VMZINC

Gutter and downpipe systems

Design, specification and installation guidelines

Architect: Antoni Holowinski

VM BUILDING SOLUTIONS

Half Round rainwater system

A complete gutter and downpipe range

Introduction

Through the use of concealed brackets, the Half Round rainwater system provides a stylish, flowing gutter line. The surface is resistant to the accumulation of dirt and debris thereby ensuring that good water flow and discharge rates are maintained.

Designed to be easily and quickly installed, the Half Round rainwater system's concealed brackets (fixed at 400mm max centres) simply clip onto the gutter sections, which in turn slide and twist together. The gutter joints are then bonded and sealed using a high performance gunapplied one component MS polymer solvent-free adhesive, VMZINC-G.

Downpipes are secured to the wall using a simple but ingenious v-lock and self-locking bracket assembly. Downpipes are then push-fitted together but are not bonded, allowing the joints to expand and contract to accommodate varying thermal conditions.

Benefits

- Comes in ready-to-use kit form
- Stylish flowing gutter line through use of concealed galvanised steel brackets
- Self-locking downpipe brackets
- Sleeve connection on pipes
- QUARTZ-ZINC®, ANTHRA-ZINC® and PIGMENTO® finishes
- Lightweight yet durable
- Quick to install
- Low maintenance
- Long life expectancy
- Aesthetically distinctive
- Strength not affected by ultraviolet light
- Good flow rates and discharge of water
- Colour does not deteriorate as a result of ultraviolet light

VMZINC® Surface finishes

A complete gutter and downpipe range

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, wall and rainwater systems are also highly cost-effective, both from an initial procurement and design life perspective. Whether for new build or refurbishment, the VMZINC® systems have been designed to complement a wide range of building materials and styles.

The finishes available offer exceptional colour 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.

VMZINC® can be used for warm or cold roof constructions as well as rainscreen facades.

Natural zinc by VMZINC®

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

Natural zinc by VMZINC®

QUARTZ-ZINC®

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

QUARTZ-ZINC®
RAL 7037*

ANTHRA-ZINC®

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

ANTHRA-ZINC®
RAL 7021*

*The RAL reference is indicative as preweathered zinc is not a painted surface therefore making exact paint matches is almost impossible.

AZENGAR®

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

AZENGAR®
RAL 9006*

AZENGAR® 3R

With AZENGAR® 3R* (Reduce - Reuse - Recycle), we take sustainable construction one step further. This product is 100% recycled ad infinitum with no loss of quality has an exceptionally low carbon footprint (1.27 kg CO_2 per kg of zinc). AZENGAR® 3R combines the unique aesthetics of AZENGAR® with strong ecological added value.
* Contact us for more information.

PIGMENTO®

PIGMENTO® finishes offer a unique range of colours (Blue, Green, Brown, Red) that enhances any building. This natural product enables the texture of the QUARTZ-ZINC® to still be seen whilst offering the designer the choice of colour to complement other elements of a facade or roof. The colouration of the zinc is achieved with a special pigment layer that enhances the qualities of the zinc without presenting a block colour. This product is tested to EN13523-10/2010 and EN 15523-3/2001. PIGMENTO® provides a special resilience in a marine environment and makes the removal of salt deposits easier than on the regular surfaces of other zinc finishes.

