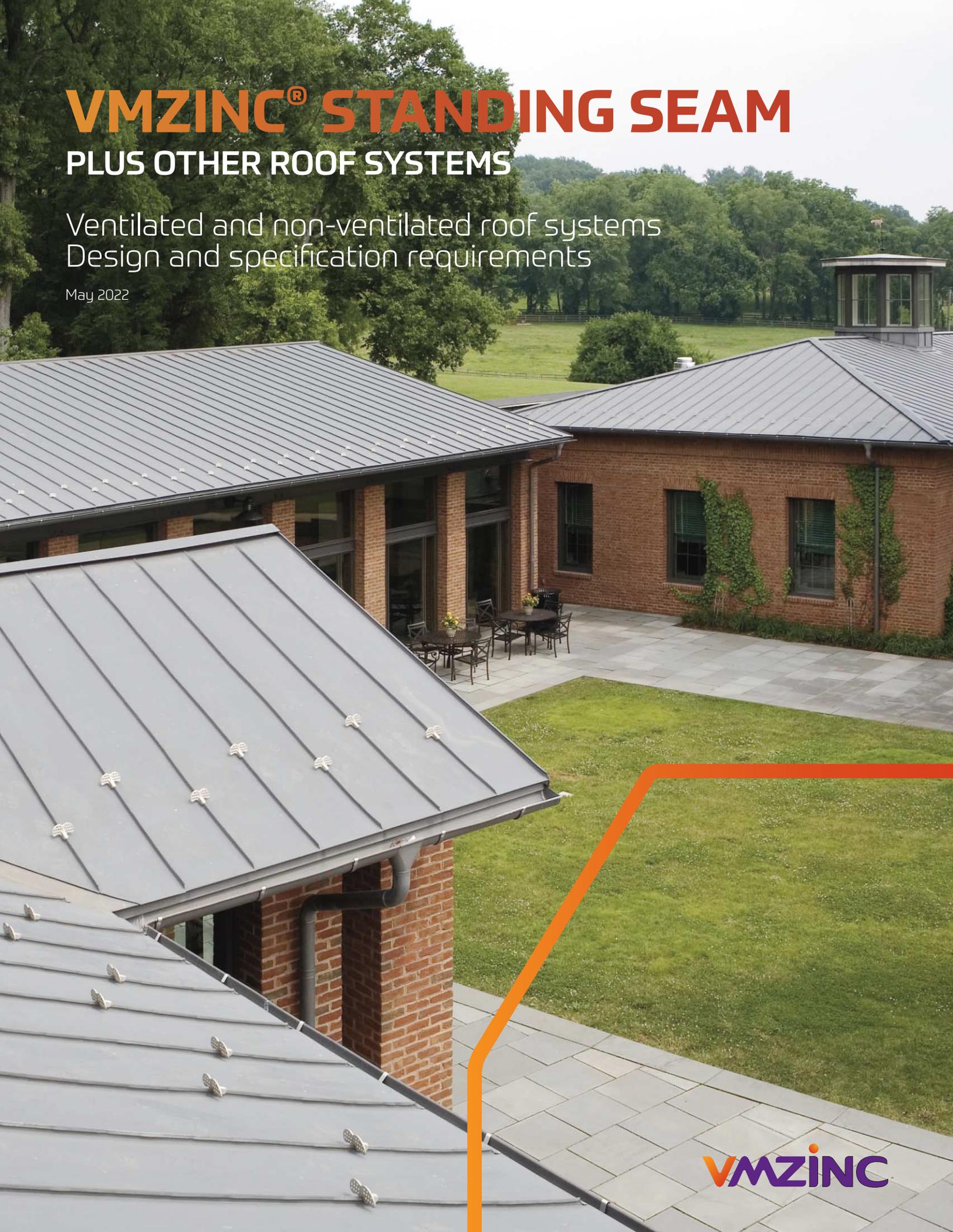


VMZINC® STANDING SEAM PLUS OTHER ROOF SYSTEMS

Ventilated and non-ventilated roof systems
Design and specification requirements

May 2022



VMZINC

VMZINC® STANDING SEAM

Contents



COMPANY PROFILE

VMZINC® has been manufacturing a wide range of rolled zinc products used primarily for building envelopes since 1837. In addition to batten cap and standing seam roof systems, products include rainwater systems, a wide range of cladding systems, including a number of rainscreen facade products. Since its creation the company has also produced decorative roofing products such as dormers, bull's eyes, weather vanes, finials and balustrades.

Front cover building credit
Architect:
Glave Holmes Bartzen & Ball Associates Architecture & Design
Project:
Montpelier Visitors Center

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VMZINC® STANDING SEAM

Why use a VMZINC® roof?

INTRODUCTION

Zinc is among the most sustainable metals used in construction today and has been used on the roofs of Paris for almost 200 years. VMZINC® roof systems can be highly cost-effective, both from an initial procurement and design life perspective.

Whether for new build or refurbishment, VMZINC® roofs have been designed to complement a wide range of building materials and styles. The finishes available offer exceptional color stability. This ensures that maintenance requirements will be minimal throughout the system's design life and that the material's installed appearance will be retained for many years.

The VMZINC® versatile Standing Seam system can be used for warm or cold roof constructions. Some of its many benefits are listed below.



BENEFITS OF THE VMZINC® STANDING SEAM SYSTEM

- Lightweight and durable
- Minimal expansion and creak
- Fully recyclable
- A design life of 100 years
- Virtually maintenance-free
- Can be installed on pitches from 1:12 to vertical
- Complex shapes can be easily achieved. Zinc panels can be pre-curved to a radius as low as 24"
- Can be used to cover soffits (box gutter overhangs, etc)
- LEED certified
- Conforms to EN 988 and ASTM B 69-Architectural zinc type 1
- Can be laid in lengths up to 30' without the need for expansion steps
- Available in a choice of either a natural finish or 10 pre-weathered finishes as well as bespoke PIGMENTO® colors



VMZINC® STANDING SEAM

Sustainable performance

LOW ENERGY USED IN THE MANUFACTURING PROCESS

VMZINC® rolled zinc products are used in construction industries throughout the world for their sustainability, distinctive appearance, and low maintenance requirements. As with VMZINC® facade and rainwater systems, manufacturing processes for our roofing systems present a low environmental impact, particularly with regard to energy expenditure.

As the comparative energy expenditure diagram opposite shows, less energy is required to extract zinc from the ground than the other principal metals, and is even more favorable for recycled zinc. Such minimal use of energy in the production of zinc clearly indicates its contribution to sustainable development.

RECYCLED MATERIAL

Almost 99% of old rolled zinc recovered every year in Western Europe, currently estimated at 100,000 tonnes, is reused. This represents savings in mining resources of between 1 and 2 million tonnes.

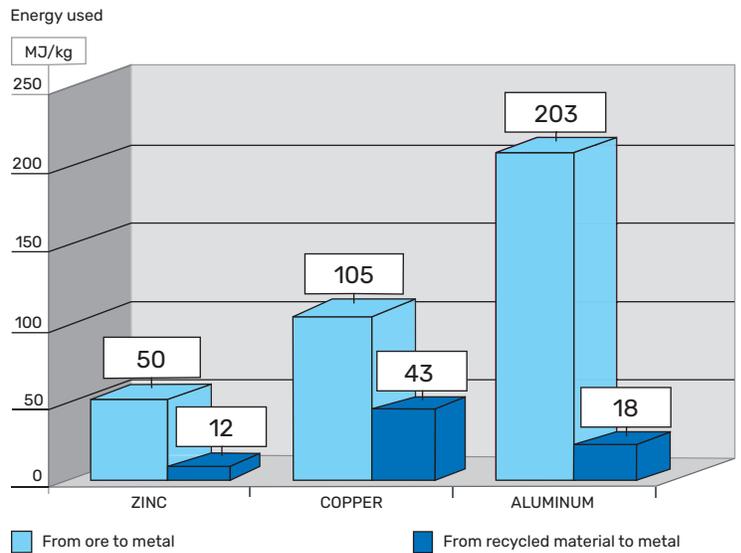
LOW CORROSION, LONG LIFE

The VMZINC® Standing Seam system benefits from zinc's self-protecting patina which develops as a result of exposure to water and carbon dioxide. Over the last 50 years the quantity of sulfur dioxide in the atmosphere has been greatly reduced. SO₂ being the key agent of corrosion means that corrosion rates are now approximately 1-2µm per year with a sheet of VMZINC® being at least 700µm thick.

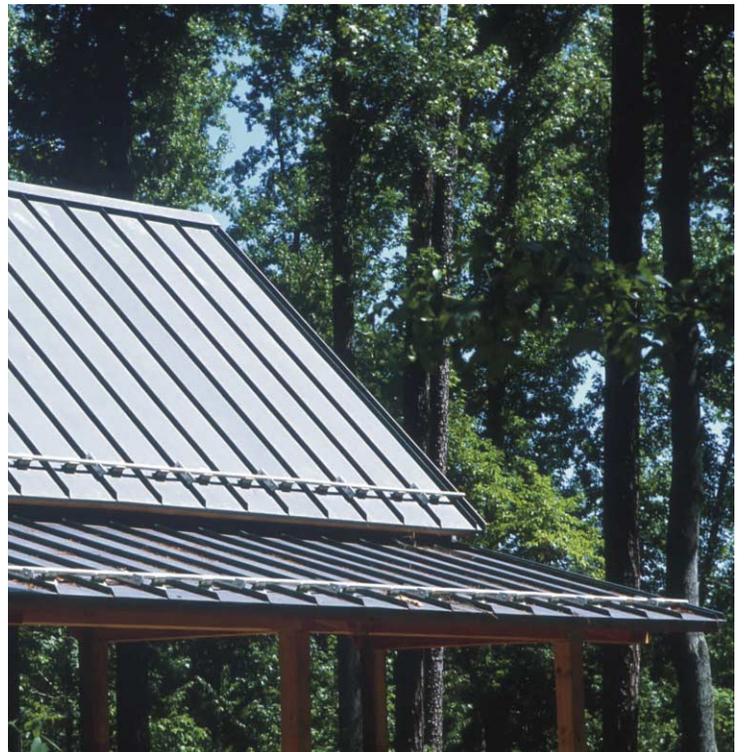
A NATURAL MATERIAL

VMZINC® undertakes Life Cycle Analysis (LCA) on its products and publishes Environmental Product Declarations (EPDs). VMZINC® offers many advantages and these enable them to contribute towards LEED® certification for the building in which they are used. The information is also used by VMZINC® as the basis for its eco-design approach.

Comparative energy expenditure in manufacture



Compared with other metals, very little energy is needed to manufacture zinc metal from ore – less than half the consumption of copper and stainless steel and less than a quarter of that used for aluminum. CO₂ and other greenhouse gas emissions are also, therefore, proportionally less.



VMZINC® STANDING SEAM

Sustainable performance

VMZINC® AND LEED® V4

VMZINC® products contribute to achieving LEED® points in a number of ways.

Material and Resources:

Credit 2.1 Construction Waste Management 1 point

All zinc construction wastes can easily be separated from other metals and sent to any local metal scrap dealer. Zinc is then processed and reused by the galvanization industry.

Material and Resources:

Credit 4.1 Recycled Content 1 point

Post-consumer content: 20%

Pre-consumer (Post-industrial) content: 35%

Post-consumer content: Most VMZINC® products come from one smelting plant located in Aubry, France. The plant uses 20% of recycled zinc for all VMZINC® products.

Post-industrial content: VMZINC® recycles all of the scrap generated during the manufacturing process. VMZINC® is the world's leading players in the rolled zinc industry with a total production capacity of over 100,000 tons per year.

Indoor Environment Quality:

Credit 4.2 Low Emitting Materials: Paints and Coatings 1 point

VMZINC® does not apply any coating on standard QUARTZ-ZINC® PLUS material. Consequently, no VOCs are generated.

Regarding VOC and aldehydes emissions, the results of assessment tests of VOC and aldehydes emissions in accordance with the French AFSSET method on organic coated rolled zinc of VMZINC® show that the total VOC concentration after 28 days of exposure is zero. These results lead to rank VMZINC® solutions "A+" according to the French regulation that means in the best class of building products.



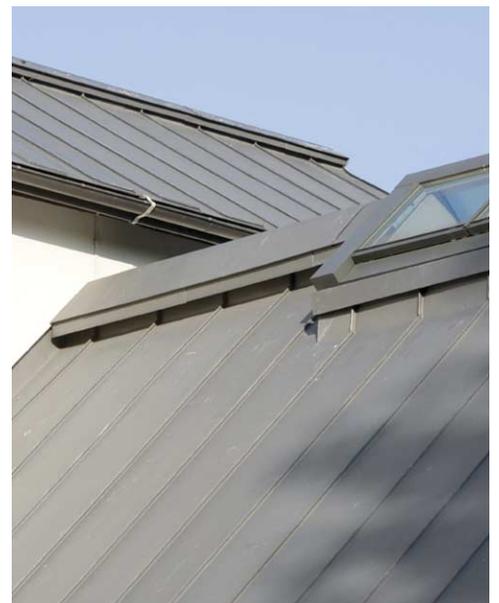
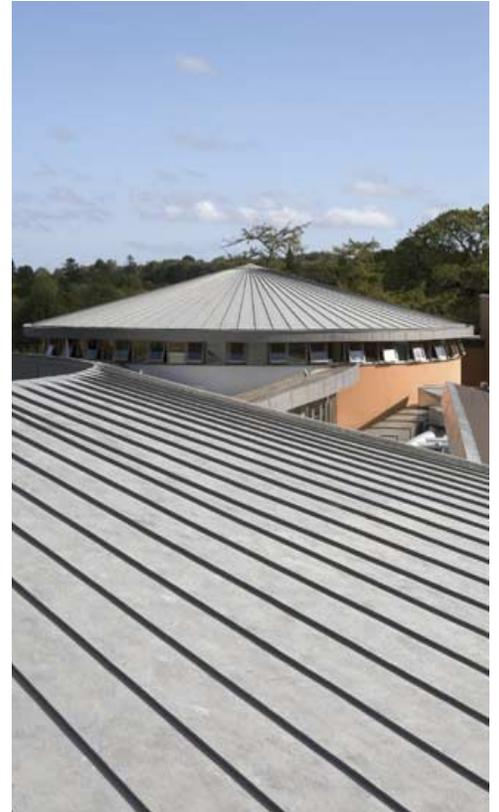
Environmental profiles measure the impacts of a construction material, product or building system throughout its life, not only during its manufacture, but also its use in a building over a 100 year period. This includes its extraction, processing, use and maintenance and its eventual disposal.

