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Test Report

Personal Fall Arrest Equipment
ANSI Z359.18-2017
Anchorage Connectors

Report no: 2.21.02.12

Client: Jinhua Jech Tools Co., Ltd.
No.1448 Tongxi Road, Linjiang Industrial Park
Wucheng District
Jinhua City
Zhejiang 321025
China

Manufacturer: Jinhua Jech Tools Co., Ltd.

Client orders and Dates received: T/0744C (26 May 2020)
T/0831 (29 September 2020)

Model: JE910020H

Dates of tests: 6 July 2020 to 18 November 2020, and 10 February 2021

Signed:

Steven Sum, Laboratory Manager

Issued: 10 February 2021

Conditions

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

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Summary of assessment*

Clause	Requirement	Assessment (See Key)
3.1	Design requirements	Ltd
3.2.1	Static Strength Requirements	Pass
3.2.2	Dynamic Strength Requirements	Pass
3.2.3	Residue Strength Requirements	Pass
3.2.4	Serviceability Load Requirements	Pass
3.2.5	Corrosion Test Requirements	
5.1	Marking Requirements	Ltd
5.2	Instructions Requirements	Ltd

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.
Anchorage strap, model JE910022H	15	10 June 2020	2H13101 to 15
Anchorage strap, model JE910020H	01		2H12901

Procedures

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

Testing was performed in accordance with ANSI Z359.18-2017 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.

The manufacturer made the following declarations:

Anchor straps JE910020H and JE910022H are made of the same materials (D-ring, webbing, threads), have the same stitching patterns, and same width. Only the lengths are different.

To avoid duplicate testing, the longest anchor strap JE910022H was selected for performance testing.

Result details

3.1 Design Requirements

Specimen 2H12901 was assessed.

The specimen was specified as "Type T Anchorage Connector" by the manufacturer.

3.1.1 Connection Points

a)	The manufacturer specified the anchor straps were designed to be used for one personal fall arrest system at a time only.	Pass
b)	The connection point was a full-circle D-ring. The inside radius of the D-ring was 1.2 inch. This is more than the minimum one inch radius permitted.	Pass
c)	There were no closed loops intended for connection point.	Pass
d)	Testing of the D-rings incorporated in the specimens was not requested.	NAs
e)	The specimen did not incorporate multiple connection points.	NAp

3.1.2 Surface Finish of Connector

All surfaces of the specimen, which may come in contact with other components, were free of burrs, pits, sharp corners and roughness. Pass

3.1.3 Metallic Materials

3.1.3.1 Corrosion Resistance

The specimens were made of webbing. NAp

3.1.3.2 Low-Temperature Performance

This clause was not assessed. Manufacturer to specify. NAs

3.1.3.3 Finishes

All hardware finishes were clean and free of scale, rust and deposits of foreign matter. Pass

3.1.3.4 Welded Assembly

There were no welded assembly. NAp

3.1.3.5 Fasteners

Fasteners were not used. NAp

3.1.4 Textiles and Other Synthetic Materials

3.1.4.1 General

The materials used for components and their characteristics were not assessed. Manufacturer to certify. NAs

3.1.4.2 Stitching and Cutting

a) Lock stitching was not assessed. Manufacturer to specify. NAs

b) End of threads were not assessed. Manufacturer to specify. NAs

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

d) Webbings were hot-cut to prevent fraying. Pass

e) Threads used for sewing the webbing were black colour. This contrasted with the orange colour of the webbings. Pass

3.1.5 Other Requirements

3.1.5.1 There were no other loading materials. NAp

3.1.5.2 There were no integrally connected components other than those specify in 3.1.1 NAp

3.2 Performance Requirements

3.2.1 Static Strength Requirements

Specimens 2H13101 to 2H13103 were assessed.

3.2.1.2 When tested in accordance with 4.2.1.2, the specimens withstood a tensile test of 5000 pounds applied for 3 minutes without breaking. Pass

3.2.2 Dynamic Strength Requirements

Specimens 2H13104 to 2H13106 were assessed.

3.2.2.2 When tested in accordance with 4.2.2.2, the specimens arrested the test weight. Pass

3.2.3 Residue Strength Requirements

Specimens 2H13104 to 2H13106 were assessed.

3.2.3.2 When tested in accordance with 4.2.3.2, the specimens arrested the test weight and maintain the test weight in suspension for 1 minute. Pass

3.2.4 Serviceability Load Requirements

Specimens 2H13107 to 2H13109 were assessed.

The working load limit specified by the manufacturer was 310 pounds.

