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For the attention of: Gina Bogota

Technical Report

Subject: ASSESSMENT OF SRL DESCRIBED AS "PCGS30FT" AND "BLOQUE AUTORETRACTIL DE 9M 30FT (CODE 500878)" (variant) IN ACCORDANCE WITH ANSI Z359.14 - 2014
Our ref: SPC0222213/1407/4 Issue 7 Ext 2
Date: 6th April 2018
This is an extension of report reference SPC0222213/1407/4 Issue 7

Report signed by: Daniel Harrison
Position: PPE Technologist
Department: Safety Product Centre

WORK REQUESTED

Samples of self-retracting device, described as "PCGS30FT", were received by SATRA on 24th February 2014, for testing in accordance with ANSI/ ASSE Z359.14 – 2014 Safety Requirements for Self-Retracting Devices for Personal Fall Arrest and Rescue Systems. (Version 2)

Additional samples were received on the 31st March 2017 for testing in accordance with ANSI Z359.14 – 2014 clause 3.1.5 only to verify addition of nickel plating process added to brake pawls would not affect corrosion resistance – see table 2 for results

Testing was initially carried out in accordance with ANSI Z359.14 – 2012 and the clauses shown below in the conclusions section have not changed in ANSI Z359.14 – 2014 to require further testing

This device can be obtained in a range of lengths PCGS25FT – PCGS30FT and variant 500878 25FT – 500878 33FT. The sample length tested was PCGS30FT

All testing was carried out on "PCGS30FT" variant

CONCLUSIONS

SAMPLE REFERENCE	STANDARD	CLAUSE / PROPERTY	SUB CLAUSE / PROPERTY	PASS / FAIL
PCGS30FT 500878	ANSI Z359.14 – 2014	3.1 General Requirements	3.1.1 Integral Connectors	PASS
			3.1.2 Locking Function	PASS
			3.1.3 Energy Absorption	PASS
			3.1.4 Visual Indicator	PASS
			3.1.5 Corrosion Protection	PASS
			3.1.6 Retraction Tension	PASS
			3.1.7 Static Strength (SRL)	PASS
			3.1.8 Dynamic Strength	PASS
			3.1.9 Dynamic Performance	PASS

TESTING

Testing was carried out in accordance with ANSI Z359.14 – 2014 between 3rd & 17th April 2014

The retractable lanyard is a class B device and therefore has a maximum fall arrest distance of 1372mm

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

Figure 1 – Self-retracting device described as “PCGS30FT”

Figure 1a – Self-retracting device described as “BLOQUE AUTORETRACTIL DE 9M 30FT (CODE 500878)”

TEST RESULTS

Table 1 – Testing of Self-retracting device described as "PCGS30FT" in accordance with ANSI Z359.14 – 2014

ANSI Z359.14 – 2014 CLAUSE / TEST	ANSI Z359.14 – 2014 REQUIREMENT	TEST RESULTS	UoM (See note 1)	PASS / FAIL
3.1.1 Integral Connectors	Snap hooks or carabineers which are integral to self retracting devices shall meet the requirements of ANSI Z359.12	Connector is marked as compliant with ANSI Z359.12	N/A	PASS
	Integral rings or similar openings intended to accept a snap hook or carabineer shall be designed to minimize the possibility of rollout	Possibility of rollout minimised		PASS
3.1.2 Locking Function	Self-retracting devices shall be automatic in their locking function	SRL automatically locks in the event of a fall	N/A	PASS
	It shall not be possible to override the self-locking feature of the device when in use	Self-locking mechanism cannot be overridden		PASS
	The design of the device shall prevent the possibility of performance being impaired by casual interference	Casual interference would not impair the performance of the device		PASS
3.1.3 Energy Absorption	Self-retracting devices which have an energy absorption function shall be designed so that it works across the whole range of the device	Energy absorption is provided across the whole range of the device	N/A	PASS
3.1.4 Visual Indicator	Self-retracting devices shall have a visual indicator that will activate in accordance with the requirements of section 3.1.9	Visual indicator is included Indicator deployed successfully following each dynamic performance test	N/A	PASS

<table>
<tr><th>ANSI Z359.14 – 2014
CLAUSE / TEST</th><th>ANSI Z359.14 – 2014
REQUIREMENT</th><th>TEST RESULTS</th><th>UoM
(See note 1)</th><th>PASS / FAIL</th></tr>
<tr><td rowspan="2">3.1.5 Corrosion Protection</td><td rowspan="2">Protection, at a minimum, shall allow the device to operate as intended and show no signs of corrosion which, left unchecked, could result in a corrosion related failure of the device after being salt spray tested for 96 hours. Following the salt spray test the device shall pay out the line, retract and lock</td><td>Corrosion test in accordance with ASTM B 117-07a– 96 hours Neutral Salt Spray

Temperature: 35 °C
Fall out rate: 1.0 ml/hr
pH of test solution: 7.2
Specific gravity of test solution: 1.032

Sample 1

White & black scaling on connector and wire termination only. No other visual evidence of any corrosion present

Retraction tension following corrosion test
<table>
<tr><th>Length of line (m)</th><th>Force (N)</th></tr>
<tr><td>0.305</td><td>12.5</td></tr>
<tr><td>1.79</td><td>15.5</td></tr>
<tr><td>3.58</td><td>16.0</td></tr>
<tr><td>5.36</td><td>16.5</td></tr>
<tr><td>7.15</td><td>15.5</td></tr>
<tr><td>8.94</td><td>21.5</td></tr>
</table></td><td rowspan="2">±2.0%</td><td>PASS</td></tr>
<tr><td>Sample 2

White & black scaling on connector and wire termination only. No other visual evidence of any corrosion present

