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Test Report

Personal Fall Arrest Equipment
ANSI Z359.13-2013
Energy Absorbing Lanyard

Report no: 2.15.09.17

Client: Jinhua Jech Tools Co., Ltd
No.10 Jinlong Road,
Bailongqiao Town,
Jinhua City, Zhejiang,
China

Manufacturer: Jinhua Jech Tools Co., Ltd

Client order: Email confirmation

Order received: 17 September 2015

Model: JE312206

Dates of tests: 18 September 2015 to 23 September 2015

Signed:

Steven Sum, Laboratory Manager

Issued: 24 September 2015

Conditions

This report may be reproduced and distributed to your clients, provided that it is reproduced and distributed in full.

Specimens will be disposed of four weeks from the date of this report, unless otherwise instructed.

Opinions, comments and interpretations expressed in this report are shown in italics.

Copies of INSPEC interpretations referenced in this report are available upon request.

Tests marked ☒ are not included in our ACLASS Scope of Accreditation.

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Summary of assessment* - Energy Absorber

Clause	Requirement	Assessment (See Key)
3.1.1	Classifications	Pass
3.1.2	Material	NAs
3.1.3	Terminations	Ltd
3.1.4	Connectors	
3.1.5	Deployment indicator	Pass
3.1.6	Activation force	Pass
3.1.7	Static strength	
3.1.8	Dynamic performance – ambient dry	
3.1.9	Dynamic performance – ambient wet	
	Dynamic performance – cold dry	
	Dynamic performance – hot dry	
5.1 / 5.2	Marking	
5.3 / 5.4	Instructions	

Summary of assessment* - Energy Absorbing Lanyard

Clause	Requirement	Assessment (See Key)
3.2	Energy absorber	Ltd
3.2.1	Material	NAs
3.2.2	Terminations	Ltd
3.2.3	Connectors	
3.2.4	Dynamic performance – ambient dry	Pass
3.2.5	Dynamic performance – ambient wet	Pass
	Dynamic performance – cold dry	Pass
	Dynamic performance – hot dry	Pass
3.2.6	Static strength	
3.2.7	Static test for wrap-around lanyards (3600 lbf – abraded)	
3.2.8	Static test for wrap-around lanyards (5000 lbf – unabraded)	
3.2.9	Static test for Y-lanyards	Pass
3.2.10.1	Dynamic test for Y-lanyards (Single connection)	Pass
3.2.10.2	Dynamic test for Y-lanyards (Dual connection)	Pass
3.2.10.3	Dynamic test for Y-lanyards (Hip connection)	Pass
5.1 / 5.2	Marking	
5.3	Instructions	

Key

	Shading shows the clauses requested. Any other clauses were not requested.
Pass	Requirement satisfied.
Ltd	Testing requested was insufficient completely to verify compliance with the clause. Refer to the "Result details" section for more information.
Fail	Requirement not satisfied. Refer to the "Result details" section for more information.
NAs	Assessment not carried out.
NAp	Requirement not applicable.
NT	Requested but not tested due to early termination following failure.

* Assessment relates only to those specimens which were tested and are the subject of this report.

Submission details

Product	Quantity	Date received	INSPEC specimen no. (job 2C152+)
Twin Legged Energy Absorber Lanyard, model JE312206	10	26 August 2015	01 to 10

Procedures

The specimens detailed within the submissions above were used for the tests covered by this report.

Testing was performed in accordance with ANSI Z359.13-2013 unless otherwise specified below. Reference should be made to the standard when reading this report.

Unless stated otherwise, specimens were tested in the condition as received by INSPEC.

Testing was performed at INSPEC's laboratory in Kunshan, China.

Result details – Energy absorber

3.1 Personal Energy Absorber Component

Specimens 2C15201 to 2C15203 were assessed and satisfied the design and testing requirements of this standard. Ltd

3.1.1 Classifications

The specimens assessed were classified by the manufacturer as "6 ft FF". Pass

3.1.2 Materials

The personal energy absorber was constructed of webbing. The characteristics of the material used were not assessed. Manufacturer to certify. NAs

3.1.3 Terminations

Specimen 2C15201 was assessed.

