

MAC 150

STRUCTURAL
STANDING SEAM
METAL ROOF SYSTEM

Trusted | Tested | Tough



kloeckner metals

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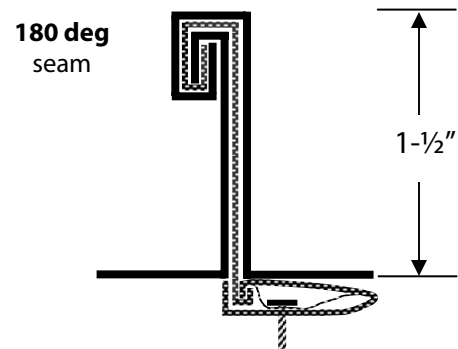
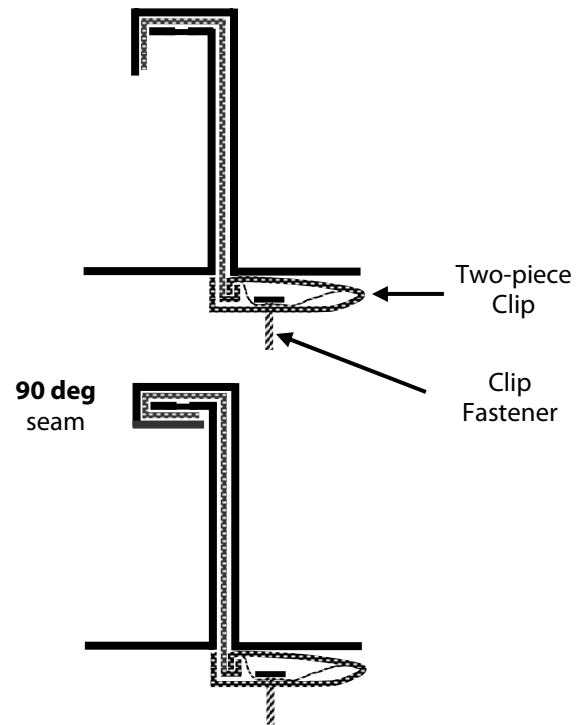
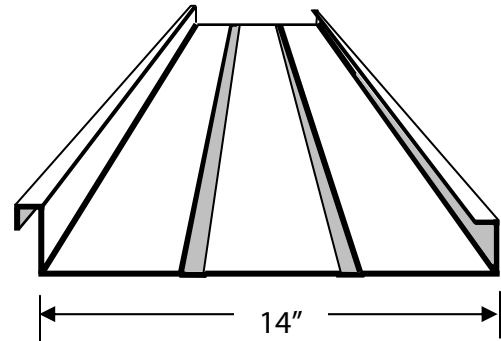
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MAC 150 STANDING SEAM METAL ROOF SYSTEM

MAC 150 FEATURES

PRODUCT DATA

- Kloeckner Metals **MAC 150** is a structural standing seam metal roof system. The panel has 1-½" high standing seams and is mechanically seamed over two-piece, concealed clips.
- Recommended slopes are 1:12 and greater.
- It may be installed over open purlins with a maximum span of 4', on plywood deck, or on rigid foam insulation over steel deck.
- Mechanical seam increases uplift resistance.
- Eight standard stocking colors
- Smooth or ribbed pan surface.
- Optional automatically applied, hot melt seam sealant.
- UL 580 Class 90 Uplift Rating.
- ASTM E 1592 Tested



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ARCHITECT / ENGINEER INFORMATION

1. **MAC 150** is a mechanically seamed, integral standing seam metal roof system, available in widths: 20", 18", 16" and 14".
2. The minimum recommended slope is 1:12. For slopes less than 1:12, call Kloeckner Metals.
3. **MAC 150** is a UL90 rated, structural roofing panel. This panel can be installed directly over purlins or bar joists. It does not require a solid substructure for support.
4. **MAC Curv** can be convex curved to a radius as tight as 100" on 24 gauge steel, and 36" on aluminum and copper. Field forming enables fine tune adjustments for better fit.
5. Narrower widths, heavier gauges, and embossing minimize oil canning. Industry standard is 14" wide, 24 gauge. Oil canning is not a cause for rejection.
6. Substructure must be on an even plane (1/4" tolerance) from eave to ridge to avoid panel distortion (oil canning).
7. All panels require end sealant at eave and valley conditions. However, for illustration purposes, this sealant is not shown on all drawings.
8. The information in this manual is believed to be correct and accurate. It should not be used for any specific application without being reviewed by a registered professional engineer.
9. Avoid restricting thermal expansion and contraction of the **MAC 150** panels (i.e. do not attach panels to the substrate at both the eave and ridge).
10. **MAC 150** panels are not designed to be work platforms. Avoid any unnecessary foot traffic on **MAC 150** panels. If foot traffic is required, protect the roof panels by using some type of roof pad, temporary deck, or walkway.
11. When installing **MAC 150** panels over open framing with blanket insulation: (A) install insulation parallel to purlins or joists, or (B) install insulation across purlins or joists and compress it with pinch bars or hat channels.
12. A vapor retarder may be necessary to protect roofing components when high interior humidity is a factor. An architect or engineer should determine the need for a vapor retarder, as well as the type, placement and location. The following are examples of conditions that may require a vapor retarder: (A) Project where outside temperatures below 40 deg. F are anticipated where average interior relative humidity of 45% or greater is expected; (B) Building usages with high humidity interiors, such as indoor swimming pools, textile manufacturing operations, food, paper or other wet-process industrial plants; (C) Construction elements that may release moisture after the roof is installed, such as interior concrete and masonry, plaster finishes and fuel burning heaters.