Retraction tension following corrosion test
<table>
<tr><th>Length of line (m)</th><th>Force (N)</th></tr>
<tr><td>0.305</td><td>13.5</td></tr>
<tr><td>1.79</td><td>21.0</td></tr>
<tr><td>3.58</td><td>11.5</td></tr>
<tr><td>5.36</td><td>18.5</td></tr>
<tr><td>7.15</td><td>48.5</td></tr>
<tr><td>8.94</td><td>21.0</td></tr>
</table></td><td>PASS</td></tr>
</table>

<table>
<tr><th>ANSI Z359.14 – 2014
CLAUSE / TEST</th><th>ANSI Z359.14 – 2014
REQUIREMENT</th><th>TEST RESULTS</th><th>UoM
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<tr><td>3.1.5 Corrosion Protection</td><td>Protection, at a minimum, shall allow the device to operate as intended and show no signs of corrosion which, left unchecked, could result in a corrosion related failure of the device after being salt spray tested for 96 hours. Following the salt spray test the device shall pay out the line, retract and lock</td><td>Sample 3

White & black scaling on connector and wire termination only. No other visual evidence of any corrosion present

Retraction tension following corrosion test
<table>
<tr><th>Length of line (m)</th><th>Force (N)</th></tr>
<tr><td>0.305</td><td>15.0</td></tr>
<tr><td>1.79</td><td>16.5</td></tr>
<tr><td>3.58</td><td>18.0</td></tr>
<tr><td>5.36</td><td>20.0</td></tr>
<tr><td>7.15</td><td>13.5</td></tr>
<tr><td>8.94</td><td>20.0</td></tr>
</table></td><td>±2.0%</td><td>PASS</td></tr>
</table>

<table>
<tr><th>ANSI Z359.14 – 2014
CLAUSE / TEST</th><th>ANSI Z359.14 – 2014
REQUIREMENT</th><th>TEST RESULTS</th><th>UoM
(See note 1)</th><th>PASS / FAIL</th></tr>
<tr><td>3.1.6 Retraction Tension</td><td>Retraction tension of the self-retracting device line, shall not be less than 1.25 pounds (5.55N) or more than 25 Pounds (111.1N) at any point in the range of motion provided by the line constituent

SRL-LE’s shall retract without stopping when tested in a horizontal orientation

For SRL’s and SRL-R’s, no more than 24 inches (610mm) of the line can remain extended when the device is fully retracted.

For SRL-LE’s, no more than 60 inches (1.5m) of the line can remain extended when the device is fully retracted</td><td>Sample 1

<table>
<tr><th>Length of line (m)</th><th>Force (N)</th></tr>
<tr><td>0.305</td><td>9.5</td></tr>
<tr><td>1.79</td><td>14.0</td></tr>
<tr><td>3.58</td><td>15.0</td></tr>
<tr><td>5.36</td><td>17.5</td></tr>
<tr><td>7.15</td><td>22.0</td></tr>
<tr><td>8.94</td><td>20.0</td></tr>
</table>

310mm lanyard length permanently extracted from device

Sample 2

<table>
<tr><th>Length of line (m)</th><th>Force (N)</th></tr>
<tr><td>0.305</td><td>12.0</td></tr>
<tr><td>1.79</td><td>20.0</td></tr>
<tr><td>3.58</td><td>19.5</td></tr>
<tr><td>5.36</td><td>20.5</td></tr>
<tr><td>7.15</td><td>19.0</td></tr>
<tr><td>8.94</td><td>22.0</td></tr>
</table>

310mm lanyard length permanently extracted from device

Sample 3

<table>
<tr><th>Length of line (m)</th><th>Force (N)</th></tr>
<tr><td>0.305</td><td>10.0</td></tr>
<tr><td>1.79</td><td>17.5</td></tr>
<tr><td>3.58</td><td>16.5</td></tr>
<tr><td>5.36</td><td>20.0</td></tr>
<tr><td>7.15</td><td>15.5</td></tr>
<tr><td>8.94</td><td>22.0</td></tr>
</table>

310mm lanyard length permanently extracted from device</td><td>±0.43%</td><td>PASS</td></tr>
</table>

ANSI Z359.14 – 2014 CLAUSE / TEST	ANSI Z359.14 – 2014 REQUIREMENT	TEST RESULTS	UoM (See note 1)	PASS / FAIL
3.1.7 Static Strength	Self-retracting devices shall withstand a tensile load of 3,000 pounds (13.3kN) statically applied	Sample 1 13.3kN sustained for 1 minute without failure	± 0.37% See note 2	PASS
		Sample 2 13.3kN sustained for 1 minute without failure		
		Sample 3 13.3kN sustained for 1 minute without failure		
3.1.8 Dynamic Strength	SRL's & SRL-LE's shall lock, remain locked until released and the test weight shall not strike the ground For SRL's and SRL-R's, the line shall retain a minimum of 1,000 pounds(4.4kN) of residual tensile strength after the dynamic test	Sample 1 136kg test mass held Additional information only Arrest distance: 2.37m Residual strength: 4.4kN sustained following dynamic strength test without failure	± 4.0% See note 2	PASS
		Sample 2 136kg test mass held Additional information only Arrest distance: 2.38m Residual strength: 4.4kN sustained following dynamic strength test without failure		
		Sample 3 136kg test mass held Additional information only Arrest distance: 2.59m Residual strength: 4.4kN sustained following dynamic strength test without failure		

