VULCAN
STEEL STRUCTURES, INC.

DL 324 ROOF PANEL

STANDING SEAM METAL ROOFING

PRODUCT SPECIFICATIONS

Applications: Roof

Coverage Widths: 24”

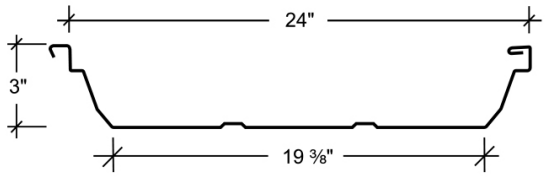
Minimum Slope: ¼:12

Panel Attachment: Concealed Fastening System; Low, High and 2” Standoff Sliding Clips

Gauges: 24 and 22

Finishes: Smooth (standard); Embossed (optional)

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



The DL 324 roof panel is a mechanically field-seamed, trapezoidal-leg standing seam roof system. DL 324 panels are available in 24” widths. DL 324 requires a minimum slope of ¼:12. DL 324 panels are ideal for industrial, commercial and architectural applications.

FEATURES AND BENEFITS

- Designed to cope with the forces of expansion and contraction. This is accomplished by allowing the panels to move freely up and down the roof slope.
- 2” and 4” sliding clips are available in high and low versions, which allow thermal movement on a wide variety of building widths.
- 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.
- DL 324 carries FM, Florida approval and Dade County ratings.

Vulcan Steel Structures, Inc.
500 Vulcan Parkway
Adel, GA 31620
1-800-258-3369
www.vulcansteel.com
sales@vulcansteel.com

VULCAN
STEEL STRUCTURES, INC.

DL 324 ROOF PANEL

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	0.013 cfm/ft^2 at 6.24 psf static pressure 0.020 cfm/ft^2 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 LISTING	Roof Performance - FM Global	FM 4471	Sets performance standards for panel roofs including uplift resistance	See FM Engineering Tech Bulletin
	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, 180C, 287, 308A, 450, 538, 539 and 540
	Roof Performance - Miami-Dade County	TAS 125 TAS 201 TAS 100 FM 4471 App. G	The Product Control Approval System establishes a protocol to evaluate the standards of products used in construction in Miami-Dade County. Miami-Dade County, with its inclusion in the High Velocity Hurricane Zone (HVHZ), has the most stringent code requirements of the Florida Building Code. Therefore, all products that comprise the structure's building envelope—doors, shutters, windows, prefabricated buildings and truss plates—require the issuance of an approval in order to be used for construction in Miami-Dade County.	See NOA # 13-0425.14
	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# 33988.1 See FL# 11819.2

Vulcan Steel Structures, Inc.
500 Vulcan Parkway
Adel, GA 31620
1-800-258-3369
www.vulcansteel.com
sales@vulcansteel.com

VULCAN STEEL STRUCTURES, INC.

DL 324 ROOF PANEL

ENGINEERING

IMPORTANT READ THIS FIRST

CAUTION

The use of any field seaming machine other than that approved by the manufacturer may damage the panels, void all warranties, and will void all engineering data.

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

High Floating System - Double-slope buildings 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	2" Hi-Thermal System
No Insulation	3/8" Thermal Spacer	High System Not Recommended	2" Hi-Thermal System Not Recommended
3" Insulation	Thermal Spacer Not Recommended	1" Thermal Spacer Recommended	2" Hi-Thermal System Not Recommended
4" Insulation	Thermal Spacer Not Recommended	5/8" Thermal Spacer Recommended	2" Hi-Thermal System Not Recommended
6" Insulation	Low System Not Recommended	3/8" Thermal Spacer Recommended	1" Thermal Spacer Recommended
8" Insulation	Low System Not Recommended	Thermal Spacer Not Recommended	5/8" Thermal Spacer Recommended
9" Insulation	Low System Not Recommended	High System Not Recommended	3/8" Thermal Spacer Recommended
10" Insulation	Low System Not Recommended	High System Not Recommended	Thermal Spacer Not 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 Fahrenheit 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 its DL 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 without a thermal spacer, may create a thermal break that can cause condensation to form on the purlins/joists.
- On uninsulated buildings eliminating the thermal spacer: (1) may cause "roof rumble," and (2) you may encounter problems holding the panel module.
- When a high clip Is used without a thermal spacer: (1) you may encounter problems holding the 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 of 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 the panel module.