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Test Report

Personal Fall Arrest Equipment
ANSI Z359.12-2019 : Hardware

Report no: 2.20.12.64

Client: Nal Hon Industrial Co., Ltd
No. 418 Hsi-Hu Road
Ta-Li City (41263)
Taichung Hsien
Taiwan

Manufacturer: Nal Hon Industrial Co., Ltd

Client order: T/0698B

Order received: 6 March 2020

Model: YIC001NT

Dates of tests: 6 May 2020 to 21 December 2020

Type of testing: Qualification testing

Signed:

Steven Sum, Laboratory Manager

Issued: 22 December 2020

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 ANAB Scope of Accreditation.

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Summary of assessment*

Clause	Requirement	Assessment (See Key)
3.1.1	Surface finish of hardware	Pass
3.1.2	New and Unused	Pass
3.1.3	Snaphooks & Carabiners	Pass
3.1.4	D-rings, O-rings & Oval rings	
3.1.5	Buckles and adjusters	
3.1.6	Proof load testing	
3.1.7	Dynamic drop test	Pass
5.1 / 5.2	Marking	Ltd
5.3	Instructions	Pass

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. (2H010+)
Carabiner, model YIC001NT	21	13 January 2020	01 to 21

Procedures

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

Testing was performed in accordance with ANSI Z359.12-2019 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 City, China.

Result details

3.1 Component and Element Requirements

3.1.1 Surface Finish of Hardware

Specimens 2H01001 to 2H01003 were assessed.

a)	The finishes of the specimens were clean and free of scale, rust and deposits of foreign matter.	Pass
b)	Following the salt spray test, there were no evidence of either, red rust visible to the unaided eye, or corrosion of the base metal of the specimens.	Pass
c)	All surfaces of the specimens, which may come in contact with tearable materials, were free of burrs, pits, sharp edges and rough surfaces.	Pass

3.1.2 Condition of Hardware

All specimens were new and unused when received. Pass

3.1.3 Snaphooks and Carabiners

Specimen 2H01004 was assessed.

	The connector incorporated a self-closing gate.	Pass
	The gate locked automatically when the gate closed.	Pass
	The connector was capable of being opened only by at least two consecutive, deliberate actions.	Pass
3.1.3.1	When tested along the major axis, specimens 2H01004 to 2H01006 withstood the 5,000 pound force for 1 minute without breaking. The gate did not separate from the nose of the snaphook body.	Pass
3.1.3.2	During the gate face test, specimens 2H01010 to 2H01012 withstood the 3,600 pounds force for 1 minute and the gate did not separate from the nose.	Pass
3.1.3.3	During the gate side test, specimens 2H01013 to 2H01015 withstood the 3,600 pounds force for 1 minute and the gate did not separate from the nose.	Pass
3.1.3.4	When tested along the minor axis, specimens 2H01007 to 2H01009 withstood the 3,600 pounds force applied to a point midway between the nose and gate hinge for 1 minute without breaking and without distortion sufficient to release the gate.	Pass
3.1.3.5	The clause is not applicable to the type of connector tested.	NAp
3.1.3.6	The clause is not applicable to the type of connector tested.	NAp

3.1.7 Dynamic drop test

When tested to the dynamic drop tests following abrasion and cold conditioning, specimens 2H01019 to 2H01021 withstood the drop tests without permanent deformation sufficient to release the gate. Pass

5.1 General Marking Requirements

5.1.1 Markings shall be in English. Pass

5.1.2 The requirement that markings shall be expected to remain present and legible throughout the expected life of the component being marked was not assessed. NAs

5.1.3 Any restrictions on the use of such connectors (hardware) shall be marked on the connectors (hardware) or components, subsystems and systems of which they are an integral part. (No restrictions were listed.) NAp

5.2 Specific Marking Requirements

5.2.1 Connectors. Connectors (all components listed in 3.1.6, requiring proof loading as per this standard, i.e. snaphooks, carabiners, D-rings, O-rings and Oval rings) shall be marked to identify the following:

· Year of manufacture; Pass

· Manufacturer's identification; Pass

· Markings for connectors shall be sufficient to provide traceability; Pass

· Load rating for the major axis of the connector stamped or otherwise permanently marked on the device, minimum 5,000 lb (22 kN); [5000 lbs] Pass

· Load rating for gate stamped or otherwise permanently marked on the gate mechanism; [3600 lbs] Pass

· For connectors that are non-integral part (non-captive eye), then "ANSI Z359.12-XX" ("XX" denotes year of standard) is required. Pass

5.3 Specific Instruction Requirements

5.3.1 Connectors. Instructions for connector components supplied separately to the user which are not integral to the product (i.e. are removable from the product) shall include:

· The material used in the connector construction; Pass

· The size of the connector and dimensions affecting its compatibility with objects to which it may be connected; Pass

· The need to make only compatible connections and limitations of compatibility; Pass

· Proper method of coupling the connector and checking that it is closed and locked; Pass

· The minimum strength of the connector body when loaded in the direction set forth in the applicable sections of this standard; Pass

· The minimum strength of carabiner and snaphook gates when loaded in the directions set forth in 3.1.3. Pass

Estimates of the uncertainty of measurement

Clause	Test		Uncertainty
3.1.1	Surface finish of hardware		See Note 1
3.1.2	New and Unused		See Note 1
3.1.3	Snaphooks and carabiners	Tensile test	±1.4%
		Gate resistance	±1.4%
3.1.4	D-rings, O-rings and Oval rings		See Note 1
3.1.5	Buckles and Adjusters		See Note 1
3.1.6	Proof load testing		-
3.1.7	Dynamic Drop test		See Note 1
5.1 / 5.2	Marking		-
5.3	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 assessment to the pass/fail criteria.

ANNEX

This Annex comprises one section.

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

END OF REPORT

Nal Hon Industrial Co., Ltd. –
Carabiner, model YIC001NT