3.2.4.2	When tested in accordance with 4.2.4.2, the specimens withstood a tensile test of 2500 pounds applied for 3 minutes without cracking, breaking or permanent deformation of load bearing parts of the anchorage connectors visible to the unaided eye.	Pass

5.1 Marking Requirements

5.1.1		Markings shall be in English.	Pass
	-	The legibility and attachment of required markings shall be designed to endure for the life of the component, subsystem or system been marked. Mfr to certify.	NAs
		Marking or tag to be permanently affixed to the anchorage connector.	NAs
		Marking labels were provided electronically and used for assessment	
	a	The manufacturer's name or mark; [JECH]	Pass
	b	The year of manufacture; [09/2020]	Pass
	c	Model number; [JE910020H]	Pass
	d	"ANSI Z359.18" and the type; [Type T]	Pass
	e	Marking to indicate restrictions on directions of loading, if applicable;	NAp
	f	Where specified by the manufacturer, the working load; [310 lbs]	Pass
	g	An individual serial number or a lot or batch number that provides traceability;	Pass
	h	Minimum Breaking Strength, followed by "MBS"; [5.0 MBS]	Pass
5.1.2		Specific.	
5.1.2.1		Not applicable to this product.	NAp
5.1.2.2		Not applicable to this product.	NAp
5.1.2.3		The minimum service temperature for the anchorage connector according to 3.1.3.2	Pass
5.1.2.4		Not applicable to this product.	NAp

5.2 Instruction Requirements

The instructions to users have been assessed as detail below, with reference only to the relevant requirements of the standard.

INSPEC Technical Services has not assessed these instructions with respect to claims made by the manufacturer outside of these requirements, and therefore accepts no responsibility for the legitimacy of any such claims.

5.2.1	Instructions and information shall be provided to the user in English with each anchorage connector.	NAs
	User Instructions were provided electronically and used for assessment	
5.2.1.1	**Overall:**	
a)	A statement that the anchorage connector has been tested in compliance with the requirements of ANSI/ASSE Z359.7, and caution that the ANSI compliance and testing covers only the hardware and does not extend to the anchorage and substrate to which the anchorage connector is attached;	Pass
b)	Specifications for appropriate anchorage(s) to which the anchorage connector can be attached, including instructions on how to proceed when the user is unable to determine whether the anchorage meets the manufacturer's specification and instructions that the anchorage connector shall only be connected to anchorage that:	Pass
i)	can withstand 5000 pounds (22.2 kN) without failure, except that the lower strengths are acceptable when permitted by applicable legislation; or	Pass
ii)	Are certified by a professional engineer as having the required strength for fall arrest or travel restraint, as applicable; or	Pass
iii)	the manufacturer may provide specifications of allowable materials including the minimum shapes, sizes and geometry of structural elements to which the anchorage connector may be fastened. A qualified person shall approve these specifications.	Pass
c)	The manufacturer shall clearly label the minimum service temperature for the anchorage connector according to 3.1.3.2;	Pass
d)	The manufacturer shall supply complete specifications for fasteners;	NAp
e)	The anchorage connector type;	Pass
f)	The permitted uses of the anchorage connector;	Pass
g)	The connection point(s), working load limit;	Pass
h)	The material used in the anchorage connector's construction (e.g. nylon, polyester, stainless steel, rope construction, etc.);	Pass
i)	The length of the anchorage connector and any other dimensions that may affect its compatibility with anchorages to which it may be connected (e.g. diameter, width, thickness);	Pass
j)	The manufacturer shall make available upon request information for the design of systems, such as AAF and/or force vs displacement curve(s) for the device	NAs
k)	A statement that only one fall protection system or positioning system may be attached to an individual connection point;	Pass
l)	Specification providing the intended direction(s) of loading of the anchorage connector	Pass

m)	A complete list of anchorage connector components provided by the manufacturer at the time of sale; and	Pass
n)	A warning against unauthorized alterations, relocations or additions to the anchorage connector.	Pass

5.2.1.2 Use:

a)	Instructions on proper installation and use, including, but not limited to, compatibility with other fall protection components.	Pass
b)	The length of the anchorage connector and any other dimensions that may affect its compatibility with anchorages to which it may be connected (e.g. diameter, width, thickness);	Pass
c)	Where applicable, directions regarding the appropriate length of lanyard to use with the anchorage connector to compensate for the additional length that it may add to the lanyard. (Instructions to include length of anchorage connector, manner of use and location relative to working surface in the calculation of fall clearance.)	NAp
d)	Permitted and forbidden uses, including clear description of and the recommended ways of dealing with applicable compatibility concerns.	Pass
e)	A warning to remove any surface contaminations such as concrete, stucco, roofing material, etc., that could accelerate cutting or abrading of attached components.	Pass
f)	The material used in the anchorage connector's construction (e.g. nylon, polyester, stainless steel, rope construction, etc.);	Pass
g)	Training requirements	Pass

5.2.1.3 Inspection and Field Testing:

a)	Instructions on testing, if needed.	NAp
b)	Where applicable, directions for installer to perform and document proof testing upon installation. Directions shall include proof load forces and acceptable methods.	NAp
c)	Field serviceability testing: The manufacturer shall provide guidelines for how often field load testing must be undertaken to prove that the anchorage connector continues to be adequately secured to the structure. These guidelines shall include recommended methods for testing, including direction and point of application of test loads.	NAp
d)	The recommended frequencies and procedures for inspection, maintenance, and when applicable, testing.	Pass
e)	Instructions for inspecting and servicing an anchorage connector after it is subjected to a fall or an inspection reveals an unsafe condition.	Pass
f)	If applicable, guidelines for retirement of the anchorage connector.	Pass
g)	The action to be taken if an inspection of the anchorage connector reveals an unsafe condition.	Pass
h)	The action to be taken after the anchorage connector is subjected to a fall.	Pass
i)	Criteria for removal of an anchorage connector from service if deformed from its original installed configuration.	Pass