The end terminations satisfied 3.1.3.2, as appropriate (see below). Ltd

3.1.3.2 Webbing terminations

Specimen 2C15201 was assessed.

a) Lock stitches sewn on all stitched eye termination straps were not assessed. Manufacturer to certify. NAs

b) The material and characteristics of thread used was not assessed. Manufacturer to certify. NAs

Threads used for sewing the harness were white colour. This contrasted with the red colour of the webbing. Pass

c) The webbing was protected at load-bearing connector elements. Pass

e) The ends of the webbing were seared and fused so as to prevent unravelling. Pass

3.1.5 Deployment indicator

Subsequent to the testing of specimen 2C15203 against clause 3.2.4, it became obvious that the energy absorber component had been activated. Pass

3.1.6 Activation force

Specimen 2C15202 was assessed.

The specimens showed no sign of activation when subjected to the 450 pounds static force. Pass

The permanent elongation following the test was 0.51 inches. This is less than the maximum 2 inches permitted. Pass

Result details – Energy absorbing lanyard

3.2 Energy Absorbing Lanyard Component

Specimens 2C15201 to 2C15208 were assessed.

The specimens each incorporated a Personal Energy Absorber Component which satisfied this standard. Ltd

3.2.1 Material

Specimen 2C15201 was assessed.

Webbing was used on the construction of the energy absorbing lanyard.

The materials used in the construction of this energy absorbing lanyard, and their characteristics, were not assessed. Manufacturer to certify. NAs

3.2.2 Terminations

Specimen 2C15201 was assessed.

The energy absorbing lanyard was constructed of webbing.

The end terminations satisfied 3.2.2.2, as appropriate (see below). Ltd

3.2.2.2 Webbing terminations

Specimen 2C15201 was assessed.

a) Lock stitches sewn on all stitched eye termination straps were not assessed. Manufacturer to certify. NAs

b) The material and characteristics of thread used was not assessed. Manufacturer to certify. NAs

Threads used for sewing the fibre rope were white colour. This contrasted with the green colour of the webbing. Pass

c) The webbing was protected at load-bearing connector elements. Pass

e) The ends of the lanyard were seared and fused so as to prevent unravelling. Pass

3.2.4 Dynamic performance test - Ambient dry condition

Specimen 2C15203 was assessed.

During the dynamic performance test, the average arrest force was 818 pounds. Pass
This value is less than the maximum 900 pounds permitted.
See Annex 1 for the plot of force versus time.

During the dynamic performance test, the maximum arrest force was 1105 pounds. Pass
This value is less than the maximum 1,800 pounds permitted.
See Annex 1 for the plot of force versus time.

During the dynamic performance test, the deployment distance was 38.6 inches. Pass
This value is less than the maximum 48 inches permitted.

3.2.5 Dynamic performance test - Ambient wet condition

Specimen 2C15204 was assessed.

During the dynamic performance test, the average arrest force was 831 pounds. Pass
This value is less than the maximum 1,125 pounds permitted.
See Annex 1 for the plot of force versus time.

During the dynamic performance test, the maximum arrest force was 1063 pounds. Pass
This value is less than the maximum 1,800 pounds permitted.
See Annex 1 for the plot of force versus time.

During the dynamic performance test, the deployment distance was 35.8 inches. Pass
This value is less than the maximum 48 inches permitted.

3.2.5 Dynamic performance test - Cold dry condition

Specimen 2C15205 was assessed.

During the dynamic performance test, the average arrest force was 911 pounds. Pass
This value is less than the maximum 1,125 pounds permitted.
See Annex 1 for the plot of force versus time.

During the dynamic performance test, the maximum arrest force was 1357 pounds. Pass
This value is less than the maximum 1,800 pounds permitted.
See Annex 1 for the plot of force versus time.

During the dynamic performance test, the deployment distance was 32.3 inches. Pass
This value is less than the maximum 48 inches permitted.

3.2.5 Dynamic performance test - Hot dry condition

Specimen 2C15206 was assessed.

During the dynamic performance test, the average arrest force was 810 pounds. This value is less than the maximum 1,125 pounds permitted. See Annex 1 for the plot of force versus time. Pass

During the dynamic performance test, the maximum arrest force was 1136 pounds. This value is less than the maximum 1,800 pounds permitted. See Annex 1 for the plot of force versus time. Pass

During the dynamic performance test, the deployment distance was 38.2 inches. This value is less than the maximum 48 inches permitted. Pass

3.2.9 Static strength – Y-lanyards only

Specimens 2C15203 and 2C15207 were assessed.

