

# ML150 Panel

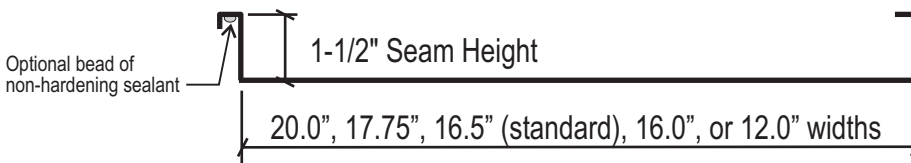
## Technical Data Guide

### Description

ML150 is a mechanical seamed standing seam roofing panel used on low to steep sloped commercial applications. The panel is factory formed in continuous lengths up to 60'-0" long. Attachment to either open framing or solid substrate with galvanized steel clips at specific intervals. Refer to product test results for clip spacing requirements. Clips are available in fixed and floating design. Floating clips allow for thermal expansion and contraction of long panel lengths.

### Application

Product can be applied to various solid substrate applications such as wood sheathing, wood planking, metal decking, and rigid insulation applied over metal decking. Minimum recommended slope is 1:12. The ML150 panel is applicable for



### Test Results

#### ASTM E-283 Air Infiltration

Standard Test Method for Determining Rate of Air Leakage

Static Pressure Differential	Air Infiltration Rate
6.24 psf	0.006 cfm/ft <sup>2</sup>

#### ASTM E-331 Water Penetration

Standard Test Method for Water Penetration

Static Pressure Differential	Water Infiltration
6.24 psf	No Water Leakage
12.00 psf	No Water Leakage
15.00 psf	No Water Leakage

#### ASTM E-1592 Structural Performance - for 16-1/2" wide, 24 gauge ML150 Panel

Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference

Clip Spacing	Ultimate Load	Design Load
12" on center	244.4 psf	122.2 psf
48" on center	83.2 psf	41.6 psf

Notes:

1. The design load is calculated by dividing the ultimate load by the factor of safety of 2.0
2. Panel seam is 180 degree (double lock) profile

#### UL 1897 Wind Uplift Resistance - for 16" wide, 24 gauge ML150 Panel over 15/32" plywood

Standard test method to provide uplift resistance data for the evaluation of the attachment of roof covering to roof decks

Clip Spacing	Ultimate Load	Design Load
6" on center	247 psf	123.5 psf
24" on center	119.5 psf	59.75 psf

Notes:

1. The design load is calculated by dividing the ultimate load by the factor of safety of 2.0
2. Panel seam is 180 degree (double lock) profile



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## Test Results (contd.)

### UL 1897 Wind Uplift Resistance - for 16-1/2" wide, 24 gauge ML150 Panel over 15/32" plywood

*Standard test method to provide uplift resistance data for the evaluation of the attachment of roof covering to roof decks*

Clip Spacing	Ultimate Load	Design Load
6" on center	168 psf	84 psf
24" on center	105 psf	52.5 psf

Notes:

1. The design load is calculated by dividing the ultimate load by the factor of safety of 2.0
2. Panel seam is 180 degree (double lock) profile
3. Panel clip: ML150 #31 Butterfly Expansion Clip (28 gauge stainless steel)

## Florida Approval Listings - Florida Bldg. Code 5th Addition (2014)

- FL9443.2 ML150 Panel up to 16" wide x 24 gauge over 15/32" Plywood
- FL17643.1 ML150 Panel up to 20" wide x 0.032" aluminum over 22 gauge steel decking
- FL17643.2 ML150 Panel up to 20" wide x 24 gauge over 19/32" Plywood
- FL17643.3 ML150 Panel up to 20" wide x 24 gauge over 22 gauge steel decking
- FL17643.4 ML150 Panel up to 20" wide x 24 gauge or 0.032" aluminum over 15/32" Plywood
- FL20484.4 ML150 Panel up to 16-1/2" wide x 24 gauge over 15/32" Plywood



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## Underwriters Laboratories Approval Listings

### UL790 Fire Resistance of Roof Covering Materials & UL2218 Impact Resistance of Roof Covering Materials

#### TGFU.R20494 Roofing Systems

##### Class A

Coated steel panels (surfacing) identified as "R Panel", "PBR Panel", "MasterRib", "5V Panel", "Advantage-Lok", "Advantage-Lok II", "Performa Steel Shingle", "Relia-Clad", "CSL Standing Seam" (SL150), "ML150", "ML200" and "SL175"

**1. Deck:** C-15/32 **Incline:** Unlimited **Impact:** Class 4  
Barrier Board: — 1/4 in. (min) G-P Gypsum DensDeck® with all joints staggered a min of 6 in. from the plywood joints.  
Ply Sheet (Optional): — Any UL Classified Type G1, G2 or G3 base/ply sheet, Type 15, 20 or 30 felt or UL Classified prepared roofing accessory or WR Grace "Ice and Water Shield".  
Surfacing: — Coated Steel roofing panels, mechanically fastened or with steel screws when roof deck fasteners (panel clips) not required.