CAUTION

Diaphragm capabilities and purlin stability are not provided by Kloeckner Metals MAC 150 roof system. Therefore, other bracing may be required to conform to A.I.S.I or A.I.S.C. specifications

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PREPARATORY REQUIREMENTS

1. The eave purlin must be in the same plane as the roof purlins.
2. Rake angles, hip and valley covers must be installed on top of the purlins prior to installing the **MAC 150** panels. Gauge of the material to be determined by the project engineer.
3. The building must be squared according to accepted building practices.
4. It is critical that the purlins or bar joists at the ridge and end laps be located exactly as detailed and they are straight from rafter to rafter. Any mislocation or bowing of these members can cause the fasteners at the ridge or end laps to foul as the panels expand and contract.
5. Peak purlin spacing:
 - Fixed ridge: 10" (5" from center line of ridge to web of purlin.)
 - Floating ridge: 18" (9" from center line of ridge to web of purlin.)
6. Kloeckner Metals can furnish **MAC 150** roof panels in 14", 16", 18", and 20" widths. However, for the purposes of this manual, we have assumed that the roof panels will be 16" wide.

CAUTION

Application and design details are for illustration purposes only, and may not be appropriate for all environmental conditions or building designs. Projects should be engineered to conform to applicable codes, regulations, and accepted industry practices.

CAUTION

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MAC 150 STANDING SEAM METAL ROOF SYSTEM

ALLOWABLE LOAD TABLES

ALLOWABLE LIVE LOAD (PSF)

Panel Gauge	Panel Width	# of Equal Spans	SPAN (FEET)							
			2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5
24 Gauge Steel	16" Inch	1	178	114	79	58	45	35	29	24
		2	180	115	80	59	45	36	29	24
		3	210	134	93	69	53	41	34	28

Notes:

1. All calculations for panel properties have been made in accordance with the 1986 edition of "Specifications for Cold-Formed Steel Design Manual" published by the American Iron and Steel Institute.
2. Values for 3 or more spans are based on 4 equal spans.
3. These load capacities are for the panel itself. Frames, purlins, clips, fasteners, and all supports must be designed to resist load imposed by the panel.
4. Materials:
ASTM A 446, Grade "C"
5. All loads are in PSF.
6. Minimum panel support bearing length = 3.00 in.
7. Loads shown are limited by L/240 deflection.

MAC 150 STANDING SEAM METAL ROOF SYSTEM

ALLOWABLE LOAD TABLES

ALLOWABLE UPLIFT LOAD (PSF)

Panel Gauge	Panel Width	# of Equal Spans	SPAN (FEET)							
			2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5
24 Gauge Steel	16" Inch	1	240	154	107	78	60	47	38	31
		2	277	177	123	91	69	55	44	37
		3	365	228	158	116	89	70	57	47

Notes:

1. All calculations for panel properties have been made in accordance with the 1986 edition of "Specifications for Cold-Formed Steel Design Manual" published by the American Iron and Steel Institute.
2. Values for 3 or more spans are based on 4 equal spans.
3. These load capacities are for the panel itself. Frames, purlins, clips, fasteners, and all supports must be designed to resist load imposed by the panel.
4. Materials:
ASTM A 446, Grade "C".
5. All loads are in PSF.
6. Minimum panel support bearing length = 3.00 in.
7. Loads shown are limited by L/240 deflection.
8. Above capacities have been increased by 33-1/3% as per AISI Sec. A4.4.
9. **THESE UPLIFT LOAD TABLES ARE FOR PANEL CAPACITY ONLY. FULL SCALE TESTS SUCH AS ASTM E-1592 MUST BE CONDUCTED TO DETERMINE THE FULL CAPACITY OF THE PANEL SYSTEM, INCLUDING CLIPS AND INTERLOCKING SYSTEM.**

