ULTRALOK

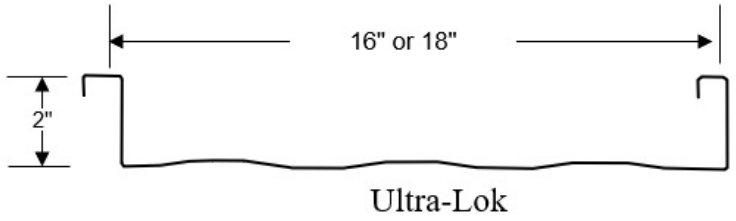
The UltraLok Roof System has been designed for use in architectural or functional applications where both appearance and weather resistance of the roof are primary concerns. Many standing seam roof systems have similar appearance but have major differences in their performance. The UltraLok Roof System has many advantages over most other roof systems and, when properly installed, will offer excellent weather resistance and be practically maintenance free. The UltraLok Roof System is adaptable for use on new construction and as a replacement roof for existing buildings where weather resistance is the most important design consideration.

PANEL

The panel will be fabricated from steel which is coated with Galvalume, and optional factory applied paint. Galvalume coated steel sheet will provide a long-lasting weathering membrane. Galvalume coating has a proven weather resistance in excess of 20 years. The steel sheet is impervious to moisture and will resist falling objectsand roof traffic better than other known roof membranes commonly used. The steel panel profiles are designed to resist live load and wind uplift without the complexity and cost of additional substrate as required on most other roofing systems. The ultimate performance of a Galvalume coated steel panel is determined by effectiveness of the design of the steel panel, perimeter seals, and panel attachment methods.

PANEL AND FLASHING MATERIALS

The roof panels will be of 24 ga. or 22 ga. steel, 50,000 psi minimum yield strength (ASTM A792, SS Grade 50,Class 1), coated with AZ50 (minimum) aluminum/zinc alloy for painted finish or AZ55 aluminum/zinc alloy for unpainted finish.



Ultra-Lok

The flashing and trim will be a 24 or 26 ga. steel 50,000 psi minimum yield strength (ASTM A792, SS Grade 50,Class 1), coated with AZ50 (minimum) aluminum/zinc alloy for painted finish zinc or AZ55 aluminum zinc for unpainted finish.

PANEL CLIPS

Panel clips fasten the roof panels to the structure. The clips are designed to allow the panel to float over the secondary structurals. Floating clips will have a tab and a base with a sliding interlock allowing the roof 1-3/4" of expansion and 1-3/4" of contraction movement. The floating clip tab will move in the sliding interlock of the 16 gauge galvanized steel clip base. The clip base will be protected from corrosion by galvanized coating that has similar weather resistance to that of the panel coating. Panel clips will be attached to the secondary structurals with two 1/4"-14 x 11/4" self-drilling screws. Fasteners required for other building applications will be determined by the type of secondary structurals or the substrate used on the building.

SEAM

The UltraLok panels have a sidelap that can be formed into two types of seams:

- TripleLok™-The TripleLok seam is formed continuously by folding the adjacent panels sides over each other to interlock the two panels so they form a watertight seal that will resist separation even if the panels are severely deformed. The TripleLok seam is partially formed in the factory and completed in the field with a powered seamer. The TripleLok seam will resist greater uplift forces than any known seam.
- QuadLok™-The "QuadLok" seam, commonly referred to as the "Pittsburgh 360" is used in high wind load areas and can reduce the need for additional sub-framing due to increased uplift forces at eaves and rakes.

SEALANTS

The seam sealant will be a non-drying, non-hardening, non-oxidizing sealant specifically formulated for factory sealing standing seam roof panels. Sealant for the eave, end splice, ridge flashing, and rake trim will be non-drying, non-hardening tape sealant specifically formulated for field application at temperatures of 20° F to 120° F. Service temperature of both sealants will be -60° F to 180° F.

CLOSURES

The end dam to be used at the ridge and high side of a single slope roof is a die-formed steel closure with factory punched holes. The end dam seals the outside of the panel at the ridge or high edge of a single slope roof panel to the ridge or high edge of roof flashing. The seal is developed using gasket techniques similar to those used at the endlap. The tape sealant is sandwiched between the roof panel, which is fully supported by a rigid heavy gauge back- up channel and the flange of the end dam. The fasteners placed in the factory-punched holes clamp the back-up channel and end dam together. The clamping force uniformly compresses the sealant between the panel and the end dam causing the sealant to be extruded with over one ton of force. The extruded sealant provides a seal that will resist wind-blown water.

FASTENERS

The UltraLok Roof System does not have exposed through-fasteners that penetrate the roof membrane over the building envelope except at panel endlaps on roof runs that are longer than the length a panel can be shipped. Endlap fasteners: Only five (5) endlap fasteners will be required to seal the panel endlaps. Endlap fasteners will be oversized #12 - 14 x 11/4" self drilling screw fasteners to minimize potential for fastener strip out.

All exposed fasteners are self-drilling and will not require special tools other than industry standard screw guns. Fasteners will have metal backed neoprene sealing washers with aluminum zinc cap.

TESTING DATA

The UltraLok panel out performs all known existing single skin roof systems in three of the leading tests for wind uplift resistance. These tests are UL 580 Class 90, ASTM E1592 and Factory Mutual 4471. The UltraLok panel has also been tested in accordance with ASTM E1680, Rate of Air Leakage Through Exterior Metal Roof Panel Systems; and ASTM E1646, Water Penetration of Metal Roof Panel Systems.

