test result is applicable only to the Test Specimens delivered to Kinectrics, other material, design or color may have a different response.
- It is the clients' responsibility to provide full and accurate information about the items supplied.
- No test is done to validate the fiber content or composition of the test item.
- Photographs of the test specimens and waveforms of the arc current, voltage and calorimeters with the circuit and arc exposure calibration records are available from Kinectrics and provided to the client separately from this report.



1 Test Standard:

Electrical arc test according to ASTM F887-18, Section 22

Standard Specifications for Personal Climbing Equipment, Electric Arc Performance Evaluation.

1.1 Test Description

Harnesses- The test program requires the specimens be placed on mannequins as normally worn. A minimum of eight samples are tested, four samples with the front facing the arc and four samples with the back side toward the arc. The mannequin is positioned as to have the arc centered on the chest for front facing exposure and centered on the fall arrest attachment for the back facing exposure.

Harness accessories, loops etc. - Three specimens of each accessory or loop are required to be exposed to the arc. These may be attached webbing or other suitable means to allow the item to be held against the mannequin or panel at a distance of 30.5 cm (12 inches).

Energy Absorbing Lanyard - Three specimens of each lanyard are required to be exposed to the arc. These are placed over the shoulder and held against the mannequin or panel at a distance of 30.5 cm (12 inches). Several lanyards may be tested at one time on the same mannequin. Other effects than the thermal effects of an electric arc like noise, light emissions, pressure rise, hot oil, electric shock, the consequences of physical and mental shock or toxic influences are not covered by this standard.

1.2 Acceptance criteria for products exposed to electrical arc:

The procedure outlined in ASTM 887 is followed to verify the electric arc performance of the personal climbing equipment. The product is considered as having passed the visual inspection criteria if the parameters defined in Table 1-1 are met. As proof of performance following the arc exposure, the exposed test specimens shall be subjected to a drop test per ANSI Z359.13 as applicable. This shall be done as soon as practically possible. The samples have been returned to the client as directed to perform the drop test.

Table 1-1: Visual inspection Criteria for Electric Arc Performance of ASTM F887

Parameter	Criterion
Arc Energy	Electrical arc exposure of 40 cal/cm ² ± 5 cal/cm ²
Ignition	No electric arc ignition.
After-flame Time	Less than 5 seconds on load bearing materials and less than 15 seconds for accessories or non-load bearing components.
Melting/Dripping	No melting and dripping of molten materials to the floor of any load bearing material. Accessories are allowed to exhibit melting and dripping provided they are not ignited while dripping.

2 Test Condition:

The following test circuit parameters and conditions were used.

- Electric arc current: 8 kA rms \pm 10%, 60 Hz
- Open circuit voltage: 2500 V rms \pm 10%, 60 Hz
- Nominal Heat Flux Density: 2100 kW/m² (50 cal/cm²·s)
- Arc duration: 0.85 seconds \pm 0.1 s to obtain required incident energy
- Electrode gap: 305 mm (12 inches)
- Distance from mannequin to electrode: 305 mm (12 inches)

3 Test Specimen:

The following description of the test sample was provided of obtained from the identification tag shown Figure 3-1.

Sample Description: Dielectric Arc Flash Shock Absorbing Lanyard
Sample Identification: Model FAP 3119(WL)(6)
Manufacturer: KSTRONG LLC
Material of Webbing: Aramid
Producer: KSTRONG LLC
Deviations and Abnormalities: None.



Figure 3-1: Sample lanyard and identification tag.



4 Test Results:

An arc exposure is performed on the samples as indicated in the test description, Section 1. The observations are performed by a qualified observer that has knowledge of behavior of materials in an arc exposure and in-depth knowledge of arc testing specifications and requirements. Additional samples may be tested when the incident energy is out of range. If the conditions and evaluation of the samples meet the criteria in Table 1-1, the product has passed the electrical arc exposure and is candidate for the mechanical drop test to fully meet the arc performance requirements of ASTM F887. Photographs of the samples before and after the arc exposures are shown in Figures 6-1 and 6-2.

Table 4-1: Summary of Test Results

Trial # 19-8165		
Mannequin	A – 2 installed.	B – 1 installed.
Item Serial #	N/A	N/A
Incident Energy, Ei (cal/cm ²)	41.3	43.7
After-flame	0	3
Ignition	N	N
Melting and Dripping	N	N
Acceptance Criteria	Pass	Pass

4.1 Observations:

Charring and embrittlement of the webbing and energy absorber cover fabric. Breakopen of the energy absorber cover fabric on mannequin B was also observed. No melting, dripping or ignition of any lanyard component was seen.

5 Interpretation of Results:

Based on the test results in Table 4-1 and Observations in 4.1, the Model FAP 3119(WL)(6) Dielectric Arc Flash Shock Absorbing Lanyard has met the reporting requirements criteria of ASTM F887-18 sections 22.1-22.4 and 22.6.1-22.6.2. A verification of performance and mechanical integrity must be performed following the arc exposure. ASTM F887 – Section 25, requires this test be performed as soon as practically possible following the arc exposure. This is to be arranged by the client or producer and the drop test report together with this report is a requirement of ASTM F887-18.

6 Photographs

The following photographs are representative of the test results observed.



Figure 6-1: Sample before arc exposure test #19-8165 (A: left, B: right).

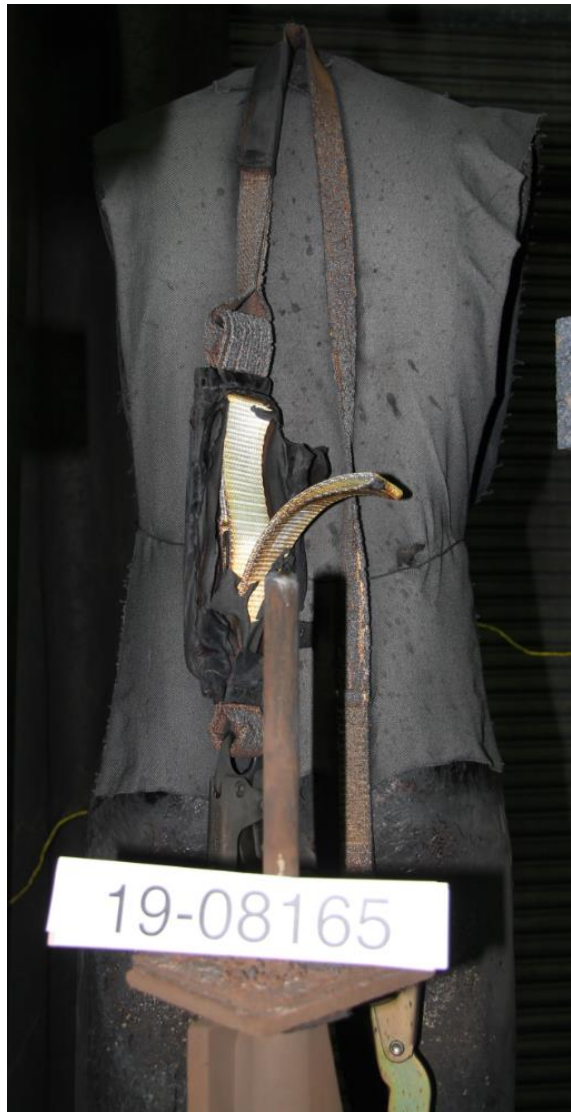


Figure 6-2: Sample after arc exposure test #19-8165 (A: left, B: right).

ArcWear

3018 Eastpoint Parkway, Louisville, KY 40223. 502-333-0510, www.ArcWear.com

Summary of Arc Test and Drop Test

Date: April 7, 2020

Report #: 1912H01-A SUMMARY

Client: KSTRONG LLC
17330 PRESTON ROAD #200 D
DALLAS, TX 7525

Sample Identified By Client As:

Dielectric Arc Flash Shock Absorbing Lanyard, Style FAP 3119(WL)(6), Aramid Webbing, ArcWear# 1912H01

Summary:

The fall protection samples, as described above, were tested in accordance with ASTM F887-18 *Standard Specifications for Personal Climbing Equipment Section 22, Electric Arc Performance Evaluation*. This testing was performed at Kinectrics, Inc, 800 Kipling Avenue, Toronto, Ontario, Canada and the results documented in ArcWear Report 1912H01. Based on this test report, the following was noted:

- FAP 3119(WL)(6), was tested and met the no melting, no dripping, no ignition criteria of ASTM F887-18 section 22.

Following the arc test, the arc-exposed samples were drop tested in accordance with ASTM F887-18. This testing was performed by Intertek, Inc. 3933 US Route 11, Cortland, NY 13045 and the results documented in Intertek Report 104079615CRT-002. Based on this test report, the following was noted:

- FAP 3119(WL)(6), passed the dynamic performance criteria of ASTM F887-18.

Signed for the Company by:

Hugh Hoagland, President



SATRA Technology Centre Ltd
Wyndham Way, Telford Way, Kettering,
Northamptonshire, NN16 8SD United Kingdom
Tel: +44 (0) 1536 410000
Fax +44 (0) 1536 410626
email: info@satra.com
www.satra.com



Customer details: KSTRONG LLC
17330 PRESTON ROAD
#200 D DALLAS
TX 7525

SATRA reference: SPC0282166 /1910
Issue 2 Ext 1

Your reference: SQ/039/2019-20

Date of report: 7 October 2019

Samples received: 4 June 2019

Date(s) work carried out: Between 30 August &
12 September 2019

TECHNICAL REPORT

Subject:

Qualification testing of a range of 6ft free fall energy absorbing lanyards described as "FAP3118(WL)(6)", "UFL201701", "FAP30198(WL)(6)" & "UFL201721" in accordance with ANSI Z359.13 – 2013

This is an extension of report SPC0282166/1910 Issue 2 dated 25 September 2019

Conditions of Issue:

This report may be forwarded to other parties provided that it is not changed in any way. It must not be published, for example by including it in advertisements, without the prior, written permission of SATRA.

Results given in this report refer only to the samples submitted for analysis and tested by SATRA. Comments are for guidance only.

Tests marked \neq fall outside the UKAS Accreditation Schedule for SATRA. All interpretations of results of such tests and the comments based upon them are outside the scope of UKAS accreditation and are based on current SATRA knowledge.

A satisfactory test report in no way implies that the product tested is approved by SATRA and no warranty is given as to the performance of the product tested. SATRA shall not be liable for any subsequent loss or damage incurred by the client as a result of information supplied in the report.

The uncertainty of the results (UoM) in this report is based on a standard uncertainty multiplied by a coverage factor $k=2$, which provides a coverage probability of approximately 95%.

Report signed by: Daniel Harrison
Position: Business Area Manager
Department: Safety Product Testing

(Page 1 of 27)

Work Requested

Samples of 6ft energy absorbing lanyards, described as "FAP3118(WL)(6)", "UFL201701", "FAP30198(WL)(6)" & "UFL201721", were received by SATRA on the 4th June 2019, for testing in accordance with ANSI Z359.13 – 2013

All variations within this range are mostly identical. "FAP3118(WL)(6)" and "UFL201701" are identical, with the only difference being different connectors, and "FAP30198(WL)(6)" and "UFL201721" being twin leg variants of "FAP3118(WL)(6)" and "UFL201701" respectively. Testing was performed on a combination of all styles in order to make 3 full sets of tests, covering both single leg and twin leg variants.