ANSI Z359.14 – 2014 CLAUSE / TEST	ANSI Z359.14 – 2014 REQUIREMENT	TEST RESULTS	UoM (See note 1)	PASS / FAIL
3.1.9 Dynamic Performance	SRL's & SRL-LE's shall not exceed an arrest distance of 54 inches (1,372mm) and the average arresting force shall not exceed 900 pounds (4kN) or a maximum peak of 1,800 pounds (8kN) for class B devices The locking function must operate and the device must pay out and retract the line after every dynamic performance test	Sample 1 128kg test mass held Peak arrest force:4.9kN (see figure 2) Arrest distance: 0.68m Average arrest force: 3.36kN Device still able to retract and pay out in accordance with 3.1.6 Visual indicator deployed	Force ±0.37% Height ±0.22%	PASS
		Sample 2 128kg test mass held Peak arrest force: 3.9kN (see figure 3) Arrest distance: 0.96m Average arrest force: 2.73kN Device still able to retract and pay out in accordance with 3.1.6 Visual indicator deployed		
		Sample 3 128kg test mass held Peak arrest force: 4.2kN (see figure 4) Arrest distance: 0.92m Average arrest force: 3.17kN Device still able to retract and pay out in accordance with 3.1.6 Visual indicator deployed		

ANSI Z359.14 – 2014 CLAUSE / TEST	ANSI Z359.14 – 2014 REQUIREMENT	TEST RESULTS	UoM (See note 1)	PASS / FAIL
3.1.9 Dynamic Performance (continued)	The visual indicator shall activate when dynamic performance is tested and give clear evidence that the device has been impact loaded The dynamic performance requirements shall also be met after conditioning to heat, cold & wet, where the average arresting force shall not exceed 1,125 pounds (5kN) or a maximum peak of 1,800 pounds (8kN) for Class B devices	Sample 1 Wet conditioning: sample sprayed with 70 litres/hour of water for 3 hours. Test carried out within 90 seconds of removal 128kg test mass held Device still able to retract and pay out in accordance with 3.1.6 Visual indicator deployed Peak arrest force: 3.7kN (See figure 5) Average arrest force: 2.65kN Arrest distance: 0.69m	Force ±0.37% Height ±0.22%	PASS
		Sample 2 Wet conditioning: sample sprayed with 70 litres/hour of water for 3 hours. Test carried out within 90 seconds of removal 128kg test mass held Device still able to retract and pay out in accordance with 3.1.6 Visual indicator deployed Peak arrest force: 3.5kN (See figure 6) Average arrest force: 2.51kN Arrest distance: 0.67m		
		Sample 3 Wet conditioning: sample sprayed with 70 litres/hour of water for 3 hours. Test carried out within 90 seconds of removal 128kg test mass held Device still able to retract and pay out in accordance with 3.1.6 Visual indicator deployed Peak arrest force: 3.6kN (See figure 7) Average arrest force: 2.43kN Arrest distance: 1.20m		

ANSI Z359.14 – 2014 CLAUSE / TEST	ANSI Z359.14 – 2014 REQUIREMENT	TEST RESULTS	UoM (See note 1)	PASS / FAIL
3.1.9 Dynamic Performance (continued)	The visual indicator shall activate when dynamic performance is tested and give clear evidence that the device has been impact loaded The dynamic performance requirements shall also be met after conditioning to heat, cold & wet, where the average arresting force shall not exceed 1,125 pounds (5kN) or a maximum peak of 1,800 pounds (8kN) for Class B devices	Sample 1 Cold conditioning: sample placed in a freezer at -40°C for 2 hours. Test carried out within 90 seconds of removal 128kg test mass held Device still able to retract and pay out in accordance with 3.1.6 Visual indicator deployed Peak arrest force: 4.4kN (See figure 8) Average arrest force: 2.93kN Arrest distance: 0.72m	Force ±0.37% Height ±0.22%	PASS
		Sample 2 Cold conditioning: sample placed in a freezer at -40°C for 2 hours. Test carried out within 90 seconds of removal 128kg test mass held Device still able to retract and pay out in accordance with 3.1.6 Visual indicator deployed Peak arrest force: 4.7kN (See figure 9) Average arrest force: 3.23kN Arrest distance: 0.46m		
		Sample 3 Cold conditioning: sample placed in a freezer at -40°C for 2 hours. Test carried out within 90 seconds of removal 128kg test mass held Device still able to retract and pay out in accordance with 3.1.6 Visual indicator deployed Peak arrest force: 5.9kN (See figure 10) Average arrest force: 3.45kN Arrest distance: 0.70m		

ANSI Z359.14 – 2014 CLAUSE / TEST	ANSI Z359.14 – 2014 REQUIREMENT	TEST RESULTS	UoM (See note 1)	PASS / FAIL
3.1.9 Dynamic Performance (continued)	The visual indicator shall activate when dynamic performance is tested and give clear evidence that the device has been impact loaded The dynamic performance requirements shall also be met after conditioning to heat, cold & wet, where the average arresting force shall not exceed 1,125 pounds (5kN) or a maximum peak of 1,800 pounds (8kN) for Class B devices	Sample 1 Heat conditioning: sample placed in a heated chamber at 54°C & 85% relative humidity for 2 hours. Test carried out within 90 seconds of removal 128kg test mass held Device still able to retract and pay out in accordance with 3.1.6 Visual indicator deployed Peak arrest force: 4.0kN (See figure 11) Average arrest force: 2.42kN Arrest distance: 0.99m	Force ±0.37% Height ±0.22%	PASS
		Sample 2 Heat conditioning: sample placed in a heated chamber at 54°C & 85% relative humidity for 2 hours. Test carried out within 90 seconds of removal 128kg test mass held Device still able to retract and pay out in accordance with 3.1.6 Visual indicator deployed Peak arrest force: 3.3kN (See figure 12) Average arrest force: 2.42kN Arrest distance: 1.30m		
		Sample 3 Heat conditioning: sample placed in a heated chamber at 54°C & 85% relative humidity for 2 hours. Test carried out within 90 seconds of removal 128kg test mass held Device still able to retract and pay out in accordance with 3.1.6 Visual indicator deployed Peak arrest force: 3.8kN (See figure 13) Average arrest force: 2.52kN Arrest distance: 0.94m		