WARRANTY

Twenty-year material and weather tightness warranties are available.

PRODUCT NOTES

"Oil-canning", a slight waviness inherent in light gauge metal may exist in this panel.

This minor waviness does not affect the finish or structural integrity of the panel and is therefore not a cause for rejection.

SECTION PROPERTIES: 16" WIDE, 50 KSI ULTRALOK PANEL						
Gauge	Panel Thickness (in.)	Wt. (psf)	Yield Stress (ksi)		Allowable Shear kips/ft	
24	0.0221	1.254	50		0.79	
22	0.0275	1.555	50		1.22	
Ga.	Panel Top in Compression (Positive Bending)			Panel Bottom in Compression (Negative Bending)		
	Ixe (in 4/ft)	Sxe (in 3/ft)	Maxo (in 3/ft)	Ixe (in 4/ft)	Sxe (in 3/ft)	Maxo (in.kip s/ft)
24	0.1943	0.1113	3.333	0.0900	0.0762	2.282
22	0.2490	0.1448	4.337	0.1155	0.1002	2.999

ALLOWABLE GRAVITY LOADS – ALL LOADS IN POUNDS PER SQUARE FOOT										
	Span Condition		Span (in feet)							
			2	2.5	3	3.5	4	4.5	5	6
24 Guage Steel	SS	Stress	555.5	355.5	246.9	181.4	138.9	109.7	88.9	61.7
		L/180	2122.4	1086.6	628.8	396	265.3	186.3	135.8	78.6
	DS	Stress	235.9	219.3	156.9	117.4	91.1	72.6	59.2	41.4
		L/180	5108.1	2615.4	1513.5	953.1	638.5	448.4	326.9	189.2
	TS	Stress	366.7	249.4	179.6	135.1	105	83.9	65.5	48.1
		L/180	4005.1	2050.6	1186.7	747.3	500.6	351.6	256.3	148.3
22 Guage Steel	SS	Stress	722.8	462.6	321.2	236.0	180.7	142.8	115.6	80.3
		L/180	2720.6	1392.9	806.1	507.6	340.1	238.8	174.1	100.8
	DS	Stress	445.0	296.1	210.3	156.7	121.1	96.3	78.4	54.8
		L/180	6547.9	3352.5	1940.1	1221.8	818.5	574.8	419.1	242.5
	TS	Stress	504.7	338.7	241.8	180.8	140.1	111.6	90.9	63.6
		L/180	5133.9	2628.6	152.2	957.9	641.7	450.7	328.6	190.1

- Section properties and allowables are calculated in accordance with North American Specification for the Design of Cold-Formed Steel Structural Members (2001 Edition & 2004 Supplement)
- I +/- is for deflection determination, S +/- is for bending determination & Ma is allowable bending moment.
- Ma is allowable bending moment and Va is allowable shear.
- All values are for one foot of panel width.
- Web Crippling:
  - 24 gauge: Allowable intermediate bearing at 2.5" = 0.357 kips/ft ; Allowable end bearing at 2.5" = 0.126 kips/ft
  - 22 gauge: Allowable intermediate bearing at 2.5" = 0.534 kips/ft ; Allowable end bearing at 2.5" = 0.189 kips/ft
  - UltraLok Allowable Gravity Loads - All loads in lbs per sq.ft.
  - A. 24 Gauge Material (Fy = 50 ksi)

- Allowable load based on stress is the smallest load due to bending, shear and combined bending and shear.
- Allowable load based on deflection limit cannot exceed allowable load based on stress.
- These loads are for panel strength. Frames, purlins, clips, fasteners and all supports must be designed to resist all loads imposed on the panel.
- Allowable loads for deflection are based on deflection limitation of span/180.
- For roof panels, self weight of the panel has to be deducted from the allowable inward load to arrive at the actual 'live load' carrying capacity of the panel.
- TripleLok Seam- UltraLok Allowable Wind Uplift Loads
- 24 Gauge Material (Fy = 50ksi) - All loads in pounds per sq.ft.

TRIPLELOK SEAM			
Span	1592 Test Ultimate Load	1592 Design Load	COE Design Load
2.0	232.3	136.4	140.8
2.5		113.2	116.9
3.0		94.3	97.3
3.5		80.9	83.5
4.0		70.8	73.1
4.5		62.9	64.9
5.0	96.5	56.6	58.5

QuadLok Seam- UltraLok Allowable Wind Uplift Loads
24 Gauge Material (Fy = 50ksi) - All loads in pounds per sq.ft.

QUADLOK SEAM			
Span	1592 Test Ultimate Load	1592 Design Load	COE Design Load
2.0	332.0	194.7	201.2
2.5		157.6	163.0
3.0		131.3	135.8
3.5		112.6	116.5
4.0		98.5	101.9
4.5		87.6	60.9
5.0	134.7	78.8	81.6

- The above tabulated loads are generated from certified ASTM E-1592 testing.
- Intermediate design loads are interpolated from ultimate test loads.
- Design loads contain a safety factor calculated per AISI.
- COE design load contains a 1.65 safety factor per COE 07416 Specification.
- These load capacities are for the panel itself. Frames, purlins, clips, fasteners, and all supports must be designed to resist all loads imposed by the panel.
- Allowable wind uplift loads have not been increased by 33% as allowed by some codes when wind load controls.
- This material is subject to change without notice. Contact ACI Metal Roofing Systems, Inc. for most current values.