Conclusions

Sample Reference	Standard	Clause / Property	Sub-Clause / Property	Pass / Fail
FAP3118(WL)(6), UFL201701, FAP30198(WL)(6) & UFL201721	ANSI Z359.13 - 2013	3.1 Personal Energy Absorber Component	3.1.1 Classifications	PASS
			3.1.2 Material	Not fully assessed
			3.1.3 Terminations	PASS
			3.1.4 Connectors	PASS
			3.1.5 Deployment Indicator	PASS
			3.1.6 Activation Force	PASS
			3.1.7 Static Strength	PASS
			3.1.8 Personal Energy Absorber Dynamic Performance – Ambient Dry Test	PASS
			3.1.9 Personal Energy Absorber Dynamic Performance – Conditioning Tests	PASS
		3.2 Energy Absorbing Lanyard Component	3.2.1 Material	Not fully assessed
			3.2.2 Terminations	PASS
			3.2.3 Energy Absorber Lanyard Connectors	PASS
			3.2.4 Energy Absorbing Lanyard Dynamic Performance – Ambient Dry Test	PASS
			3.2.5 Energy Absorbing Lanyards Dynamic Performance – Conditioning Tests	PASS
			3.2.6 Static Strength	PASS
			3.2.9 Static Test – Y-Lanyards	PASS
			3.2.10.1 Dynamic Performance Testing of Y-Lanyards – Y-Lanyards Single Connection	PASS
3.2.10.2 Dynamic Performance Testing of Y-Lanyards – Y-Lanyards Dual Connection	PASS			
3.2.10.3 Dynamic Performance Testing of Y-Lanyards – Hip Connection	PASS			

Testing

Testing was carried out in accordance with ANSI Z359.13 – 2013 between the 30th August & 12th September 2019

Samples were tested as received, and were not subject to any pre-conditioning processes other than those stated in individual test clauses



Figure 1 – Energy absorbing lanyard described as “FAP3118(WL)(6)”



Figure 2 – Energy absorbing lanyard described as “UFL201701” (Photo supplied by client)



Figure 3 – Energy absorbing lanyard described as “FAP30198(WL)(6)”



Figure 4 – Energy absorbing lanyard described as “UFL201721” (Photo supplied by client)

Test Results

Table 1 – Testing of 6ft energy absorbing lanyard described as “FAP3118(WL)(6)”, “UFL201701”, “FAP30198(WL)(6)” & “UFL201721” in accordance with ANSI Z359.13 – 2013

ANSI Z359.13 – 2013 Clause / Test	ANSI Z359.13 – 2013 Requirement	Result / Comment	UoM	Pass / Fail
3.1.1 Classifications	<p>3.1.1.1 “6ft FF” personal energy absorbers shall be designed for up to 6 foot (1.83m) free fall applications and users weighing between 130 and 310 pounds (59 – 140kg)</p> <p>3.1.1.2 “12ft FF” personal energy absorbers shall be designed for up to 12 foot (3.66m) free fall applications and users weighing between 130 and 310 pounds (59 – 140kg)</p>	<p>Lanyards are 6ft FF energy absorbers for use between 59 – 140kg</p> <p>Not applicable – Lanyards are 6ft FF energy absorbers</p>	N/A	PASS
3.1.2 Material	Material used in the construction of personal energy absorbers shall be made of virgin synthetic material having strength, aging, abrasion resistance and heat resistance characteristics equivalent or superior to polyamides	Not assessed – information to be supplied by manufacturer	N/A	Not assessed
3.1.3 Terminations – 3.1.3.1 Spliced	<p>Formed eye terminations in rope shall be made in accordance with the rope manufacturer’s recommendation, subject to the following requirements.</p> <p>Eye splices in twisted rope having three or more strands shall have a minimum of four tucks.</p> <p>A properly sized thimble shall be part of a formed eye termination</p> <p>Knots shall not be used to form energy absorbing lanyard end terminations.</p> <p>Terminations (including cut ends) and splices shall be seized, whipped or otherwise integrally finished to prevent the termination or splice from unravelling or unsplicing</p>	Not applicable – lanyards are not rope	N/A	N/A

ANSI Z359.13 – 2013 Clause / Test	ANSI Z359.13 – 2013 Requirement	Result / Comment	UoM	Pass / Fail
3.1.3 Terminations – 3.1.3.2 Stitched	<p>Stitched eye terminations on strap energy absorbers shall be sewn using lock stitches</p> <p>Thread shall be of the same material type as the webbing and shall be of a contrasting colour to facilitate inspection</p> <p>Webbing shall be protected from concentrated wear at all interfaces with load bearing connector elements.</p> <p>Webbing ends shall be seared or otherwise prevented from unravelling</p>	<p>Lanyard is lock stitched throughout</p> <p>Thread is of the same material type as webbing Colour of webbing: Black with white stripe Colour of thread: Yellow</p> <p>Additional material insert placed between connector and lanyard</p> <p>Webbing ends are hot cut to prevent unravelling</p>	N/A	<p>PASS</p> <p>PASS</p> <p>PASS</p> <p>PASS</p>
3.1.3 Terminations – 3.1.3.3 Wire rope	<p>Formed eye terminations of wire rope shall have a minimum breaking strength of 80% of the wire rope when tested in accordance with ASTM E8/8M-11.</p> <p>The following methods may be used for forming eyes in wire rope</p> <p>(a) spliced eye with one swaged fitting (b) return eye with minimum of two swaged fittings</p> <p>All formed eyes shall incorporate a properly sized thimble</p>	Not applicable – no wire components	N/A	N/A
3.1.3 Terminations – 3.1.3.4 Other terminations	Terminations other than splicing, stitching and swaging are permitted when it can be demonstrated by testing the requirements of this standard can be met and additionally, that the durability, reliability, strength and other properties pertinent to the intended uses have been evaluated and determined suitable by the manufacturer	Not applicable – no other termination types	N/A	N/A

ANSI Z359.13 – 2013 Clause / Test	ANSI Z359.13 – 2013 Requirement	Result / Comment	UoM	Pass / Fail
3.1.4 Connectors	Personal energy absorbers shall have integrally attached connectors or be integral to the energy absorbing lanyard. Connectors used on all personal energy absorbers shall meet the requirements of ANSI/ASSE Z359.12	Integral connectors labelled as “PN146” & “PN167” are marked compliant with ANSI Z359.12	N/A	PASS
3.1.5 Deployment Indicator	Personal energy absorbers shall be designed such that it is obvious if they have been activated or by a warning flag or label that indicates activation	Indicator provided	N/A	PASS
3.1.6 Activation Force	Personal energy absorbers when subjected to a static force no less than 450 pounds (2kN), shall not show signs of activation or exhibit permanent elongation greater than 2 inches (51mm)	Sample 1 – FAP3118(WL)(6) 2kN sustained for 1 minute Permanent extension: 8mm	± 1.953%	PASS
		Sample 2 – FAP3118(WL)(6) 2kN sustained for 1 minute Permanent extension: 8mm		
		Sample 3 – UFL201701 2kN sustained for 1 minute Permanent extension: 10mm		
3.1.7 Static Strength	Personal energy absorbers when statically tested shall have a minimum breaking strength no less than 5,000 pounds (22.2kN)	Sample 1 – FAP3118(WL)(6) 22.2kN sustained for 1 minute without failure	± 1.025% See note 1	PASS
		Sample 2 – FAP3118(WL)(6) 22.2kN sustained for 1 minute without failure		
		Sample 3 – UFL201701 22.2kN sustained for 1 minute without failure		

ANSI Z359.13 – 2013 Clause / Test	ANSI Z359.13 – 2013 Requirement	Result / Comment	UoM	Pass / Fail
3.1.8 Personal Energy Absorber Dynamic Performance – Ambient Dry Test	Personal energy absorbers tested in accordance with 4.4 shall meet the following requirements: 6ft FF personal energy absorbers shall have an average arrest force no greater than 900 pounds (4kN) and a maximum deployment distance of 48 inches (1.2m) without exceeding 1,800 pounds (8kN) maximum arrest force	Sample 1 – FAP3118(WL)(6) Sample length: 1.84m 128kg test mass help following 1.83m freefall Peak force: 4.6kN (see figure 5) Average arrest force: 3.6kN Energy absorbing lanyard deployment distance: 0.99m		PASS
	12ft FF personal energy absorbers shall have an average arrest force no greater than 1,350 pounds (6kN) and a maximum deployment distance of 60 inches (1.5m) without exceeding 1,800 pounds (8kN) maximum arrest force	Sample 2 – FAP3118(WL)(6) Sample length: 1.84m 128kg test mass help following 1.83m freefall Peak force: 4.5kN (see figure 6) Average arrest force: 3.7kN Energy absorbing lanyard deployment distance: 0.98m	± 0.435%	PASS
		Sample 3 – UFL201701 Sample length: 1.84m 128kg test mass help following 1.83m freefall Peak force: 4.7kN (see figure 7) Average arrest force: 3.7kN Energy absorbing lanyard deployment distance: 0.97m		PASS

ANSI Z359.13 – 2013 Clause / Test	ANSI Z359.13 – 2013 Requirement	Result / Comment	UoM	Pass / Fail
3.1.9 Personal Energy Absorber Dynamic performance – Conditioning Tests	<p>Personal energy absorbers shall be conditioned according to the requirements of 4.13.1, 4.13.2 and 4.13.3 and tested according to 4.4.</p> <p>Conditioning tests do not need to be performed when the energy absorber is integral to a lanyard and the energy absorbing lanyard is tested according to 3.2.5</p>	<p>Condition: Wet (20°C water for 8 hours) Sample 1 – FAP3118(WL)(6) Sample length: 1.85m</p> <p>128kg test mass help following 1.83m freefall</p> <p>Peak force: 5.3kN (see figure 8) Average arrest force: 3.8kN Energy absorbing lanyard deployment distance: 0.81m</p>	± 0.435%	PASS
	<p>6ft FF personal energy absorbers shall have an average arrest force no greater than 1,125 pounds (5kN) and a maximum deployment distance of 48 inches (1.2m) without exceeding 1,800 pounds (8kN) maximum arrest force</p>	<p>Condition: Wet (20°C water for 8 hours) Sample 2 – FAP3118(WL)(6) Sample length: 1.85m</p> <p>128kg test mass help following 1.83m freefall</p> <p>Peak force: 5.6kN (see figure 9) Average arrest force: 4.0kN Energy absorbing lanyard deployment distance: 0.82m</p>		PASS
	<p>12ft FF personal energy absorbers shall have an average arrest force no greater than 1,575 pounds (7kN) and a maximum deployment distance of 60 inches (1.5m) without exceeding 1,800 pounds (8kN) maximum arrest force</p>	<p>Condition: Wet (20°C water for 8 hours) Sample 3 – UFL201701 Sample length: 1.84m</p> <p>128kg test mass help following 1.83m freefall</p> <p>Peak force: 5.2kN (see figure 10) Average arrest force: 4.0kN Energy absorbing lanyard deployment distance: 0.79m</p>		PASS
		<p>Condition: Cold (-35°C for 8 hours) Sample 1 – FAP3118(WL)(6) Sample length: 1.84m</p> <p>128kg test mass help following 1.83m freefall</p> <p>Peak force: 6.0kN (see figure 11) Average arrest force: 4.2kN Energy absorbing lanyard deployment distance: 0.80m</p>		PASS

ANSI Z359.13 – 2013 Clause / Test	ANSI Z359.13 – 2013 Requirement	Result / Comment	UoM	Pass / Fail
<p>3.1.9 Personal Energy Absorber Dynamic performance – Conditioning Tests (Cont.)</p>	<p>Personal energy absorbers shall be conditioned according to the requirements of 4.13.1, 4.13.2 and 4.13.3 and tested according to 4.4.</p> <p>Conditioning tests do not need to be performed when the energy absorber is integral to a lanyard and the energy absorbing lanyard is tested according to 3.2.5</p>	<p>Condition: Cold (-35°C for 8 hours) Sample 2 – FAP3118(WL)(6) Sample length: 1.85m</p> <p>128kg test mass help following 1.83m freefall</p> <p>Peak force: 5.5kN (see figure 12) Average arrest force: 4.2kN Energy absorbing lanyard deployment distance: 0.79m</p>	± 0.435%	PASS
	<p>6ft FF personal energy absorbers shall have an average arrest force no greater than 1,125 pounds (5kN) and a maximum deployment distance of 48 inches (1.2m) without exceeding 1,800 pounds (8kN) maximum arrest force</p>	<p>Condition: Cold (-35°C for 8 hours) Sample 3 – UFL201701 Sample length: 1.85m</p> <p>128kg test mass help following 1.83m freefall</p> <p>Peak force: 6.0kN (see figure 13) Average arrest force: 4.2kN Energy absorbing lanyard deployment distance: 0.79m</p>		PASS
	<p>12ft FF personal energy absorbers shall have an average arrest force no greater than 1,575 pounds (7kN) and a maximum deployment distance of 60 inches (1.5m) without exceeding 1,800 pounds (8kN) maximum arrest force</p>	<p>Condition: Hot (45°C for 8 hours) Sample 1 – FAP3118(WL)(6) Sample length: 1.85m</p> <p>128kg test mass help following 1.83m freefall</p> <p>Peak force: 4.8kN (see figure 14) Average arrest force: 3.5kN Energy absorbing lanyard deployment distance: 1.11m</p>		PASS
		<p>Condition: Hot (45°C for 8 hours) Sample 2 – FAP3118(WL)(6) Sample length: 1.85m</p> <p>128kg test mass help following 1.83m freefall</p> <p>Peak force: 5.1kN (see figure 15) Average arrest force: 3.4kN Energy absorbing lanyard deployment distance: 1.10m</p>		PASS