Leg A of specimen 2C15203 withstood the tensile test of 5,000 pounds applied for 1 minute without breaking. Pass

Legs A and B of specimen 2C15207 withstood the tensile test of 5,000 pounds applied for 1 minute without breaking. Pass

3.2.10.1 Dynamic test, Y-lanyards only – Single connection

See results at clause 3.2.4 of this report. Pass

3.2.10.2 Dynamic test, Y-lanyards only - Dual connection

Specimen 2C15207 was assessed.

During the dynamic test, the maximum arrest force was 1287 pounds. This value is less than the maximum 1,800 pounds permitted. See Annex 1 for the plot of force versus time. Pass

3.2.10.3 Dynamic test, Y-lanyards only - Hip connection

Specimen 2C15208 was assessed.

During the dynamic test, the nylon keeper was broken.

The energy absorbing lanyard did include a warning label on each leg according to clause 5.2.2. Pass

5.1 / 5.2 Marking

The detailed results of the assessments are on page 10 of this report. Pass

5.3 Instructions

The detailed results of the assessments are given on page 11 of this report. Pass

5.1 General Marking Requirements

5.1.1 Markings shall be in English. Pass

5.1.2 The legibility and attachment of required markings shall endure for the life of the component, subsystem or system being marked was not assessed. NAs

Marking labels were supplied electronically and used for assessment.

When pressure sensitive labels are used, they shall comply with the applicable provision of reference 8.5.1. No pressure sensitive labels were used. NAp

5.1.3 Except for connectors, as set forth in Section 5.2.1, equipment shall be marked with the following:

- part number and model designation; Pass
- year of manufacture; Pass
- manufacturer's name or logo; Pass
- capacity rating; Pass
- serial number; Pass
- standard number; Pass
- warning to follow the manufacturer's instructions included with the equipment at time of shipment from the manufacturer. Pass

5.2 Specific Marking Requirements

5.2.1 Energy absorbing lanyards shall be marked to identify:

- the fiber used in the material of construction; Pass
- the length; Pass
- the need to avoid contact with sharp edges and abrasive surfaces; Pass
- the need to make only compatible connections; Pass
- the maximum elongation; Pass
- restriction, if any, on the types of components, subsystems or systems with which the personal energy absorber is designed to be used; NAp
- the average arrest force, maximum free fall distance and capacity of the personal energy absorber on a separate label identical in size, color and content as figure 16a and 16b; Pass
- 6 ft FF personal energy absorbers shall be in black print on a contrasting white background. See figure 16a; Pass
- 12 ft FF personal energy absorbers shall be in white print on a contrasting black background. See figure 16b; NAp

5.3 General Instruction Requirements

5.3.1	Instructions shall be provided to the user, printed in English.	Pass
	User instructions were supplied electronically and used for assessment.	
5.3.2	Instructions shall contain the following information:	
	· a statement that the manufacturer's instructions shall be provided to users;	Pass
	· manufacturer's name, address, and telephone number;	Pass
	· manufacturer's part number and model designation for the equipment;	Pass
	· intended use and purpose of the equipment;	Pass
	· proper method of use and limitation on use of the equipment;	Pass
	· illustrations showing locations of markings on the equipment;	Pass
	· reproduction of printed information on all markings;	Pass
	· inspection procedures required to assure the equipment is in serviceable condition and operating correctly;	Pass
	· anchorage requirements;	Pass
	· an illustration of how to calculate free fall distances;	Pass
	· criteria for discarding equipment which falls inspection;	Pass
	· procedures for cleaning, maintenance, and storage;	Pass
	· reference to the ANSI/ASSE Z359.13, *Personal Energy Absorbers and Energy Absorbing Lanyards*, standard and applicable regulations governing occupational safety.	Pass
5.3.2	Instructions shall require that only the equipment manufacturer, or persons or entities authorized in writing by the manufacturer, shall make repairs to equipment.	
	Repair was not permitted	NAp
5.3.4	Instructions shall require the user to remove equipment from field service if it has been subjected to the forces of arresting a fall.	Pass