**2. Deck:** C-15/32 or spaced sheathing **Incline:** Unlimited **Impact:** Class 4  
Underlayment: — One layer Elk Corp. "VersaShield Underlayment", mechanically fastened.  
Ply Sheet (Optional): — One layer Type 30 base sheet or Elk Corp. "VersaShield", mechanically fastened.  
Surfacing: — Coated Steel roofing panels, mechanically fastened or with steel screws when roof deck fasteners (panel clips) not required.

**3. Deck:** C-15/32 or spaced sheathing **Incline:** Unlimited **Impact:** Class 4  
Underlayment: — One or more layer Elk Corp. "VersaShield Underlayment", mechanically fastened.  
Batten: — 2" x 2" wood battens  
Surfacing: — Coated Steel roofing panels, mechanically fastened or with steel screws when roof deck fasteners (panel clips) not required.

**4. Deck:** NC **Incline:** Unlimited **Impact:** Class 4  
Barrier Board: — 1/4 in. min. G-P Gypsum DensDeck®.  
Ply Sheet (Optional): — Any UL Classified Type G1, G2 or G3 base/ply sheet, Type 15, 20 or 30 felt or UL Classified prepared roofing accessory or WR Grace "Ice and Water Shield".  
Surfacing: — Coated Steel roofing panels, mechanically fastened or with steel screws when roof deck fasteners (panel clips) not required.

**5. Deck:** NC **Incline:** Unlimited **Impact:** Class 4  
Barrier Board: — 7/16 OBS or 5/8 in. plywood over polyisocyanurate insulation board or polyisocyanurate composite board, any thickness.  
Ply Sheet (Optional): — Any UL Classified Type G1, G2 or G3 base/ply sheet, Type 15, 20 or 30 felt or UL Classified prepared roofing accessory or WR Grace "Ice and Water Shield".  
Surfacing: — Coated Steel roofing panels, mechanically fastened or with steel screws when roof deck fasteners (panel clips) not required.

**6. Deck:** NC **Incline:** Unlimited **Impact:** Class 4  
Insulation: — Polyisocyanurate, glass fiber, perlite or wood fiber, any thickness.  
Ply Sheet (Optional): — Any UL Classified Type G1, G2 or G3 base/ply sheet, Type 15, 20 or 30 felt or UL Classified prepared roofing accessory or WR Grace "Ice and Water Shield".  
Surfacing: — Coated Steel roofing panels, mechanically fastened or with steel screws when roof deck fasteners (panel clips) not required.

**7. Deck:** NC **Incline:** Unlimited **Impact:** Class 4  
Insulation: — None required, however any UL Classified insulations may be used over open purlin spans. Any combination and any total thickness of insulation may be used.  
Surfacing: — Coated Steel roofing panels, mechanically fastened or with steel screws when roof deck fasteners (panel clips) not required.

##### Class C

Coated steel panels (surfacing) identified as "R Panel", "PBR Panel", "MasterRib", "5V Panel", "Advantage-Lok", "Advantage-Lok II", "Performa Steel Shingle", "Relia-Clad", "CSL Standing Seam" (SL150).

**1. Deck:** C-15/32 **Incline:** Unlimited **Impact:** Class 4  
Surfacing: — Coated Steel roofing panels, mechanically fastened or with steel screws when roof deck fasteners (panel clips) not required.

### Maintenance and Repair Class A

Coated steel panels (surfacing) identified as "R Panel", "PBR Panel", "MasterRib", "5V Panel", "Advantage-Lok", "Advantage-Lok II", "Performa Steel Shingle", "Relia-Clad", "CSL Standing Seam", "ML150", "ML200" and "SL175".

**1. Deck:** C-15/32 or spaced sheathing **Incline:** Unlimited **Impact:** Class 4  
Existing Roof System: — Any class A, B, or C shingle  
Underlayment: — One layer Elk Corp. "VersaShield Underlayment", mechanically fastened.  
Surfacing: — Coated Steel roofing panels, mechanically fastened or with steel screws when roof deck fasteners (panel clips) not required.



