

**EVALUATION OF ITEMS:
SMALL & LARGE CLAMPS
SMALL & LARGE PRESS BLOCKS
WRIST & HARNESS LANYARDS**

Prepared for:

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Technical Report Number

2664034.1

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Program Description

Evaluation, as per Client's request outlined below:

- Three samples of each of 4 sizes of Tool Clamps / Press Blocks were pre-conditioned at -40 °C for a period of no less than 24 hours prior to being subjected a continuous pull force test immediately after being removed from the freezer.
- Three samples of each of 2 sizes of Lanyards were pre-conditioned at -40 °C for a period of no less than 24 hours prior to being subjected a continuous pull force test immediately after being removed from the freezer.

Executive Summary

The test results for each of the 6 test sample types and sizes are shown elsewhere in this report.

Prepared by:

J.T.

Approved by:



**Eli Szamosi, Senior Manager,
New Business Development**

Confidential

Table of Contents





Samples Received	4
Load Testing – Tool Clamps.....	7
Load Testing - Lanyards	8
Test Results – Tool Clamps	9
Graphs – Sample “A1”.....	10
Graphs – Sample “A2”	11
Test Results – Tool Clamps	13
Graphs – Sample “B1”	14
Graphs – Sample “B2”	15
Graphs – Sample “C3”	16
Test Results – Press Blocks	17
Graphs – Sample “C1”	18
Graphs – Sample “C2”	19
Graphs – Sample “C3”	20
Test Results – Press Block.....	21
Graphs – Sample “D1”	22
Graphs – Sample “D2”	23
Graphs – Sample “D3”	24







Test Results – Lanyards	25
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Test Results – Lanyards	26
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Samples Received

<i>Illustration only</i>	Identified as Type “A” for purpose of this report
 <p>Clamp - Small has an opening of 0.94” x 0.33”</p>	
<i>Illustration only</i>	Identified as Type “B” for purpose of this report
 <p>Clamp - Large has an opening of 1.31” x 0.59”</p>	

<i>Illustration only</i>	Identified as Type “C” for purpose of this report
 <p>Press Block - Small fits diameters of 1/2” to 3/4”</p>	

<i>Illustration only</i>	Identified as Type “D” for purpose of this report
 <p>Press Block - Large fits diameters of 1-1/16” to 1-1/4”</p>	

<i>Illustration only</i>	Identified as Type “E” for purpose of this report
	

<i>Illustration only</i>	Identified as Type “F” for purpose of this report
	

NOTE: The Lanyards were tested as one complete assembly including carabiner, bungee and buckle. The carabiner and buckle were NOT tested separately and therefore no claims are made nor implied as to their breaking strength / ability to support loads equal to or greater than the lowest test failure point as indicated in this report.

IMPORTANT NOTE: It is suggested to state “WARNING: NOT TO BE USED IN CLIMBING OR RESCUE APPLICATIONS” or similar wording on the Lanyard products.

Load Testing – Tool Clamps

Test Protocol:

- Three samples of each of 4 sizes of Tool Clamps were pre-conditioned at -40 °C for a period of no less than 24 hours prior to being subjected a continuous pull force test immediately after being removed from the freezer.

Typical Sample Configuration:



Shown by type; bottom to top of photograph:

Type “A”: Small Clamp

Type “B”: Large Clamp

Type “C”: Small Press Block

Type “D”: Large Press Block

Load Testing - Lanyards

Test Protocol:

- Three samples of each of 2 sizes of Lanyards were pre-conditioned at -40 °C for a period of no less than 24 hours prior to being subjected a continuous pull force test immediately after being removed from the freezer.

Typical Sample Test Configuration:



Shown: Type “E” Wrist Type of Lanyard prior to being tested

NOTE: The Lanyards were tested as one complete assembly including carabiner, bungee and buckle. The carabiner and buckle were NOT tested separately and therefore no claims are made nor implied as to their breaking strength / ability to support loads equal to or greater than the lowest test failure point as indicated in this report.

IMPORTANT NOTE: It is suggested to state “WARNING: NOT TO BE USED IN CLIMBING OR RESCUE APPLICATIONS” or similar wording on the Lanyard products.







Test Results – Tool Clamps

NOTE: Each of the samples was uniquely identified as shown below.

