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# NAL HON INDUSTRIES CO. LTD

# TEST REPORT

**SCOPE OF WORKs**
ANSI Z359.12-2009 Safety Requirements for Connecting Components for Personal Fall Arrest Systems

**REPORT NUMBER**
104162718CRT-001a

**ISSUE DATE**
12/19/19

**PAGES**
6

**DOCUMENT CONTROL NUMBER**
GFT-OP-10a (6-March-2017)


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# TEST REPORT FOR NAL HON INDUSTRIES CO. LTD

Report No.: 104162718CRT-001a
December 19th 2019

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**Taichung City**
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**Report Number..... :** 104162718CRT-001a

**Signed Quote Number..... :** Qu-01020583

**PO Number** None

**Name of Testing Laboratory Preparing the Report ..... :** Intertek Testing Services NA Inc.

**Test Specification:**

**Standard..... :** ANSI/ASSP Z359.12-2009

**Date(s) of Testing..... :** 12/16/19 – 12/19

**Product Description:**

**Product Type: ..... :** Carabiner

**Brand Name: ..... :** Nal Hon Industries

**Model Number(s): ..... :** YAE 200 / YAE 210 Carabiner

**Date(s) Samples Received ..... :** 12/16/19

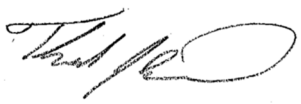
## SECTION 1

**SUMMARY OF TESTING**

| TESTS COMPLETED | ANSI/ASSP Z359.12-2009 CLAUSE | STATUS |
|---|---|---|
| Surface Finish of Hardware 48 Hour Salt Spray | 3.1.1.1 | Pass |
| Gate Face Testing of Snap hook & Carabiner | 4.2.1.1.2 | Pass |
| Side Load Testing of Snap hook & Carabiner Gates | 4.2.1.1.3 | Pass |
| Minor Axis Testing of Snap hook & Carabiner Gates | 4.2.1.1.4 | Pass |
| Tensile Testing of Snap hook & Carabiner Bodies | 4.2.1.1.1 | Pass |
| Dynamic Strength Testing | 4.2.3.1 | Pass |
| Markings and Instructions | 5 | FAIL |

## SECTION 2

**This test report concludes the work anticipated in the testing phase of your project. If there are any questions regarding this report please contact the undersigned at 607-753-6711.**

| | | | |
|---|---|---|---|
| **COMPLETED BY:** | Theodore Brown | **REVIEWED BY:** | Matthew Stevens |
| **TITLE:** | Technician | **TITLE:** | Reviewer |
| **SIGNATURE:** |  | **SIGNATURE** |  |
| **DATE** | 12/19/19 | **DATE:** | 12/19/19 |