Estimates of the uncertainty of measurement – Energy Absorber

Clause	Test		Uncertainty
3.1.1	Classifications		-
3.1.2	Material		-
3.1.3	Terminations		-
3.1.4	Connectors		-
3.1.5	Deployment indicator		•
3.1.6	Activation force		•
	Permanent elongation		± 0.33%
3.1.7	Static strength		•
3.1.8	Dynamic performance – ambient dry	Force	± 1.2%
		Deployment distance	± 1mm
3.1.9	Dynamic performance – various conditions	Force	± 1.2%
		Deployment distance	± 1mm
5.1 / 5.2	Marking		-
5.3 / 5.4	Information		-

Estimates of the uncertainty of measurement – Energy Absorbing Lanyard

Clause	Test		Uncertainty
3.2	Personal Energy Absorber Component, if fitted		See report
3.2.1	Materials		-
3.2.2	Terminations		-
3.2.3	Connectors		See report
3.2.4	Dynamic performance – ambient dry	Force	± 1.2%
		Deployment distance	± 1mm
3.2.5	Dynamic performance – various conditions	Force	± 1.2%
		Deployment distance	± 1mm
3.2.6	Static strength – single lanyard		*
	Static strength – slippage		± 2.1%
3.2.7	Abrasion and Static strength - Wrap-around energy absorbing lanyards only		*
3.2.8	Static strength - Wrap-around energy absorbing lanyards only		*
3.2.9	Static strength - Y-lanyards only		*
3.2.10.1	Dynamic test, Y-lanyards only - Single connection	Force	± 1.2%
		Deployment distance	± 1mm
3.2.10.2	Dynamic test, Y-lanyards only - Dual connection	Force	± 1.2%
3.2.10.3	Dynamic test, Y-lanyards only - Hip connection		*
5.1 / 5.2	Marking		-
5.3 / 5.4	Information		-

* The acceptance criterion for this test is a straightforward "Pass/Fail", rather than a numerical value. Consequently, as there is no value to be reported, uncertainty has not been reported either.

Values expressed as a percentage (%) are relative.

It should be noted that the above values have not been taken into account when making assessment to the pass/fail criteria.

ANNEX

This Annex comprises two sections.

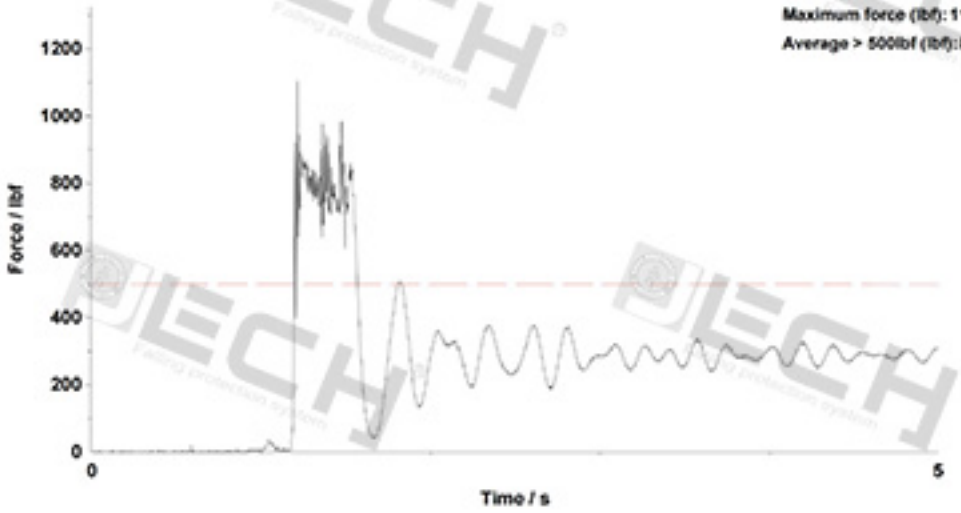
1. Plot of arrest force versus time. (5 pages)

2. Photograph of the product tested. (1 page)

INSPEC Technical Services

Technician:	TAN
Standard	ANSI Z359.13:2013 Energy absorbing lanyard
Sample / File name:	2C15203
Drop item	Drop weight, US 128 kg
Orientation/Attachment Point:	Centre eyebolt
Time and Date of Test:	10:19 19/09/15