PRODUCT:

Type “A” – Small Clamp

Temperature: -40°C

Small Clamp (A1)	Small Clamp (A2)	Small Clamp (A3)
Result: Eyelet failed. Maximum pull force: 140 LBS.	Result: Eyelet failed. Maximum pull force: 147 LBS.	Result: Eyelet failed. Maximum pull force: 144 LBS.
Test Setup 	Test Setup 	Test Setup 
Test Result 	Test Result 	Test Result 

Graphs – Sample “A1”



Universal Test Peak Force Imperial

Specimen ID A1-40

Test Number 400

Report Number 385

Test Date 10/04/2013 10:31:36 AM

Test Results	
Tension (lbf)	140

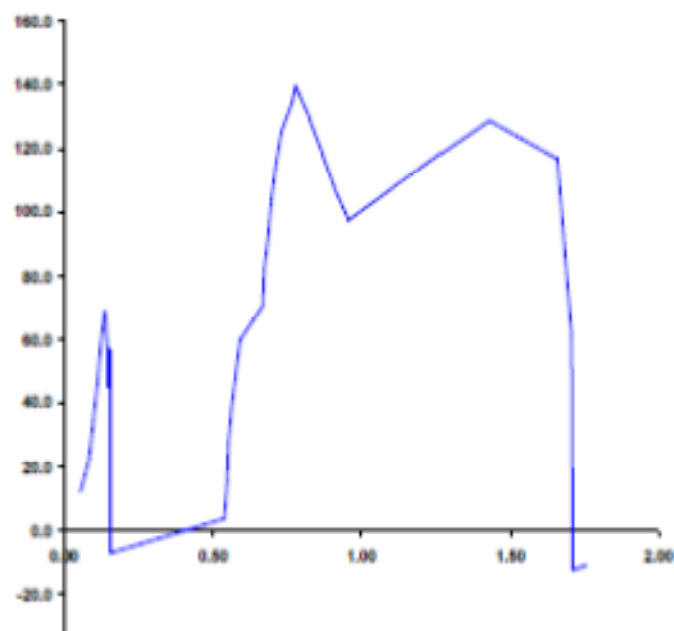
Testing Machine SFM-150KN 0313817
Load Cell SN (QS353), Units (Lbs) 130000
Crosshead Speed (Inches / min) or Rate 0.2
Extension or Position Measured by EZ-1-2 (4025)

By : _____ Date : _____

Customer Name Vendor	Purchase Order	Operator
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Template No 200	04-Oct-13
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Force (Lbs) vs Position (Inches)



Graphs – Sample “A2”



Universal Test Peak Force Imperial

Specimen ID A2-40

Test Number 399

Report Number 384

Test Date 10/04/2013 10:15:24 AM

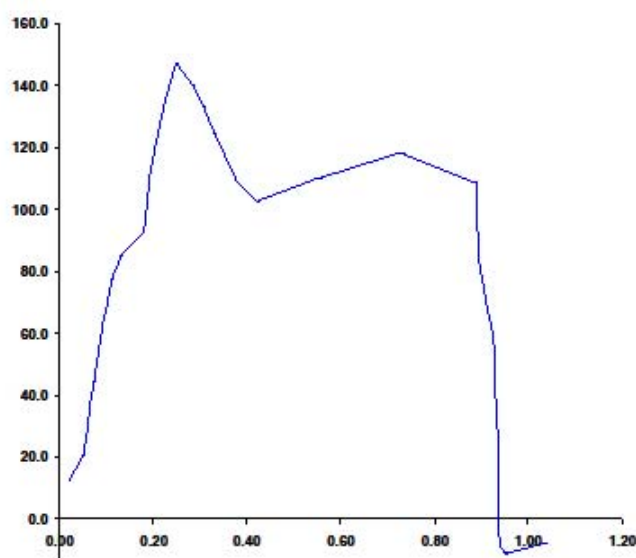
Test Results	
Tension (lbf)	147

Testing Machine SFM-150KN 0313517	
Load Cell S/N (Q5353), Units (Lbs)	130000
Crosshead Speed (Inches / min) or Rate	0.2
Extension or Position Measured by	EZ 1-2 (4026)

By : _____ Date : _____

Customer Name Vendor	Purchase Order	Operator
Template No 200	04-Oct-13	

Force (Lbs) vs Position (Inches)



Graphs – Sample “A3”