Table 2 – Testing of Self-retracting device described as "PCGS30FT" with new nickel plated brake pawls in accordance with ANSI Z359.14 – 2014 clause 3.1.5

<table>
<tr><th>ANSI Z359.14 – 2014
CLAUSE / TEST</th><th>ANSI Z359.14 – 2014
REQUIREMENT</th><th>TEST RESULTS</th><th>UoM
(See note 1)</th><th>PASS / FAIL</th></tr>
<tr><td rowspan="2">3.1.5 Corrosion Protection</td><td rowspan="2">Protection, at a minimum, shall allow the device to operate as intended and show no signs of corrosion which, left unchecked, could result in a corrosion related failure of the device after being salt spray tested for 96 hours. Following the salt spray test the device shall pay out the line, retract and lock</td><td>Corrosion test in accordance with ASTM B 117-07a– 96 hours Neutral Salt Spray

Temperature: 35 °C
Fall out rate: 1.1 ml/hr
pH of test solution: 6.4
Specific gravity of test solution: 1.030</td><td rowspan="2">±2.0%</td><td rowspan="2">PASS</td></tr>
<tr><td>Sample 1

Moderate scaling present on connector, eyebolt and cable. Small amount of rust present on case screws. No other visual evidence of any corrosion present

Retraction tension following corrosion test
<table>
<tr><th>Length of line (m)</th><th>Force (N)</th></tr>
<tr><td>0.305</td><td>24.55</td></tr>
<tr><td>1.83</td><td>16.60</td></tr>
<tr><td>3.66</td><td>21.10</td></tr>
<tr><td>5.49</td><td>24.55</td></tr>
<tr><td>7.32</td><td>16.90</td></tr>
<tr><td>9.14</td><td>10.25</td></tr>
</table>
See note 3</td></tr>
</table>