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### Underwriters Laboratories Approval Listings

#### UL580 Class 90 Wind Uplift Resistance

##### **Construction No. 512 - Steel or Aluminum ML150 Panel over Rigid Insulation over Metal Decking**

1. Metal Panels: No. 24 MSG minimum thickness coated steel. Panel width 12 to 20 inches maximum
- 1a. Metal Panel: 0.032 inch thick aluminum. Panel width 12 to 20 inches maximum
2. Liner Panel (decking): No. 22 MSG minimum thickness coated steel (yield strength to be 33,000 psi). Minimum depth 1-1/2 inch, maximum pitch 6 inch fabricated in various profiles
3. Panel Clips: 0.015 inch minimum stainless steel (ML150 butterfly expansion). Spaced 12 inches on center
4. Fasteners: used to attach panel clips to liner panel to be No. 12-13 truss head coated steel screw. Length to be 3/4 inch longer than overall thickness of roof deck. Two screws per clip.
- 4a. Fasteners: used to attach panel clips to plywood or OSB cover board to be No. 10x1 inch steel screw. Two screws per clip.
5. Insulation: Rigid insulation maximum 10 inches thickness combined with optional cover board layer
6. Cover Board (optional): Minimum 1/2 inch thickness plywood, minimum 7/16 inch OSB, 1/2 inch thick gypsum board, 1/2 inch thick wood fiberboard, or 1/4 min thickness glass fiber gypsum sheathing
7. Bearing Plates: Minimum 4 inch by 4 inch by No. 26 MSG minimum thickness galvanized steel

##### **Construction No. 512A - Steel or Aluminum ML150 Panel over 5/8" Plywood Sheathing**

1. Metal Panels: No. 24 MSG minimum thickness coated steel. Panel width 12 to 20 inches maximum
- 1a. Metal Panel: 0.032 inch thick aluminum. Panel width 12 to 20 inches maximum
2. Decking: Minimum 5/8 inch (19/32 inch actual) thickness plywood, exposure 1, APA rated sheathing
3. Panel Clips: 0.015 inch minimum stainless steel (ML150 butterfly expansion). Spaced 12 inches on center
4. Fasteners: used to attach panel clips to plywood to be No. 10-12 by 1 inch long coated steel screw. Two screws per clip.
5. Insulation (optional): Rigid insulation maximum 10 inches thickness combined with optional cover board layer
6. Cover Board (optional): Minimum 1/2 inch thickness plywood, minimum 7/16 inch OSB, 1/2 inch thick gypsum board, 1/2 inch thick wood fiberboard, or 1/4 min thickness glass fiber gypsum sheathing
7. Bearing Plates: when used with rigid insulation minimum 4 inch by 4 inch by No. 26 MSG minimum thickness galvanized steel

##### **Construction No. 554 - Steel ML150 Panel over 1/2" Plywood Sheathing**

1. Metal Panels: No. 24 MSG minimum thickness coated steel. Panel width 16 inches maximum
2. Decking: Minimum 1/2 inch (15/32 inch actual) thick APA Rated sheathing
3. Panel Clips: No. 24 MSG minimum coated steel (ML150 fixed clip). Space clips 24 inches on center maximum
4. Fasteners: used to attach panel clips to plywood to be No. 10-12 by 1 inch long coated steel screw. Two screws per clip.

##### **Construction No. 588 - Steel ML150 Panel over 5/8" Plywood Sheathing**

1. Metal Panels: No. 24 MSG minimum thickness coated steel. Panel width 16 inches maximum
2. Decking: Minimum 5/8 inch (19/32 inch actual) thick APA Rated sheathing
3. Panel Clips: Two part assembly 4-1/4 inch long coated steel (ML150 expansion clip). Space clips 36 inches on center maximum
4. Fasteners: used to attach panel clips to plywood to be No. 14-13 by 1-5/8 inch long coated steel screw. Two screws per clip.

##### **Construction No. 603 - Aluminum ML150 Panel over 5/8" Plywood Sheathing**

1. Metal Panels: 0.032 inch minimum thickness aluminum. Panel width 20 inches maximum
2. Decking: Minimum 5/8 inch (19/32 inch actual) thick APA Rated sheathing
3. Panel Clips: Two part assembly 4-1/4 inch long coated steel (ML150 expansion clip). Space clips 36 inches on center maximum
4. Fasteners: used to attach panel clips to plywood to be No. 14-13 by 1-5/8 inch long coated steel screw. Two screws per clip.