Universal Test Peak Force Imperial

Specimen ID A3 -40

Test Number 401

Report Number 386

Test Date 10/04/2013 10:45:54 AM

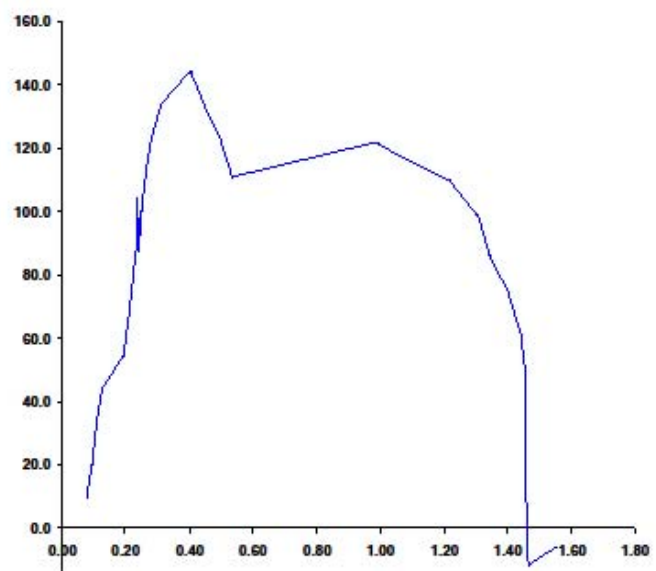
Test Results	
Tension (lbf)	144

Testing Machine SFM-150KN 0313517	
Load Cell S/N (QS353), Units (Lbs)	130000
Crosshead Speed (Inches / min) or Rate	0.2
Extension or Position Measured by	EZ 1-2 (4026)

By : _____ Date : _____

Customer Name Vendor	Purchase Order	Operator
Template No 200	04-Oct-13	

Force (Lbs) vs Position (Inches)







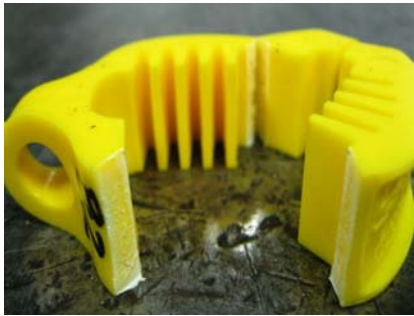
Test Results – Tool Clamps

NOTE: Each of the samples was uniquely identified as shown below.

PRODUCT:

Type “B” – Large Clamp

Temperature: -40°C

Large Clamp (B1)	Large Clamp (B2)	Large Clamp (B3)
Result: Eyelet failed. Maximum pull force: 160 LBS.	Result: Clamp failed. Maximum pull force: 122 LBS.	Result: Eyelet failed. Maximum pull force: 150 LBS.
Test Setup 	Test Setup 	Test Setup 
Test Result 	Test Result 	Test Result <p><i>PHOTOGRAPH IS NOT AVAILABLE</i></p>

Graphs – Sample “B1”



Universal Test Peak Force Imperial

Specimen ID B1 -40

Test Number 403

Report Number 388

Test Date 10/04/2013 11:37:08 AM

Test Results	
Tension (lbf)	160

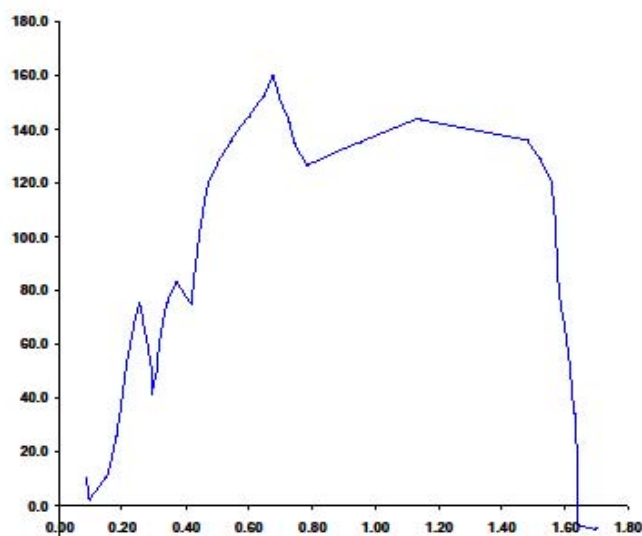
Testing Machine SFM-150KN 0313517

Load Cell S/N (QS353), Units (Lbs) 130000

Crosshead Speed (Inches / min) or Rate 0.2

Extension or Position Measured by EZ-1-2 (4026)