ANSI Z359.13 – 2013 Clause / Test	ANSI Z359.13 – 2013 Requirement	Result / Comment	UoM	Pass / Fail
3.1.9 Personal Energy Absorber Dynamic performance – Conditioning Tests (Cont.)		Condition: Hot (45°C for 8 hours) Sample 3 – UFL201701 Sample length: 1.85m 128kg test mass help following 1.83m freefall Peak force: 4.8kN (see figure 16) Average arrest force: 3.5kN Energy absorbing lanyard deployment distance: 1.12m	± 0.435%	PASS
3.2.1 Material	Rope, webbing and tubular webbing used in the construction of energy absorbing lanyards shall be made of virgin synthetic material having strength, aging, abrasion resistance and heat resistance characteristics equivalent or superior to polyamides	Not assessed	N/A	Not assessed
3.2.2 Terminations – 3.2.2.1 Spliced	Formed eye terminations in rope shall be made in accordance with the rope manufacturer's recommendation, subject to the following requirements. Eye splices in twisted rope having three or more strands shall have a minimum of four tucks. A properly sized thimble shall be part of a formed eye termination Knots shall not be used to form energy absorbing lanyard end terminations. Terminations (including cut ends) and splices shall be seized, whipped or otherwise integrally finished to prevent the termination or splice from unravelling or unsplicing	Not applicable – lanyard is not rope	N/A	N/A

ANSI Z359.13 – 2013 Clause / Test	ANSI Z359.13 – 2013 Requirement	Result / Comment	UoM	Pass / Fail
3.2.2 Terminations – 3.2.2.2 Stitched	<p>Stitched eye terminations on strap energy absorbers shall be sewn using lock stitches</p> <p>Thread shall be of the same material type as the webbing and shall be of a contrasting colour to facilitate inspection</p> <p>Webbing shall be protected from concentrated wear at all interfaces with load bearing connector elements.</p> <p>Webbing ends shall be seared or otherwise prevented from unravelling</p>	<p>Lanyard is lock stitched throughout</p> <p>Thread is of the same material type as webbing Colour of webbing: Black with white stripe Colour of thread: Yellow</p> <p>Additional material insert placed between connector and lanyard</p> <p>Webbing ends are hot cut to prevent unravelling</p>	N/A	<p>PASS</p> <p>PASS</p> <p>PASS</p> <p>PASS</p>
3.2.2 Terminations – 3.2.2.3 Wire rope	<p>Formed eye terminations of wire rope shall have a minimum breaking strength of 80% of the wire rope when tested in accordance with ASTM E8/8M-11.</p> <p>The following methods may be used for forming eyes in wire rope</p> <p>(a) spliced eye with one swaged fitting (b) return eye with minimum of two swaged fittings</p> <p>All formed eyes shall incorporate a properly sized thimble</p>	Not applicable – lanyard is not wire rope	N/A	N/A
3.2.2 Terminations – 3.2.2.4 Other terminations	Terminations other than splicing, stitching and swaging are permitted when it can be demonstrated by testing the requirements of this standard can be met and additionally, that the durability, reliability, strength and other properties pertinent to the intended uses have been evaluated and determined suitable by the manufacturer	Not applicable – no other types of terminations	N/A	N/A
3.2.3 Energy Absorbing Lanyard Connectors	Energy absorbing lanyards shall have integrally attached connectors. Connectors used on all personal energy absorbers shall meet the requirements of ANSI/ASSE Z359.12	Integral connectors labelled as “PN146” & “PN167” are marked compliant with ANSI Z359.12	N/A	PASS

ANSI Z359.13 – 2013 CLAUSE / TEST	ANSI Z359.13 – 2013 REQUIREMENT	RESULT / COMMENT	UoM	PASS / FAIL
3.2.4 Energy Absorbing Lanyard Dynamic Performance – Ambient Dry Test	<p>Energy absorbing lanyards shall be tested as a complete system according to 4.5.</p> <p>6ft FF personal energy absorbers shall have an average arrest force no greater than 900 pounds (4kN) and a maximum deployment distance of 48 inches (1.2m) without exceeding 1,800 pounds (8kN) maximum arrest force</p> <p>12ft FF personal energy absorbers shall have an average arrest force no greater than 1,350 pounds (6kN) and a maximum deployment distance of 60 inches (1.5m) without exceeding 1,800 pounds (8kN) maximum arrest force</p>	See clause 3.1.8 for results	± 0.435%	PASS

ANSI Z359.13 – 2013 Clause / Test	ANSI Z359.13 – 2013 Requirement	Result / Comment	UoM	Pass / Fail
3.2.5 Energy Absorbing Lanyards Dynamic performance – Conditioning Tests	<p>Energy absorbing lanyards shall be conditioned according to the requirements of 4.13.1, 4.13.2 and 4.13.3 and tested according to 4.5.</p> <p>6ft FF personal energy absorbers shall have an average arrest force no greater than 1,125 pounds (5kN) and a maximum deployment distance of 48 inches (1.2m) without exceeding 1,800 pounds (8kN) maximum arrest force</p> <p>12ft FF personal energy absorbers shall have an average arrest force no greater than 1,575 pounds (7kN) and a maximum deployment distance of 60 inches (1.5m) without exceeding 1,800 pounds (8kN) maximum arrest force</p>	See clause 3.1.9 for results	± 0.435%	PASS
3.2.6 Static Strength	Energy absorbing lanyards when statically tested in accordance with 4.6 shall have a minimum breaking strength no less than 5,000 pounds (22.2kN).	See clause 3.2.9 for results	± 1.025% See note 1	PASS
	Energy absorbing lanyards that incorporate a means of length adjustment shall be tested in accordance with 4.6.1 and shall maintain their adjusted length up to a load of 2,000 pounds (8.8kN)	Not applicable – lanyard is not adjustable	± 1.898% See note 1	N/A
3.2.9 Static Test – Y-Lanyards	Y-lanyards shall be statically tested in accordance with 4.7 and shall have a minimum breaking strength no less than 5,000 pounds (22.2kN)	<p>Sample 1 – FAP30198(WL)(6) Position; Leg 1</p> <p>22.2kN sustained for 1 minute without failure</p> <p>Sample 2 – UFL201721 Position: Leg 1</p> <p>22.2kN sustained for 1 minute without failure</p> <p>Sample 3 – UFL201721 Position: Across both legs</p> <p>22.2kN sustained for 1 minute without failure</p>	± 1.025% See note 1	PASS

ANSI Z359.13 – 2013 Clause / Test	ANSI Z359.13 – 2013 Requirement	Result / Comment	UoM	Pass / Fail
3.2.10 Dynamic Performance Testing of Y- Lanyards – 3.2.10.1 Y- Lanyards Single Connection	6ft FF and 12ft FF Y-Lanyards shall be tested in accordance with 4.8 and meet the following 6ft FF personal energy absorbers shall have an average arrest force no greater than 900 pounds (4kN) and a maximum deployment distance of 48 inches (1.2m) without exceeding 1,800 pounds (8kN) maximum arrest force 12ft FF personal energy absorbers shall have an average arrest force no greater than 1,350 pounds (6kN) and a maximum deployment distance of 60 inches (1.5m) without exceeding 1,800 pounds (8kN) maximum arrest force	Sample 1 – FAP30198(WL)(6) 128kg mass held: Yes Average arrest force: 3.8kN Deployment distance: 0.97m Peak arrest force: 5.0kN (see figure 17) Sample 2 – UFL201721 128kg mass held: Yes Average arrest force: 3.6kN Deployment distance: 0.98m Peak arrest force: 5.0kN (see figure 18) Sample 3 – UFL201721 128kg mass held: Yes Average arrest force: 3.7kN Deployment distance: 0.99m Peak arrest force: 4.6kN (see figure 19)	± 0.438%	PASS
3.2.10 Dynamic Performance Testing of Y- Lanyards – 3.2.10.2 Y- Lanyards Dual Connection	6ft FF and 12ft FF Y-lanyards shall be tested in accordance with 4.9 and shall not at any time exceed a force reading over 1,800 pounds (8kN)	Sample 1 – FAP30198(WL)(6) 128kg mass held: Yes Peak arrest force: 5.0kN (see figure 20) Sample 2 – UFL201721 128kg mass held: Yes Peak arrest force: 4.9kN (see figure 21) Sample 3 – UFL201721 128kg mass held: Yes Peak arrest force: 5.0kN (see figure 22)	± 0.419%	PASS

ANSI Z359.13 – 2013 Clause / Test	ANSI Z359.13 – 2013 Requirement	Result / Comment	UoM	Pass / Fail
3.2.10 Dynamic Performance Testing of Y-Lanyards – 3.2.10.3 Dynamic Test – Hip Connection	Y-lanyards shall be tested in accordance with 4.10. If the energy absorbing lanyard breaks the nylon keeper during the test, the energy absorbing lanyard shall include a warning label on each lanyard leg according to 5.2.2	Sample 1 – FAP30198(WL)(6) 128kg mass held: Yes Did nylon keeper remain intact: No Are both legs marked with instructions for safe storage: Yes		
		Sample 2 – UFL201721 128kg mass held: Yes Did nylon keeper remain intact: No Are both legs marked with instructions for safe storage: Yes	± 0.174%	PASS
		Sample 3 – UFL201721 128kg mass held: Yes Did nylon keeper remain intact: No Are both legs marked with instructions for safe storage: Yes		