VMZINC® is a member of BRE Global's certification scheme and carries Environmental Product Declarations in accordance with EN 15804 for Natural Zinc, QUARTZ-ZINC®, ANTHRA-ZINC®, the PIGMENTO® range as well as VMZINC® PLUS.



All of VMZINC® production plants conform to ISO 14001 creating a high level of quality control with regards to the environment.

Quality management certification ISO 9001 also applies to all production plants.



VMZINC® STANDING SEAM

The system

Underlying principles

INTRODUCTION

The Standing Seam system consists of a comprehensive range of robust components that ensures appropriate and correct installation is achieved when designed and installed according to VMZINC® recommendations. It is important that Standing Seam roofs are installed by professionals with the correct equipment and experience.

Individual panels are held in place at the top of the pitch by a minimum of 5 fixed clips and then towards the lower portion of the panel by sliding clips allowing thermal movement. These stainless steel clips, which are fixed to the structure, are crimped inside the joints. Thus the fixing clips for panels and flashings never penetrate the material and therefore do not affect the appearance or damage the waterproofing. The low height of the seams (1" standard) and the 16 $\frac{7}{8}$ " standard spacing between joints give the roof a light, harmonious appearance.

The Standing Seam panels weigh approx 1½lbs per ft².

See pages 8 and 9 for samples of the 8 pre-weathered finishes available.

The system is eminently suitable for cold roof constructions (pages 12-19) and for warm roof constructions (pages 22-27).

VMZINC® PLUS

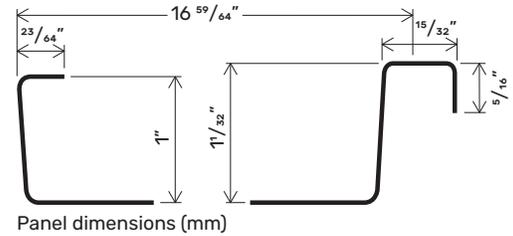
VMZINC® PLUS is a unique patented product that improves the performance of zinc installed on recommended cold (ventilated) and warm (non-ventilated) substrates. The product consists of VMZINC® (in all finishes) having a 60µm coating applied to the underside thus allowing a more varied amount of substrates to be used. VMZINC® PLUS resists to an abrasion of 140 litres when tested in accordance with ASTM D 968.

STANDING SEAM COIL DIMENSIONS

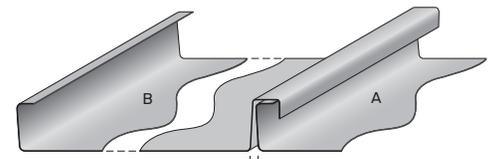
Surface finish	Coil thickness	Coil width*	Standing seam centres*
Natural zinc PLUS	0.7mm (24Ga) or 0.8mm (22Ga)	19 $\frac{11}{16}$ "	16 $\frac{7}{8}$ "
QUARTZ-ZINC® PLUS	0.7mm (24Ga) or 0.8mm (22Ga)	19 $\frac{11}{16}$ "	16 $\frac{7}{8}$ "
ANTHRA-ZINC® PLUS	0.7mm (24Ga) or 0.8mm (22Ga)	19 $\frac{11}{16}$ "	16 $\frac{7}{8}$ "
Grained zinc	0.7mm (24Ga) or 0.8mm (22Ga)	19 $\frac{11}{16}$ "	16 $\frac{7}{8}$ "
AZENGAR® PLUS	0.7mm (24Ga) or 0.8mm (22Ga)	19 $\frac{11}{16}$ "	16 $\frac{7}{8}$ "

*For other dimensions please consult us.

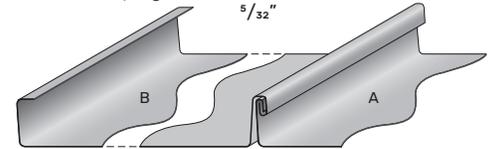
Standing Seam zinc roofing will not give a perfectly flat finish. However, by reducing panel width and increasing zinc thickness, oil canning will be reduced.



Panel dimensions (mm)

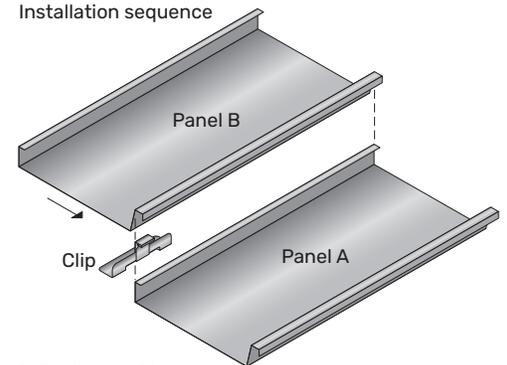


Before crimping



After crimping (double lock standing seam)

Installation sequence



1. Position panel A
2. Engage clips to upstand of panel A and screw fix to substrate
3. Engage edge of panel B over clip
4. Crimp all 3 components together to form double lock standing seam

VMZINC® STANDING SEAM

The system

Underlying principles

Please contact us
for further
design assistance

DELTA VMZINC® MEMBRANE AND CLIPS

For all roofing applications VMZINC® PLUS must be installed on Delta VMZINC® Membrane using Delta VMZINC® Membrane clips. For clip spacing please see page 36 (Further technical information).

Delta VMZINC® Membrane is a structured underlay $\frac{3}{8}$ " thick manufactured from high density polyethylene.

The overall purpose of the Delta VMZINC® Membrane is to provide an additional drainage and air flow directly under the zinc panels.



WIND UPLIFT REQUIREMENTS

Technical & Commercial Requirements based on FEMA/IBC "Metal Roof Systems in High-Wind Regions"

UL 580

The UL 580 rating determines the uplift resistance of roof assemblies. The test evaluates the roof panel, panel clips, fasteners, and the substrate.

UL 580 is a **pass/fail test** and does not specifically determine wind resistance of the panel assembly. It only tests over a specific substrate at a certain clip/fastener spacing.

The test standard will not indicate how strong the panel assembly is under load nor does this test simulate real conditions.

UL 1897

The UL 1897 wind test is a continuation of UL 580, and is the standard for uplift tests for roof covering systems. The purpose of this test is to gain uplift resistance data for the panel assembly, and evaluate the attachment of the roof covering systems to the roof decks.

ASTM E 1592

The ASTM E 1592 tests for **structural performance** under uniform static air pressure differences, and is run to failure to determine the ultimate uplift load capacity. This test measures both panels and anchors.

ASTM E 1592 is not a pass/fail test; it merely shows how a roof performs under uniform static load.

It is important to note that zinc Standing Seam roofing panels are not structural or able to self support.

Components and Cladding Chart

Architectural firms in the Gulf area use the "Components and Cladding Chart" in determining wind loads.

The "Components and Cladding Chart" is included in the design document set and shows the design pressures for the different planes of the building for anchorage of roof and wall cladding. The structural engineer makes a diagram, identifies the zones and calculates the wind pressures based on the ASCE-7 guidelines.

The ASCE-7 is an integral part of building codes in the United States, **Minimum Design Loads and Associated Criteria of Buildings and Other Structures (ASCE/SEI 7-16)** describes the means for determining dead, live, soil, flood, tsunami, snow, rain, atmospheric ice, earthquake, and wind loads, and their combinations for general structural design.

The Standing Seam roofing system is UL rated up to 225 PSF. For detailed information on the test carried out please do not hesitate to contact us.

VMZINC® STANDING SEAM

Surface finishes

NATURAL VMZINC® PLUS

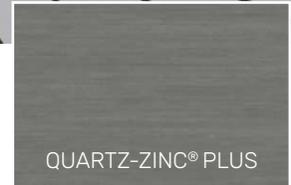
Natural VMZINC® PLUS has a shiny metallic appearance when new and develops a patina over time. In facade applications, it may take 10 years for the matt gray patina to form. It can be quickly soldered without removing the patina.



Natural VMZINC® PLUS

QUARTZ-ZINC® PLUS

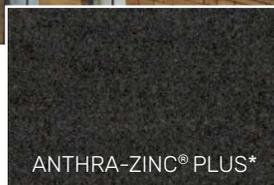
QUARTZ-ZINC® PLUS offers an appearance and texture that does not change over time. When QUARTZ-ZINC® PLUS is scratched, it will self heal. The gray tones of QUARTZ-ZINC® PLUS blend well with existing construction materials – ideal for refurbishment.



QUARTZ-ZINC® PLUS

ANTHRA-ZINC® PLUS

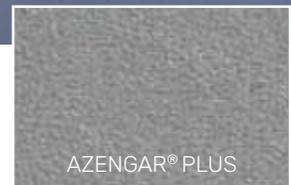
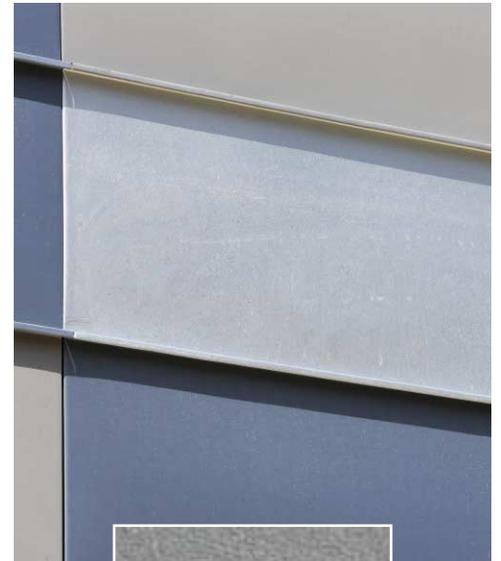
ANTHRA-ZINC® PLUS with its visible grain matches the color of slate and blends well in combination with photovoltaic panels.



ANTHRA-ZINC® PLUS*

AZENGAR® PLUS

AZENGAR® PLUS is the new surface finish from VMZINC which is the first engraved zinc giving a product with a matt, heterogeneous and light aspect. AZENGAR® PLUS can be used in the same fashion as other VMZINC® products for both roofs and facades.



AZENGAR® PLUS

* ANTHRA-ZINC® STRAT should be considered if salt is present in the air

VMZINC® STANDING SEAM

Surface finishes

Please contact us
for
samples

STANDARD PIGMENTO® PLUS

PIGMENTO® finishes offer a unique range of colors (Blue, Green, Brown, Red and Grey) that enhances any building. This natural product enables the texture of the QUARTZ-ZINC® PLUS to still be seen whilst offering the designer the choice of color to complement other elements of a facade or roof.

VMZINC® is not a painted product and therefore colour variations may occur. No colour matches are guaranteed therefore zinc should be installed from the same coil/batch because of colour variations in the manufacturing process.

The coloration of the zinc is achieved with a special pigment layer that enhances the qualities of the zinc without presenting a block color. This product is tested to EN13523.

PIGMENTO®, available in five standard colors, provides an increased resilience, however in a severe non-rinsed marine environment (1 mile from the sea), staining is still possible and therefore the material should not be used in this application.

The PIGMENTO® range is now available in bespoke colors. Samples of the colors indicated here are available upon request. For other colors a sample and RAL color should be submitted in order to assess feasibility.