PIGMENTO® green
RAL 7003*

PIGMENTO® brown
RAL 8028*

PIGMENTO® red
RAL 8025*

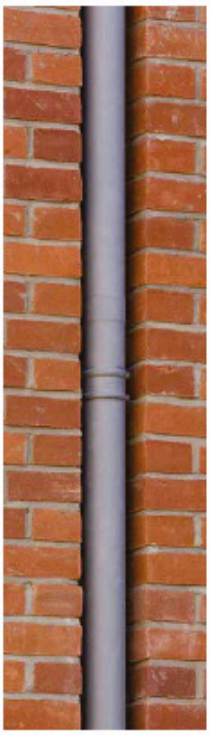
PIGMENTO® blue
RAL 7031*

Bespoke PIGMENTO®

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

Half Round rainwater system

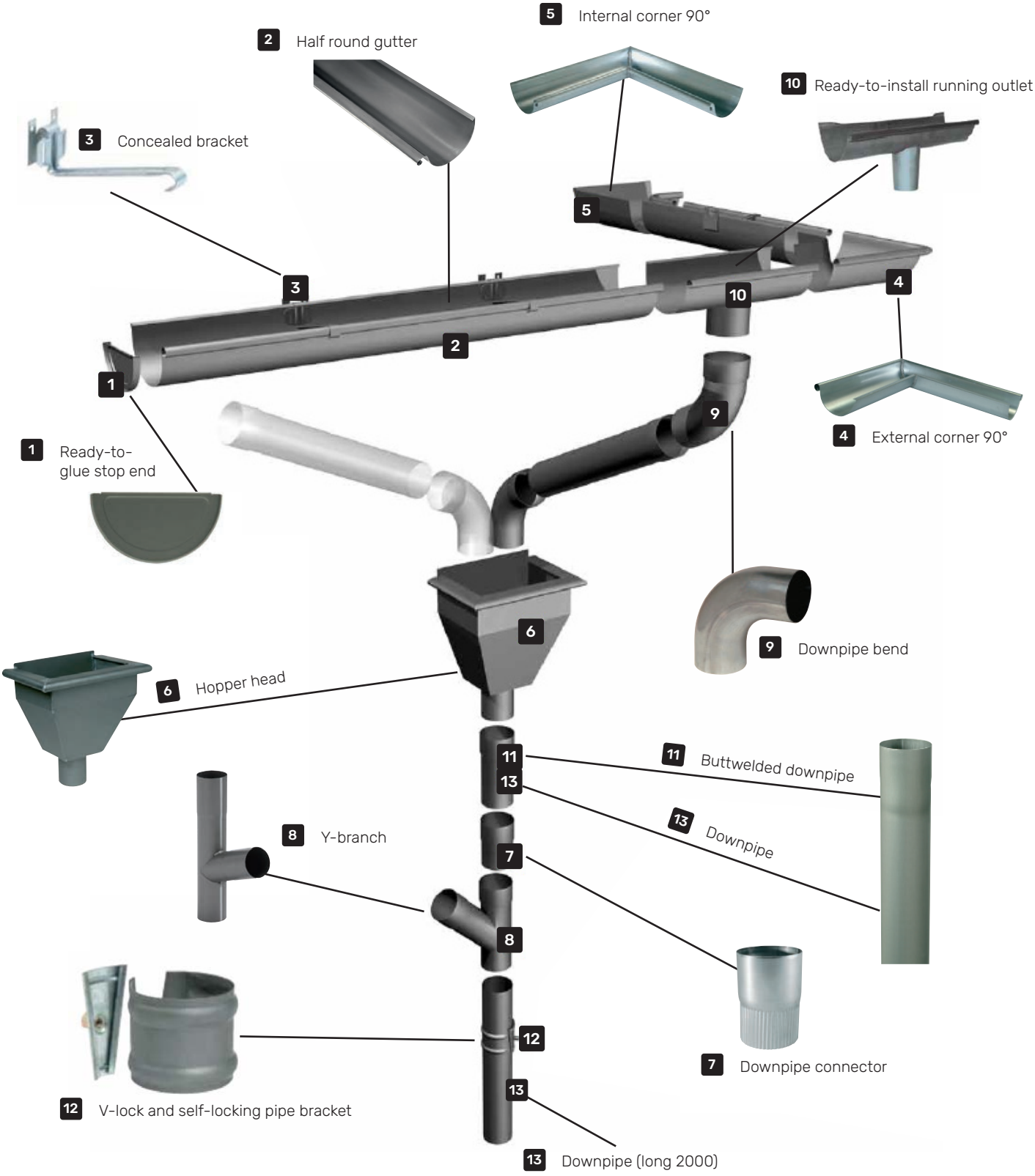
A complete gutter and downpipe range



Half Round rainwater system

All gutters, pipes and fittings are available in QUARTZ-ZINC® and ANTHRA-ZINC®.
They are also available in PIGMENTO® except where indicated with an asterisk.

VNMZINC-G high performance adhesive provides exceptional bond strength in extreme conditions, requiring no primer. It is solventfree, will not support the growth of fungi or bacteria, does not shrink or crack, and is odourless.



Half Round rainwater system

All gutters, pipes and fittings are available in QUARTZ-ZINC® and ANTHRA-ZINC®.
They are also available in PIGMENTO® except where indicated with an asterisk.