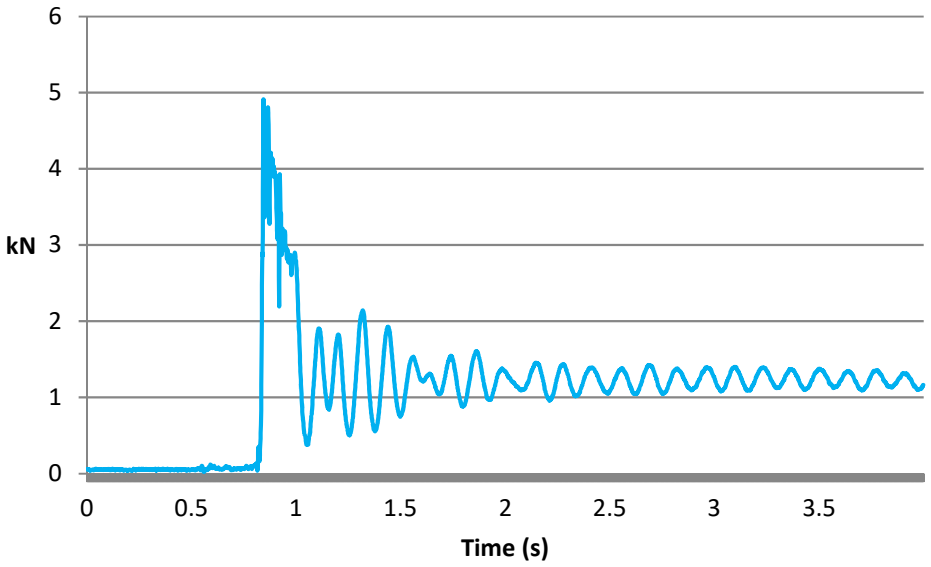

Figure 2 – Dynamic performance test: Graph of force vs. time

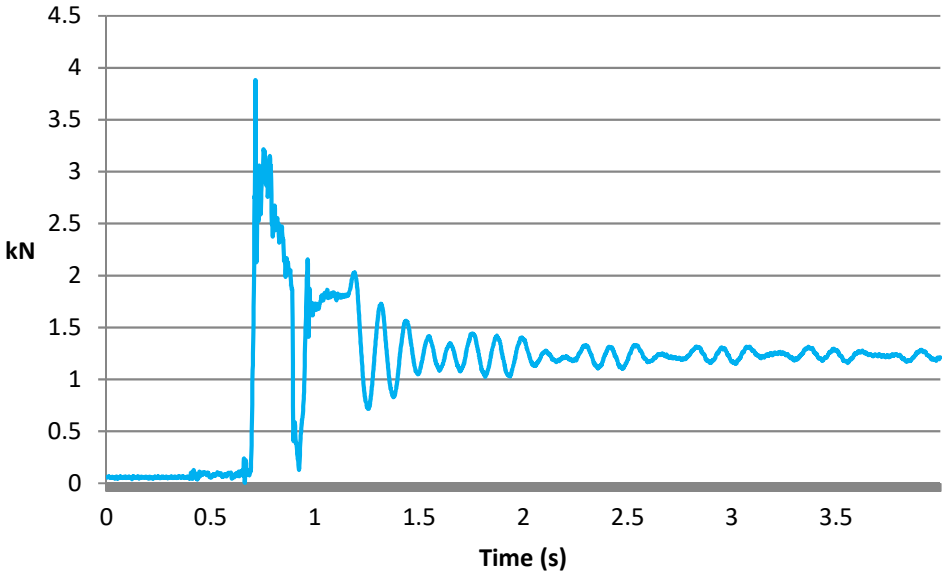

Figure 3 – Dynamic performance test: Graph of force vs. time

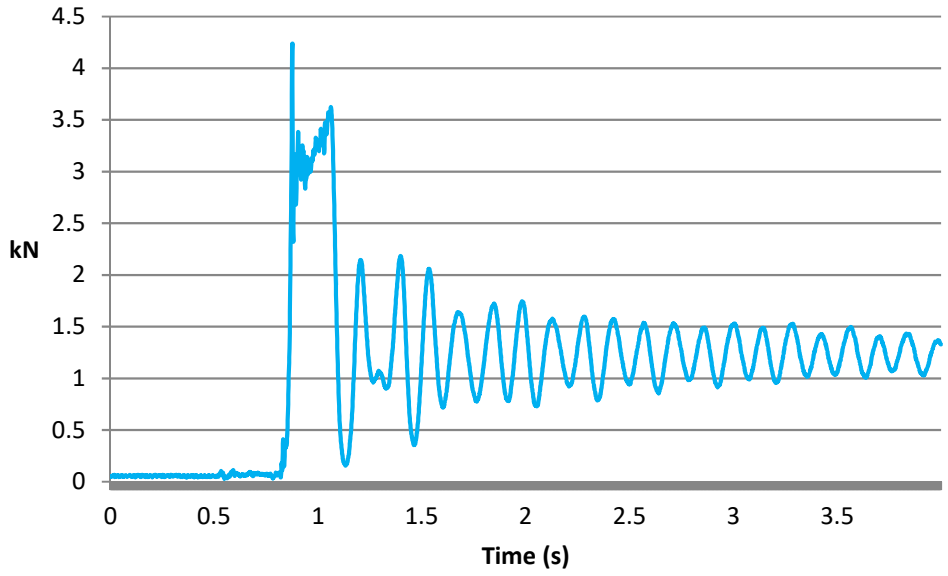

Figure 4 – Dynamic performance test: Graph of force vs. time

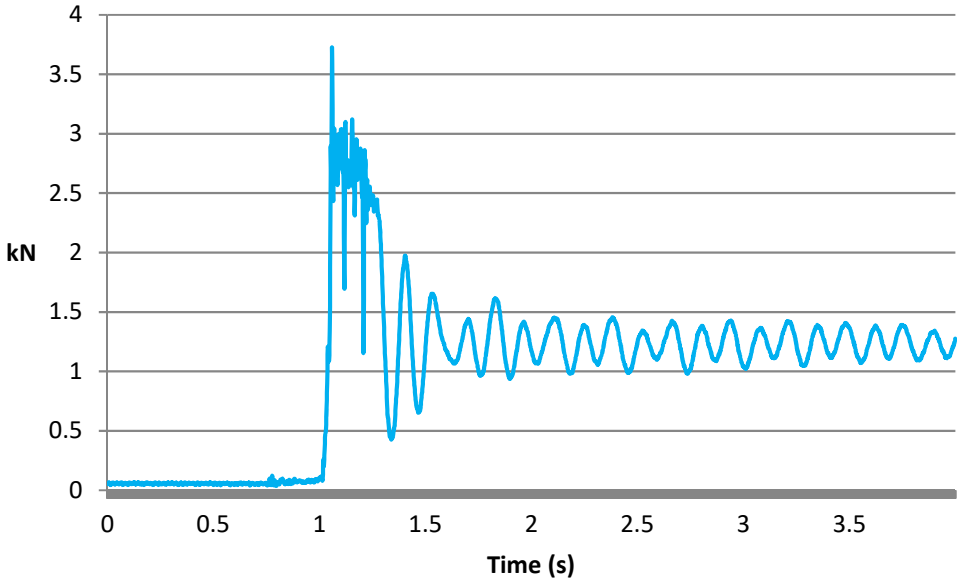

Figure 5 – Dynamic performance test: Graph of force vs. time

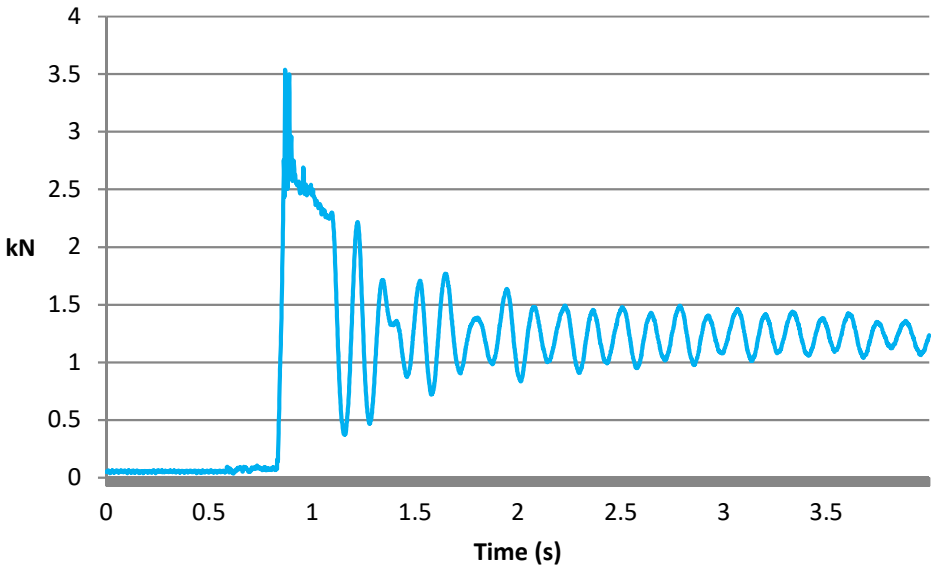

Figure 6 – Dynamic performance test: Graph of force vs. time

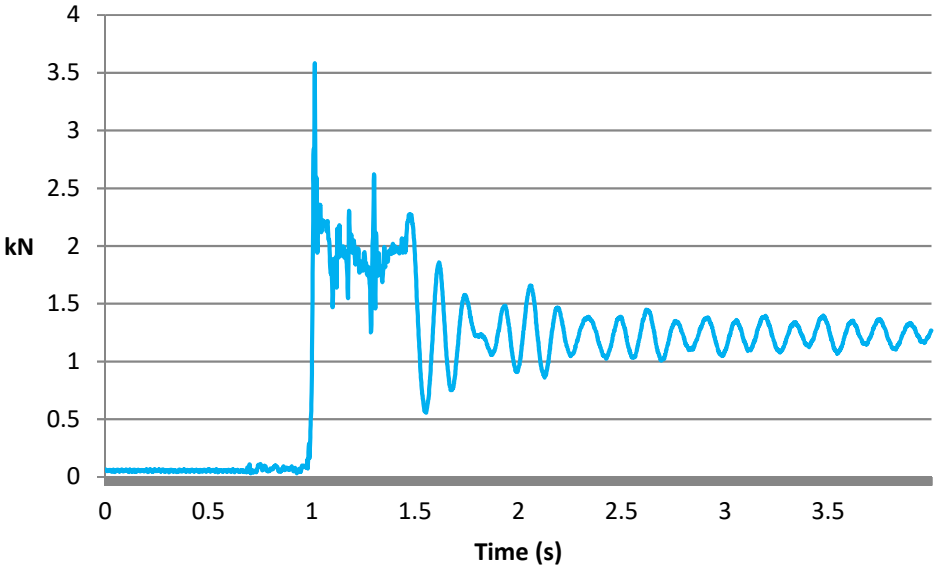

Figure 7 – Dynamic performance test: Graph of force vs. time

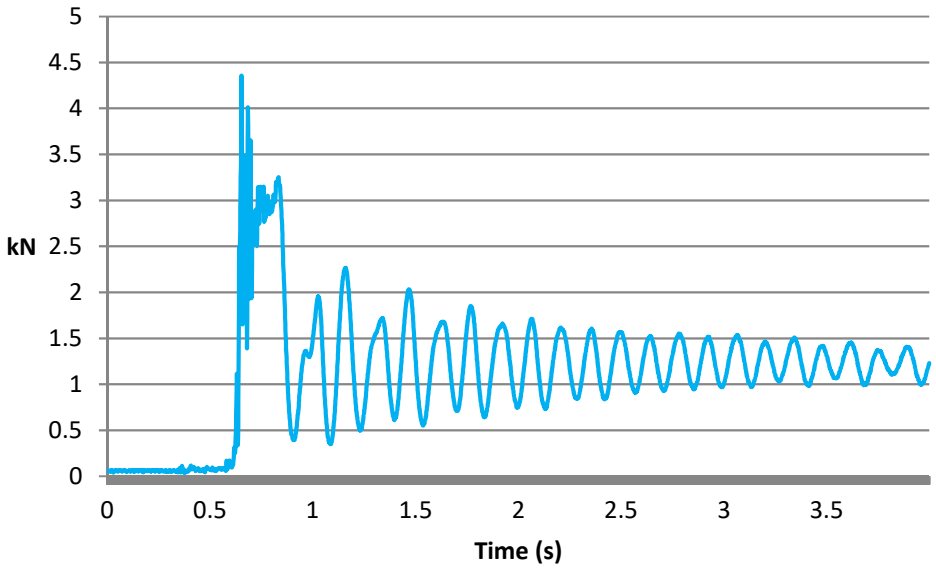

Figure 8 – Dynamic performance test: Graph of force vs. time

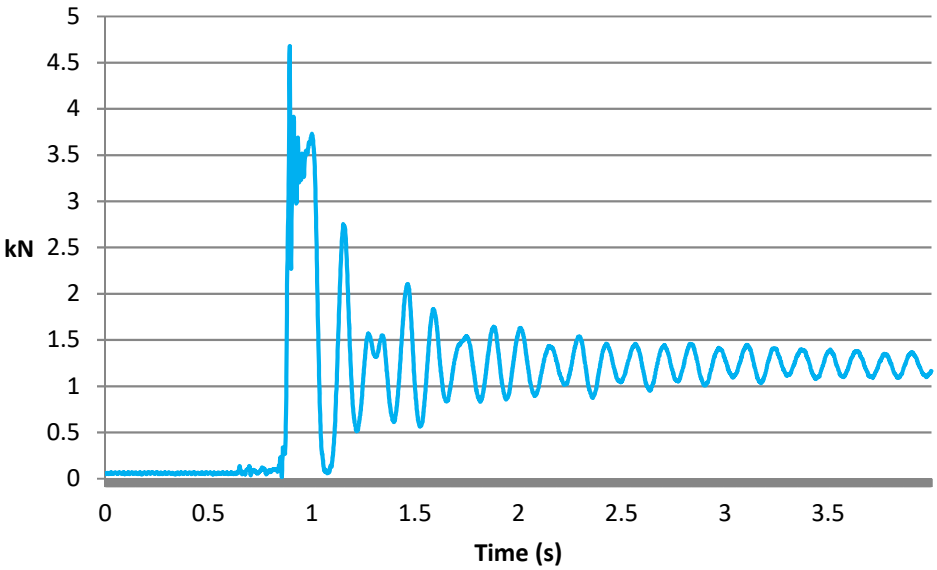

Figure 9 – Dynamic performance test: Graph of force vs. time

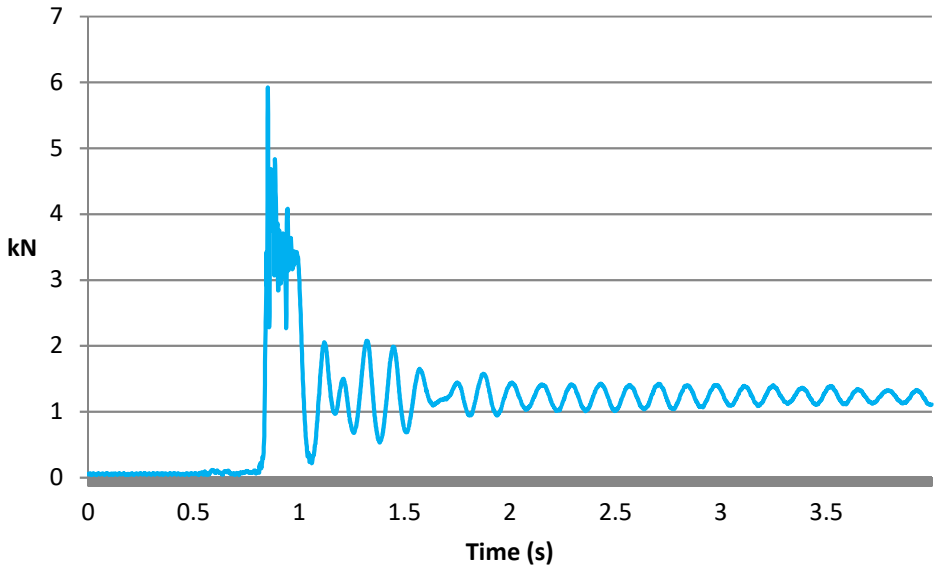

Figure 10 – Dynamic performance test: Graph of force vs. time

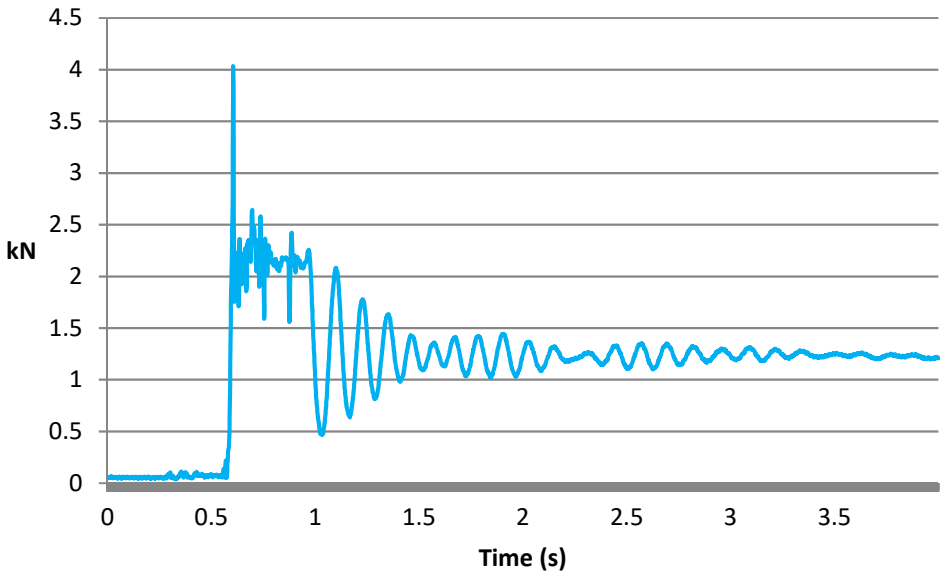

Figure 11 – Dynamic performance test: Graph of force vs. time

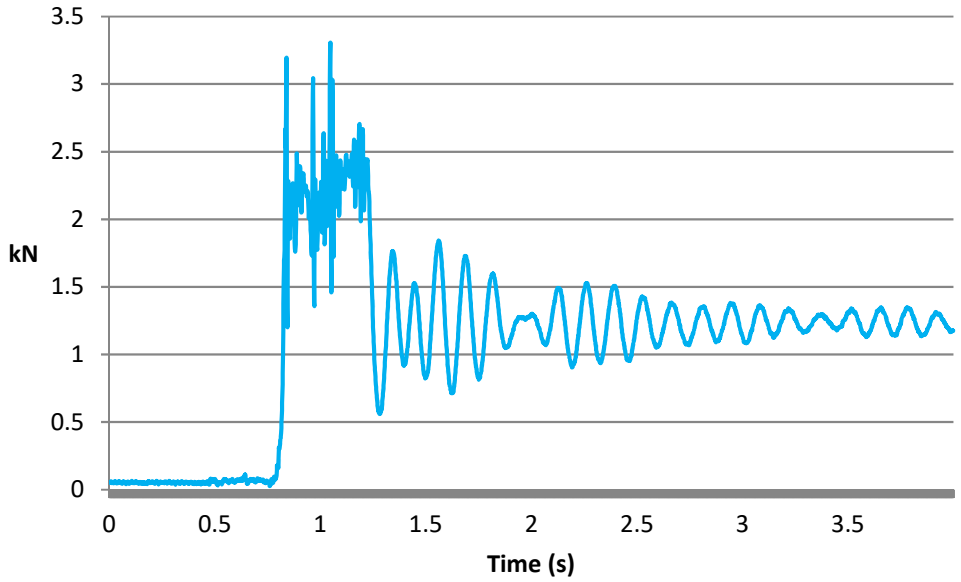

Figure 12 – Dynamic performance test: Graph of force vs. time

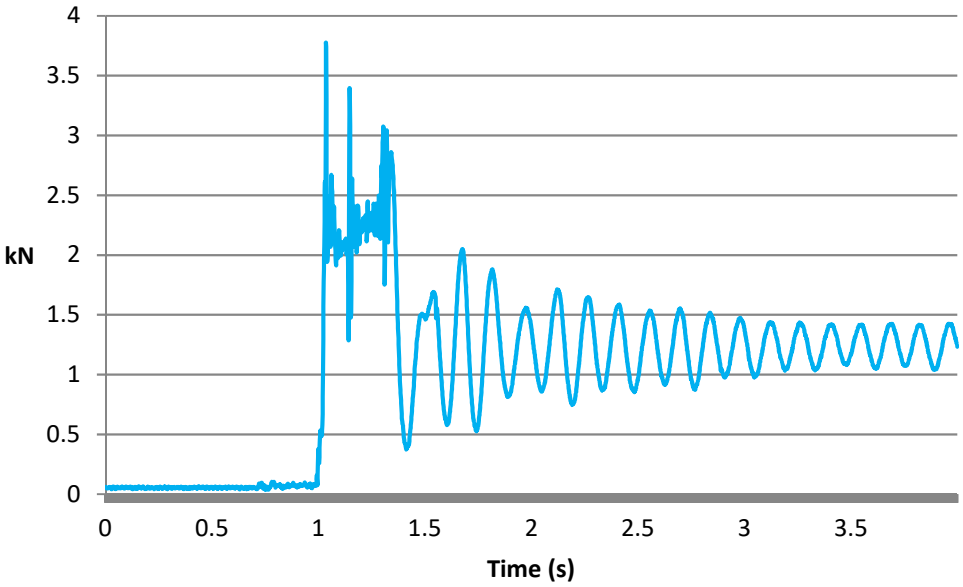

Figure 13 – Dynamic performance test: Graph of force vs. time

ADDITIONAL INFORMATION / NOTES

Note 1 – 'UoM' denotes estimated Uncertainty of Measurement for stated test results. This uncertainty value is based on a standard uncertainty multiplied by a coverage factor k = 2, which provides for a confidence level of approximately 95%

Note 2 – 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