**Please see attached test data for details.**

<table>
<tr><th>SECTION (TEST)</th><th>REQUIREMENT</th><th>RESULTS</th></tr>
<tr><td>3.1.1.3 / 4.2.1.1.2</td><td>Gate Face Testing of Snaphook & Carabiner:<br>Apply a load perpendicular to the face of the gate at a point as close to the nose as possible. Apply a load < 3 inches per minute until 3,600 lbs. has been achieved and hold for one minute. While the load is applied measure the distance of gate separation at the point of minimum clearance. Opening shall not exceed 0.125 inches.<br>TEST 3 SAMPLES</td><td>
<table>
<tr><td>Sample #</td><td>1</td></tr>
<tr><td>Break</td><td>No</td></tr>
<tr><td>Gate opening</td><td>< 0.125</td></tr>
</table>
<table>
<tr><td>Sample #</td><td>2</td></tr>
<tr><td>Break</td><td>No</td></tr>
<tr><td>Gate opening</td><td>< 0.125</td></tr>
</table>
<table>
<tr><td>Sample #</td><td>3</td></tr>
<tr><td>Break</td><td>No</td></tr>
<tr><td>Gate opening</td><td>< 0.125</td></tr>
</table>
</td></tr>
<tr><td>3.1.1.3 / 4.2.1.1.3</td><td>Side Load Testing of Snaphook & Carabiner Gates:<br>Apply a load parallel to the gate at the midpoint between the nose and gate hinge. Measure the height (h initial) from the test bed, apply the load until 3,600 lbs-f is achieved and maintain for 1 minute. Measure the distance of gate separation with the load applied. Release the load and measure the height (h final) from the test bed. Determine the permanent deformation (h initial – h final) of the gate. Gate opening and deformation shall not exceed 0.125 inches.<br>TEST 3 SAMPLES</td><td>
<table>
<tr><td>Sample #</td><td>1</td></tr>
<tr><td>Break</td><td>No</td></tr>
<tr><td>Gate Opening</td><td>< 0.125</td></tr>
<tr><td>Hin</td><td>60mm</td></tr>
<tr><td>HFn</td><td>58mm</td></tr>
<tr><td>Deformation</td><td>2mm</td></tr>
</table>
<table>
<tr><td>Sample #</td><td>2</td></tr>
<tr><td>Break</td><td>No</td></tr>
<tr><td>Gate Opening</td><td>< 0.125</td></tr>
<tr><td>Hin</td><td>60mm</td></tr>
<tr><td>HFn</td><td>57mm</td></tr>
<tr><td>Deformation</td><td>3mm</td></tr>
</table>
<table>
<tr><td>Sample #</td><td>3</td></tr>
<tr><td>Break</td><td>No</td></tr>
<tr><td>Gate Opening</td><td>< 0.125</td></tr>
<tr><td>Hin</td><td>60mm</td></tr>
<tr><td>HFn</td><td>58mm</td></tr>
<tr><td>Deformation</td><td>2mm</td></tr>
</table>
</td></tr>
<tr><td>3.1.1.1 / 8.3</td><td>Surface Finish of Hardware 48 Hour Salt Spray (ASTM B117)</td><td>
<table>
<tr><td>Sample #</td><td>1,2,3</td></tr>
<tr><td>Corrosion</td><td>None</td></tr>
<tr><td>Function</td><td>Yes</td></tr>
</table>
</td></tr>
<tr><td>3.1.1.3 / 4.2.1.1.4</td><td>Minor Axis Testing of Snaphook & Carabiner Gates:<br>Apply a load parallel to the inside face of the gate until 3,600 lbs-f is achieved and at a rate < 3 inches per minute. Gate shall not release.<br>TEST 3 SAMPLES</td><td>Sample(s) # 1,2,3<br>Break= No<br>Gate Release= No</td></tr>
<tr><td>3.1.1.3 / 4.2.1.1.1</td><td>Tensile Testing of Snaphook & Carabiner Bodies:<br>(Includes Proof Load Test, 4.3.2)<br>Test load to 3,600 lbs-f (proof load) between the bearing points at a rate > 1 minute and maintain the load for a minimum of 1 minute. Then test load to 5,000 lbs-f between the bearing points at a rate > 1 minute and maintain the load for a minimum of 1 minute. The gate shall not release.<br>TEST 3 SAMPLES</td><td>Sample(s) # 1,2,3<br>Break= No<br>Gate Release= No</td></tr>
</table>

| SECTION (TEST) | REQUIREMENT | RESULTS |
|---|---|---|
| 4.2.3.3 | Rotate 3 samples on steel hardened hex bar for 50,000 cycles between 50-75 RPM<br><br>Cold Conditioning, -35 +/- 2 C for a minimum of 8 hrs<br><br>Dynamic Test Procedure:<br><br>Test 3 samples within 5 minutes after removing from the chamber noted above, Test weight = 100 kg (220 +/-2 lbs.) Start with free fall distance of 150 mm (6 inches) then adjust to reach an arresting force between 22.5-24 KN (5,000- 5,405 lbs-force) prior to actual test. | Drop Height: 2' - 1 ½'<br><br>MAF (Lbf)<br><br>Sample 1: 5008 Lbf<br><br>Sample 2: 5428 Lbf<br><br>Sample 3: 6094 Lbf<br><br>Notes: N/A |
| 5 | 5.1 General Marking Requirements:<br><br>5.1.1; Markings shall be in English<br>5.1.2; Legibility and attachment shall endure for the life of the component.<br>5.1.3; mark any restrictions of use<br><br>5.2.1 Specific Markings for Connectors:<br><br>Connectors shall be marked as described below:<br>1. year of manufacturer<br>2. manufacturer's identification<br>3. markings for connectors shall be sufficient to provide traceability.<br>4. load rating for the major axis<br>5. load rating for the gate stamped<br>6. For connectors that are non-integral, include the standard number. | 1: NO<br><br>2: NO<br><br>3: NO<br><br>1. NO<br><br>2. NO<br><br>3. NO<br><br>4. NO<br><br>5. NO<br><br>6. NO |

## SECTION 5

**REVISION HISTORY**

| REPORT NUMBER | DATE OF REVISION | DESCRIPTION OF CHANGE: | PROJECT OWNER | REVIEWED BY |
|---|---|---|---|---|
| 104162718CRT-001a | 12/19/19 | Original | Theodore Brown | Matthew Stevens |

**Sample Picture(s)**