VULCAN
STEEL STRUCTURES, INC.

UD 324 ROOF PANEL

STANDING SEAM METAL ROOFING

PRODUCT SPECIFICATIONS

Applications: Roof

Coverage Widths: 24”

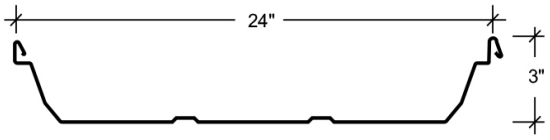
Minimum Slope: ¼:12

Panel Attachment: Concealed Fastening System; Low, High, Fix and Sliding

Gauges: 24 (standard); 22

Finishes: Smooth (standard); Embossed (optional)

Coatings: Galvalume Plus©, Standard Color, Kynar, Kynar Metallic



The UD 324 roof panel is a snap-together, trapezoidal-leg standing seam roof system. UD 324 panels are available in 24” widths. UD 324 requires a minimum slope of ¼:12 and is ideal for industrial,commercial and architectural applications. UD 324 can be erected on various types of construction.

FEATURES AND BENEFITS

- Begins and ends in the high, reducing the risk of leakage at the rake that can occur when finishing in the low.
- Low and high clips are available to allow for various thicknesses of insulation to be installed between the panels and purlins.
- Numerous UL 580 construction ratings are available, as well as UL 790, Class A for external fire, numerous roof assemblies for UL 263 for internal fire and the UL 2218 Class 4 impact rating.
- UD 324 carries Florida approval rating.

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CATEGORY	CHARACTERISTIC	TEST METHOD	PURPOSE	RESULT
ENVIRONMENTAL	Air Leakage Through Roof Panel Joints	ASTM E1680	Determines the air leakage characteristics of metal panels under specified air pressure differences at ambient conditions	0.251 cfm/ft² at 6.24 psf static pressure 0.502 cfm/ft² at 12.00 psf static pressure
	Water Penetration Through Roof Panel Joints	ASTM E1646	Determines the resistance to water penetration of metal roof panels under uniform static air pressure difference	No uncontrolled water penetration through the panel joints at a static pressure of 12.00 psf
	Impact Resistance	UL 2218	Determines Impact Resistance of prepared Roof Covering Materials	Class 4 Rating
FIRE RESISTANCE	Room Fire Performance	UL 790	Standard for Standard Test Methods for Fire Tests of Roof Coverings	See Class A Fire Rating Data Sheet
	Room Fire Performance	UL 263	Standard for Fire Tests of Building Construction and Materials	For use in Design Nos. P225, P227, P230, P237, P265, P268, P508, P510, P512, P701, P711, P720, P722, P726, P731, P734, P801, P815, P819
STRUCTURAL	Uplift Resistance	ASTM E1592	Provides a standard procedure to evaluate or confirm structural performance under uniform static air pressure difference	See Load Chart Section
	Gravity Loads	AISI S100	North American Specification for the Design of Cold-Formed Steel Structural Members	See Section Properties and Allowable Load Table Section
ROOF LISTINGS	Roof Performance - Underwriters Laboratories	UL 580	Determines the uplift resistance of roof assemblies consisting of the roof and roof coverings materials	Class 90 Rating - Construction Nos. 165, 180B, 205, 205A, 286, 308B, 534, 535, 536, 537 and 541
	Roof Performance - Florida Approval	ASTM E1592 FM 4471 UL 790	Florida product approval is the approval of products and systems, which comprise the building envelope and structural frame, for compliance with the structural requirements of the Florida Building Code.	See FL# 11819.5

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ENGINEERING

IMPORTANT READ THIS FIRST

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 building codes, regulations, and accepted industry practices. UD 324 is a snap together system. Use of a mechanical seaming tool on the UD 324 system may damage panels, void all warranties, and will void all engineering data.

In order to design, quote or order a UD 324 roof system, you must determine which system you need, based on building width and insulation requirements.

Low Fixed System - Double slope buildings 200' wide or less and single slope buildings 100' wide or less, with or without a ⅜" thermal spacer.
See Insulation/Thermal Spacer Selection Chart below.

High Fixed System - Double slope buildings 200' wide or less and single slope buildings 100' wide or less, with ⅜", ⅝", or 1" thermal spacer.
See Insulation/Ther mal Spacer Selection Chart below.

Fixed systems utilize fixed clips that do not allow the roof panels to float on the substructure. For this reason, use fixed systems only on pre-engineered metal buildings with purlins, subject to the building width restrictions outlined above. **Do not use fixed systems on buildings with bar joist construction, wood decks or metal decks.**

Low Floating System - Double slope buildings over 200' wide or single slope buildings over 100' wide, with or without ⅜" thermal spacer.
See Insulation/Thermal Spacer Selection Chart below.

High Floating System - Double slope buildings over 200' wide or single slope buildings over 100' wide, with ⅜", ⅝" or 1" thermal spacer.
See Insulation/Thermal Spacer Selection Chart below.

Thermal calculations should be performed for each project to ensure that the thermal movement of the roof is not greater than the floating clip's capacity. Various densities of blanket insulation may affect the installation and or the appearance of a metal roof system. The installer is responsible for selecting the proper clip and thermal spacer for their conditions.

Insulation/Thermal Spacer Selection Chart

Insulation Thickness	Low System	High System
No Insulation	3/8" Thermal Spacer	High System Not Recommended
3" Insulation	Thermal Spacer Not Recommended	1" Thermal Spacer Recommended
4" Insulation	Thermal Spacer Not Recommended	5/8" Thermal Spacer Recommended
6" Insulation	Low System Not Recommended	3/8" Thermal Spacer Recommended

WARNING

As with all standing seam roof systems, sound attenuation (example: blanket insulation) should be installed between the panels and open framing, such as purlins or joists, to prevent "roof rumble" during windy conditions.

Applications over solid deck such as rigid insulation over a metal deck or a wood deck may require additional acoustical consideration to ensure that thermal vibration noises are isolated from the building interior. This is especially important if the bottom of the deck is left open to the interior, in cathedral ceiling applications or when the attic space is used as a return air plenum.

A vapor retarder may be necessary to protect roofing components when high humidity is a factor. The need for a vapor retarder, as well as the type, placement and location should be determined by an architect or engineer. The following are examples of conditions that may require a vapor retarder: (A) a project where outside winter temperatures below 40 degrees F are anticipated and where average winter 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, masonry or plaster work and fuel burning heaters.

Thermal Spacer Disclaimer

The above thermal spacer chart is intended to be used as a general guideline only. Because of the various densities of insulation currently available, the manufacturer cannot guarantee that this chart will be accurate in all situations. Further, the manufacturer does not specifically require that the roofing contractor use thermal spacers with it's UD 324 roof system. However, please review the following information

- Although the manufacturer does not require a thermal spacer, the architect or building owner may
- In certain environments, the compression of the fiberglass insulation wltiout a thermal spacer, may create a thennal break which can cause condensation to form on the purlins/joists
- On uninsulated buildings eliminatIng lhe thennal spacer (1) may cause "roof rumble" and (2) you may encounler problems holding panel module
- When a high clip Is used without a thermal spacer (1) you may encot.nter problems holding panel module and (2) foot traffic on the panel ribs may
- result In bent clips
- Using a low clip with too much insulation or too thick a thermal spacer: (1) may cause "purlin read" (2) may cause difficulty In properly installing the panel side laps, and (3) you may encounter problems holding panel module.