Force (Lbs) vs Position (Inches)



By : _____ Date : _____

Customer Name Vendor	Purchase Order	Operator
Template No 200 04-Oct-13		

Graphs – Sample “B2”



Universal Test Peak Force Imperial

Specimen ID B2 -40

Test Number 404

Report Number 389

Test Date 10/04/2013 11:47:51 AM

Test Results	
Tension (lbf)	122

Testing Machine SFM-150KN 0313517

Load Cell S/N (QS353), Units (Lbs) 130000

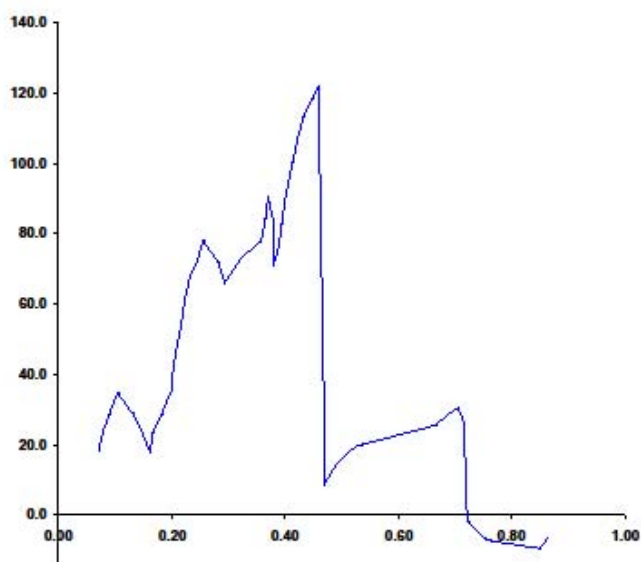
Crosshead Speed (Inches / min) or Rate 0.2

Extension or Position Measured by EZ-1-2 (4026)

By : _____ Date : _____

Customer Name Vendor	Purchase Order	Operator
Template No 200 04-Oct-13		

Force (Lbs) vs Position (Inches)



Graphs – Sample “C3”



Universal Test Peak Force Imperial

Specimen ID B3 -40

Test Number 405

Report Number 390

Test Date 10/04/2013 12:01:21 PM

Test Results	
Tension (lbf)	150

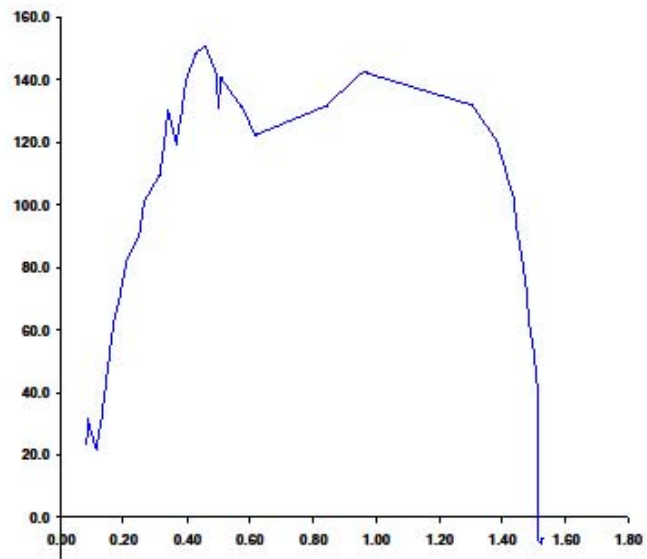
Testing Machine SFM-150KN 0313517

Load Cell S/N (QS353), Units (Lbs) 130000

Crosshead Speed (Inches / min) or Rate 0.2

Extension or Position Measured by EZ-1-2 (4026)

Force (Lbs) vs Position (Inches)



By : _____ Date : _____

Customer Name Vendor	Purchase Order	Operator
Template No 200 04-Oct-13		







Test Results – Press Blocks

NOTE: Each of the samples was uniquely identified as shown below.