Complete UL assembly information for each construction number can be referenced online at Underwriters Laboratories Online Certifications Directory ([UL.com](http://UL.com)).



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### Approval Listings

#### UL580 Class 90 Wind Uplift Resistance (continued)

##### Construction No. 604 - Zinc ML150 Panel over 5/8" Plywood Sheathing

1. Metal Panels: 0.032 inch minimum thickness Zinc. Panel width 16 inches maximum
2. Decking: Minimum 5/8 inch (19/32 inch actual) thick APA Rated sheathing
3. Panel Clips: Two part assembly 4-1/4 inch long stainless steel (ML150 expansion clip). Space clips 36 inches on center maximum
4. Fasteners: used to attach panel clips to plywood to be No. 14-13 by 1-5/8 inch long coated steel screw. Two screws per clip.

##### Construction No. 605 - Copper ML150 Panel over 5/8" Plywood Sheathing

1. Metal Panels: 0.022 inch minimum thickness or 16 oz. Copper. Panel width 16 inches maximum
2. Decking: Minimum 5/8 inch (19/32 inch actual) thick APA Rated sheathing
3. Panel Clips: Two part assembly 4-1/4 inch long stainless steel (ML150 expansion clip). Space clips 36 inches on center maximum
4. Fasteners: used to attach panel clips to plywood to be No. 14-13 by 1-5/8 inch long coated steel screw. Two screws per clip.

##### Construction No. 656 - Steel ML150 Panel over Rigid Insulation over 5/8" Plywood Sheathing

1. Metal Panels: No. 24 MSG minimum thickness coated steel. Panel width 20 inches maximum
2. Decking: Minimum 5/8 inch (19/32 inch actual) thickness plywood, exposure 1, APA rated sheathing
3. Panel Clips: 0.015 inch minimum stainless steel (ML150 butterfly expansion). Spaced 24 inches on center
4. Fasteners: used to attach panel clips to plywood to be No. 12 pancake head coated steel screw. Two screws per clip.
5. Insulation: Rigid insulation maximum 10 inches thickness combined with optional cover board layer
6. Cover Board (optional): Minimum 1/2 inch thickness plywood, minimum 7/16 inch OSB, 1/2 inch thick gypsum board, 1/2 inch thick wood fiberboard, or 1/4 min thickness glass fiber gypsum sheathing
7. Bearing Plates: when used with rigid insulation minimum 4 inch by 4 inch by No. 26 MSG minimum thickness galvanized steel

##### Construction No. 658 - Steel ML150 Panel over Rigid Insulation over Metal Decking

1. Metal Panels: No. 24 MSG minimum thickness coated steel. Panel width 20 inches maximum
2. Liner Panel (decking): No. 22 MSG minimum thickness coated steel (33,000 psi minimum yield strength). Minimum depth 1-1/2 inch, maximum pitch 6 inch fabricated in various profiles.
3. Panel Clips: 0.015 inch minimum stainless steel (ML150 butterfly expansion). Spaced 24 inches on center
4. Fasteners: to attach panel clips to liner panel to be No. 12 pancake head coated steel screw. Two screws per clip.
5. Insulation: Rigid insulation maximum 10 inches thickness combined with optional cover board layer
6. Cover Board (optional): Minimum 1/2 inch thickness plywood, minimum 7/16 inch OSB, 1/2 inch thick gypsum board, 1/2 inch thick wood fiberboard, or 1/4 min thickness glass fiber gypsum sheathing
7. Bearing Plates: when used with rigid insulation minimum 4 inch by 4 inch by No. 26 MSG minimum thickness galvanized steel

##### Construction No. 663 - Steel ML150 Panel over 5/8" Plywood Sheathing

1. Metal Panels: No. 24 MSG minimum thickness coated steel. Panel width 16 inches maximum
2. Decking: Minimum 5/8 inch (19/32 inch actual) thickness plywood, exposure 1, APA rated sheathing
3. Panel Clips: 0.015 inch minimum stainless steel (ML150 butterfly expansion). Spaced 18 inches on center
4. Fasteners: to attach panel clips to plywood to be No. 10 pancake head coated steel screw. Two screws per clip.

Complete UL assembly information for each construction number can be referenced online at Underwriters Laboratories Online Certifications Directory (UL.com).