5.2.1.4 Cinching and Non-Cinching Style Anchorage Connectors:

a)	Where the anchorage connector includes an abrasion pad, provide directions that the abrasion pad shall be installed between the anchorage and the load bearing loop.	NAp
b)	The proper method of installing the anchorage connector including, as applicable for non-cinching anchorage connectors, the maximum angle permitted between the connecting legs.	Pass

5.2.1.4 Tripod and Davit Style Anchorage Connectors Instructions and Information

Not applicable to the product tested. NAp

6. INSPECTION, MAINTENANCE AND STORAGE.

The manufacturer shall provide the following information in its instructions for use and require the authorized person, authorized rescuer or others using this equipment to comply with these instructions. Additionally, it shall recommend the program administrator, or other similarly recognised person, retain the manufacturer's user instructions and require them to be read, understood and readily available to all users. Pass

6.1 Inspection. Instructions shall include:

6.1.1	Authorised person or rescuer shall inspect equipment before each use. Additionally, a competent or qualified person other than the user shall conduct inspections annually.	Pass
6.1.2	The program administrator shall set inspection criteria for the equipment. Such criteria shall equal or exceed the most restrictive of the criteria established by this standard or the manufacturer's user instructions. Keep inspection criteria current in relationship to changing patterns or conditions of use.	Pass
6.1.3	The program administrator shall maintain documentation of equipment inspections. This documentation shall include, at the minimum, the identity of the equipment, inspection date, name of the competent or qualified person conducting the inspection and the results of that inspection.	Pass
6.1.4	When an inspection reveals:	
•	defects in equipment; or	Pass
•	damage to equipment; or	Pass
•	Inadequate maintenance of equipment; or	Pass
•	activated stress indicators; or	NAp
•	activated warning systems or devices; or	NAp
•	deformation exceeding the manufacturer's stated limits	NAp
•	Permanently remove equipment from service or it shall undergo corrective maintenance in accordance with the manufacturer's recommendations before return to service.	Pass

6.1.5 In addition to the inspection requirements set forth in the manufacturer's user instructions, inspect equipment at each inspection level described in 6.1.1 for:

- absence or illegibility of markings or tags — Pass
- absence of any elements affecting the equipment form, fit or function; — NAp
- evidence of defects in or damage to hardware elements including cracks, sharp edges, deformation, corrosion, chemical attack, excessive heating, alteration and excessive wear; — Pass
- evidence of defects in or damage to straps, wire rope or ropes including fraying, crushing, unsplicing, unlaying, kinking, knotting, roping, broken or pulled stitches, broken or pulled wires or multiple broken wires, excessive elongation, chemical attack, excessive soiling, abrasion, alteration, needed or excessive lubrication, excessive aging and excessive wear. — Pass
- Alteration, absence of parts, or evidence of defects in, damage to or improper function of mechanical devices and connectors; — NAp
- Any other condition that calls to question the suitability of the equipment for its intended purpose. — NAp

6.1.6 If the equipment has arrested a fall or been damaged, remove the equipment from service. Additionally, clearly mark or tag the equipment not for use and either disposed of or serviced in accordance with manufacturer's recommendation. — Pass

6.2 Maintenance and Storage. Instructions shall indicate:

6.2.1 Conduct maintenance and storage of equipment in accordance with the manufacturer's user instructions. The manufacturer shall address unique issues, which may arise due to conditions of use. Retain the manufacturer's user instructions for reference. — Pass

6.2.2 Tag equipment which is in need of or scheduled for maintenance not for use until maintenance is performed. — Pass

6.2.3 Store equipment in a manner as to preclude damage from environmental factors such as heat, light, excessive moisture, oil, chemicals and their vapors or other degrading elements. — Pass

Estimates of the uncertainty of measurement

Clause	Test	Uncertainty
3.1	Design requirements	See report
3.1.1b)	Connection point eye – inside radius	± 0.1%
3.2.1.2	Static strength – type T	See Note 1
3.2.2.2	Dynamic strength – type T	See Note 1
3.2.3.2	Residual strength – type T	See Note 1
3.2.4.2	Serviceability load – type T	See Note 1
3.2.5.2	Corrosion test	See Note 1
5.1	Marking	-
5.2	Instructions	-

Note 1. 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.

Note 2. The uncertainty value is based on a standard uncertainty multiplied by a coverage factor k = 2, which provides for a confidence level of approximately 95%. Values expressed as a percentage (%) are relative.

Note 3. It should be noted that the above values have not been taken into account when making assessments against the pass/fail criteria.

ANNEX

This Annex comprises one section.

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

END OF REPORT

Jinhua Jech Tools Co., Ltd. -
Anchorage Strap, type T, JE910020H

Photograph provided by the manufacturer

7 January 2021