BESPOKE PIGMENTO® PLUS New



Standard
PIGMENTO® BLUE



Standard
PIGMENTO® GREEN



Standard
PIGMENTO® BROWN



Standard
PIGMENTO® RED

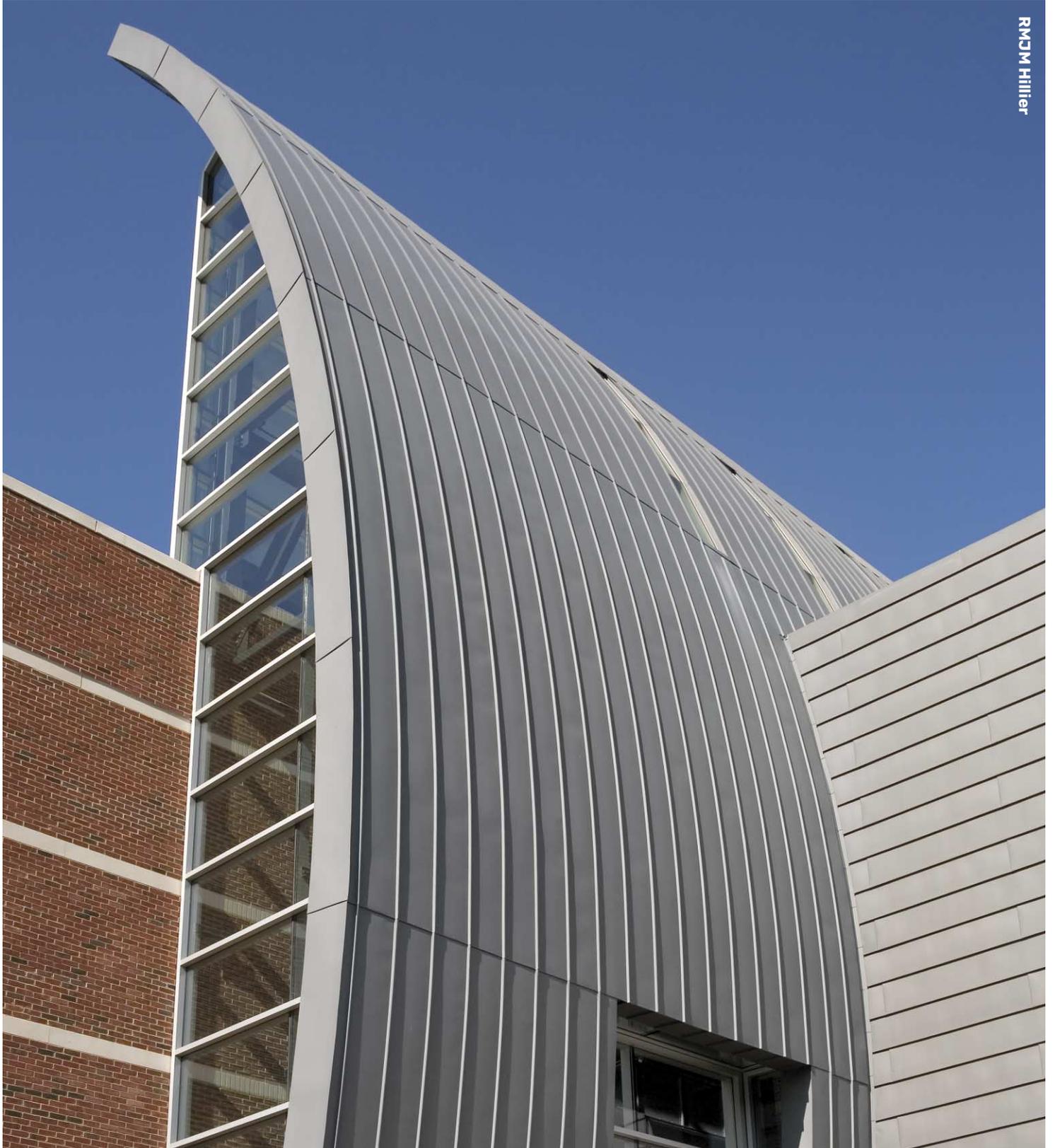


Bespoke PIGMENTO®
colors



Standard
PIGMENTO® GREY

VMZINC® STANDING SEAM



RMDM Hillier

VMZINC® STANDING SEAM



Rafael Architects

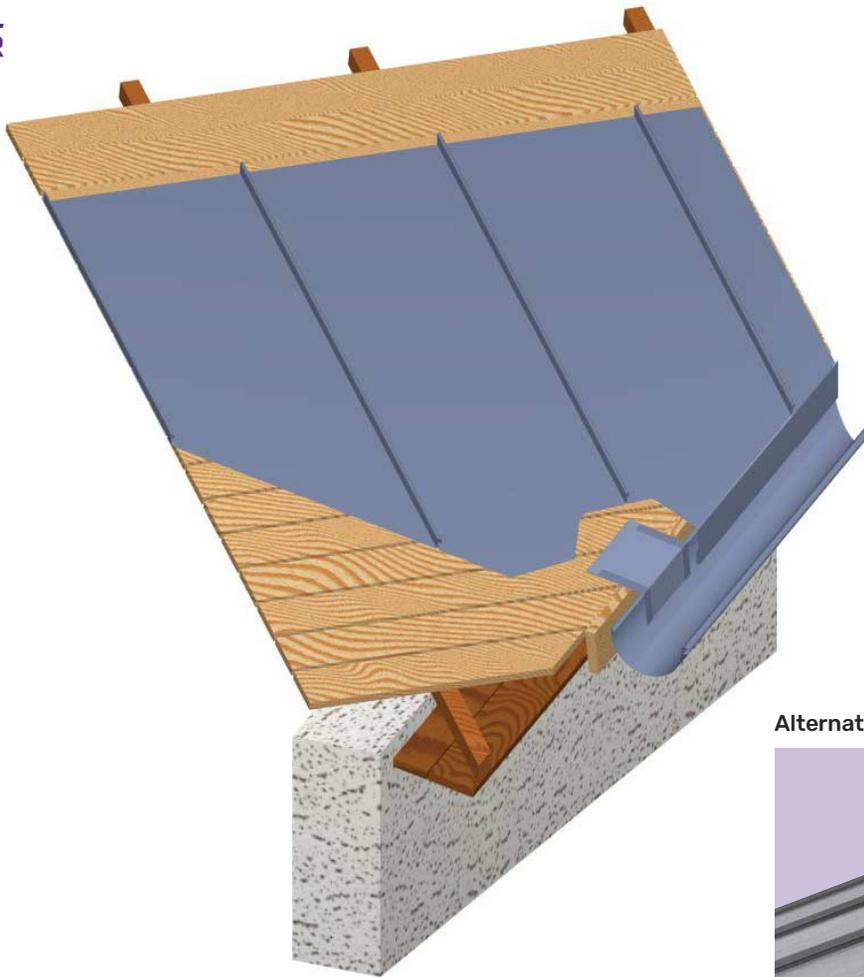


George Steele Architect

Cold roofs (ventilated)

Introduction

EAVE DETAIL WITH GUTTER



Alternative ridge detail



VMZINC® PLUS VMZINC® PLUS is a unique solution that offers a protective coating 60 microns thick on its underside to protect the zinc from possible corrosion from incompatible materials. VMZINC® PLUS is available in a choice of either a natural finish or 8 standard pre-weathered finishes to be installed on a cold vented roof using a plywood deck (page 14).

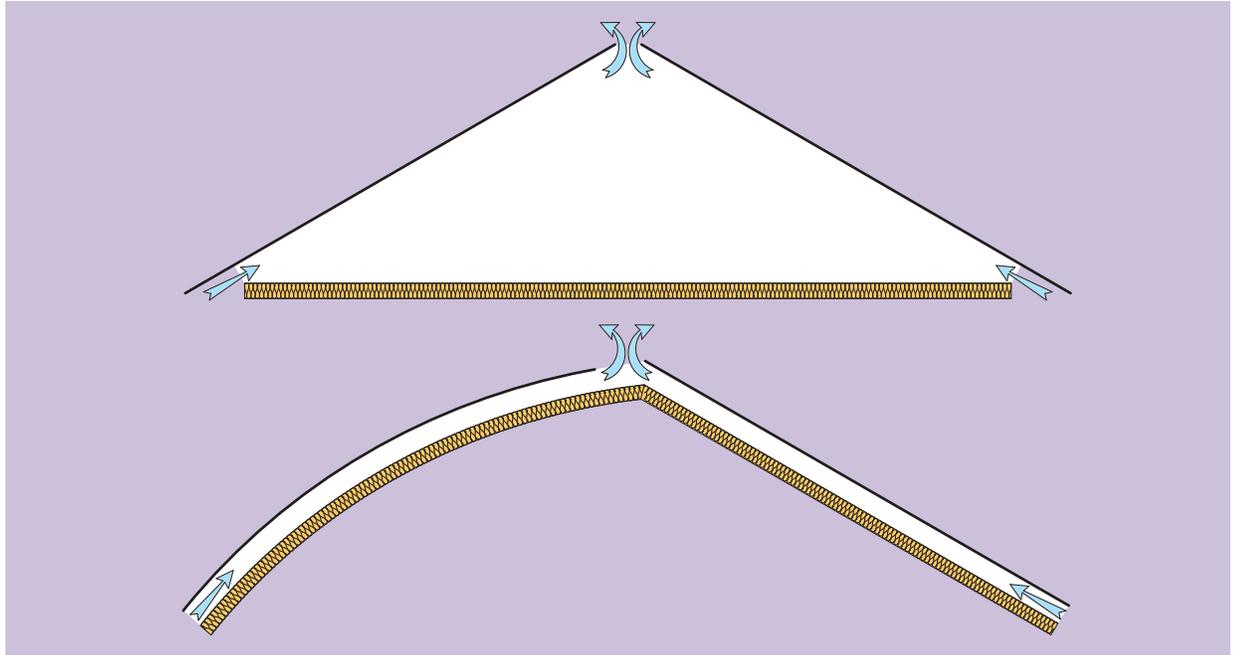
ADVANTAGES OF A COLD VENTED ROOF Cold vented substrates have a long and established track record and have existed since the first zinc roof was installed in 1809. This type of build-up can be used on roofs ranging from 1:12 pitches to vertical walls as well as soffits.

For more information contact us on
984 212 5471
or send an e-mail to
info@vmzinc-us.com

Cold roofs (ventilated)

Introduction

**TYPICAL
COLD ROOF
ARRANGEMENTS**



Linear air vents must be at least 3/8" wide (open).

**DEFINITION OF
COLD ROOF IN
NORTH
AMERICA**

Cold ventilated roofs and warm non-ventilated roofs are two terms which do not always denote the same ideas to all building professionals. In order to put the cold ventilated roof system into context, we will refer to it as a roof where there is a continuous air space of at least 2" between the substrate supporting the zinc and the insulation. This air space must be a vented space with openings generally at the eaves and the ridge. Linear air vents must be at least 3/8" wide and are commonly protected by insect mesh. It is always good practice to include a vapor control layer in the build up and this should be installed on the warm side of the insulation.

**ELEMENTS OF
THE SYSTEM**

- VMZINC® PLUS must be used for all Standing Seam roofing applications
- Delta VMZINC® Membrane must be used for all substrates with the exception of vented open gap skip sheathing
- The substrate must be continuous and even, and the correct fixing clips must be used



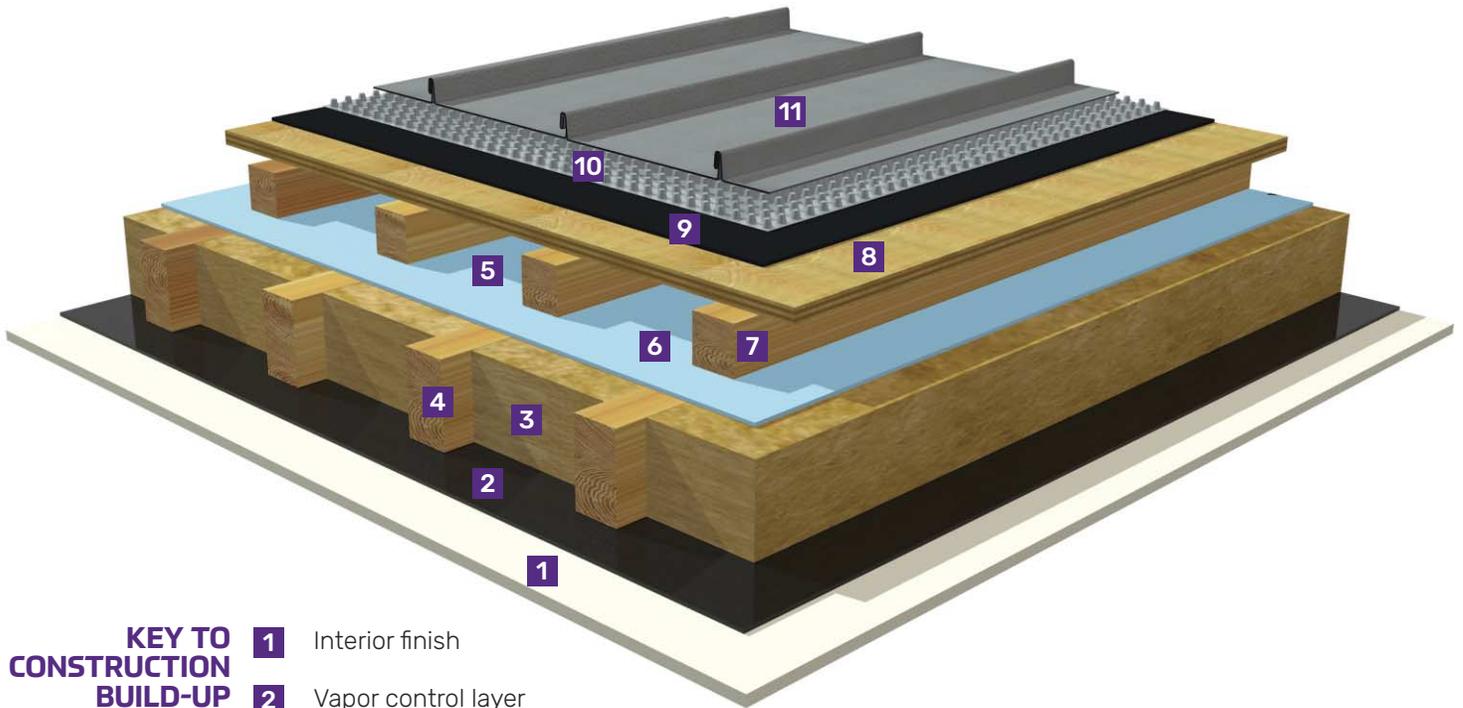
**COLD ROOF
STANDING SEAM
CONSTRUCTIONS**

Using vented plywood **p14**

UL Class A Fire Buildup **p16**

For snowy climates **p18**

Standing Seam using vented plywood



KEY TO CONSTRUCTION BUILD-UP

- 1** Interior finish
- 2** Vapor control layer
- 3** Insulation
- 4** Rafter
- 5** 2" ventilated air space (minimum)
- 6** Breathable membrane
- 7** Batten
- 8** 3/4" plywood
- 9** Breather membrane
- 10** Delta VMZINC® Membrane
- 11** VMZINC® PLUS Standing Seam

ADVANTAGES OF STANDING SEAM USING VENTED PLYWOOD

- Provides a continuous rigid deck for the VMZINC® PLUS
- Plywood decking is readily available and widely used



Standing Seam using vented plywood

AREA OF APPLICATION

Suitable for all buildings (dwellings with high occupancy, sport halls, etc but not high humidity buildings such as swimming pools) and roofs with pitches from 1:12 to the vertical. VMZINC® PLUS is installed over Delta VMZINC® Membrane on the plywood.

STRUCTURE

A 2" continuous air gap must be left clear beneath the 3/4" exterior grade plywood. Continuous ventilation openings are made at the ridge and eaves and are generally 3/8" wide (open) and can be protected with insect mesh. In order to maintain the integrity of the roof, a breather membrane should be installed on the cold side of the insulation, and a vapor control layer appropriate to the building's humidity levels laid on the warm side of the insulation. It should be noted that the VMZINC® PLUS and Delta VMZINC® Membrane should be installed over a dry substrate (plywood with a moisture content of no more than 22%).



Note:
The information relating to the installation of insulation and membranes is indicative only.

The choice and installation of these products will be according to the recommendations of the insulation and membrane manufacturers.