PRODUCT:

Type “C” – Small Press Block

Temperature: -40°C

Small Press Block (C1)	Small Press Block (C2)	Small Press Block (C3)
Result: Eyelet failed. Maximum pull force: 312 LBS.	Result: Eyelet failed. Maximum pull force: 318 LBS.	Result: Eyelet failed. Maximum pull force: 325 LBS.
Test Setup 	Test Setup 	Test Setup 
Test Result 	Test Result 	Test Result 

Graphs – Sample “C1”



Universal Test Peak Force Imperial

Specimen ID C1 -40

Test Number 406

Report Number 391

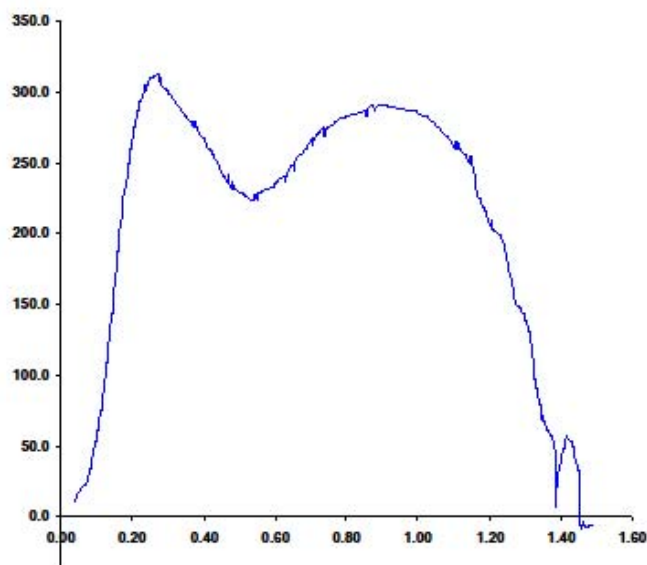
Test Date 10/04/2013 12:14:24 PM

Test Results	
Tension (lbf)	312

Testing Machine SFM-150KN 0313517
Load Cell S/N (QS353), Units (Lbs) 130000

Crosshead Speed (Inches / min) or Rate 0.2
Extension or Position Measured by EZ 1-2 (4026)

Force (Lbs) vs Position (Inches)



By : _____ Date : _____

Customer Name Vendor	Purchase Order	Operator
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Template No 200	04-Oct-13
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Graphs – Sample “C2”



Universal Test Peak Force Imperial

Specimen ID C2 -40

Test Number 407

Report Number 392

Test Date 10/04/2013 12:27:56 PM

Test Results	
Tension (lbf)	318

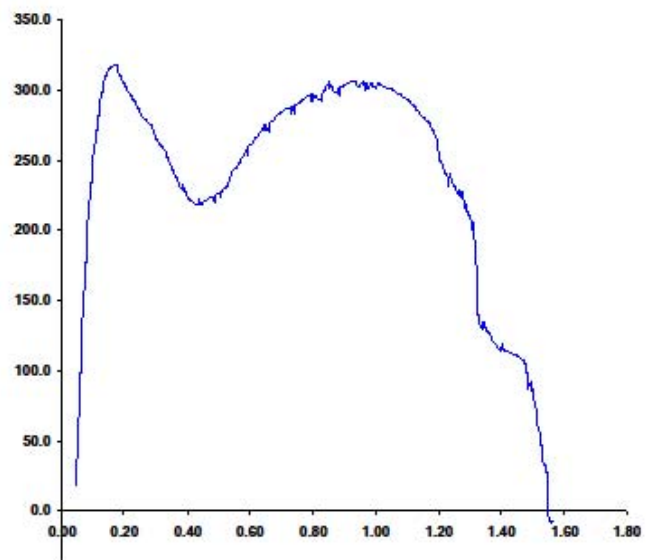
Testing Machine SFM-150KN 0313517

Load Cell S/N (GS353), Units (Lbs) 130000

Crosshead Speed (Inches / min) or Rate 0.2

Extension or Position Measured by EZ-1-2 (4026)

Force (Lbs) vs Position (Inches)



By : _____ Date : _____

Customer Name Vendor	Purchase Order	Operator
Template No 200 04-Oct-13		

Graphs – Sample “C3”