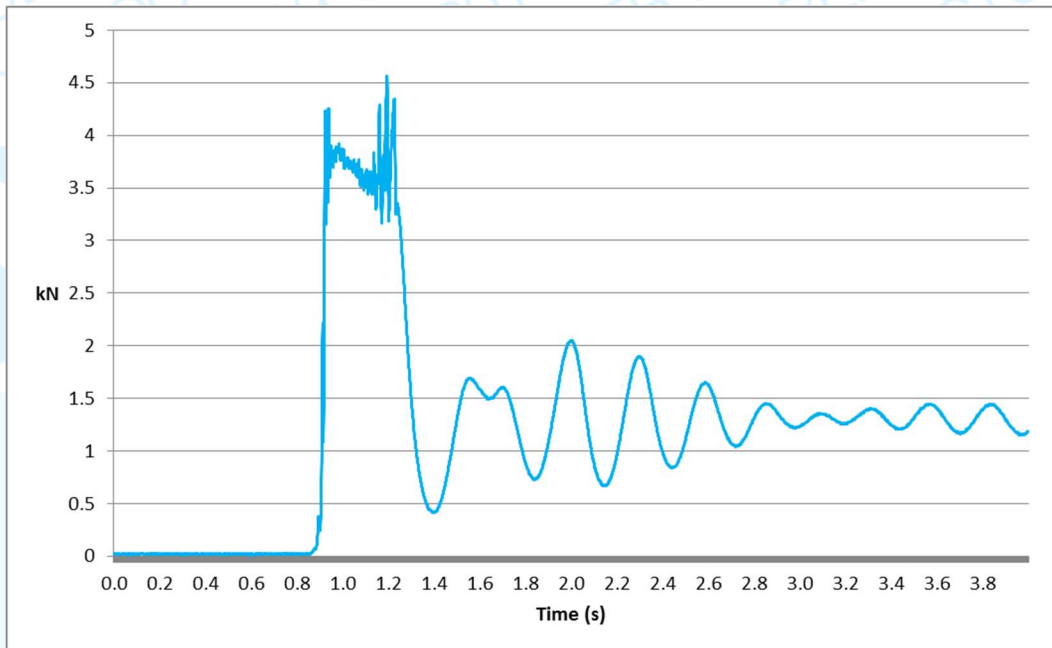


Figure 5 – Dynamic performance test: Graph of force vs. time

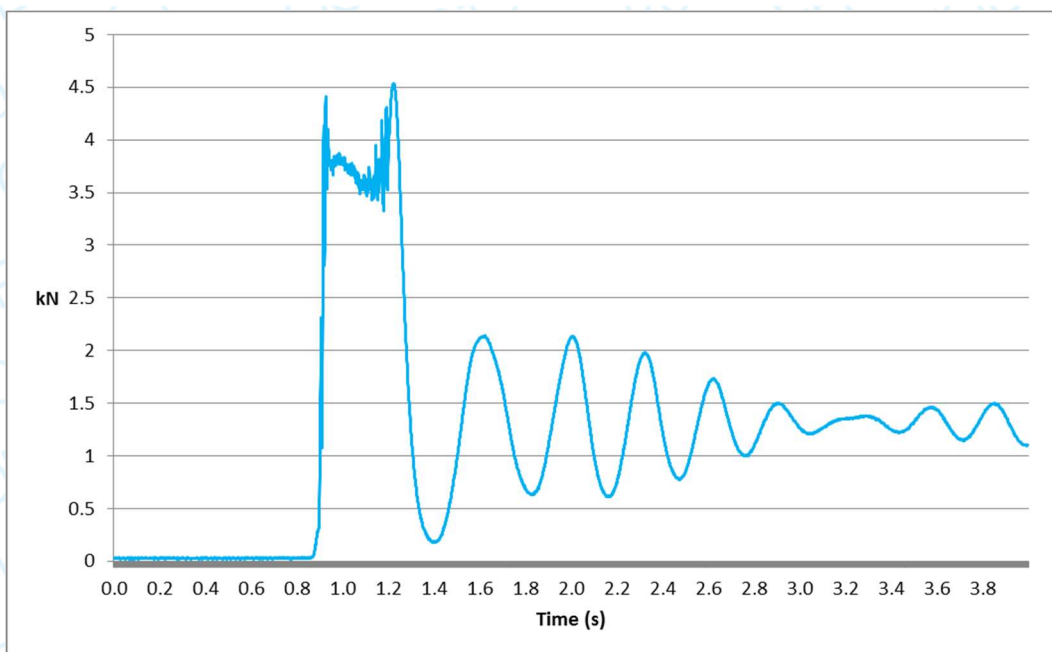


Figure 6 – Dynamic performance test: Graph of force vs. time

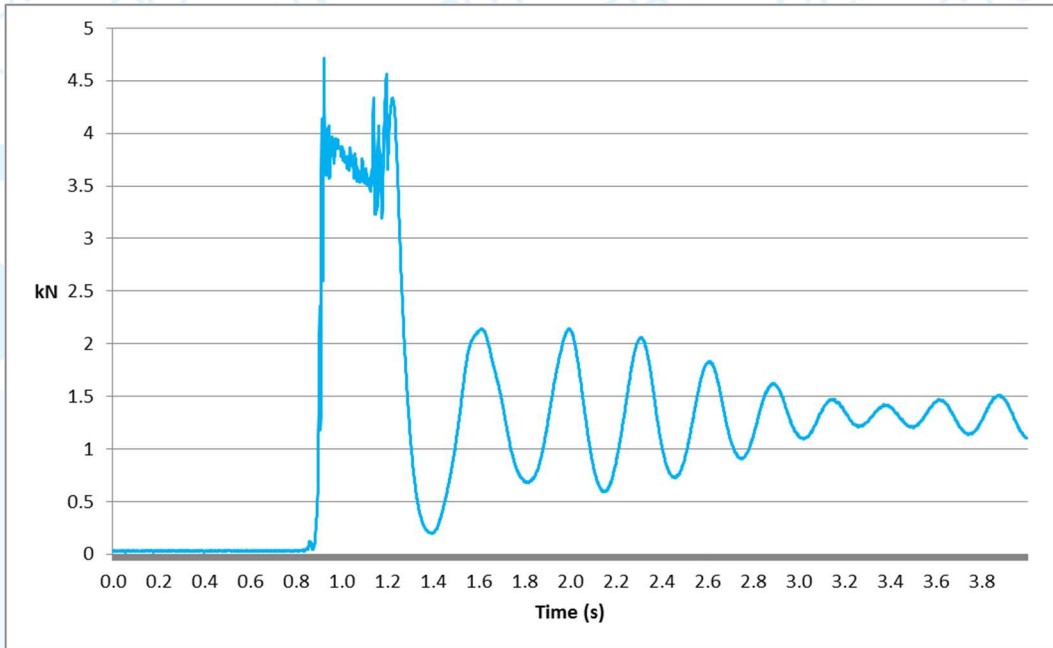


Figure 7 – Dynamic performance test: Graph of force vs. time

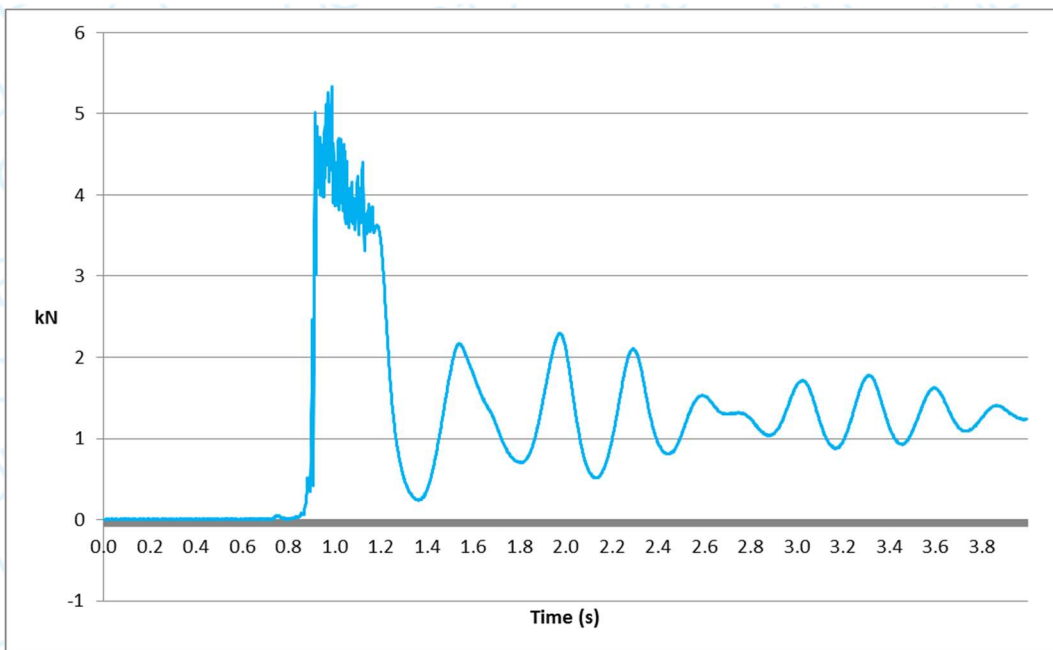


Figure 8 – Dynamic performance test: Graph of force vs. time

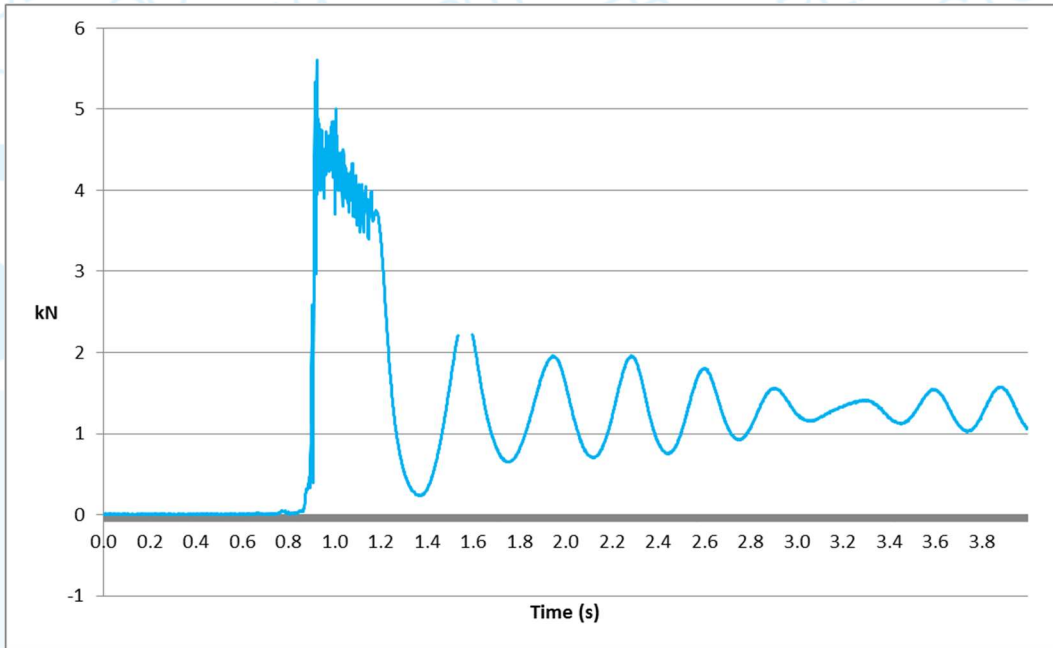


Figure 9 – Dynamic performance test: Graph of force vs. time

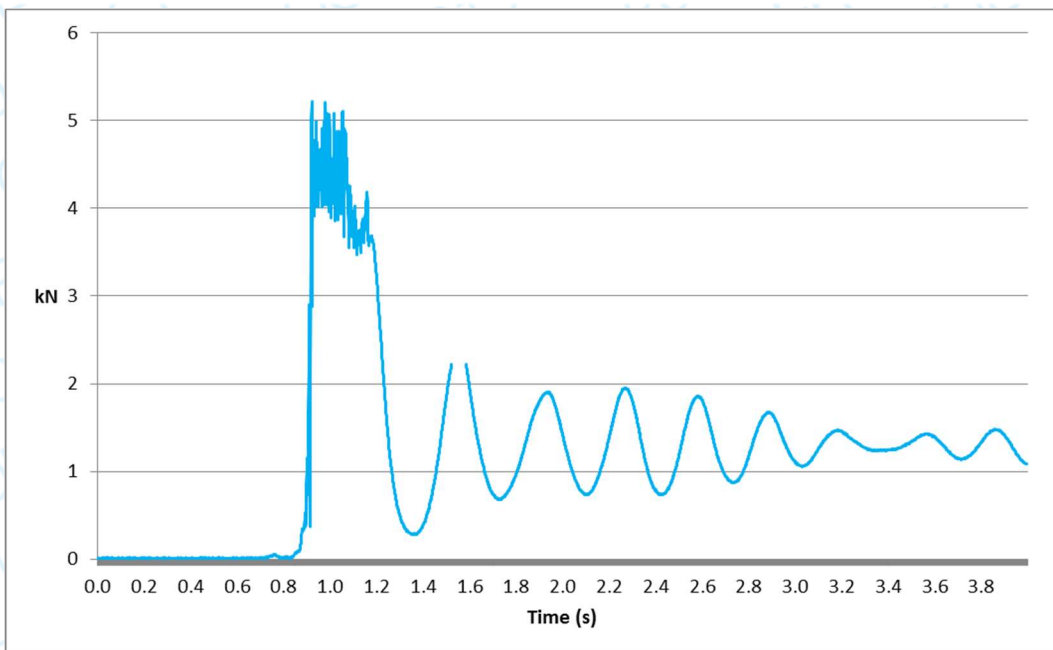


Figure 10 – Dynamic performance test: Graph of force vs. time

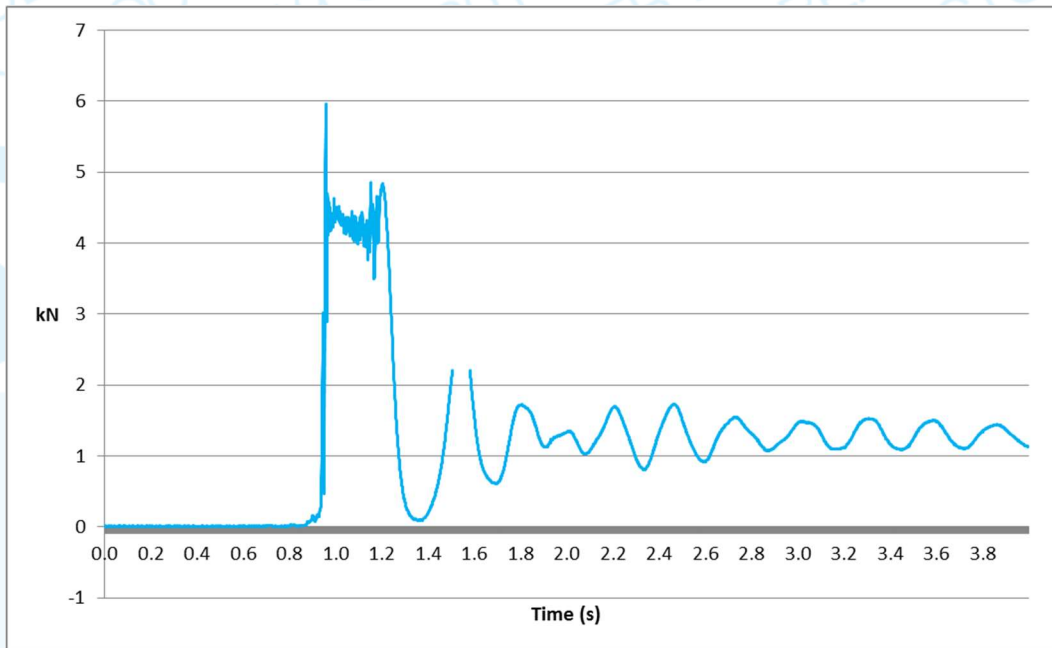