Download the technical drawings of this roof build-up from our website
www.vmzinc-us.com

UL Class A Fire Buildup

FIRE RATING REQUIREMENTS

UL Class A Fire Rating

A UL Class A fire rating depends on **all** the components of the roof buildup. Under **UL 790**, roof systems are evaluated for external fire. The operative word here is systems. Roof systems are segregated into combustible and non-combustible construction types.

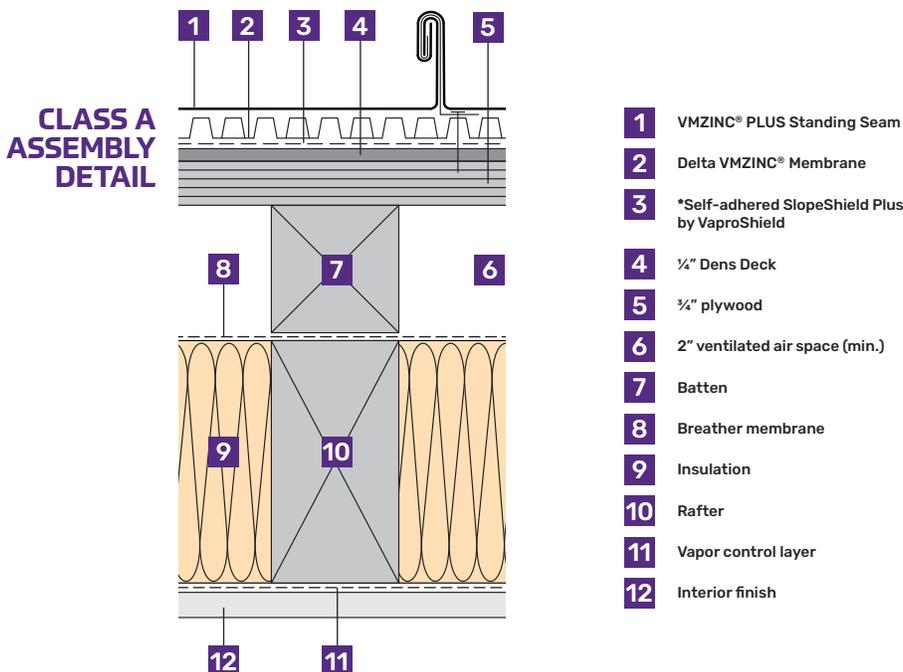
The **UL 790** is a Standard Test Method for Fire Tests of Roof Assemblies. The test provides the basis for the Class A, B and C designations. During the test, burning embers are placed on the surface of the system. The classification is determined on how long it takes the burning sample to penetrate and start a fire underneath. A Class A fire rating means the product takes the most amount of time to resist relatively severe fire-test exposure.

How to obtain a Class A rating within the VMZINC® roof buildup

The fire rating depends on **all** the components of the roof. By including a Class A underlayment, such as *Self-adhered SlopeShield Plus by VaproShield underlayment, between the Delta VMZINC® Membrane (ventilation mat) and a ¼" Dens Deck, an approved Class A rating buildup has proven possible.

Can Architectural Zinc be certified as UL Class A?

A Class A fire rating specifically means the product has the highest classification for fire resistance. Although we know metal is noncombustible, when products are tested for fire rating, **they are tested as a complete assembly**. Therefore Architectural Zinc on its own cannot be solely certified as UL Class A.



Note*
All commercial requirements are directly related to local building codes. As codes are updated regularly, it is important to verify the latest local code requirements for a particular project.

ADVANTAGES

This Class A assembly provides a simple vented roof that has a Class A rating for flame spread.

Download the technical drawings of this roof build-up from our website
www.vmzinc-us.com

UL Class A Fire Buildup

THE MEANING OF ROOF FIRE RATINGS

When designing your project, the roof can obtain one of four ratings classifications: Class A, Class B, Class C, or unrated. A Class A rated roof assembly is ideal for fire protection and could be required depending on your local building codes. Each classification is defined by the flame spread rate (FSR) test.

A Class A roof is particularly important for areas that are prone to wildfires, having a FSR of 0-25.

A Class B roof is effective against moderate fire exposures, with a FSR of 26-75.

A Class C roof is light fire protection, with a FSR of 76-200.

ACHIEVING A CLASS A FIRE RATING WITH ZINC

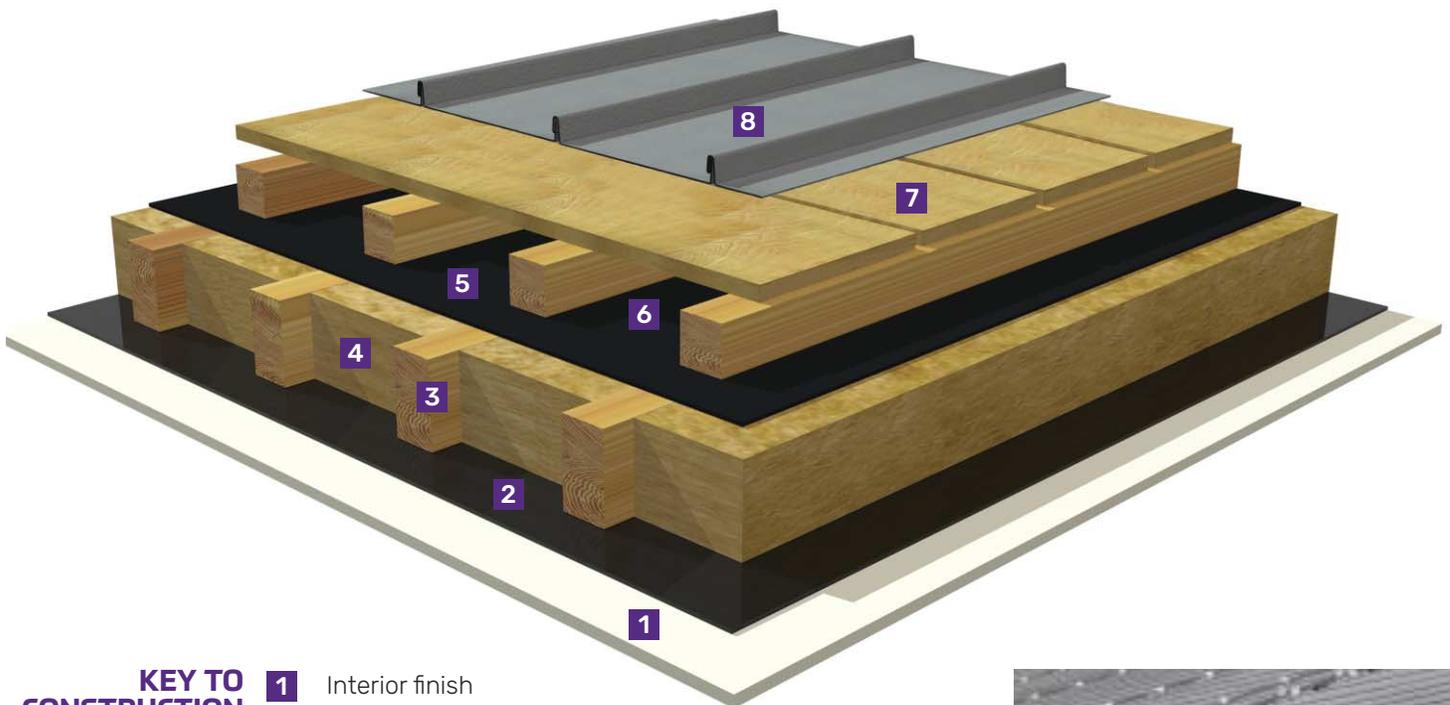
Architectural metals are by definition non-combustible, which is a good start to designing a fire safe building envelope. While VMZINC®'s roofing and cladding products are classified as A1 or A2 for non-combustibility, metal roofing in general is considered to be an Assembly-Rated Class A. This simply means one element of a buildup will not complete a UL Class A fire rating. An assembly requirement should include a Class A rated underlayment with a minimum ¼" Dens Deck.

AREA OF APPLICATION AND STRUCTURE

Suitable for all buildings with the exception of high humidity buildings such as swimming pools with pitches of 1:12 to vertical. The build up is similar to the one indicated on page 14 of this brochure. However an additional Self-adhered SlopeShield Plus by VaproShield and ¼" Dens Deck must be placed between the Delta VMZINC® Membrane and vented plywood.



Standing Seam on open gap skip sheathing



KEY TO CONSTRUCTION BUILD-UP

- 1 Interior finish
- 2 Vapor control layer
- 3 Rafter
- 4 Insulation
- 5 Ice and Water Shield
- 6 2" ventilated air space (minimum)
- 7 ¾" open gap skip sheathing
- 8 VMZINC® PLUS Standing Seam

ADVANTAGES OF USING STANDING SEAM

- Straightforward construction
- Can be used in areas with lying snow for over 4 weeks (please contact us for extreme mountain climates)
- Flexible because it also permits complex shapes to be clad in zinc



Snow and ice guards

Standing Seam on open gap skip sheathing

AREA OF APPLICATION

This build up should be used in areas where snow will lie on the roof for 4 weeks or more. Please contact us for further information on extreme mountain climates as double vented solutions maybe necessary.



STRUCTURE

VMZINC® PLUS Standing Seam panels are installed over ¾" open gap skip sheathing. This allows any wind blown snow to be evacuated into the 2" vented zone which is protected by an ice and water shield.



Roof showing snow guards

VMZINC® STANDING SEAM

Tim Ronalds Architects



VMZINC® STANDING SEAM



Waggoner and Ball Architects

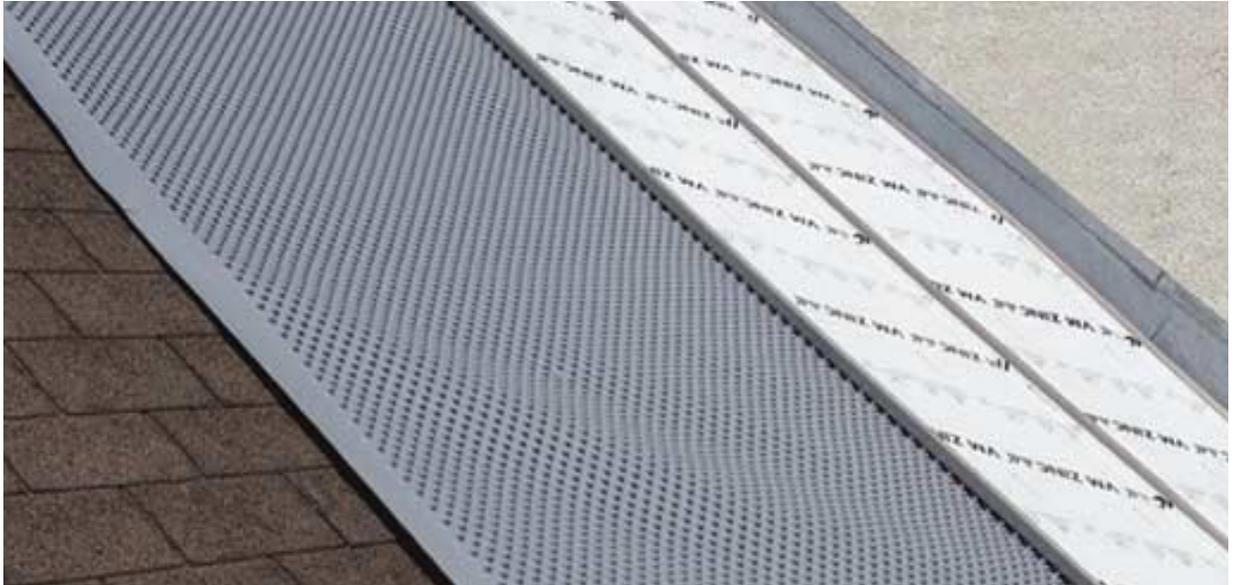


Perkins and Will Architects

Warm roofs (non-ventilated)

Introduction

**TYPICAL
DETAIL USING
A WARM
NON-VENTED
BUILD-UP**



VMZINC® PLUS on Delta VMZINC® Membrane.

VMZINC® PLUS

The Delta VMZINC® Membrane must be used on all warm roof construction combined with VMZINC® PLUS.

VMZINC® PLUS is a unique solution that offers a protective coating 60 microns thick and has an abrasion resistance: ASTM D 968, Method A: 140 liters.

ADVANTAGES OF A WARM NON-VENTED ROOF

This type of construction reduces thermal bridges and increases air tightness.

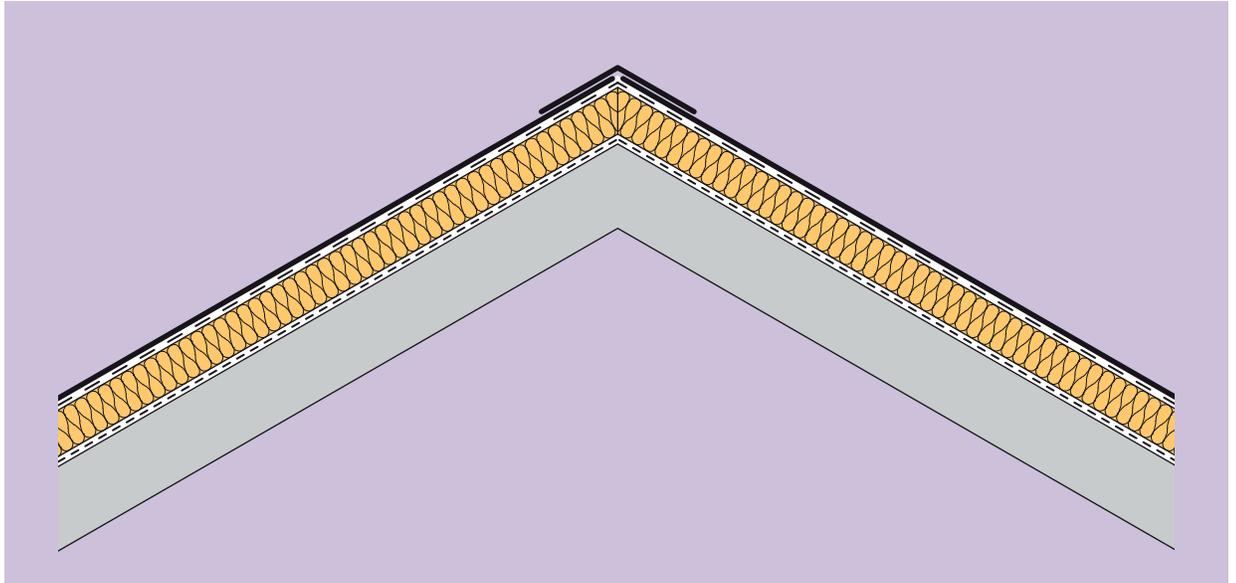


For more information contact us on
984 212 5471
or send an e-mail to
info@vmzinc-us.com

Warm roofs (non-ventilated)

Introduction

TYPICAL WARM ROOF ARRANGEMENT



Continuous layer of insulation covering a fully supported vapor barrier.