Note 3 – Testing carried out under job reference SPC0256038/1714

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TERMS AND CONDITIONS OF BUSINESS

1. GENERAL
Work done or services undertaken are subject to the terms and conditions detailed below and all other conditions, warranties and representations, expressed or implied are hereby excluded.

2. PRICES
Prices are based on current material and production costs, exchange rates, duty and freight and are subject to change without notice.

3. DELIVERY ESTIMATES
Delivery estimates are made in good faith and date from receipt of a written order and full information to enable us to proceed. While SATRA or its subsidiaries (hereafter referred to as "SATRA") make every effort to fulfil them, such estimates are subject to unforeseen events and if not maintained, cannot give rise to any claim. Offers "ex stock" are subject to prior sale.

4. CANCELLATION AND RETURNS
Cancellation of orders for goods, services, training or consultancy is only acceptable by prior agreement of SATRA and a charge will normally be made.

5. CLAIMS
Claims for errors, shortages etc should be notified within 10 days of date of receipt. In the event of goods damaged in transit, packing materials should be retained for examination; otherwise no liability can be accepted.

6. PAYMENT TERMS
Payment terms are net 21 days from date of invoice. Failure to comply with the terms of payment may result in delayed delivery of goods and services and a review of the Customer's credit account. Should the customer become subject to an administration order, or becomes bankrupt or goes into liquidation, SATRA has a right to cancel any contract and discontinue any work. SATRA reserves the right to adjust US Dollar and Euro sales price where customer exceeds credit terms and where the exchange rate has moved more than 10% since invoicing.