Figure 11 – Dynamic performance test: Graph of force vs. time

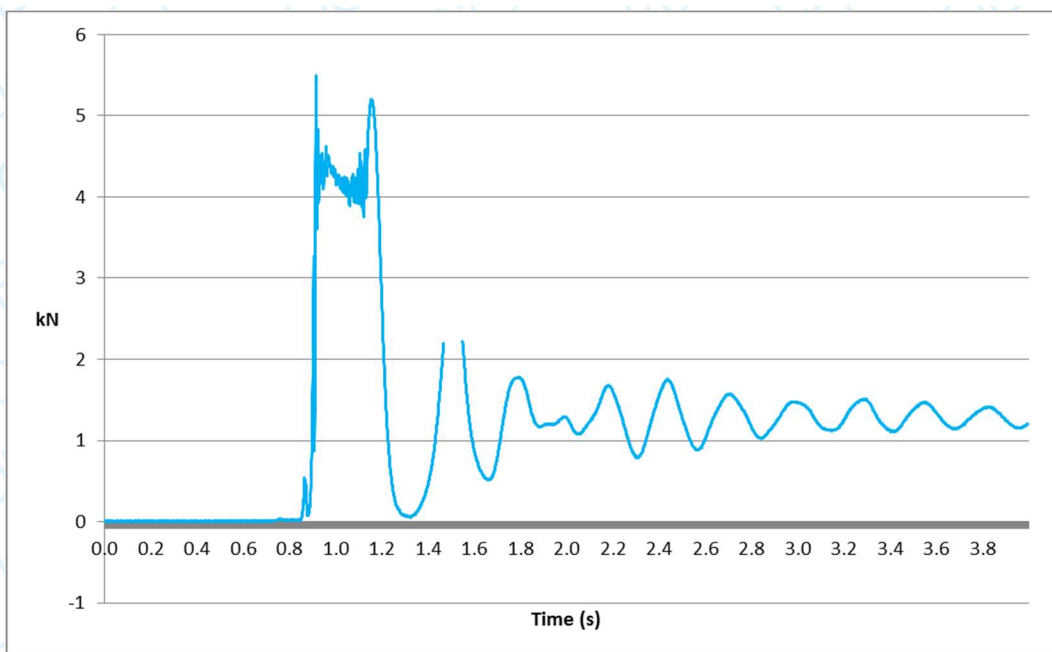


Figure 12 – Dynamic performance test: Graph of force vs. time

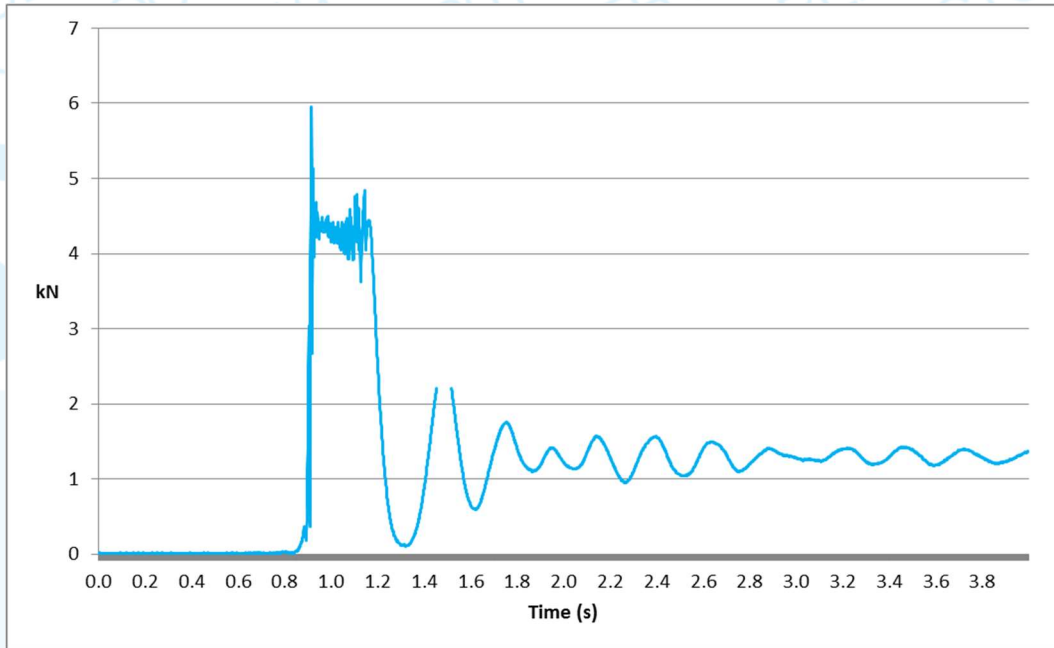


Figure 13 – Dynamic performance test: Graph of force vs. time

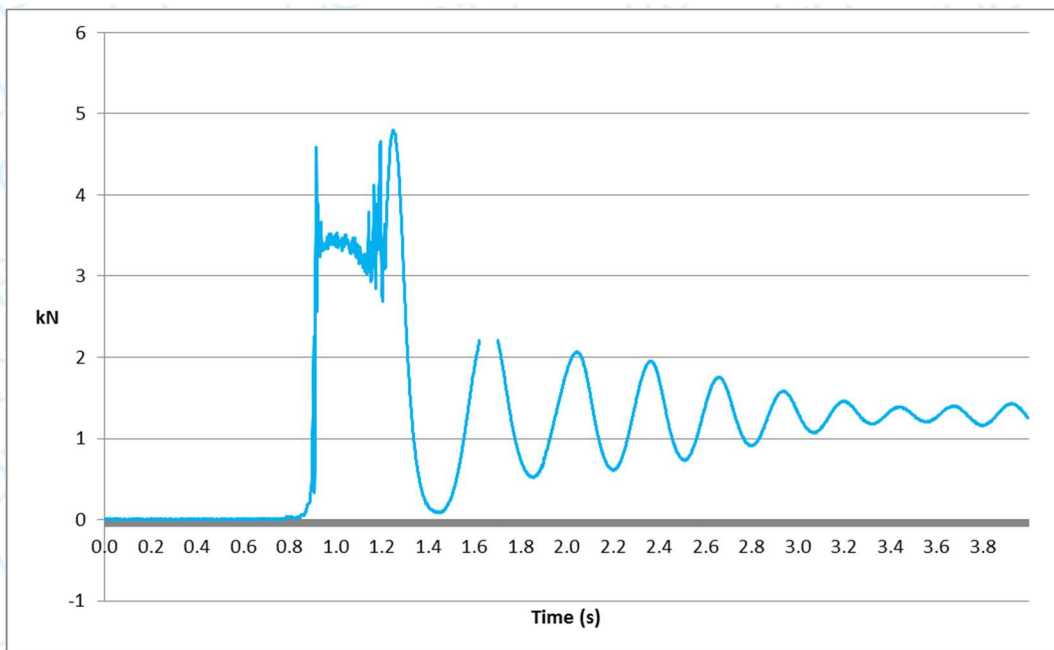


Figure 14 – Dynamic performance test: Graph of force vs. time

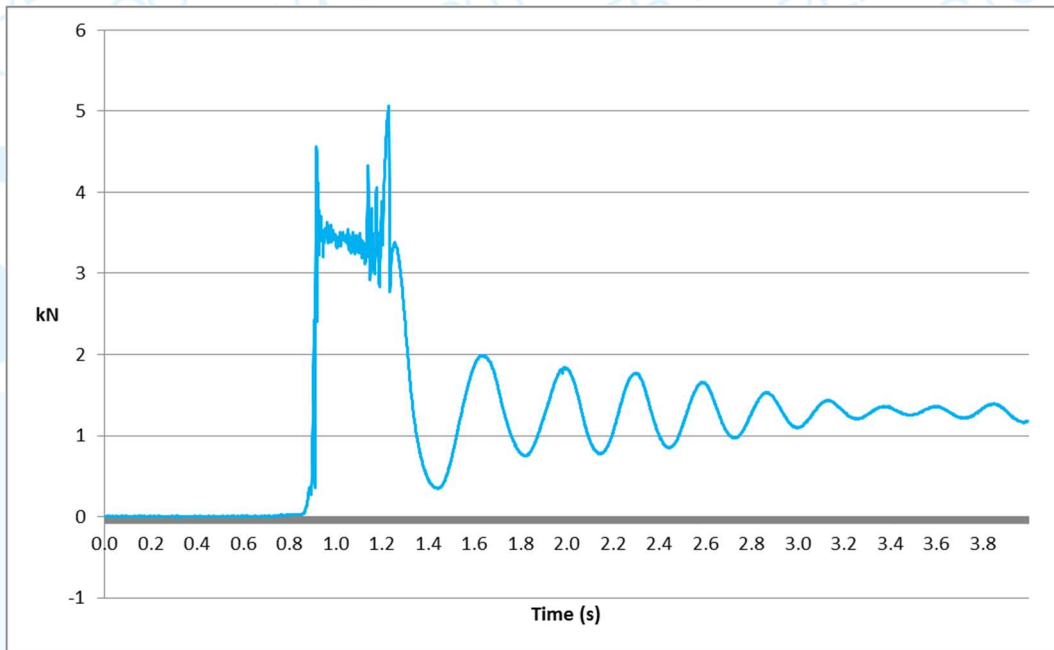


Figure 15 – Dynamic performance test: Graph of force vs. time

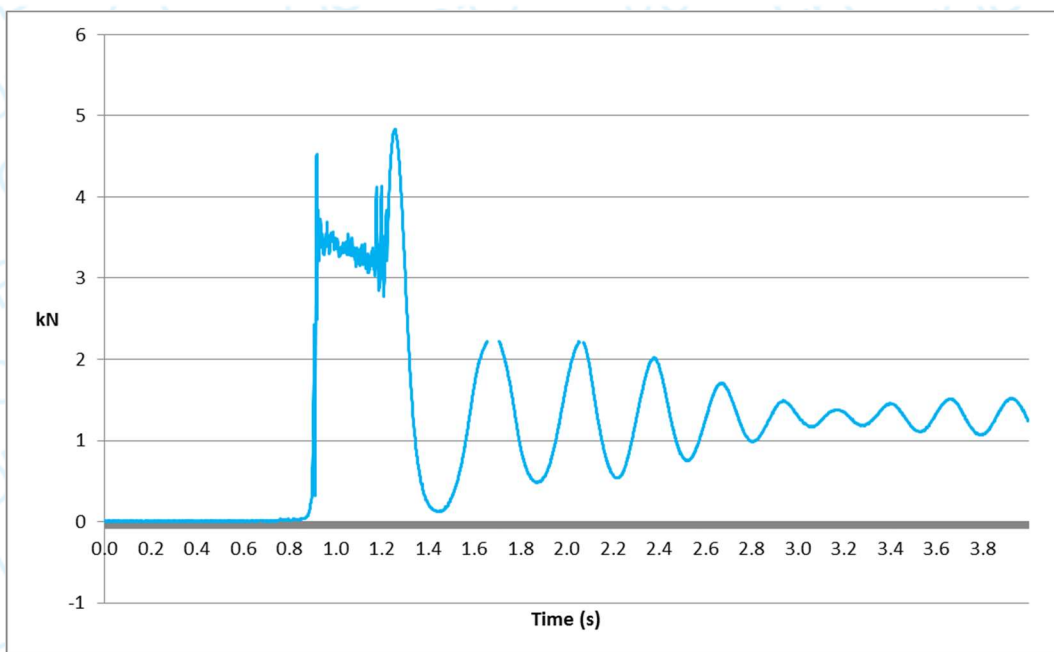


Figure 16 – Dynamic performance test: Graph of force vs. time

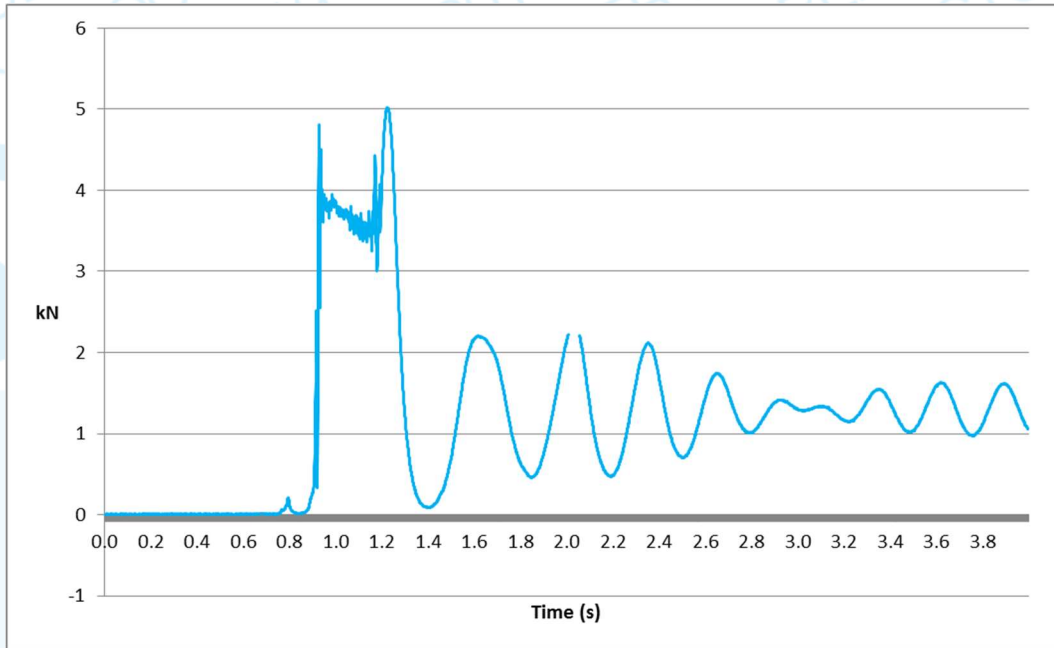


Figure 17 – Dynamic performance test: Graph of force vs. time

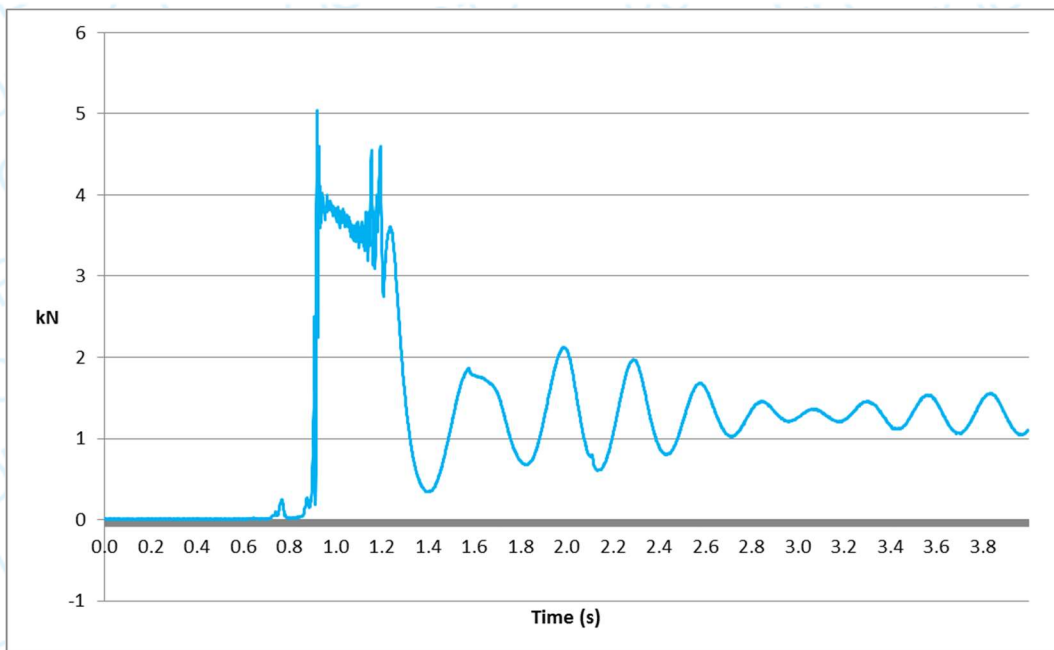


