

ROOF PANELS SPECIFICATIONS



www.vulcansteel.com 1-800-258-3369



PBR PANEL

EXPOSED FASTENING SYSTEMS

PRODUCT SPECIFICATIONS

Applications: Roof and Wall

Coverage Widths: 36"

Rib Spacing: 12" on center

Rib Height: 1 1/4"

Minimum Slope: 1/2:12

Panel Attachment: Exposed Fastening System

Gauges: 26 (standard); 29, 24 and 22 (optional)

Finishes: Smooth (standard); Embossed (optional)

Coatings: Galvalume Plus^{©,} Standard Color, Kynar

The PBR panel is commonly used for a wide variety of architectural, agricultural, commercial and industrial applications. PBR is a structural panel and an exposed fastener panel that can be used for both roof and wall applications. The minimum roof slope for PBR is ½:12.

FEATURES AND BENEFITS

- Numerous UL 580 ratings are available, as well as UL 790, Class A for external fire, roof assembly for UL 263 for internal fire and the UL 2218 Class 4 impact rating.
- PBR carries Florida approval, Miami-Dade county ratings and FM 4471 approval standard for Class 1 panel roofs.





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



PBR 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	0.005 cfm/ft at 1.57 psf static pressure
			ambient conditions	0.006 cfm/ft ² at 6.24 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 20.00 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	AISI S100	Provides a standard procedure to evaluate or confirm structural performance under uniform static air pressure difference	See Section Properties and Allowable Load Table 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 - 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.30, 54, 79, 104, 112, 161, 167, 184 and 542
	Roof Performance - TAS 125 Miami-Dade County TAS 201 TAS 100 FM 4471 App. G		The Product Control Approval System establishes 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 # 12-0123.07
	Roof Performance - Florida ApprovalASTM E 1592 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# 5346.1 See FL# 11868.1
	Roof Performance - Texas ASTM E 1592 Department of Insurance		TWIA provides windstorm and hail insurance in areas exposed to hurricanes and currently provides windstorm and hail coverage in the following 14 "first tier" Texas coastal counties: Aransas, Brazoria, Calhoun, Cameron, Chambers, Galveston, Jefferson, Kenedy, Kleberg, Matagorda, Nueces, Refugio, San Patricio and Willacy	See RC-358 and RC-393
WALL LISTING	Wall Performance - Florida Approval	ASTM E1592		FL# 5335.1 FL# 11917.5

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



DL 324 ROOF PANEL

STANDING SEAM METAL ROOFING

PRODUCT SPECIFICATIONS

Applications: Roof

Coverage Widths: 24"

Minimum Slope: 1/4:12

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 1/4:12. 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



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	
	Water Penetration	ASTM E1646	Determines the resistance to water penetration of	No uncontrolled water penetration through the	
	Through Roof Panel Joints	7.0 TM E 1040	metal roof panels under uniform static air pressure difference	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 4471 FM Global		Sets performance standards for panel roofs including uplift resistance	See FM Engineering Tech Bulletin	
	Roof Performance UL 580 Determines the consisting of the consistence of the		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	

These contents are for general information only and are not intended to serve as any type of advice. Every effort is made to ensure the accuracy of the information included herein and it is believed to be accurate and reliable as of the date of publication. Vulcan Steel Structures does not warrant or represent the accuracy or reliability of any information included in this brochure. Any reliance on any information without consultation with Vulcan Steel Structures or a duly authorized representative shall be at the user's own risk.

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



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 3/6" 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 ¾", №" 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.



UD 324 ROOF PANEL

STANDING SEAM METAL ROOFING

PRODUCT SPECIFICATIONS

Applications: Roof

Coverage Widths: 24"

Minimum Slope: 1/4:12

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, trapezoidalleg standing seam roof system. UD 324 panels are available in 24" widths. UD 324 requires a minimum slope of 1/4:12 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.



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



UD 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	0.251 cfm/ft ² at 6.24 psf static pressure 0.502 cfm/ft ² at 12.00 psf static pressure	
	Water Penetration ASTM E16 Through Roof Panel Joints		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 UL 580 - Underwriters Laboratories		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	



UD 324 ROOF PANEL

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 3/6" 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 %", 5%", 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 3/6" 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 3/6", 5/6" 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	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 witiout a thermal spacer, may create a thennal break which can cause condensation to form on the purlins/joists
- On uninsulated buildings eliminating the thennal spacer (1) may cause "roof rumble" and (2) you may encounter 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.



BL 216 ROOF PANEL

STANDING SEAM METAL ROOFING

PRODUCT SPECIFICATIONS

Applications: Roof

Coverage Widths: 16"

Minimum Slope: 1/2:12

Panel Attachment: Concealed Fastening System; Low, High (fixed or floating), Utility (no insulation clearance)

Gauges: 24 (standard); 22 (optional)

Finishes: Smooth or Embossed; with Striations or Striations and Pencil Ribs

Coatings: Galvalume Plus[®], Standard Color, Kynar, Kynar Metallic



BL 216 HS is a mechanically field-seamed, highstrength structural standing seam roof system. The BL 216 HS panels have a 2-inch-tall vertical seam and are available in 16-inch widths. BL 216 HS can be installed directly over purlins or bar joists, is capable of transitioning from roof to fascia and does not require a solid substructure for support.