DEFINITION OF WARM ROOF IN NORTH AMERICA

Warm non-ventilated and cold ventilated roofs are two terms which do not always denote the same ideas to all building professionals. In order to put the warm non-ventilated roof system into context, we will refer to it as a roof where there is absolutely no vented space within the roof build-up and furthermore the entire roof structure is on the warm side of the insulation. Whilst there are a few very limited exceptions in North America this means that the roof structure is generally below the insulation.

ELEMENTS OF THE SYSTEM

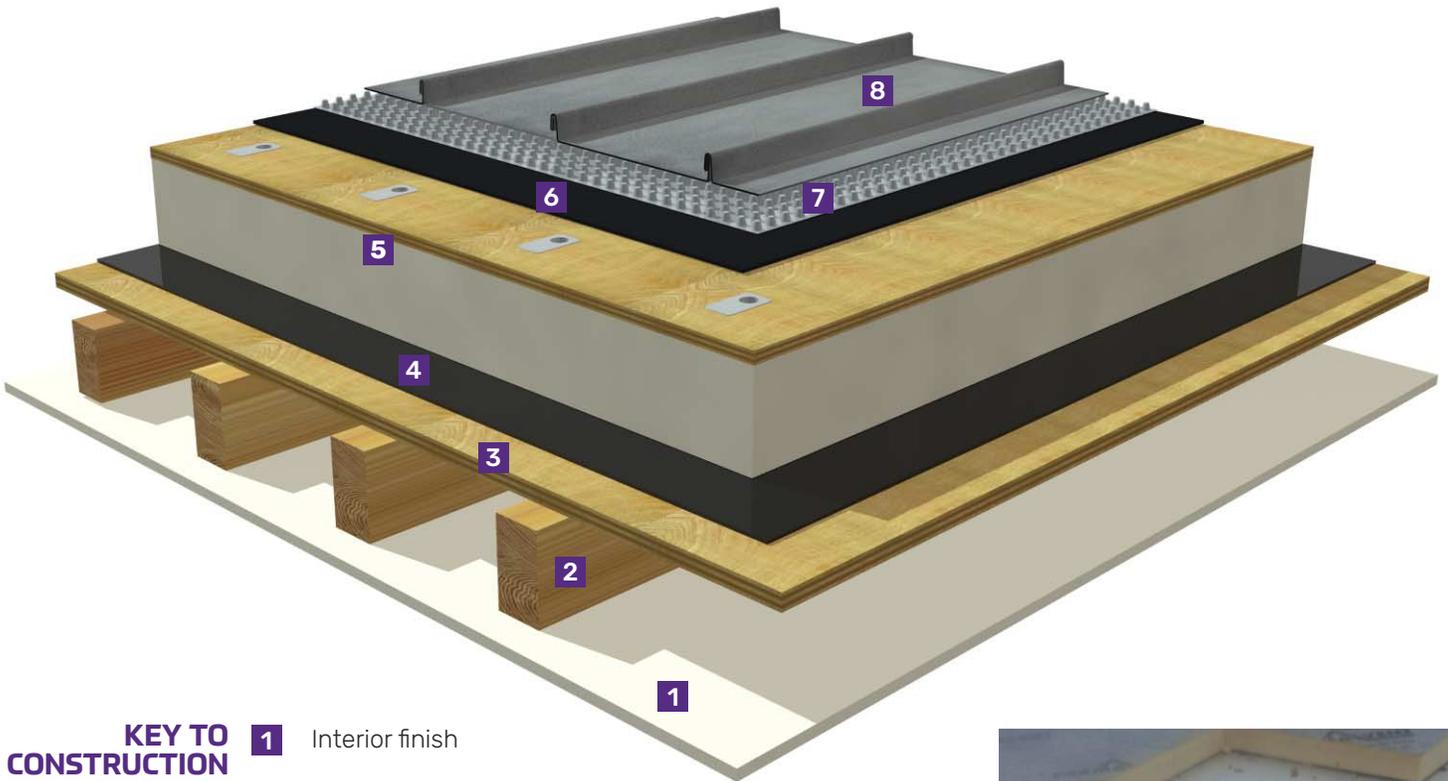
- VMZINC® PLUS must be used on all warm roof build-ups
- Delta VMZINC® Membrane must be used
- The substrate must be continuous and even and the correct fixing clips must be used
- A fully supported continuous vapor barrier must be installed (bitumen-backed aluminum foil). Polythene films are not acceptable

WARM ROOF STANDING SEAM CONSTRUCTIONS

Using nail base	p24
On insulated metal-faced panels	p26



Standing Seam on nail base



KEY TO CONSTRUCTION BUILD-UP

- 1 Interior finish
- 2 Rafters
- 3 Continuous support (e.g. steel deck or plywood)
- 4 Continuous, fully supported aluminum foil, bitumen-backed vapor barrier
- 5 Nail base
- 6 Breathable membrane
- 7 Delta VMZINC® Membrane
- 8 VMZINC® PLUS Standing Seam

ADVANTAGES OF STANDING SEAM ON NAIL BASE

- Reduces thermal bridging
- Provides a solid fastening surface
- Increases air tightness



Example of bituminous vapor barrier with aluminium foil

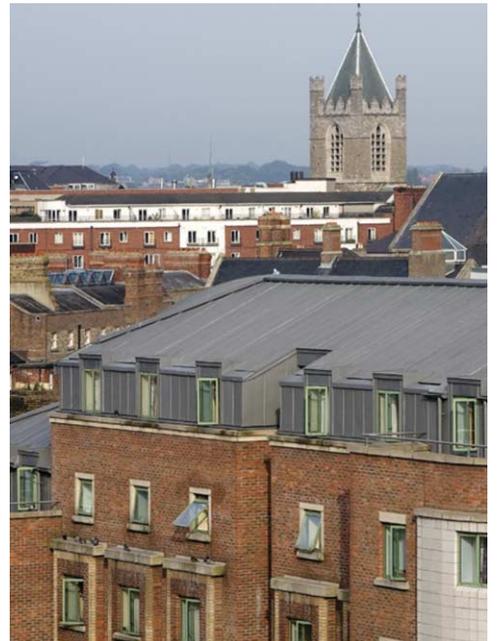
Standing Seam on nail base

AREA OF APPLICATION

With this warm roof system VMZINC® PLUS Standing Seam and Delta can be installed on the nail base without ventilating the substrate. The system can be used for roofs with a pitch from 1:12 to 70° and for buildings with all humidity classes (dwellings with high occupancy, sport halls, etc) with the exception of very high humidity buildings such as swimming pools.

STRUCTURE

The supporting structure can be a steel or plywood deck. Either deck is covered by an aluminum foil-reinforced bituminous vapor barrier with a high water vapor resistance (minimum vapor resistance 4000MNsg) installed with cold or hot glued joints. Higher performance vapor barriers may be required depending on the humidity class of the building. The nail base must have an external skin of 3/4" plywood with appropriate thickness of rigid insulation required for the project in question and comply with current Building Regulations.



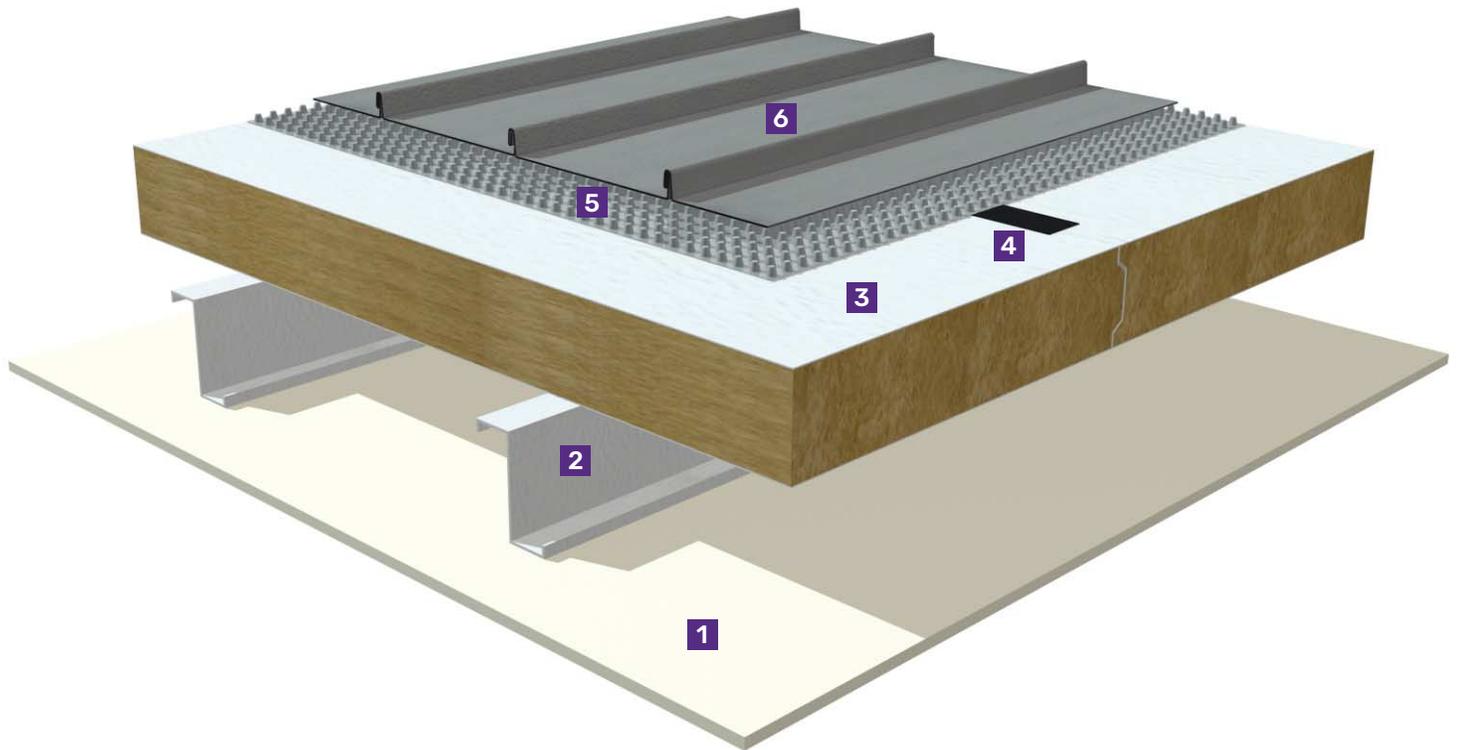
Note:

The information relating to the installation of insulation and membranes is indicative only.

The choice and installation of these products will be according to the recommendations of the insulation and membrane manufacturers.

Download the technical drawings of this roof build-up from our website
www.vmzinc-us.com

Standing Seam on insulated metal-faced panels



KEY TO CONSTRUCTION BUILD-UP

- 1 Interior finish
- 2 Steel purlins
- 3 Insulated metal-faced panel (24Ga steel thickness)
- 4 Aluminum-faced tape
- 5 Delta VMZINC® Membrane
- 6 VMZINC® PLUS Standing Seam

ADVANTAGES OF STANDING SEAM ON INSULATED METAL-FACED PANELS

- This solution provides good pull-out resistance
- Offers a fast track installation process over large areas
- Reduced thermal bridges
- Allows building to dry out rapidly



Standing Seam on insulated metal-faced panels

AREA OF APPLICATION

Suitable for buildings with all humidity classes (dwellings with high occupancy, sports halls, etc) with the exception of very high humidity buildings such as swimming pools. The system can be used for roofs with a pitch from 1:12 to 70°.

STRUCTURE

The insulated metal-faced composite panel must be made from galvanised steel on both the internal and external facing (minimum thickness 0.7mm for external facing). Fixings and clips must not inhibit the required expansion and contraction of the VMZINC® PLUS installed over the Delta VMZINC® Membrane.

The insulated metal-faced composite panel must provide a 100% vapor barrier. This is normally achieved using a panel with a vapor-tight interlocking jointing system. It is the specifiers responsibility to ensure there is no risk of condensation in this type of roof construction and the use and humidity of the building should be considered before specifying this solution.

The warm side of the insulated panel joint must be sealed together with the top side. All joints and penetrations should be sealed appropriately.



Note:

The information relating to the installation of panel, clips and membranes is indicative only.

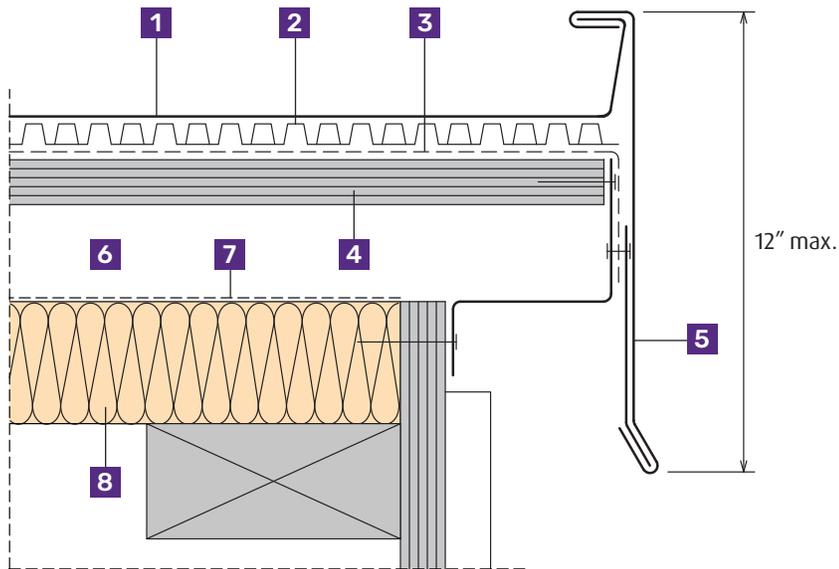
The choice and installation of these products will be according to the recommendations of the panel manufacturer.