Figure 18 – Dynamic performance test: Graph of force vs. time

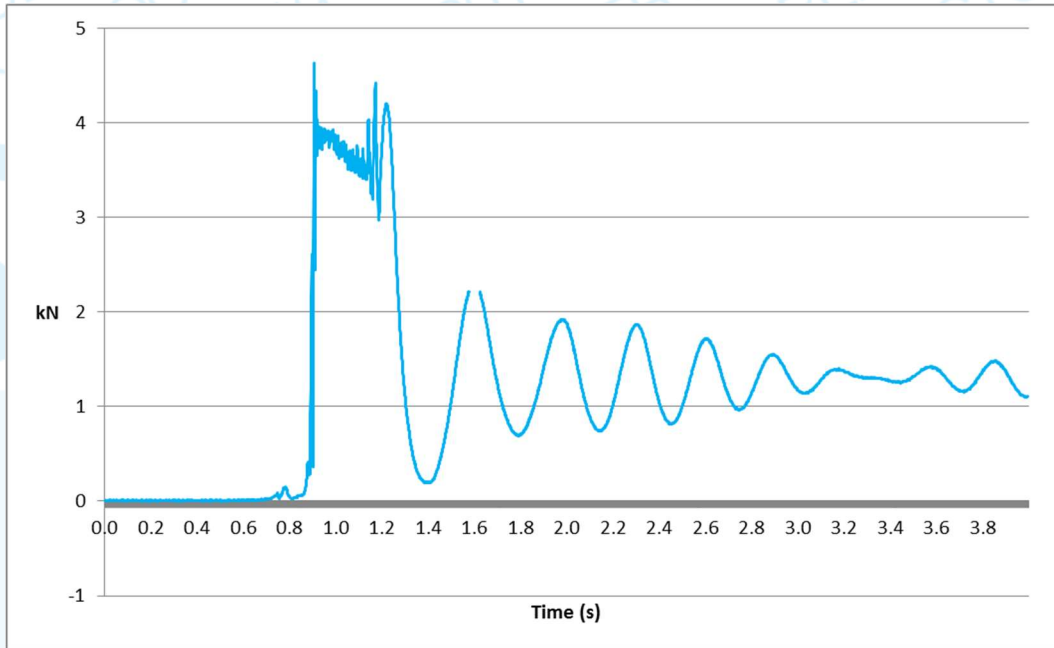


Figure 19 – Dynamic performance test: Graph of force vs. time

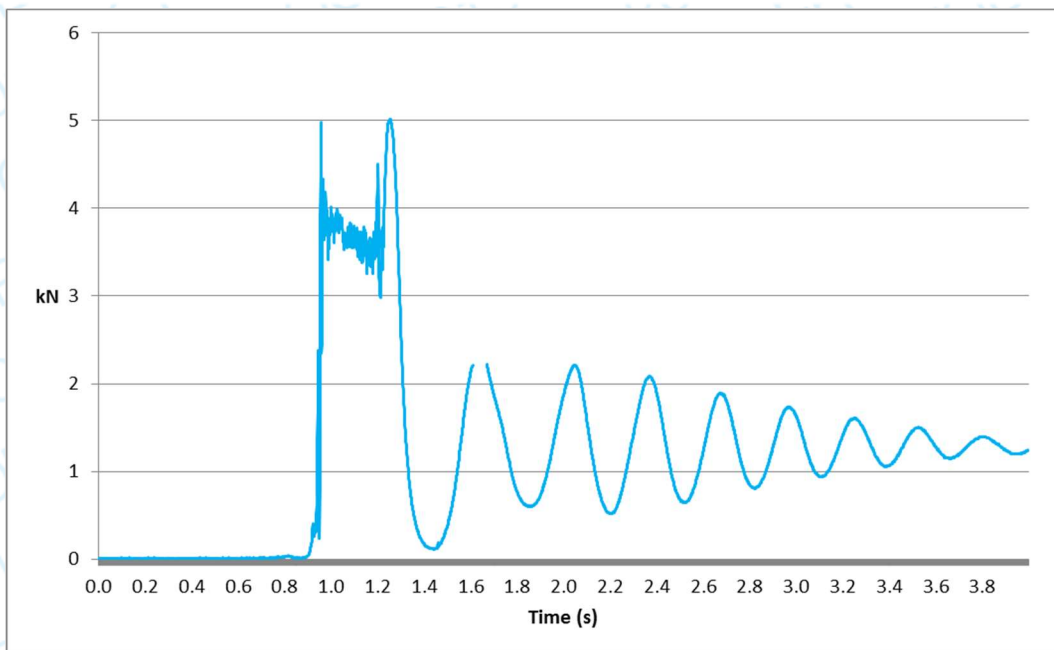


Figure 20 – Dynamic performance test: Graph of force vs. time

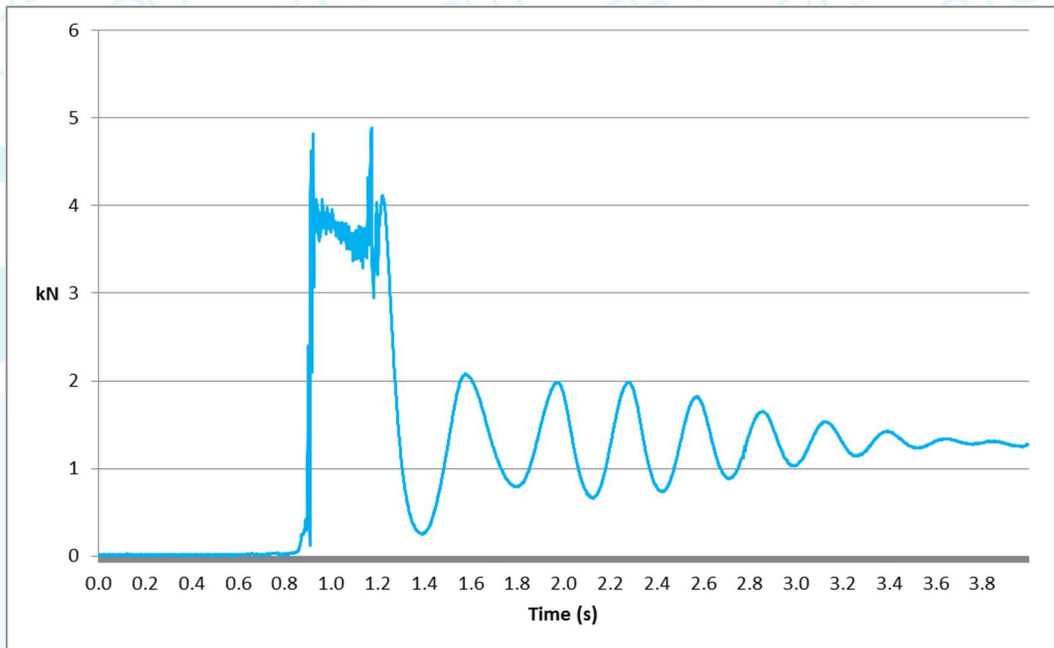


Figure 21 – Dynamic performance test: Graph of force vs. time

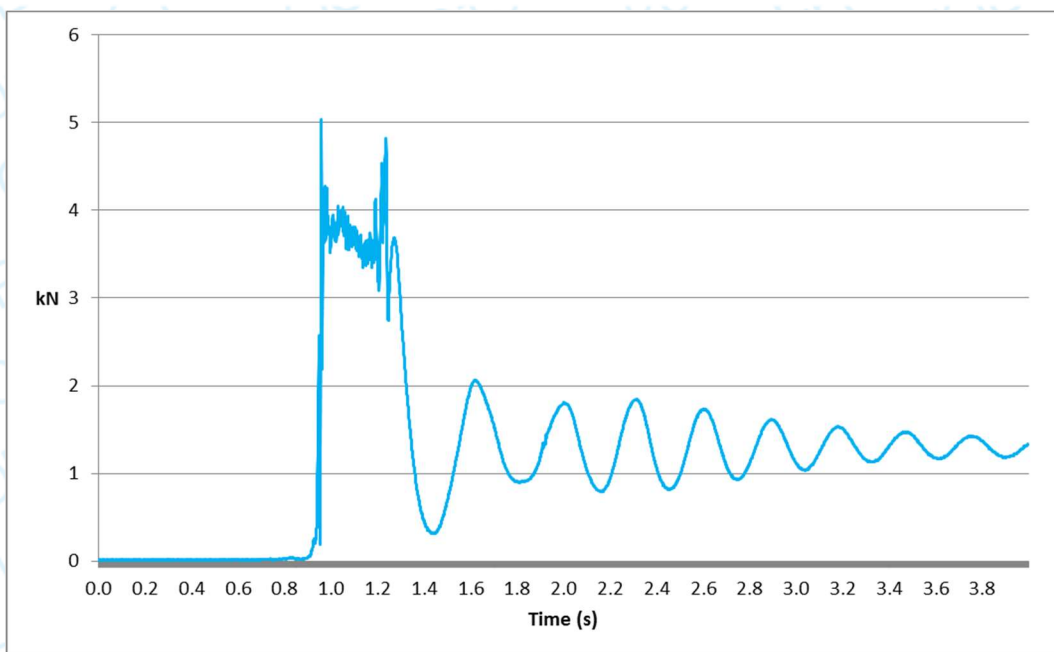


Figure 22 – Dynamic performance test: Graph of force vs. time

Additional Information / Notes

Note 1 – Estimated uncertainty of measurement applied at point of test (e.g. to applied force or to tolerance limits) to ensure product meets requirements of the standard