FEATURES AND BENEFITS

- Low and high clips are available to allow for various thicknesses of insulation to be installed between the panels and purlins.
- Heavier gauges, striations, embossing and installation over a solid deck minimize oil canning.
- 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.
- BL 216 HS carries Florida approval rating.



These contents are for general information only and are not intended to serve as any type of advice. Every effort is made to ensure the accuracy of the information included herein and it is believed to be accurate and reliable as of the date of publication. Vulcan Steel Structures does not warrant or represent the accuracy or reliability of any information included in this brochure. Any reliance on any information without consultation with Vulcan Steel Structures or a duly authorized representative shall be at the user's own risk.

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



BL 216 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	0.016 cfm/ft [*] at 1.57 psf static pressure 0.025 cfm/ft [*] at 6.24 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 20.00 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 - UL 580 Underwriters Laboratories		Determines the uplift resistance of roof assemblies consisting of the roof and roof coverings materials	Class 90 Rating - Construction Nos.90, 176, 180, 238B, 437, 449, 451, 452 and 487	
	Roof Performance - Florida ApprovalASTM E159 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# 11819.1 See FL# 33988.3	
	Roof Performance - Texas UL 580 Department of Insurance		TWIA provides windstorm and hail insurance in areas exposed to hurricanes and currently provides windstorm and hail coverage in the following 14 "first tier" Texas coastal counties: Aransas, Brazoria, Calhoun, Cameron, Chambers, Galveston, Jefferson, Kenedy, Kleberg, Matagorda, Nueces, Refugio, San Patricio and Willacy.	See RC-24	

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



BL 216 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 - With or without %" thermal spacer. See Insulation/Thermal Spacer Selection Chart below.

High Floating System - With 3/6", 5/6" 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	High System							
No Insulation	3/8" Thermal Spacer	High System Not Recommended						
3" Insulation	Thermal Spacer Not Recommended	5/8" Thermal Spacer Recommended						
4" Insulation	Thermal Spacer Not Recommended	3/8" Thermal Spacer Recommended						
6" Insulation	Low 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 BL 216 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.



SL 216 ROOF PANEL

STANDING SEAM METAL ROOFING

PRODUCT SPECIFICATIONS

Applications: Roof

Coverage Widths: 16"

Minimum Slope: 1/2:12

Panel Attachment: Concealed Fastening System; Low, High (fixed or floating), Utility (no insulation clearance)

Gauges: 24 (standard)

Finishes: Smooth Striated (standard); Embossed Striated (optional)

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



SL 216 is a mechanically field-seamed, vertical-leg standing seam roof system that combines a 2-inch-tall slim rib with exceptional uplift resistance. It is available in 16" width. SL 216 has been designed to withstand the most rigorous weather conditions. SL 216 can be installed directly over purlins or bar joists and does not require a solid substructure for support.

FEATURES AND BENEFITS

- SL 216 panels are standard with striations to minimize oil canning.
- 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.
- SL 216 carries FM, Florida and Miami-Dade County approval ratings.



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



SL 216 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	0.0035 cfm/ft at 1.57 psf static pressure		
			ambient conditions	0.007 cfm/ft at 6.24 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 - 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.90, 176, 180, 238B, 437, 449, 451, 452 and 487		
	Roof Performance - TAS 125 Miami-Dade County TAS 20 TAS 100 FM 4471 Ap		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 # 12-0123.07 24 ga. material See NOA # 12-0911.02 22 ga. material		
	Roof Performance - ASTM E1592 Florida Approval 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# 33988.2 See FL# 11819.4		
	Roof Performance - Texas ASTM E1592 Department of Insurance		TWIA provides windstorm and hail insurance in areas exposed to hurricanes and currently provides windstorm and hail coverage in the following 14 "first tier" Texas coastal counties: Aransas, Brazoria, Calhoun, Cameron, Chambers, Galveston, Jefferson, Kenedy, Kleberg, Matagorda, Nueces, Refugio, San Patricio and Willacy.	See RC-392		

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



SL 216 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 - With or without %" thermal spacer. See Insulation/Thermal Spacer Selection Chart below.

High Floating System - With 3/6", 5/6" or 1" thermal spacer. See Insulation/Ther mal 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	High System							
No Insulation	3/8" Thermal Spacer	High System Not Recommended						
3" Insulation	Thermal Spacer Not Recommended	5/8" Thermal Spacer						
4" Insulation	Thermal Spacer Not Recommended	3/8" Thermal Spacer Recommended						
6" Insulation	Low 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 SL 216 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.