7 Downpipe connector

8 Y branch

6 Hopper head

Box Hopper head

9 Bend 72°

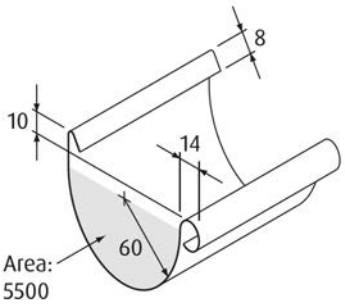
Elbow 72°

Bend 40°

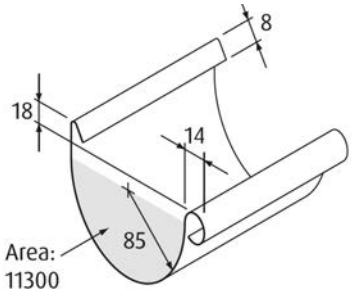
(Available in the PIGMENTO range only)

14 Rainwater diverter with overflow

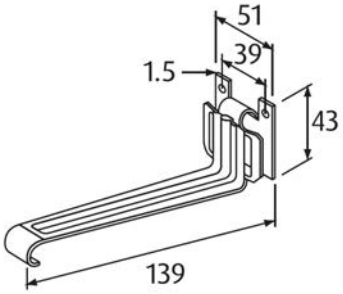
15 Offset



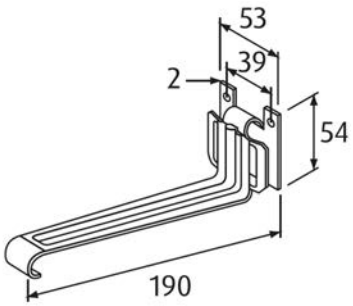
Half round gutter (3000 long): **Type 250**



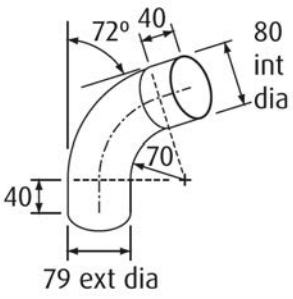
Half round gutter (3000 long): **Type 333**



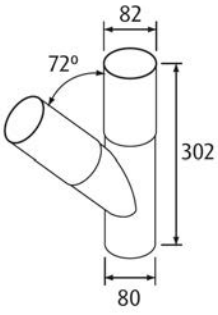
Concealed bracket: Type 250



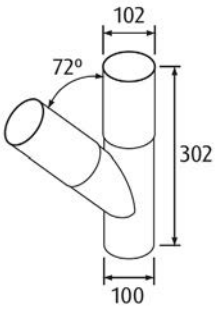
Concealed bracket: Type 333



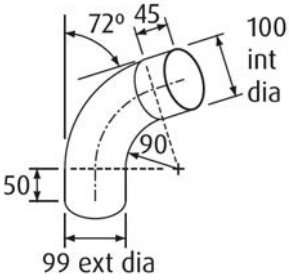
Bend: 80 dia



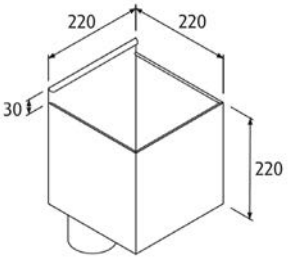
Y branch: 80 dia



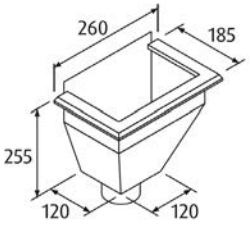
Y branch: 100 dia



Bend: 100 dia



Box hopper head: Outlet size 100



Hopper head: Outlet size 80 or 100

Half Round rainwater system

Installation procedures

Installing the gutters

1 Using a rule, make a chalkline setting the fall (min 1:200) towards the running outlet and required position of the downpipe.

2 Cut the running outlet to the required length, starting from the rolled front edge.

3 Use the VMZINC adhesive to seal and fix the stop end. To avoid cuts from edges, always wear gloves when handling zinc components.