TERMS AND CONDITIONS FOR THE SALE OF GOODS AND/OR THE PROVISION OF SERVICES

1. GENERAL

- 1.1 Work done, Services undertaken or the sale of Goods are subject to the terms and conditions detailed below and (subject to clause 5.2) all other conditions, warranties and representations, expressed or implied by statute relating thereto are hereby excluded.
- 1.2 SATRA Technology Centre Limited, its subsidiaries and associated companies (hereinafter referred to as "SATRA") may perform Services for or supply Goods to persons or entities (public, private or governmental) issuing instructions (hereinafter termed the "Client"). Each also known individually as a Party, or jointly as Parties.
- 1.3 These terms and conditions will apply to the Contract between SATRA and the Client to the exclusion of any other terms which the Client may seek to impose or which may be implied by trade, custom, practice or course of dealing
- 1.4 Unless otherwise agreed in writing no party other than the Client is entitled to provide instructions or information relating to the Goods or Services required or to the delivery of goods, results, reports or certificates.
- 1.5 All references in these terms and conditions to:
 - (a) the "Contract" is the contract between SATRA and the Client for the supply of Goods or Services which is made subject to these terms and conditions; and
 - (b) "Services" are the work or services to be supplied or performed under the Contract (including where relevant the supply of software, components and consumables); and
 - (c) "Goods" are the equipment, consumables or other physical items sold under the Contract (including documents, drawings or other information required in order to operate the equipment).
- 1.6 All drawings, descriptive matter, specifications and advertising material (including brochures and catalogues) are issued or published with the sole purpose of giving an indication of the goods or services being described and shall not form part of the Contract.
- 1.7 Where SATRA and the Client agree that the sale of Goods shall be governed by Incoterms 2010 (or any subsequent revision thereto) then the sale shall be governed by the relevant Incoterms mode of transport which is agreed by SATRA and the Client.

2. FEES AND PAYMENT

- 2.1 Where SATRA has agreed to perform the Services or supply the Goods on the basis of credit then payment terms are net 21 days from date of invoice, unless otherwise specified and may require part payment prior to delivery of the Services or Goods. In the event of the Client failing to make payment as agreed SATRA will be entitled to withhold delivery of the Goods or Services or cancel the Contract. SATRA reserves the right to charge interest on any overdue payments at a rate of 1.5% per month accruing on a daily basis from the date the invoice is due until the date payment is received.
- 2.2 Where the provision of Services or the sale of Goods is subject to a proforma invoice then SATRA shall not be obliged to start working on the provision of the Goods or Services until after payment in full has been made as cleared funds to SATRA.
- 2.3 SATRA reserves the right to charge for any and all expenses incurred as a result of performing the Services required by the Client. Although SATRA will try and provide an estimate of such expenses these may change as a result of circumstances out of SATRA's control.
- 2.4 Unless otherwise agreed in writing, the price for the Goods or Services shall be the price set in the order acknowledgement. SATRA shall not be bound by any price quoted which is not in writing. Prices for the sale of Goods include packing cases and materials but not carriage or installation which will be quoted separately and as agreed with the Client.
- 2.5 Quotations are valid from the date of issue for a period of 90 days unless otherwise specified or agreed in writing.
- 2.6 Should the Client become insolvent, bankrupt, subject to an administration order, enter into liquidation or receivership, or make arrangements with creditors SATRA reserves the right to cancel the Contract and terminate the supply of the Goods or Services. Where the Contract with SATRA is terminated all outstanding monies due from the Client to SATRA shall be immediately payable, and any materials supplied by SATRA to the Client returned. Termination of the Contract shall be without prejudice to any of SATRA's accrued rights.
- 2.7 All invoices issued by SATRA are payable in full. The Client is responsible for payment of withholding and any other taxes and all import duties. Payments made to SATRA shall not be reduced by such amounts.
- 2.8 The Client shall not be entitled to withhold or defer payment due to SATRA as a result of any dispute or counter claim that it may allege against SATRA.
- 2.9 SATRA reserves the right to bring action against the Client in order to collect unpaid fees, including court action. All fees associated with such actions shall be paid for by the Client including legal fees and related costs.
- 2.10 Where unforeseen costs arise as a result of provision of the Goods or carrying out the Services SATRA shall inform the Client immediately but reserves the right to charge additional costs to cover said costs and expenses.

3. INTELLECTUAL PROPERTY RIGHTS

- 3.1 All intellectual property rights belonging to a Party prior to entry into the Contract shall remain with that Party. Nothing in this Contract shall allow transfer of any intellectual property rights from one Party to the other.
- 3.2 In the event of certification services the use of certification marks by the Client may be subject to national and international laws and regulations. The responsibility for the use of these certification marks lies solely with the Client.
- 3.3 All intellectual property rights in reports, drawings, graphs, charts, photographs or any other material (in whatever medium) produced by SATRA pursuant to this Contract shall belong to SATRA. The Client shall have the right to use said material in accordance with the terms of this Contract.
- 3.4 The Client agrees and acknowledges that SATRA retains any and all propriety rights in concepts, ideas and inventions that may arise during the preparation or provision of any report (including any deliverables provided by SATRA to the Client) and the provision of the Services to the Client.
- 3.5 All intellectual property rights in any software supplied to the Client shall belong to SATRA or SATRA's licensors. With respect to the sale of SATRA Timeline, SATRASUMM and SATRA Visionsstich, provided that the Client is a member of SATRA and has paid its annual Smartcare fee then the Client will be entitled to use the software for its own internal use and will be entitled to receive minor software upgrades and fixes. SATRA may however terminate the supply of software upgrades and fixes for older versions of software which it no longer considers viable to support. The Client's rights to use the software and receive software upgrades and fixes will terminate if the Client has not paid its annual Smartcare fee. Major upgrades are not included within the entitlement to upgrades but may be offered by SATRA from time to time for an additional fee.
- 3.6 SATRA shall observe all statutory provisions with regard to data protection including but not limited to the provisions of the Data Protection Act 1998. To the extent that SATRA processes or gets access to personal data in connection with the Services or otherwise in connection with this Contract, it shall take all reasonable technical and organisational measures to ensure the security of such data (and guard against unauthorised or unlawful processing, accidental loss, destruction or damage to such data).

4. SUSPENSION OR TERMINATION OF SERVICES

- 4.1 Cancellation by the Client of orders for Goods or Services will only be acceptable by prior agreement with SATRA and a charge will usually be made.
- 4.2 SATRA shall not be liable for any delay or failure in providing the Goods or Services due to circumstances beyond its reasonable control (including any failure by the Client to comply with its obligations). If any such circumstances arise which prevent SATRA from delivering the Goods or completing the Services, then SATRA will be entitled to cancel or reschedule the delivery of Goods or Services at its discretion. In the event of cancellation SATRA will be entitled to retain all fees paid by the Client for Goods or Services already supplied but will refund to the Client any fees paid by the Client for Goods or Services which have not yet been supplied. The Client will not be liable for any non-refundable expenses already incurred by SATRA in relation to Goods or Services not yet supplied unless the cancellation is due to the Client's failure to comply with its obligations under the Contract.

5. LIABILITY AND INDEMNIFICATION

- 5.1 Reports are issued on the basis of information, documents and/or samples submitted to SATRA by the Client, or on behalf of the Client and are provided solely for the benefit of the Client who is responsible for acting as it sees fit on the basis of such reports and findings. Subject to clause 5.2, neither SATRA nor any of its employees, agents or subcontractors shall be liable to the Client or any third party for any actions taken or not taken on the basis of such findings and reports, nor for any incorrect results arising as a result of unclear, erroneous, incomplete, misleading or false information provided to SATRA.
- 5.2 Nothing in these terms and conditions shall limit or exclude SATRA's liability for:
 - (a) death or personal injury caused by its negligence or the negligence of its employees or agents;
 - (b) fraud or fraudulent misrepresentation;
 - (c) breach of the terms implied by Section 12 of the Sale of Goods Act 1979;
 - (d) defective products under the Consumer Protection Act 1987; or
 - (e) any other liability which cannot be limited or excluded by applicable law.
- 5.3 Subject to clause 5.2 SATRA shall not be liable to the Client whether in contract, tort (including negligence), breach of statutory duty or otherwise arising under or in connection with the Contract for loss of profits, sales, contracts, anticipated savings, loss or damage to goodwill or any indirect or consequential loss.
- 5.4 Subject to clause 5.2 SATRA's total aggregate liability to the Client, whether in contract, tort (including negligence), breach of statutory duty or otherwise arising under or in connection with the Contract shall be limited to the total amount of fees for the Services or the price of the Goods (excluding any value added tax or other sales tax or expenses) payable by the Client to SATRA under the Contract or £100,000 whichever is the lower figure.

6. MISCELLANEOUS

- 6.1 If any one or more provisions of these conditions are found to be illegal or unenforceable in any respect, the validity, legality and enforceability of the remaining provisions shall not in any way be affected or impaired thereby.
- 6.2 During the course of providing the Goods or Services and for a period of one year thereafter the Client shall not directly or indirectly entice, encourage or make any offer to SATRA's employees to leave their employment with SATRA.
- 6.3 The use of SATRA's corporate name or registered marks for advertising purposes is not permitted without SATRA's prior written authorisation.
- 6.4 All reports and documentation which are supplied to the Client under the Contract remain the property of SATRA until paid in full. Under no circumstances will a Client's purchase order override SATRA's retention of title in accordance with this clause.
- 6.5 The Client acknowledges that in entering into this Contract it has not relied on any representation, warranty, collateral contract or other assurance (except those set out or referred to in these terms and conditions) made by or on behalf of SATRA or any other party before entering into the Contract. The Client waives all rights and remedies that, but for this clause, might otherwise be available to it in respect of any such representation, warranty, collateral contract or other assurance.
- 6.6 All provisions of the Contract that limit or exclude the liability of SATRA are intended also to be for the benefit of SATRA's holding company (called SATRA, and being a company limited by guarantee and incorporated in England and Wales with company number 00153475), and shall accordingly be enforceable by such holding company as well as or instead of by SATRA, and on the basis that any limit on the liability of SATRA shall apply to it and to such holding company in the aggregate.

7. CONFIDENTIALITY

- 7.1 Unless specifically excluded in the terms of an individual contract between SATRA and the Client, the following shall apply to all deliverables including, reports, advice, drawings, photographs, specifications, data or other forms of media.
 - 7.2 Deliverables referred to in clause 7.1 shall not be disclosed to third parties or used in litigation without the consent of SATRA.
 - 7.3 Where SATRA has given consent to disclosure of any service deliverables referred to in clause 7.1, the Client shall draw the attention of the third party to these terms of business and the basis on which SATRA undertakes testing, reporting and advising. The Client shall indemnify SATRA for any failure to do so.
 - 7.4 The service deliverables referred to in clause 7.1 are submitted to the Client as confidential documents. Confidentiality shall continue to apply after completion of the business, but shall cease to apply to information or knowledge which has come into the public domain through no breach of this Contract by the Client.
 - 7.5 The Client shall not disassemble, remove parts or carry out any form of analysis on goods or materials sold by SATRA for the purposes of reverse engineering or obtaining information on the construction, content or composition of the item without the consent of SATRA.

8. AMENDMENT

- 8.1 No amendment to this Contract shall be effective unless it is in writing, expressly stated to amend this Contract and signed by an authorised signatory of both Parties.