Download the technical drawings of this roof build-up from our website
www.vmzinc-us.com

Technical drawings

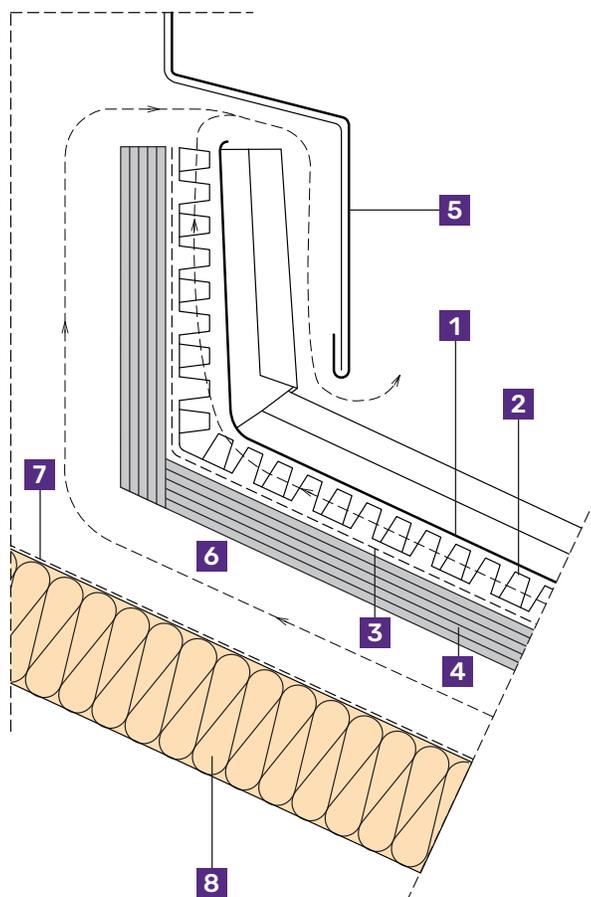
Download the complete set of technical drawings from our website www.vmzinc-us.com

VERGE DETAIL



- 1 VMZINC® PLUS Standing Seam
- 2 Delta VMZINC® Membrane
- 3 Breathable membrane
- 4 Plywood substrate
- 5 VMZINC® PLUS Flashing
- 6 2" ventilated air space
- 7 Breather membrane
- 8 Insulation and structure

WALL ABUTMENT DETAIL

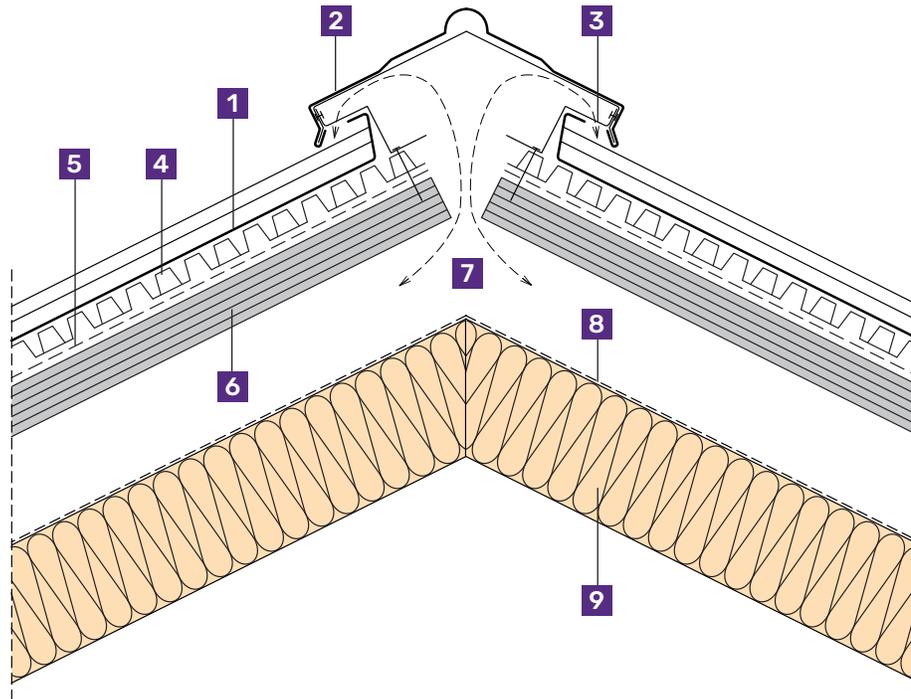


- 1 VMZINC® PLUS Standing Seam
- 2 Delta VMZINC® Membrane
- 3 Breathable membrane
- 4 Plywood substrate
- 5 VMZINC® PLUS Flashing
- 6 2" ventilated air space
- 7 Breather membrane
- 8 Insulation and structure

Technical drawings

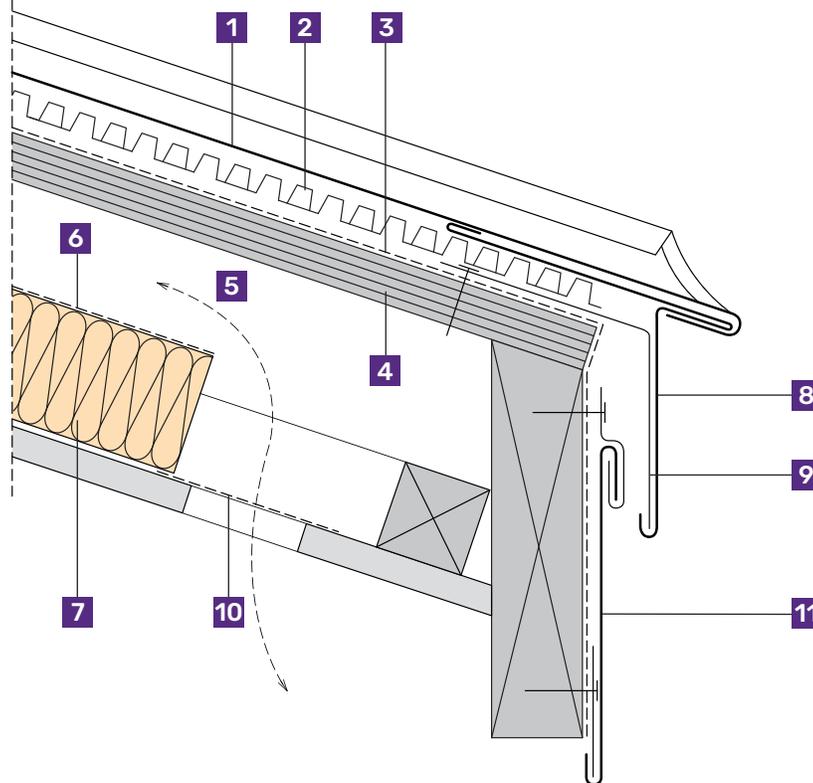
Download the complete set of technical drawings from our website www.vmzinc-us.com

RIDGE DETAIL



- 1** VMZINC® PLUS Standing Seam
- 2** VMZINC® PLUS Ridge Cap
- 3** Galvanised steel stiffener and perforated Z closure
- 4** Delta VMZINC® Membrane
- 5** Breathable membrane
- 6** Plywood substrate
- 7** 2" ventilated air space
- 8** Breather membrane
- 9** Insulation and structure

EAVES DETAIL

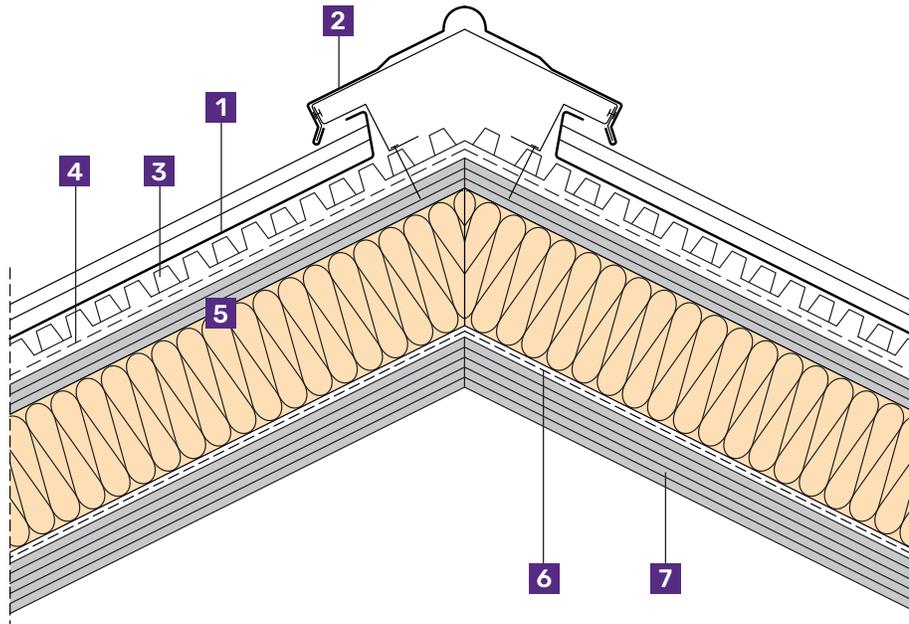


- 1** VMZINC® PLUS Standing Seam
- 2** Delta VMZINC® Membrane
- 3** Breathable membrane
- 4** Plywood substrate
- 5** 2" ventilated air space
- 6** Breather membrane
- 7** Insulation and structure
- 8** VMZINC® PLUS Eave Flashing
- 9** Continuous galvanised steel stiffener
- 10** VMZINC® continuous 50% perforated insect screen
- 11** VMZINC® PLUS Fascia Flashing

Technical drawings

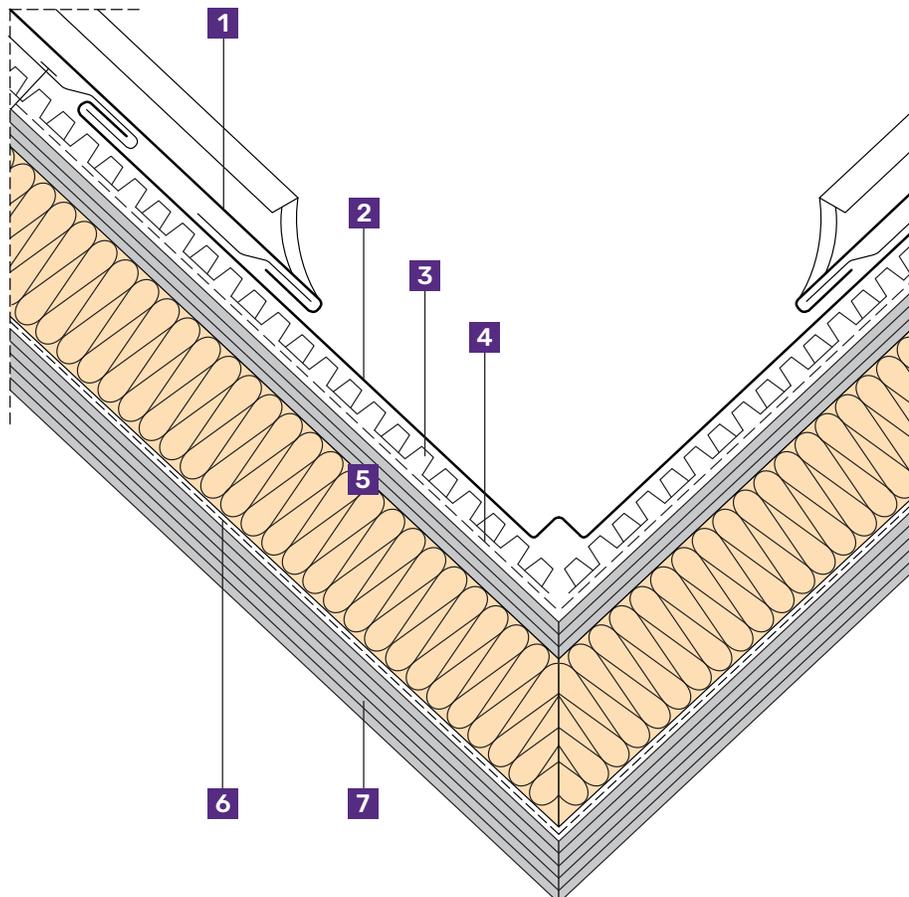
Download the complete set of technical drawings from our website www.vmzinc-us.com

RIDGE DETAIL



- 1 VMZINC® PLUS Standing Seam
- 2 VMZINC® PLUS Ridge Cap
- 3 Delta VMZINC® Membrane
- 4 Breathable membrane
- 5 Nail base
- 6 Continuous, fully supported aluminium foil, bitumen-backed vapor barrier
- 7 Continuous support