4 Always use two concealed brackets to secure the running outlet.

5 Firmly fix the prepared running outlet according to the chalkline.

6 As for the running outlet, when cutting gutter to the required length, always saw from the rolled front edge first.

7 Clip concealed brackets to the cut lengths of gutter at 400mm max centres.

8 Secure each bracket to the gutter by folding in the two tabs. Then thoroughly clean the gutter joints before gluing.

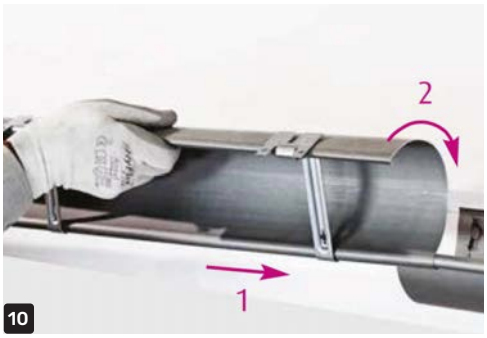
Half Round rainwater system

Installation procedures

Installing the gutters

9

Apply two, thin, parallel beads of VMZINC-G adhesive to the inner surface of the running outlet at max 50mm from the edge.



10

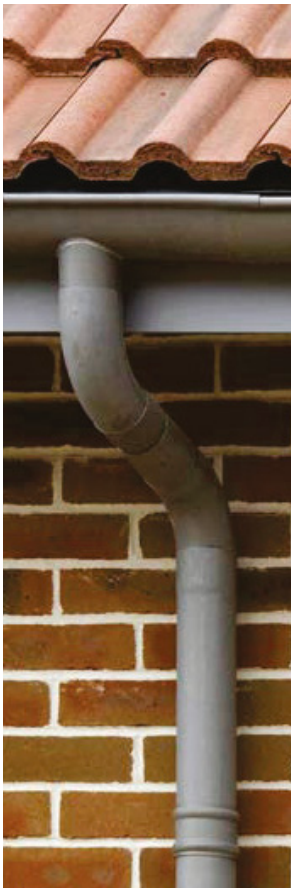
Insert the prepared gutter into the already installed running outlet via the rolled front edge first. Ensure a 50mm min overlap.

11

Fix the gutter brackets according to the chalkline.

12

Finally, fit the other stop end.



Installing the downpipes

1

Take two bends and measure the distance from the wall.

2

Once measured, fit the two bends together. It may be necessary to extend the assembly using a piece of downpipe.

3

At downpipe joints, mark positions for the v-locks at every 2 metres (maximum). Then firmly screw-fix the v-lock to the wall.

4

Place the self-locking bracket on the end of each pipe, then slide the assembly neatly into the v-lock to complete the installation.

Box gutters and other profiles

Complete gutter and downpipe ranges

Introduction

As well as the half round rainwater system VMZINC® offers a wide range of other gutter shapes and sizes that offers scope for use with buildings of varying style and function. These gutters have been developed over many years and have been in widespread use in Europe for all types of buildings in both the new build and refurbishment sectors.

The varying profiles allow the right gutter to be matched with the right architecture. The use of soldered joints for gutters provides a low maintenance jointing solution that has been used for over two hundred years and requires virtually no maintenance throughout the building's design life.

As with all VMZINC® solutions the products are in accordance with the BRE Global certification scheme and carry an Environmental Product Declaration, EN 15804. The box gutters and other profiles are manufactured from solid pre-weathered zinc so will not discolour, distort or become brittle over time.

Due to the purity of rolled zinc used, cut edges will not corrode as the metal develops a natural self-protecting patina. By contrast, systems which utilise powder coated and even zinc-coated finishes may be susceptible when gutter lengths are cut or to surface abrasion.

VMZINC® Rainwater systems suffer no adverse effects of surface deterioration (surface staining is possible on non-rinsed surfaces within 1km of the sea) and, with the Box rainwater system in particular, faceted details can be accommodated without the need for bespoke components.

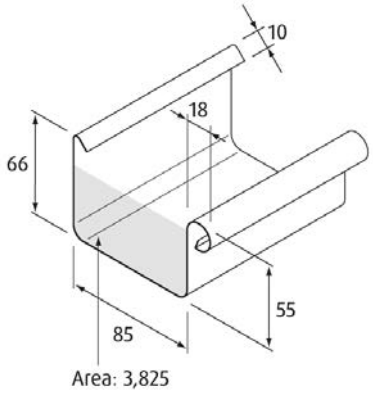
VMZINC® gutters are often used in conjunction with other zinc products including the ornaments range which produces dormer windows, finials as well as bespoke ornate roofing products. The gutters can also be used as an elegant addition with slate and tile roofs.