STANDARD B DECK

BALANCE OF STRENGTH, ECONOMY AND VERSATILITY

Type B, wide-rib structural roof deck is a high-performance, cost-efficient choice with a variety of options to meet multiple project needs. Standard or cellular, acoustic or vented, interlocking or nested side laps, B deck is among the most flexible of our 1½-inch-deep roof decks.

Standard B Deck

Type B roof deck provides the best balance of strength and economy of all the 1½-inch-deep roof decks. Where rigid roofing insulation is used with B deck, a minimum 1-inch thickness is required. B deck is available in lengths from 6' 0" to 40' 0". Conforms to ASTM A1008/A1008M for uncoated and painted deck, and A653/A653M for galvanized deck. Approved by UL, ULC and listed in the UL and ULC Fire Resistance Directories. Yield strength up to 80 ksi.

- B-Dek is available with nested side laps.
- Available as an acoustic deck, types BA, BA-Dek and BIA are manufactured with perforations in the vertical ribs, having an NRC rating of 0.50 to 0.95 when used with rigid insulation, as tested in accordance with ANSI/ ASTM C423 and E795.
- Available as a vented deck, types BV, BV-Dek and BIV are manufactured with slot vents in the bottom flutes (to be specified when venting is required for cementitious insulation fill).
- The openings for types BV and BIV can be specified from 0.5% up to 1.5% of total surface.
- The openings for BV-Dek can be specified from 0.25% up to 2.0% of total surface.
- Also available with rolled-in hanger tabs (non-vented types only).
- Type B roof deck is FM-approved for use as a component in Classes 1-60, 1-75 and 1-90 wind uplift construction.
- When ratings above 1-90 are required, the contract documents must specify special requirements in accordance with FM Data Sheet 1-29, Section 2.2.13.
- Types B, BI and B-Dek are ICC-, FM- and UL-approved.





These contents are for general information only and are not intended to serve as any type of advice. Every effort is made to ensure the accuracy of the information included herein and it is believed to be accurate and reliable as of the date of publication. Vulcan Steel Structures does not warrant or represent the accuracy or reliability of any information included in this brochure. Any reliance on any information without consultation with Vulcan Steel Structures or a duly authorized representative shall be at the user's own risk.

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



STANDARD B DECK



Height	1 1/2 in.
Fy (minimum)	33 ksi
Modulus of Elasticity	29500 ksi

SECTION PROPERTIES

Gauge	Fy (ksi)	Coverage (in)	Thickness (in)	Weight (psf)	l (in⁴/ft)	Sp (in³/ft)	Sn (in³/ft)
22	33	36	0.0295	1.63	0.177	0.189	0.198
20	33	36	0.0358	1.96	0.213	0.235	0.247
18	33	36	0.0474	2.57	0.290	0.315	0.316

ALLOWABLE UNIFORM LOADS

				Allowa	ble Total	(Dead +	Live) Uni	iform Loa	ad (psf)			Max. Constr.
Span Condition	Gauge		Center to Center Span (ft in.)								Span	
Condition		5 - 0	5 - 6	6 - 0	6 - 6	7 - 0	7 - 6	8 - 0	8 -6	9 - 0	9 - 6	(ctr. to ctr.)
	22	91	71	57	47	40	34	30	27	24	22	5 - 8
Single	20	111	86	69	56	47	40	35	31	27	25	6 - 7
	18	156	119	94	76	63	53	46	40	35	31	8 - 2
	22	107	88	74	63	54	47	42	37	33	30	6 - 8
Double	20	133	110	92	79	68	59	52	46	41	37	7 - 10
	18	170	140	118	101	87	76	66	59	53	47	9 - 6
Triple	22	133	110	93	79	68	59	50	44	38	34	6 - 9
	20	166	137	115	98	84	70	59	51	45	39	7 - 11
	18	213	176	146	125	107	93	78	67	58	51	9 - 8

NOTES

- 1. Section properties are calculated using the AISI cold-formed steel design specifications, 1996 edition.
- 2. Loads and maximum construction spans are based on the SDI design manual for composite decks, form decks and roof decks, publication no. 30.
- 3. Maximum cantilever spans are based on SDI criteria and are sensitive to adjacent spans. For this table, adjacent span is assumed to be at least 1.5 times longer than the cantilever span.
- 4. Minimum end-bearing length shall be 1 1 /2".
- 5. Loads shown in RED are governed by the live-load deflection not in excess of 1/240 of span. 10 psf dead load has been included.
- 6. Perforations that are placed in the vertical ribs of type BA deck reduce the strength less than 5 %.

FACTORY MUTUAL SPANS

Gauge	Max. Ctr. to Ctr. Span (ftin.)
22	6 - 0
20	6 - 6
18	7 - 5

CANTILEVER SPANS

Gauge	Max. Cantilever Span (ftin.)
22	2 - 0
20	2 - 4
18	2 - 8

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