Technical Bulletin

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Guidelines for Fastener Pull Tests

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Mule-Hide requires fastener pull tests on various deck types that routinely fail to meet our minimum warranty requirements. Below is a list of the most common deck types that require pull out testing for warranty consideration. The fastener pull testing must be received before any warranty application can be reviewed.

- Lightweight Insulating Concrete
- Gypsum (plank or poured in place)
- Cementitious Wood Fiber (Tectum)
- Metal Roof Panels (Standing seam, corrugated and other profiles)
- Oriented Strand Board (OSB)
- Other deck type may apply. Contact Mule-Hide Technical Department with any questions.

Typically, these tests are performed by an independent third party such as a fastener manufacturer, however in unusual cases the project timetable requires an alternative solution. When this occurs it is possible to perform and submit pull tests to Mule-Hide to verify the deck is an acceptable substrate for a Mule-Hide roofing system, as long as this procedure is followed and proper documentation is provided. **Until the report is submitted, reviewed and results deemed sufficient to install the proposed system, it is not advisable to begin insulation or membrane installation**. (This procedure is based on **ANSI/SPRI FX-1 2016 Standard Field Test Procedure for Determining the Withdrawal Resistance of Roofing Fasteners**)

Equipment Requirements

1. Use a pullout tester with either a hydraulic or electronic load cell. The gauge shall display values in lbf (kN) or psi (kPa). Conversion formulas are provided on Form B (Copy attached). During testing, the values obtained shall fall within the working range of the gauge.
2. The load gauge shall have a dated calibration certificate showing the calibrated values for the full range of the load gauge. The gauge shall be accurate to +/- 5% of the reading. Calibration shall be performed to a standard that is traceable to a nationally recognized source. The load gauge shall be calibrated every 12 months or sooner if it is suspected that the gauge is out of calibration.

Procedure

1. Complete all the project information and testing criteria on form A (Copy attached)
2. Remove any roofing materials (i.e. roofing membrane, existing insulation) before the test is performed. Use of a core cutter has been found to be an effective method of removing materials above the deck before performing the pull tests.
3. It is beneficial to bring a variety of fastener options for the deck type being tested in case a specific fastener does not meet the minimum pull resistance criteria for the system attachment type desired.
4. The fastener shall be installed using the same method and tools as will be used during actual construction (i.e. depth of installation, pre-drilled hole diameter, proper installation tools).
5. Refer to Mule-Hide's Fastener Guidelines for specifics related to minimum embedment or protrusion (this is defined for each deck type) for the specific fastener being tested.
6. The fastener shall be pulled out perpendicular to the deck.
7. Record the results of all pullout tests and a photograph of the tester value on Form B.
8. Perform a minimum of 10 pullouts for up to 50,000 ft2 (500 squares), and 5 additional pullouts for each additional 50,000 ft2 (500 squares) or portion thereof on each project. Perform the pullouts in various areas of the roof including corners, perimeter and field to provide a representative sampling of the roof area. 50% of the tests shall be performed in the corners and perimeter areas.
9. When testing a single building, each roof section with a different elevation or deck type are different test areas and shall be tested and reported separately.
10. Prepare a roof plan (on the last page of Form B) to identify the location of each pullout.
11. The roof plan shall be marked with the corresponding test number of each pullout test as recorded on Form B. The roof plan need not be to scale.
12. Record all pullout values from all tests performed.

Form A Pull Out Test Report

(Refer to the **Standard Field Test Procedure for Determining the Withdrawal Resistance of Roofing Fasteners** for full documentation)

Report results on reverse side.

Job name:	
Location:	
Test date: / /	**Ambient temperature:** °
Roof area: Sq. ft	**Tester mfg:**
Max. cap. of tester:	**Select one:** ☐ lbf ☐ kN
Date of last calibration: / /	**Number of pulls recorded on Form B:**
Fastener tested:	**Fastener manufacturer:**
Fastener tested:	**Fastener manufacturer:**
Fastener tested:	**Fastener manufacturer:**
Test performed by:	
Witnessed by:	**Test cut areas repaired by:**

Project type (select one): ☐ New construction ☐ Tear off ☐ Retrofit

Deck type (select one):

☐ Steel	Gauge:	
☐ Structural concrete	Thickness:	Select one: ☐ Poured in place ☐ Precast
☐ Lightweight concrete	Thickness:	
☐ Insulating concrete	Thickness:	
☐ Cementious wood fiber	Thickness:	
☐ Gypsum	Thickness:	Select one: ☐ Poured in place ☐ Precast
☐ Wood	Thickness:	Select one: ☐ OSB ☐ Plywood ☐ Plank
☐ Fiberglass	Thickness:	
☐ Other:_____	Thickness:	

Embedment or protrusion:

Drill bit diameter, where applicable:

Optional Information

Test time:	**Building height:**	**Thickness of existing roof assembly:**

New system manufacturer:

Roof cover type (select one):

☐ Mechanically attached single-ply	☐ Modified bitumen
☐ Ballasted single-ply	☐ Built-up roofing
☐ Adhered single-ply	☐ Other: _____

New insulation:
Type: Thickness:

Form B Pull Out Test Report

Report all test results and units of measure.

Conversion formulas

lbf × .00448222 = kN × 224.8089431 = lbf psi × 6.895 = kPa × 0.145 = psi

1.	6.	11.	16.
2.	7.	12.	17.
3.	8.	13.	18.
4.	9.	14.	19.
5.	10.	15.	20.

Pullout Results of Additional Tests Performed 4.5.

1.	6.	11.	16.
2.	7.	12.	17.
3.	8.	13.	18.
4.	9.	14.	19.
5.	10.	15.	20.

Deviation from standard procedure authorized by:

Reason for deviation:

Roof plan not to scale. Identify where the pullouts were performed with corresponding test number.

Comments

Disclaimer: Manufacturer's installation requirements shall be followed when using any of the tested fasteners. Neither the technician performing the pullout tests not his/her company is responsible for the waterproofing integrity of the repairs. This test report does not certify the structural integrity of the roof deck.