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NEGATIVE DESIGN LOADS

(WITH 180 DEG. SEAM)

16" WIDE

SPAN (FT)	ULTIMATE TEST LOAD (PSF)	DESIGN LOAD (PSF)
1	127.9	85.3
1.5	-	76
2	-	66.5
2.5	-	57.5
3	-	48
3.5	72.8	38.8

Notes:

1. The above loads were derived from uplift tests done in accordance with ASTM E 1592 (see Cerney & Ivey Engineers, Inc. Test Report No. 96505-4 for specific test data)
2. Design values are interpolated from tests performed at spans of 1'-0" and 3'-6" only.
3. Design load contains a 2.0 factor of safety and a 33% increase due to wind per AISI 96, Sec. A4.4.
4. Materials:
FY= 50 KSI for steel panels.
5. All loads are in PSF.
6. Minimum panel support bearing length = 3.00 in.

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THERMAL MOVEMENT

Maximum Roof Panel Length

Maximum length of roof panel is 150'.

Two-piece clip offers unimpeded thermal movement and does not restrict length of multiple panel runs.

Panel Fixing Information

Standing seam roof panels must be fixed at any one of the following places: Eave, ridge, hip, or an intermediate location for longer length panels. (Note: structural requirement for reinforcing supports at fixing lines.)

Steel panels 30'-0" long or less may be fixed at eave and ridge, peak, or hip. Fixing of the eave is preferred when gutters are subject to high wind loads.

See graph (Fig. 1) for steel thermal movement for temperature changes from 50 deg F to 250 deg F.

Total Thermal Movement (in.)

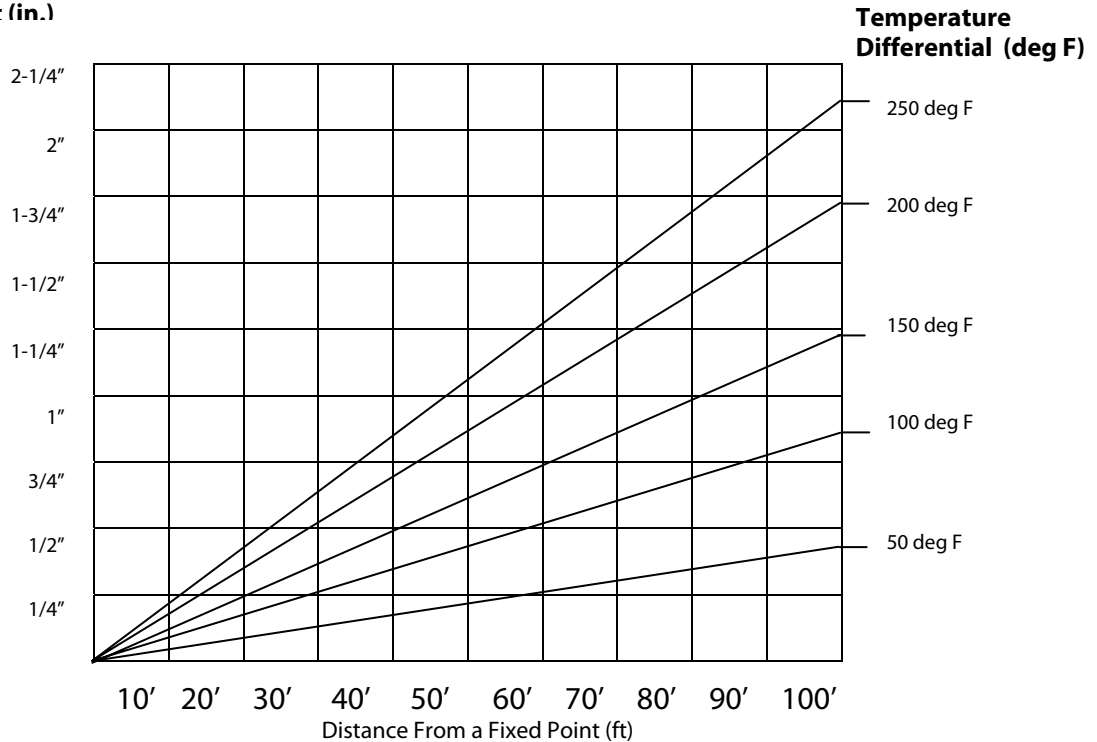


FIG. 1 – LINEAR THERMAL EXPANSION FOR STEEL PANELS