Universal Test Peak Force Imperial

Specimen ID C3-40

Test Number 408

Report Number 393

Test Date 10/04/2013 12:39:23 PM

Test Results	
Tension (lbf)	325

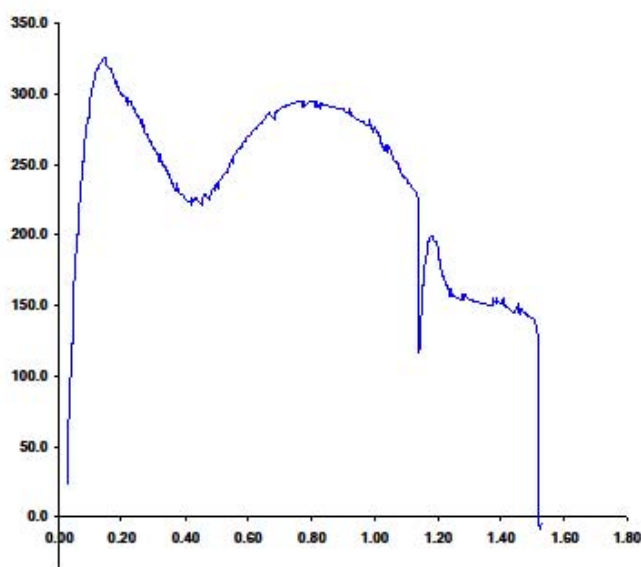
Testing Machine SFM-150KN 0313517

Load Cell S/N (QS353), Units (Lbs) 130000

Crosshead Speed (Inches / min) or Rate 0.2

Extension or Position Measured by EZ 1-2 (4026)

Force (Lbs) vs Position (Inches)



By : _____ Date : _____

Customer Name Vendor	Purchase Order	Operator
Template No 200 04-Oct-13		




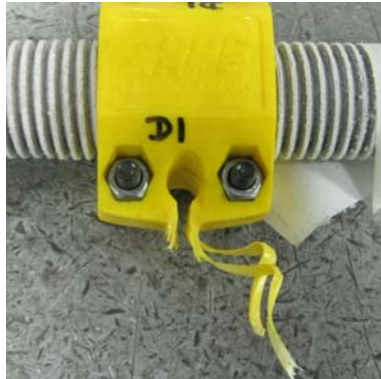


Test Results – Press Block

NOTE: Each of the samples was uniquely identified as shown below.

PRODUCT:

Type “D” – Large Press Block

Temperature: -40°C

Large Press Block (D1)	Large Press Block (D2)	Large Press Block (D3)
Result: Eyelet failed. Maximum pull force: 469 LBS.	Result: Eyelet failed. Maximum pull force: 520 LBS.	Result: Eyelet failed. Maximum pull force: 511 LBS.
Test Setup 	Test Setup 	Test Setup 
Test Result 	Test Result 	Test Result 

Graphs – Sample “D1”



Universal Test Peak Force Imperial

Specimen ID D1 -40

Test Number 409

Report Number 394

Test Date 10/04/2013 12:59:11 PM

Test Results	
Tension (lbf)	469

Testing Machine SFM-150KN 0313517

Load Cell S/N (QS353), Units (Lbs) 130000

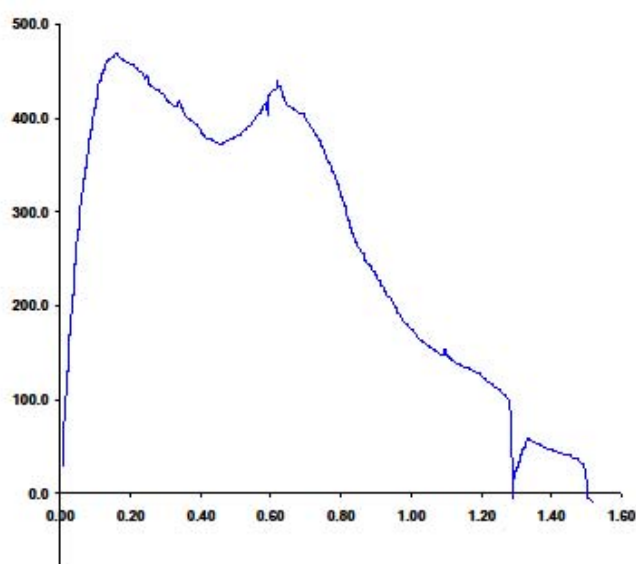
Crosshead Speed (Inches / min) or Rate 0.2

Extension or Position Measured by EZ-1-2 (4026)

By : _____ Date : _____

Customer Name Vendor	Purchase Order	Operator
Template No 200 04-Oct-13		

Force (Lbs) vs Position (Inches)