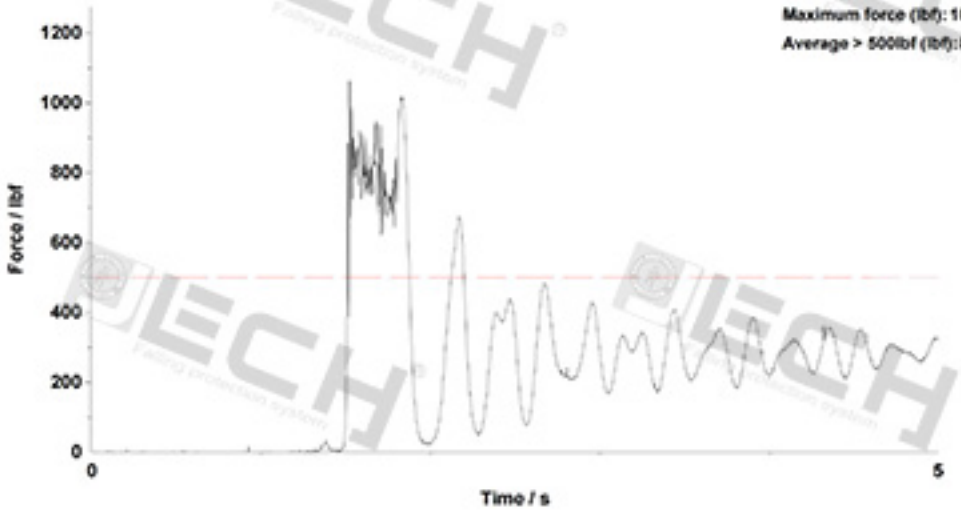
Maximum force (lbf): 1104.7
Average > 500lbf (lbf):817.8



Results do not achieve full ACLASS status until a formal test report has been issued.

INSPEC Technical Services

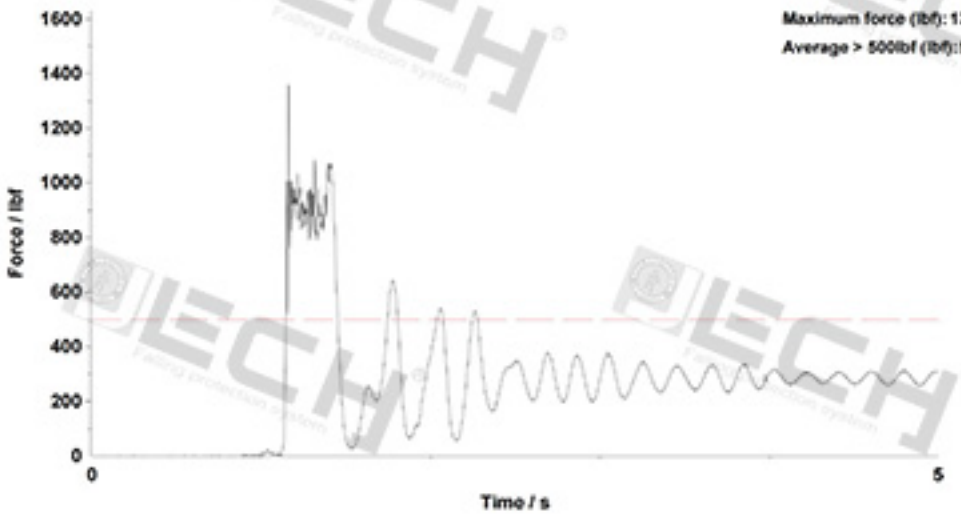
Technician:	TAN
Standard	ANSI Z359.13:2013 Energy absorbing lanyard
Sample / File name:	2C15204
Drop item	Drop weight, U.S - 128 kg
Orientation/Attachment Point:	Centre eyebolt
Time and Date of Test:	14:10 19/09/15



Results do not achieve full ACLASS status until a formal test report has been issued.