9. DISPUTE RESOLUTION

- 9.1 If there should be a dispute between the parties to this Agreement they undertake to act with goodwill and to use all reasonable endeavours to resolve that dispute.
- 9.2 Failure to resolve any dispute by discussions between the parties shall, in the first instance, be referred to a mediator for resolution. The parties shall attempt to agree upon the appointment of a mediator, upon receipt, by either of them, of a written notice to concur in such appointment. Should the parties fail to agree within 21 days, either party, upon giving written notice, may apply to the President or the Vice President, for the time being, of the Chartered Institute of Arbitrators, for the appointment of a mediator.
- 9.3 Should the mediation fail, in whole or in part, either party may, upon giving written notice, and within twenty-eight days thereof, apply to the President or the Vice President, for the time being, of the Chartered Institute of Arbitrators, for the appointment of a single arbitrator, for final resolution. The arbitrator shall have no connection with the mediator or the mediation proceedings, unless both parties have consented in writing. The arbitration shall be governed by both the Arbitration Act 1996 and the Controlled Cost Rules of the

TERMS AND CONDITIONS FOR THE SALE OF GOODS AND/OR THE PROVISION OF SERVICES

- Chartered Institute of Arbitrators (2000 Edition), or any amendments thereof, which Rules are deemed to be incorporated by reference into this clause. The seat of the arbitration shall be England and Wales.
- 9.4. The laws of England shall govern the interpretation of this Contract. Subject to clauses 9.1, 9.2 and 9.3 any dispute arising out of or in connection with the Contract shall be subject to the exclusive jurisdiction of the courts of England. However, the Party obtaining a judgement in such courts shall be entitled to enforce it in any court it chooses.
- 10. PROVISION OF SERVICES**
- 10.1 SATRA shall provide Services using reasonable care and skill and in accordance with the Clients specific instructions and as confirmed by SATRA as part of the Contract review process.
- 10.2 Estimates for completion of the Services are made in good faith and date from receipt of a written order, payment of a proforma invoice if required, full information and samples to enable SATRA to proceed. While SATRA will make every effort to fulfil them, such estimates are subject to unforeseen events and if not achieved, cannot give rise to any claim. Time will not be of the essence in relation to the performance of the Services.
- 10.3 Results given in test reports or certificates refer only to samples submitted for analysis to SATRA. A satisfactory test report in no way implies that the product tested is approved by SATRA and no warranty is given as to the performance of the product tested.
- 10.4 SATRA may delegate all or part of the Services to a subcontractor and the Client authorises SATRA to disclose all information required to undertake the Services.
- 10.5 Where the Client requests SATRA to witness testing of other services being undertaken by a third party the Client agrees that SATRA's sole responsibility is to be present at the time of the work and to forward the results or confirm that the service has been undertaken. The Client agrees that unless otherwise agreed SATRA is not responsible for the condition or calibration of any equipment unless provided by SATRA.
- 10.6 Unless otherwise agreed in advance, test samples will be retained for 6 weeks from the date of the final report after which time they will be disposed of and SATRA shall cease to have any responsibility for such samples.
- Where the nature of the samples or the Services undertaken results in specialist disposal then SATRA reserves the right to pass the cost of such disposal onto the Client. Storage for longer periods may be possible only if agreed in advance and may incur a storage charge payable by the Client.
- Where practical and agreed in advance, samples may be returned at the Client's expense. However, samples are in most instances partially or fully destroyed as part of the work undertaken and SATRA cannot guarantee that samples will be returned in an "as new" condition.
- 10.7 Where SATRA receives documents reflecting engagements between the Client and third parties or documents belonging to third parties, such documents shall be considered as being for information only and shall not release the Client from any or all obligations to SATRA.
- 10.8 SATRA reserves the right to make changes to the Services, provided that such changes do not materially affect the nature or quality of the provision of these Services or where they are necessary in order to ensure that any applicable laws or safety requirements are complied with.
- 10.9 The Client acknowledges that SATRA by providing the Services, neither takes the place of the Client or any third party or releases them from any of their obligations.
- 11. CLIENT RESPONSIBILITIES RELATING TO THE PROVISION OF SERVICES**
- 11.1 The Client shall provide sufficient samples, information, instructions and documents as required to enable SATRA to carry out the Services in accordance with the methods, standards or other specifications as agreed.
- 11.2 Where applicable the Client shall allow access by members of SATRA staff to such premises where the Services are to be performed and provide any specialist equipment and personnel.
- 11.3 The Client shall inform SATRA in advance of any known hazards, dangers or other safety matters relating to samples submitted to SATRA or on site visits made by SATRA.
- 11.4 Where the Client fails to comply with any of its responsibilities SATRA reserves the right to suspend any Services until such time as the Client has complied and may require the Client to reimburse SATRA the amount of any additional costs arising from the suspension.
- 12. DELIVERY AND NON-DELIVERY OF GOODS**
- 12.1 Delivery dates for the supply of the Goods are approximate only and not guaranteed. Time of delivery is not of the essence of the Contract and SATRA shall not be liable for any delay in delivery of Goods.
- 12.2 Should expedited delivery be requested and agreed, SATRA shall be entitled to make additional charges to cover overtime or any other additional costs.
- 12.3 Delivery of the Goods shall take place at such location as SATRA and the Client agree. If the Client agrees to collect the Goods from SATRA's premises, then delivery will take place at those premises in which case the consignment of Goods as recorded by SATRA upon dispatch shall be evidence of the Goods received by the Client unless the Client can provide conclusive evidence to the contrary.
- 12.4 SATRA shall not be liable for the non-delivery of Goods (even if caused by SATRA) unless the Client provides written notice of non-delivery in accordance with clause 13.2. Liability for non-delivery of Goods shall in any event be limited to replacing the Goods within a reasonable time frame or the issue of a credit note to the value of the Goods not delivered.
- 12.5 Should delivery of the Goods be suspended or delayed by the Client for any reason SATRA reserves the right to charge for storage and for all expenses incurred, including loss of or wastage of resources that cannot otherwise be used. If the delay extends beyond 30 days SATRA shall be entitled to immediate payment for any Goods that are ready for delivery, and any other additional costs.
- 12.6 If for any reason the Client fails to accept delivery of any of the Goods when they are ready for delivery, or SATRA is unable to deliver the Goods on time because the Client has not provided appropriate instructions, documents, licenses or authorisations then risk in the Goods shall pass to the Client, the Goods and/or Services shall be deemed to have been delivered; and SATRA may store the Goods until delivery, whereupon the Client shall be liable for all related costs and expenses (including, without limitation, storage and insurance).
- 13. RISK/TITLE OF GOODS**
- 13.1 Subject to clause 12.6 the risk in the Goods will transfer to the Client on delivery of the Goods unless SATRA and the Client have agreed that the sale of the Goods will be governed by Incoterms 2010 (or any subsequent revision thereto) in which case risk will transfer to the Client in accordance with the Incoterms mode of transport which is agreed by SATRA and the Client.
- 13.2 The Company shall not accept responsibility for loss or damage in transit unless:
- a) In the case of sales where delivery of Goods is made in the United Kingdom SATRA is notified by the Client within 10 days of the invoice date of non-arrival of Goods and within 3 days of the invoice date of receipt of Goods damaged in transit; or
- b) In all other cases the Client notifies SATRA on the non-arrival or damage in transit within a reasonable period of time as determined by SATRA.
- 13.3 Title to the Goods shall not pass to the Client until the earlier of when: -
- a) SATRA receives payment in full (in cash or cleared funds) for the Goods and any other Goods that SATRA has supplied to the Client in which case title to the Goods shall pass at the time of payment of all such sums; and
- b) the Client resells the Goods in accordance with clause 13.5 in which case title shall pass to the Client immediately before the time at which the resale by the Client occurs.
- 13.4 Until ownership of Goods has passed to the Client, the Client shall:
- a) hold the Goods as SATRA's bailee;
- b) store the Goods (at no cost to SATRA) separately from all other goods belonging to the Client or any third party in such a way that they remain readily identifiable as SATRA's property (including where the Goods have been sold to a 3rd party);
- c) not destroy, deface or obscure any identifying mark or packaging on or relating to the Goods; and
- d) maintain the Goods in satisfactory condition and keep them insured on SATRA's behalf for their full price against all risks to the reasonable satisfaction of SATRA. The Client shall obtain an endorsement of SATRA's interest in the goods on its insurance policy. On request the Client shall allow SATRA to inspect such Goods and shall produce the policy of insurance.
- 13.5 The Client may resell the Goods before ownership has passed to it solely on condition that sale shall be effected in the ordinary course of the Client's business at full market value.
- 13.6 If before title to the Goods passes to the Client, the Client becomes subject to any of the events referred to in clause 2.6 then without limiting any other right or remedy SATRA may have:
- a) the Client's right to resell the Goods or use them in the ordinary course of its business ceases immediately; and
- b) SATRA may at any time require the Client to deliver up all Goods in its possession that have not been resold or irrevocably incorporated into another product; and
- c) if the Client fails to do so promptly SATRA may exercise its rights under clause 13.7.
- 13.7 The Client grants SATRA, its agents and employees an irrevocable licence at any time to enter any premises where the Goods are or may be stored in order to inspect them, or, where the Client's right to possession has terminated, to recover them.
- 13.8 On termination of the Contract, howsoever caused, SATRA's (but not the Client's) rights contained in this clause 13 shall remain in effect.
- 14. PATENTS**
- 14.1 SATRA gives no indemnity against any claim of infringement of Letters Patent, Registered Design, Trade Mark or Copyright by the use of or sale of any article or material supplied to the Client. If its use is impossible without infringement of Letters Patent, Registered Design, Trade Mark or Copyright published at the date of the contract, SATRA will refund to the Client the purchase price of the said article or material provided that it is returned to SATRA free of charge. The Client warrants that any design or instruction furnished or given by the Client shall not be such as will cause SATRA to infringe any Letters Patent, Registered Design, Trade Mark or Copyright in the execution of the Client's order.
- 15. WARRANTY OF GOODS**
- 15.1 SATRA warrants that on delivery and for a period of 12 months from the date of delivery or within the shelf life of the Goods (whichever is the shorter period) the Goods shall be free from defects in design, material and workmanship.
- 16. DEFECTIVE GOODS**
- 16.1 Subject to clauses 16.6 and 16.7 if:
- a) the Client gives notice in writing to SATRA in accordance with clause 16.3 and during the period referred to in clause 15.1 that the Goods do not comply with the warranty in that clause; and
- b) SATRA is given a reasonable opportunity of examining such Goods; and
- c) the Client (if asked to do so by SATRA) returns such Goods to SATRA's place of business then SATRA will, at its option, repair or replace the defective Goods or refund the price of the defective Goods in full. SATRA reserves the right to repair the Goods at the Client's premises.
- 16.2 The Client must inspect all Goods upon delivery. Failure to do so may result in further charges being applied in the event of a return.
- 16.3 If Goods are found to be faulty, defective or damaged the Client must inform SATRA in writing as soon as reasonably possible and in any event within 10 working days of the fault, damage or defect being discovered.
- 16.4 Without prejudice to clause 16.1 if no notice of rejection has been received by SATRA within 3 months of delivery, the Client shall be deemed to have accepted the Goods.
- 16.5 SATRA will pay the reasonable costs of carriage, packaging and insurance for any defective Goods which are returned by the Client provided that SATRA is liable under clause 16.1 to repair or replace the defective Goods. If SATRA determines that the Goods are not defective or if SATRA is not liable to repair or replace the Goods due to the circumstances under clauses 16.6 or 16.7 then the Client will be responsible for the payment of such costs.
- 16.6 SATRA shall not be under any liability to repair or at its option replace or pay for the repair or replacement of any Goods which are found to be defective if:
- a) the defect is caused or substantially caused by wear and tear, overloading, misuse, neglect, modification or attempted modification carried out by any organisation other than by SATRA or their approved agents, or use with ancillary equipment not approved in writing by SATRA, or default in proper maintenance or cleaning; or
- b) the Client authorises or carries out any repair or replacement of any Goods without first affording SATRA a reasonable opportunity to replace or repair them; or
- c) the Client has breached any of the terms of the Contract under which the Goods were supplied; or
- d) the Goods have been manufactured to a design or specification or in compliance with other information provided by the Client and the defect has arisen as a result of that design, specification or information;
- 16.7 Where Goods or parts of Goods are not manufactured by SATRA then SATRA shall be liable for defects only to the extent that SATRA obtains redress from the manufacturer or supplier thereof provided that:
- a) SATRA shall not be obliged to take any step to attempt to obtain such redress except at the request and expense of the Client and upon provision by the Client of a full indemnity as to costs for which SATRA may thereby become liable;
- b) nothing in this condition 16.7 shall have effect as to impose upon SATRA any additional liability or obligations other than those referred to in condition 16.1.
- 16.8 Except as provided in clause 16.1 SATRA shall have no liability to the Client arising from any failure of the Goods to comply with the warranty in clause 15.1.