Graphs – Sample “D2”



Universal Test Peak Force Imperial

Specimen ID D2-40

Test Number 410

Report Number 395

Test Date 10/04/2013 2:35:17 PM

Test Results	
Tension (lbf)	520

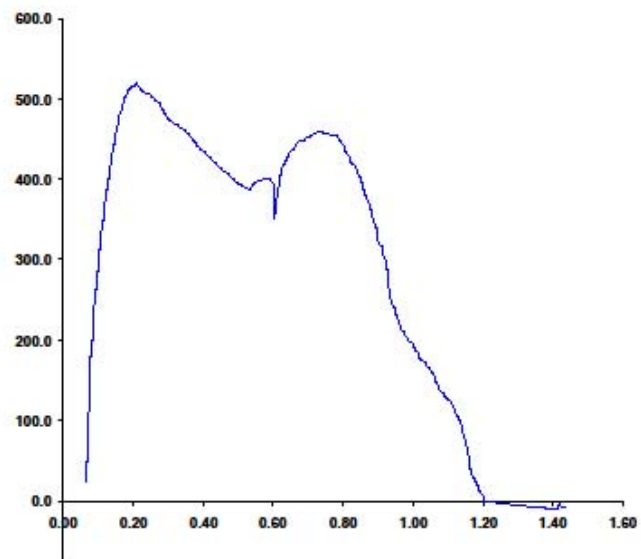
Testing Machine SFM-150KN 0313517

Load Cell S/N (QS353), Units (Lbs) 130000

Crosshead Speed (Inches / min) or Rate 0.2

Extension or Position Measured by EZ1-2 (4026)

Force (Lbs) vs Position (Inches)



By : _____ Date : _____

Customer Name Vendor	Purchase Order	Operator
Template No 200 04-Oct-13		

Graphs – Sample “D3”



Universal Test Peak Force Imperial

Specimen ID D3 -40

Test Number 411

Report Number 396

Test Date 10/04/2013 2:48:57 PM

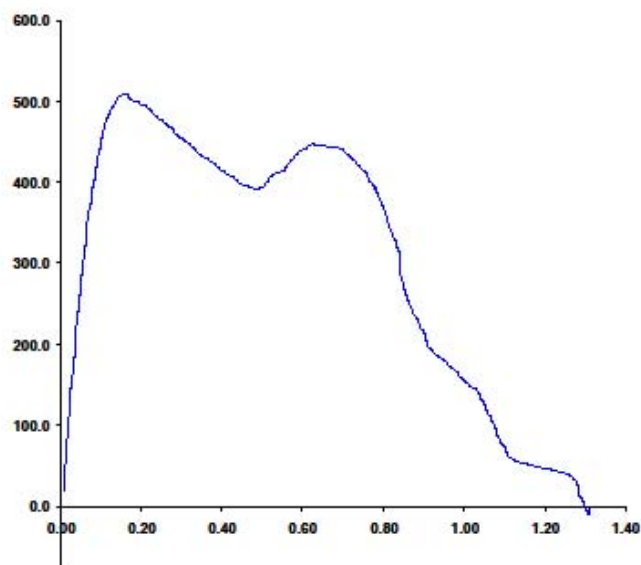
Test Results	
Tension (lbf)	511

Testing Machine SFM-150KN 0313517	
Load Cell S/N (Q8353), Units (Lbs)	130000
Crosshead Speed (Inches / min) or Rate	0.2
Extension or Position Measured by	EZ-1-2 (4026)

By : _____ Date : _____

Customer Name Vendor	Purchase Order	Operator
Template No 200	04-Oct-13	

Force (Lbs) vs Position (Inches)



Test Results – Lanyards

NOTE: Each of the samples was uniquely identified as shown below.