VALLEY DETAIL

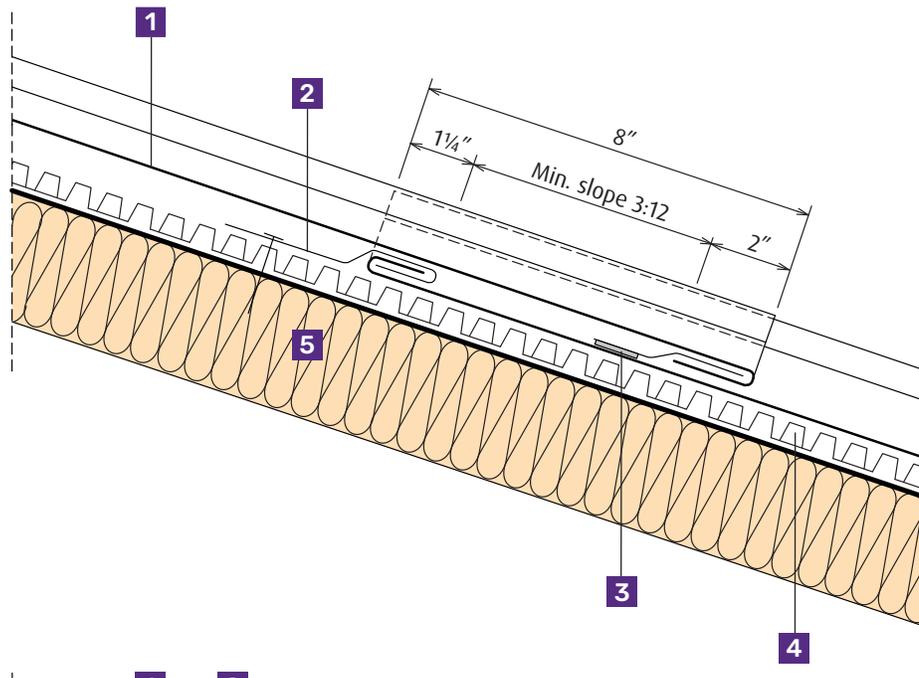


- 1 VMZINC® PLUS Standing Seam
- 2 VMZINC® PLUS Valley Flashing
- 3 Delta VMZINC® Membrane
- 4 Breathable membrane
- 5 Nail base
- 6 Continuous, fully supported aluminium foil, bitumen-backed vapor barrier
- 7 Continuous support

Technical drawings

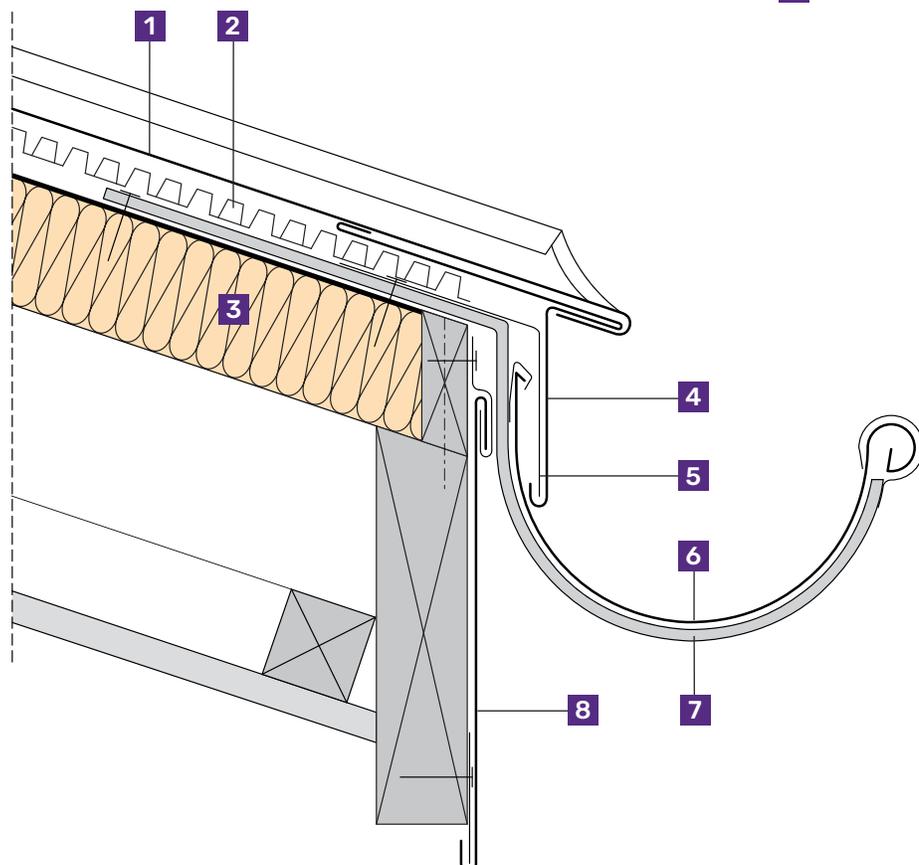
Download the complete set of technical drawings from our website www.vmzinc-us.com

DOUBLE WELT JUNCTION DETAIL



- 1** VMZINC® PLUS Standing Seam
- 2** VMZINC® PLUS Delta Sheet Clip
- 3** Zinc continuous soldered cleat
- 4** Delta VMZINC® Membrane
- 5** Insulated metal-faced panel

EAVES DETAIL



- 1** VMZINC® PLUS Standing Seam
- 2** Delta VMZINC® Membrane
- 3** Insulated metal-faced panel
- 4** VMZINC® PLUS Eave Flashing
- 5** Continuous galvanised steel stiffener
- 6** VMZINC® Half Round Gutter
- 7** Galvanised steel gutter bracket
- 8** VMZINC® PLUS Fascia Flashing

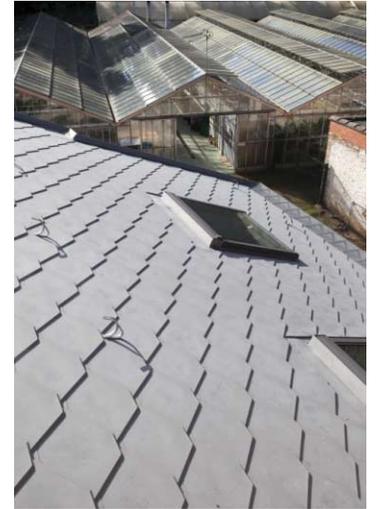
VMZINC® STANDING SEAM

Other VMZINC® roofing systems

ADEKA® tiles and roofing shingles

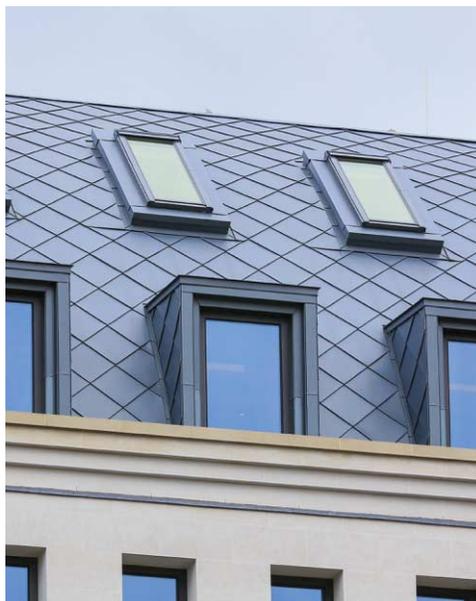
OVERVIEW ADEKA® is an innovative patented facade and roof system based on small pre-formed QUARTZ-ZINC® elements featuring a unique locking key. For other finishes please contact us.

Approximately 88 elements are required to cover 100ft². Due to the raised edges and 50mm overlaps ADEKA® can be used for roofing for slopes of 3:12.



INSTALLATION AND STRUCTURE ADEKA® can be fixed to the same substrates as the Standing Seam system. The panels are installed from bottom up with the key fixing into the lower panel. Each ADEKA® tile is then secured with 3 screws. ADEKA® is not supplied with filmed VMZINC®.

Roofing shingles (flat lock panels) can also be installed on a roof in a similar fashion to the ADEKA® tile, however the minimum slope for the majority of projects using diamond shingles with non-aligned joints is 45 degrees. Please contact us for further information.



VMZINC® STANDING SEAM

Other VMZINC® roofing systems

ADEKA® tiles and roofing shingles



Atelier Urban Face



A J Grack

VMZINC® STANDING SEAM

Other VMZINC® roofing systems

Rainscreen roofs

OVERVIEW Zinc rainscreens can be considered for roofing, however, as these are not weather resistant when installed non vertically it is vital that a secondary water proofing layer be installed under the rails supporting the zinc panels. Alternatively a complex gutter system can be created in order to evacuate the rain water.



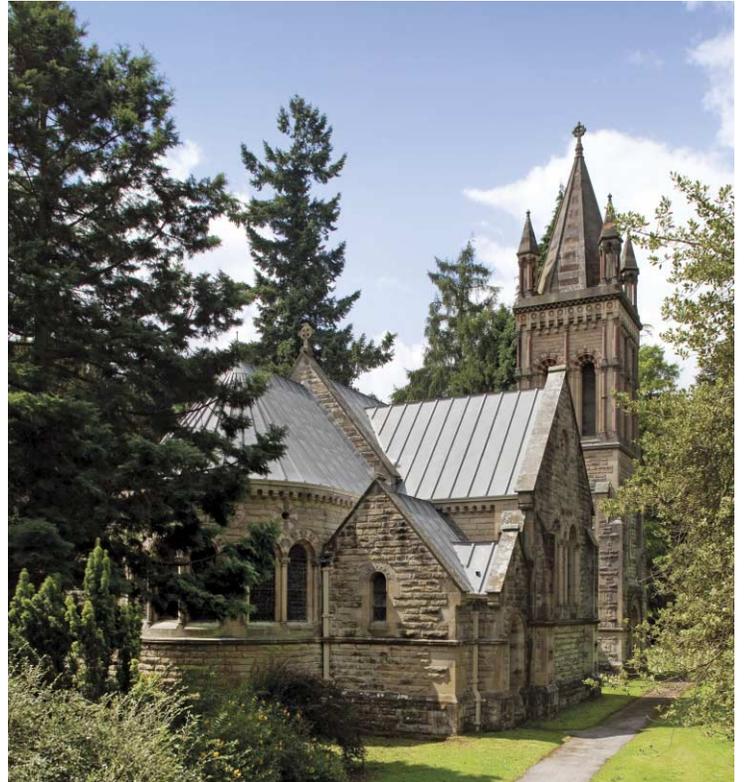
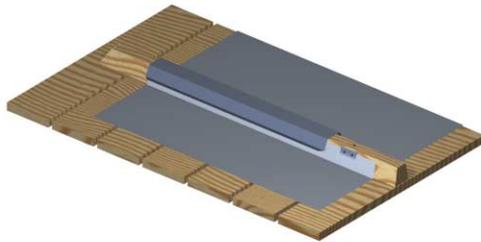
VMZINC® STANDING SEAM

Other VMZINC® roofing systems

Batten cap roofs

OVERVIEW Zinc has been used as a roofing material since the beginning of the 19th century and the first systems involved batten cap roofs which are still widely used across the whole of Europe and frequently now as a replacement for lead.

The batten cap roofing system is often a more appropriate choice for traditional buildings.



VMZINC® STANDING SEAM

Further technical information

ZINC AESTHETICS

It is generally not recommended that zinc roofs and walls are cleaned as rain water performs this task very well. Non-rinsed surfaces such as soffits and some facades, especially in coastal areas may exhibit some stains. It should be noted that this is not a form of serious corrosion.

Zinc can be installed adjacent to limestone. The run off from limestone onto zinc material is acceptable. However, limestone dust and gypsum dust generated during cutting operations can react with zinc in the presence of water and form a superficial layer of white rust. No dust should be in contact with unprotected zinc. To prevent white rust, good construction practices should be used to limit the amount of dust that comes in contact with the zinc.

VMZINC® manufacturing uses a color management system based on the Y-Factor. The Y-factor ranges from 0 to 100: 0 is black and 100 is white. The range for ANTHRA-ZINC® is 5 to 7 and the range for QUARTZ-ZINC® is 22 to 25. We recommend that one project uses one production batch.

FIXING SYSTEM METHOD

Clips have a dual function:

- Ensuring the mechanical resistance of the entire roof
- Allowing free expansion of the metal

VMZINC® clips are made of 304 stainless steel. The thickness of the fixing clip is 0.5mm. The sliding clips have a moving component, which is 0.4mm thick, and a 2¾" long slot to allow free movement of the panel when it is under expansion and contraction. Each clip must resist a pull-out force of 50daN. It is recommended that screws be used to secure the clips with two being used per sliding clip.

The use of nails offers significantly less resistance, but in the event of using nails, contractors are advised to use ring shank nails.

Center to center distance between clips:

- 16" on the main part of the roof
- 9" on perimeter of the roof (at least 4' or 1/8 of the projected roof)
- 6" in the corners



All Standing Seam panels require a minimum of 5 fixed clips installed over a 4' length of the seam. When attaching PV panels, snow guards, etc it may be necessary to further increase the number of these clips. Standard panel width is 16⅞".

Please consult us for further information and note that these are recommended spacings and all fastened points should be verified by a local engineer to confirm wind uplift requirements for your project.

VMZINC® in relation to other materials

Compatible contact products	
Metals	
Lead	
Aluminium (painted, anodised or bare)	
Galvanised steel	
Stainless steel	
Woods	
Pine	
Spruce	
Scots pine	
Poplar	
Miscellaneous materials	
Polyurethane	
Non-acetic silicones	
MS polymer mastics	
Organic timber treatments	

Incompatible contact products & run-off*	
Metals	
Copper	
Steel (non-galvanised)	
Gypsum dust/limestone dust	
Woods	
Larch	
Oak	
Chestnut	
Red cedar	
Douglas fir	
White cedar	
All woods with a pH < 5	
Miscellaneous materials	
Mortar	
Building paper	
Bituminous membranes	
Fire retardant & preservative treatments	
Acidic cleaners (brick cleaner etc)	
Acetic silicones	
Metal salt timber treatments	

* This list is not exhaustive

VMZINC® STANDING SEAM

Transport, handling and storage

TRANSPORT AND HANDLING

To ensure the durability and aesthetics of the zinc, specific recommendations must be followed in the transport and handling of zinc sheets and coils.