7. RETENTION OF TITLE
All goods remain the property of SATRA until paid in full. Under no circumstances will a customer's purchase order override SATRA's Retention of Title clause. In the case of software, the ownership of the software remains with SATRA. Payment of invoices in full will entitle the customer to use the software under licence until (a) they cease to be a member of SATRA or (b) they cease trading. In both instances, the licence shall then revert to SATRA.

8. GUARANTEE
All goods manufactured by SATRA are guaranteed both as regards material and workmanship. Any part returned carriage paid, within twelve months from date of supply and found defective, will be repaired or replaced at SATRA's option free of charge. SATRA admits no liability for loss, damage or delay consequent on any defect in any goods supplied by SATRA.

9. TEST REPORTS
Results given in test reports refer only to samples submitted for analysis and tested by 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. SATRA shall not be liable for any subsequent loss or damage incurred by the Customer as a result of information supplied in a test report.

10. TEST SAMPLES
Unless otherwise agreed in advance, test samples will be disposed of 6 weeks after the date of the final report. If required, samples can be returned at the Customer's expense.

11. RESPONSIBILITY
Every effort is made to ensure accuracy in description, drawings and other information in correspondence, catalogues, etc but no warranty is given in this respect and SATRA shall not be liable for any error therein. SATRA carries out all tests and/or advises only on the basis that the same are carried out, made or given without any responsibility whether for negligence or otherwise. SATRA and its servants or agents will not be liable for any damage or loss direct or indirect of whatsoever kind, whether or not the same results directly or indirectly from negligence on the part of SATRA or its servants or agents.

12. CONFIDENTIALITY
Unless specifically excluded in the terms of an individual contract between SATRA and its Customer, the following shall apply to all reports, advice, drawings, photographs, specifications or data:
   i. The above shall not be disclosed to third parties or used in litigation without the consent of SATRA.
   ii. Where SATRA has given consent to disclosure, the Customer shall draw the attention of the third party to these terms of business and the basis on which SATRA undertakes test, reporting and advising. The Customer shall indemnify SATRA for any failure to do so.
   iii. The above items are submitted to the Customer as confidential documents. Confidentiality shall continue to apply after completion of the business, but shall cease to apply to information or knowledge which may come into the public domain.

13. CONSTRUCTION AND ARBITRATION
The laws of England shall govern all contracts and the parties submit to exclusive jurisdiction of the courts of England, unless otherwise agreed.