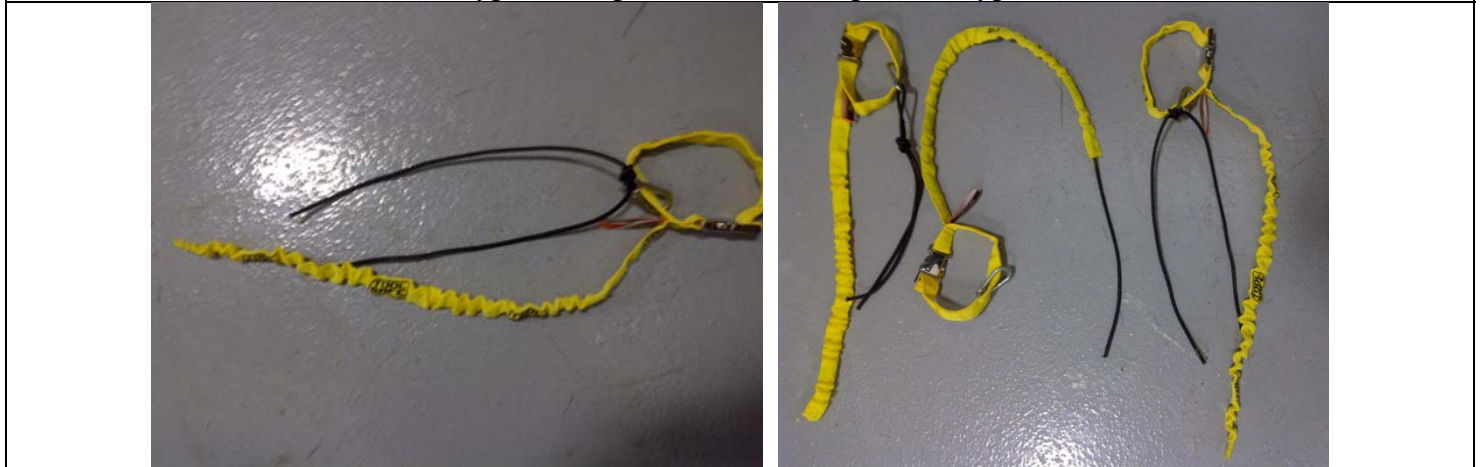
PRODUCT:

Type “E” – Wrist Lanyard

Temperature -40°C

Wrist Lanyard (E1)	Wrist Lanyard (E2)	Wrist Lanyard (E3)
Maximum Travel To Failure: 30 Inches	Maximum Travel To Failure: 23 Inches	Maximum Travel To Failure: 20 Inches
Maximum Force to Failure: 140 LBS.	Maximum Force to Failure: 110 LBS.	Maximum Force to Failure: 110 LBS.
Result: Bungee Elastic Broke	Result: Bungee Elastic Broke	Result: Bungee Elastic Broke
NOTE: Maximum Travel refers to the difference between the sample’s initial length without tension applied - vs. - the maximum extended length at point where failure occurred.		

Typical sample failure for this product Type



NOTE: The Lanyards were tested as one complete assembly including carabiner, bungee and buckle. The carabiner and buckle were NOT tested separately and therefore no claims are made nor implied as to their breaking strength / ability to support loads equal to or greater than the lowest test failure point as indicated in this report.

IMPORTANT NOTE: It is suggested to state “WARNING: NOT TO BE USED IN CLIMBING OR RESCUE APPLICATIONS” or similar wording on the Lanyard products.

Test Results – Lanyards

NOTE: Each of the samples was uniquely identified as shown below.

PRODUCT:

Type “F” – Harness Lanyard

Temperature -40°C

Harness Lanyard (F1)	Harness Lanyard (F2)	Harness Lanyard (F3)
Maximum Travel To Failure: 39 Inches	Maximum Travel To Failure: 39.5 Inches	Maximum Travel To Failure: 39 Inches
Maximum Force to Failure: 105 LBS.	Maximum Force to Failure: 113 LBS.	Maximum Force to Failure: 122 LBS.
Result: Bungee Elastic Broke	Result: Bungee Elastic Broke	Result: Bungee Elastic Broke
NOTE: Maximum Travel refers to the difference between the sample’s initial length without tension applied - vs. - the maximum extended length at point where failure occurred.		

Typical sample failure for this product Type



NOTE: The Lanyards were tested as one complete assembly including carabiner, bungee and buckle. The carabiner and buckle were NOT tested separately and therefore no claims are made nor implied as to their breaking strength / ability to support loads equal to or greater than the lowest test failure point as indicated in this report.

IMPORTANT NOTE: It is suggested to state “WARNING: NOT TO BE USED IN CLIMBING OR RESCUE APPLICATIONS” or similar wording on the Lanyard products.

Revisions:		
Rev #	Date	Description
0	October 22, 2013	Original report
1	October 29, 2013	Editorial update regarding lanyard and carabiner