- Avoid dropping sheet, coils and formed pieces. Any blow or punch to the zinc can cause deformity in the zinc, in the form of folds or bumps. This can affect one or more of the sheets and coils. These deformities will affect the aesthetics of the zinc and may also damage its structural integrity, with cracks occurring over time
- Panels must be transported and stored vertically, standing on the L profile in the containers designed for them
- When coils are shipped, they must be placed either on their horizontal axis or vertical axis, depending on the client's request
- Rough surfaces may scratch the zinc which can develop into cracks either during forming or after installation due to expansion and contraction. Therefore the dragging or sliding of sheets should be avoided
- When handling the zinc, gloves and long sleeved shirts must be worn. The acid nature of perspiration will leave visible marks and finger prints on the zinc that over time will heal but can remain visible for quite some time
- When the zinc is shipped in containers, it is essential to open the containers immediately upon receipt and store the products as soon as possible in the correct conditions



STORAGE

The zinc sheets, coils, and formed pieces must be stored in a well-ventilated, sheltered and dry area where temperature variation is kept to a minimum.

- Temperature variations can cause condensation build-up, that in turn will cause zinc hydroxide (white rust) to form. Ensure that the zinc is stored in an area without great temperature variations. Zinc hydroxide forms when the surface of zinc comes into contact with humidity without carbon dioxide. Zinc hydroxide provides no protection and leaves unattractive, indelible marks on the zinc. Consequently, we do not recommend installing any panel that has been affected by zinc hydroxide
- The sheets, coils and formed pieces should be separated from the ground by pallet or similar storage device to allow sufficient ventilation of the zinc
- Pallets or similar storage device should allow the zinc sheet to be stored flat to reduce risk of deformation
- It is recommended that the coils be stored in their original packaging

If the coils are to be stacked due to lack of storage space the following recommendations must be followed:

- If coils are delivered on their horizontal axis, the pallets must be stored in their original packaging and individually on separating racks
- If coils are delivered on their vertical axis the pallets must be stored on top of one another with a maximum of 4 pallets for stability reasons
- Zinc must never be stored outside



VMZINC® STANDING SEAM

Working with zinc

USE A PROFESSIONAL

VMZINC® provides training for installers with experience in metal roofing and cladding. This training is designed to supplement trained professionals with specific information concerning VMZINC®. Please contact us for further information.

PROFILING AND FOLDING ZINC

As zinc is a rolled metal it has a rolling direction, which is also indicated on the protective film. It is recommended that this direction is respected on a roof or wall as light will reflect differently on panels laid in opposite directions. The zinc must also be folded in a way that creates a gentle radius rather than a sharp fold.

This is the case for all equipment whether it be hand tools, CNC equipment or profilers. Natural zinc, QUARTZ-ZINC® and ANTHRA-ZINC® should always have an internal folding radius of at least 2 x the thickness of the zinc sheet, and the metal should never be folded if the temperature of the metal is less than +45°F.

When using PIGMENTO®, this radius should be increased to 3 x the thickness of the zinc sheet, and the folding should only be carried out when the temperature of the metal is at least +50°F. All folding of the zinc should be carried out with the protective film in place.

PROTECTING ZINC

Protective gloves should not only be used as a safety measure when working with zinc but also to avoid staining the metal. The protective film should be left on the zinc during panel manufacture and installation. Zinc roofs and walls must not be covered with tarpaulins during the installation as it will cause condensation build-up resulting in possible white rust staining.

SOLDERING ZINC

Soldering is an excellent way of joining two pieces of zinc to another in a weather-tight fashion. It should be noted that a soldered joint will not allow for any thermal expansion and contraction, therefore soldering should only be used to join small pieces of zinc to one another.

Before soldering, all surface treatment of oxidation on the metal must be either chemically or physically (gentle abrasion) removed.

For more information please consult our guide to soldering.

PROTECTIVE FILM

The protective film should be removed from the zinc panels upon completion of the facade or roof all at the same time.

The protective film should remain on the zinc no longer than 60 days after the installation of the panels. Make sure that other trades do not contaminate zinc panels after the film is removed.

The film must not be partially removed during installation for the remaining film to be removed at a later date, as this is likely to allow water to become trapped between the zinc and the partially removed film resulting in staining. It should be noted that most stains are very difficult to remove.

If fully filmed sheets are being used to form panels, which may make it difficult to remove the film after installation, the film can be scored by using a piece of zinc (greatly reduces scratching of the pre-weathering). This must be done on an area of the panel where water cannot build up, i.e. in the reveal of a cassette panel and not on the face of a panel. The scoring must also be done so as to leave a clean well-adhered edge to the film.

Once the film has been removed it must not be covered with timber, tarpaulins, etc as these will trap water and induce staining.



VMZINC® STANDING SEAM

Maintenance

MINIMUM REQUIREMENTS AND NORMAL MAINTENANCE

Although zinc is a metal that requires very little maintenance and the rinsing effect of rain water is often sufficient to keep the zinc in ideal condition the following precautions should be followed. The roof and or wall should be regularly inspected and any foreign matter such as leaves, grass and other deposits should be removed. Special attention should be given to gutters, insuring that they are clean and not blocked thus allowing the free flow of water (flat gutters which result in standing water are not recommended). This maintenance shall be at the owner's expense after the installation work has been completed.

FOOT TRAFFIC

Normal foot traffic use implies traffic reduced to a strict minimum for normal maintenance defined above and for other work, such as installation and servicing of aerials, etc.

It is advisable to take all the precautions and useful provisions necessary so as not to cause any puncturing of the flat parts or deformation of the joints, roll capping, roof vents, etc. Care must also be taken to clean footwear prior to walking on the roof.

In the case where technical equipment requiring frequent inspections (air conditioning, for example) is installed on the roof, certain adaptive arrangements such as walkways should be considered.

CLEANING

As indicated above, the rinsing effect of the rain will often mean that no other cleaning is necessary. However, it is possible to wash the zinc with warm water and a mild detergent.

The zinc must always be cleaned in the direction of the grain of the metal. Pressure washers are not recommended. Cleaning with detergent can be supplemented with application of a very small amount of mineral oil. The zinc must be completely dry prior to any application of mineral oil. It is always advisable that a small test area is cleaned and left for 24 hours prior to proceeding to a larger area.

SCRATCHES

Due to the self healing nature of zinc we would recommend that small scratches be left to heal on their own. We do not recommend the use of touch-up paint.

SALT

In coastal areas salty water can stagnate on all surfaces including zinc. When the water evaporates it is possible that this can leave a white stain.

On surfaces that are rinsed by rainwater the majority of the staining will be removed. However, on non-rinsed facades and soffits it is possible that these stains will build up and be more prominent.

It should be noted that this staining is purely aesthetic. All projects within 1 mile of salt water should be considered as 'severe coastal' and within 12 miles as 'coastal'.



VMZINC® STANDING SEAM

Zinc in different environments

AESTHETICS Zinc has been installed all around the world and in all types of climates ranging from coastal Scotland, the deserts of Arizona, tropical Singapore, the high mountains of Switzerland and even near the cliffs of Cape Horn, to name but a few locations.

Hot, cold, wet, dry, windy, coastal, rural and urban climates are all environments where zinc has been installed.

As well as the almost endless variety of environments where zinc can be, and has been used, zinc is a material that requires almost no maintenance as the rinsing effect of rainwater performs this task naturally. However, when zinc is used on a non-rinsed surface such as a protected facade, soffit or in a very dry climate it is possible that the zinc may exhibit some superficial stains. These stains will not significantly affect the integrity of the zinc itself.

It is for this reason that the very dark grey ANTHRA-ZINC® should be carefully considered before being designed on a non-rinsed facade or soffit. In marine locations (1 mile from the sea) the risk of superficial staining in these areas increases substantially. ANTHRA-ZINC® will also continue to evolve on rinsed roofs in marine locations and ANTHRA-ZINC® STRAT should be considered for these environments. Staining on non-rinsed surfaces will decrease further away from the sea. However, salt can still be present in the air up to 12 miles from the sea. It should be noted that non-rinsed surfaces in close proximity to roads that are heavily salted in the winter can also exhibit superficial staining. The PIGMENTO® range must not be left with bare edges exposed in marine locations, and folding radii must be respected. PIGMENTO® is also not recommended for non-rinsed surfaces within 2 miles of the sea or on rinsed surfaces within ¼ mile of the sea*. When QUARTZ-ZINC® is installed on a roof just prior to snowfall and the snow lies on the zinc for several weeks it is possible that some superficial stains can be left visible following the eventual snow melt. These stains will not affect the integrity of the zinc and will in time fade due to the rinsing effect of rainwater.

As the PIGMENTO® range continues to extend, the material can be used on all roofs and walls across the US and Canada, in very high UV environments due to the nature of the PIGMENTO® finish a reinforced version must be used for roofing, broadly South West of a line drawn from Oregon to South Carolina – see map. These recommendations also apply to the STRAT range. For further project specific information please contact us.

* for the State of Florida rinsed surfaces are extended to 1 mile from the sea.



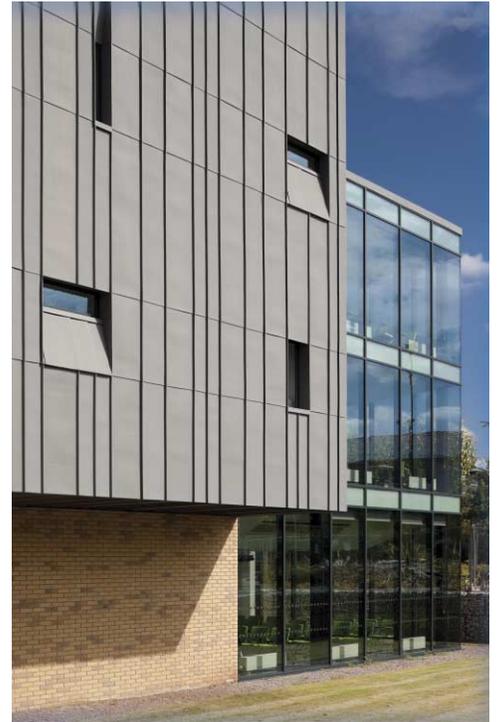
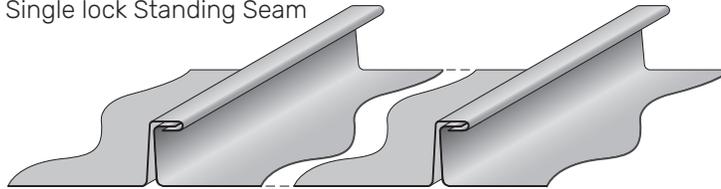
VMZINC® STANDING SEAM

Standing Seam facades

STANDING SEAM PANELS AS WALLS AND SOFFITS

VMZINC® can be used as a Standing Seam panel for all vertical walls as well as soffits. The structure must be a cold ventilated one using VMZINC® PLUS on vented open gap boarding, plywood or a galvanised steel deck. The vented air space must be at least 1½" wide. The panels can be installed vertically, horizontally or even diagonally but panel length should not exceed 15'. Although zinc Standing Seam panels are not as flat as some other VMZINC® facade systems it is possible to reduce unevenness by not exceeding a panel width of 16⅞" and increasing zinc thickness to 0.8mm (22 Ga). The use of a single lock also reduces oil canning.

Single lock Standing Seam



VMZINC® STANDING SEAM

Ornaments

ORNAMENTS VMZINC® ornaments were first made by 19th century workshops in Paris. The tradition continues with VMZINC® ornaments fabricating both standard and bespoke ornaments that are sent to all corners of the world.



Marchetto Higgins Stieve Architecture



Marchetto Higgins Stieve Architecture

VMZINC® STANDING SEAM

Other VMZINC® systems

RAINWATER SYSTEMS

Whether for new build or refurbishment, VMZINC® rainwater systems have been designed to complement a wide range of building materials and styles. Pre-weathered finishes offer exceptional color stability while developing the natural, self-protecting patina for which zinc is renowned. This ensures that maintenance requirements will be minimal throughout the systems' design life and that the material's installed appearance will be retained for many years.



RAINWATER SYSTEMS



RAINSCREEN FACADES

VMZINC® can be installed using the principle of a rainscreen facade. There are a number of panel types and sizes available. These include **Interlocking Panels** which can be installed horizontally or vertically in all finishes. Alternatively for very large panels **Zinc Composite Material** is an excellent solution. Combining the qualities, elegance and durability of VMZINC® with the rigidity and smoothness of composite technology, Zinc Composite Material offers unique architectural possibilities for facades.

Sine Wave Panels offer an alternative design in zinc whilst remaining a cost effective solution for rainscreen cladding. **Flat Lock Panels** can be used on a facade in many formats, sizes and in all finishes of VMZINC®.



Zinc Composite Material



Perforated corrugated zinc

Usage and contact information

Subject

The subject of this document is intended for specifiers (building project architects and design teams) and users (companies responsible for installation on the building site) of the designated product or system. Its purpose is to provide the main information, text and diagrams, relating to specification and installation. Any use or specification outside the area of use and/or specifications contained in this brochure requires specific consultation with the VMZINC® technical departments. This does not commit the latter to any responsibility with regard to the feasibility of the design or implementation of these projects.

Countries of application

This document applies exclusively to the specification and installation of the designated products or systems on building sites in North America.

Qualifications and reference documents

Please note that the specification of all construction systems for a given building remains the exclusive responsibility of its design team, who must, in particular, ensure that the specified products are suitable for the purpose of the building and compatible with the other products and techniques used. Please note that the correct use of this manual requires knowledge of VMZINC® materials and of the zinc roofing profession. While construction is underway all standards in force must be respected. A video showing the installation process is available via download from www.vmzinc-us.com. Furthermore, VMZINC® offers training courses specifically for professionals.

Responsibility

The specification and installation of VMZINC® products manufactured by VM Building Solutions are the sole responsibility of the architects and building professionals who must ensure these products are used in a way suited to the end purpose of the construction and that they are compatible with other products and techniques used. The specification and installation of the products implies respecting the standards in force and the manufacturer's recommendations. In this regard, VMZINC® publishes and regularly updates specification and installation manuals for specific geographic areas and provides training courses. All the information on the latter can be obtained from the local VMZINC® team. Unless otherwise agreed in writing, VMZINC® cannot be held responsible for any damages resulting from a specification or installation that does not respect all of VMZINC®'s specifications and the above standards and practices.

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