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LOAD TESTING OF Z-CLIPS AND RAILS

Eagle Aluminum	Date:	April 26, 2024
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REVISION NOTES

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Respectfully submitted,

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INTRODUCTION

This report presents the results of the vertical load testing of 2.5” Z-clips, and 48” Z-Clip rails. Tom Henrich of Eagle Aluminum submitted the samples for the testing.

OBJECTIVE

The scope of our work was limited to vertically loading the Z-clips in their normally installed position and providing a certification report of the results. Testing was completed on April 12, 2024.

SAMPLE IDENTIFICATION

Submitted by	Tom Henrich
Sample Description	Test 1 Qty (3) Z-clips mated to a 48” rail clips spaced 16” on center Test 2 Qty (4) Z-clips mated to a 48” rail clips spaced 12” on center Test 3 Qty (1) 48” rail mated to a 48” rail utilizing all 6 screw attachment points

Table 1. Sample Descriptions

The results of this test apply only to the units identified in this Engineering Report by device identifier and model / part number, or serial number.

TEST PROCEDURE

The Z-clips and rails were installed into 2”x8” SPF (Spruce, Pine, Fir) boards with No. 8 – ¾” wood screws. 1/8” diameter pilot holes were drilled into the 2”x8” prior to installing the screws.

The test was conducted at a constant cross-head speed of 0.4 in/min. The test was run until load yielded or until failure occurred.

The moisture content of the boards used in testing was determined using a moisture meter. All boards used measured between 7-8% moisture content.

TEST SETUP

Figure 1. Vertical Load Test Setup (typical)

Figure 2. 2.5” clip installation (typical)

TEST SETUP

Figure 3. Clip Engagement (typical)

CALIBRATED TEST EQUIPMENT

Description	Asset ID#	Calibration Due Date
Honeywell Temp/RH Chart Recorder	MM190-024	08 June 2024
MTS Universal Test Machine	MM210-009.3	24 May, 2024
MTS Load Cell	MM210-009.2	24 May, 2024
Measuring tape	PT166-087	19 September, 2024
Delmhorst BD-2100 Moisture meter	PT163-053	Calibrated Before Use

Table 2. Test Equipment

TEST RESULTS

Test 1 - Three (3) Z-clips mated to One (1) 48” rail.

Failure mode was screw pullout from the wood. The peak load was 899.56lbs.

Test 2 - Four (4) Z-clips mated to One (1) 48” rail.

Failure mode was screw pullout from the wood. The peak load was 898.73lbs.

Test 3 - One (1) 48” rail mated to One (1) 48” rail.

Failure mode was screw pullout from the wood. The peak load was 878.64lbs.

SUMMARY OF TEST RESULTS

Description	Peak Load	Failure Mode
Three (3) Z-clips mated to One (1) 48” rail	899.56lbs	Screw pullout from wood
Four (4) Z-clips mated to One (1) 48” rail	898.73lbs	Screw pullout from wood
One (1) 48” rail mated to One (1) 48” rail	878.64lbs	Screw pullout from wood

Table 3. Test Equipment