INSPEC Technical Services

Technician:	TAN
Standard	ANSI Z359.13:2013 Energy absorbing lanyard
Sample / File name:	2C15205
Drop item	Drop weight, US 128 kg
Orientation/Attachment Point:	Centre eyebolt
Time and Date of Test:	10:54 19/09/15

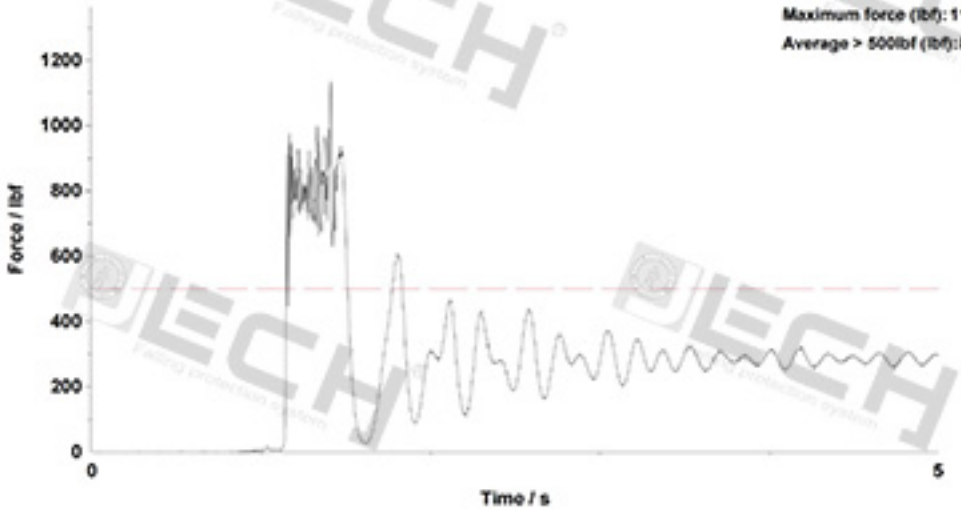


Results do not achieve full ACLASS status until a formal test report has been issued.

INSPEC Technical Services

Technician:	TAN
Standard	ANSI Z359.13:2013 Energy absorbing lanyard
Sample / File name:	2C15206
Drop item	Drop weight, US 128 kg
Orientation/Attachment Point:	Centre eyebolt
Time and Date of Test:	10:32 19/09/15

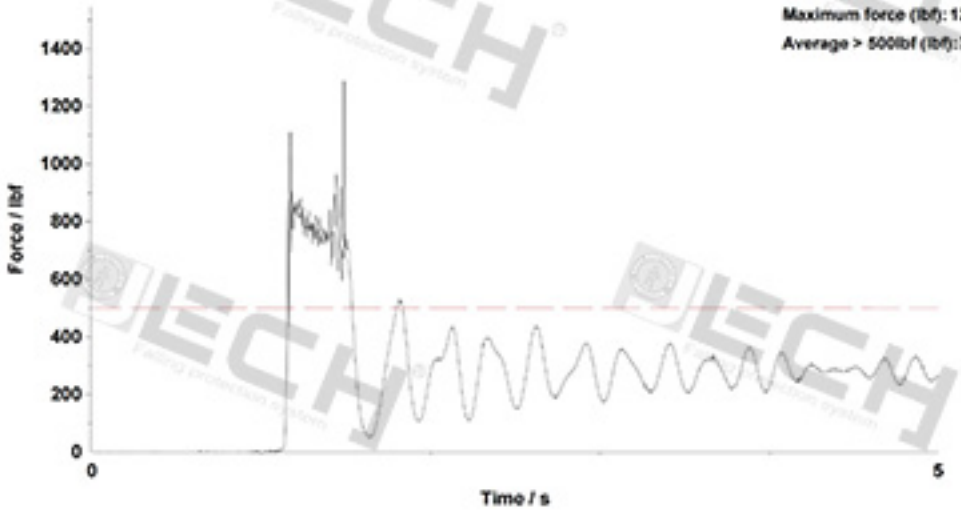
Maximum force (lbf): 1135.5
Average > 500lbf (lbf):810.0



Results do not achieve full ACLASS status until a formal test report has been issued.

INSPEC Technical Services

Technician:	TAN
Standard	ANSI Z359.13:2013 Energy absorbing lanyard
Sample / File name:	2C15207
Drop item	Drop weight, U.S - 128 kg
Orientation/Attachment Point:	Centre eyebolt
Time and Date of Test:	13:39 19/09/15



Results do not achieve full ACLASS status until a formal test report has been issued.

Jinhua Jech Tools Co., Ltd –
Twin Legged Energy Absorber Lanyard,
model JE312206

INSPEC Testing Services' specimen 2C15201 18 September 2015