Box gutters and other profiles

Complete gutter and downpipe ranges

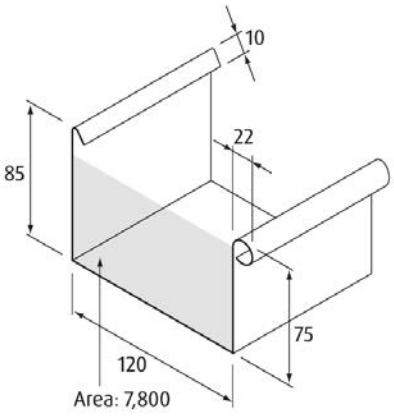
Box gutters and other profiles

Gutters and fittings available in QUARTZ-ZINC®, ANTHRA-ZINC® and Natural Zinc.



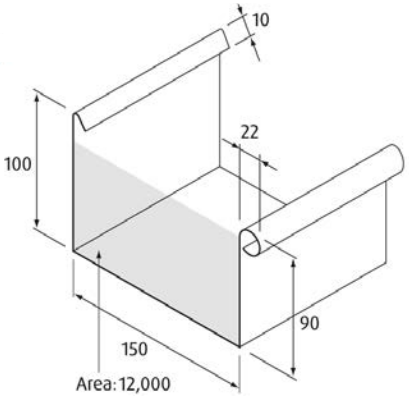
Box gutter: Type 250
(3000, 4000, 5000 or 6000 long)

Typical external corner 90°
(Internal 90° corners also available)



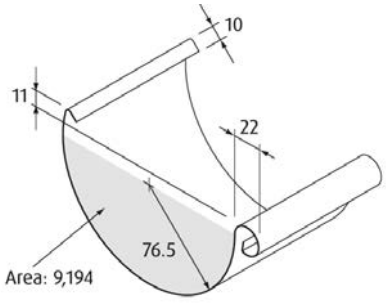
Box gutter (3000 long) : Type 333

Rafter bracket

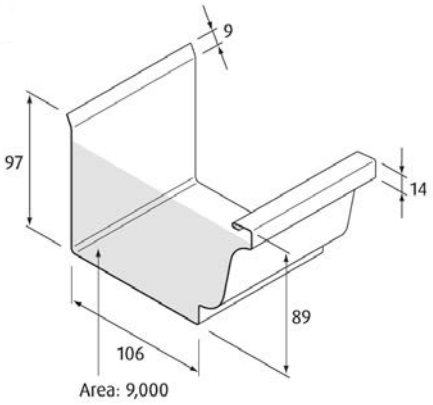


Box gutter (3000 long) : Type 400

Stop end
(not available in all finishies for all profiles)



Half round gutter for underslung bracket
(3000, 4000, 5000 or 6000 long)
Type 333



Ogee gutter (4000 or 5000 long) : Type 333

All dimensions in mm

Box gutters and other profiles

Pipes and fittings available in QUARTZ-ZINC®, ANTHRA-ZINC® and Natural Zinc

The majority of VMZINC® gutter brackets whether they be hidden, underslung fascia fix or underslung rafter fix are manufactured from galvanised steel. However we also supply a number of underslung gutter brackets which are black powder coated. Please consult us for further information.

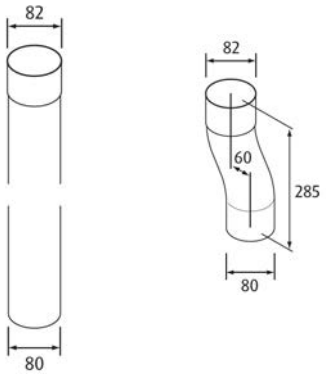
For VMZINC® round downpipes, the selflocking brackets are made from zinc but the V lock plate is manufactured from galvanised steel. As with the gutter brackets the traditional down pipe brackets are made from galvanised steel. However we also supply a number of brackets which are black powder coated for both round and square downpipes. Please consult us for further information.

Powder coated gutter brackets and downpipe brackets should be considered in locations within 5 km of the sea.

Non-standard 304 stainless steel brackets and 304 stainless steel black powder coated brackets are also available upon request.

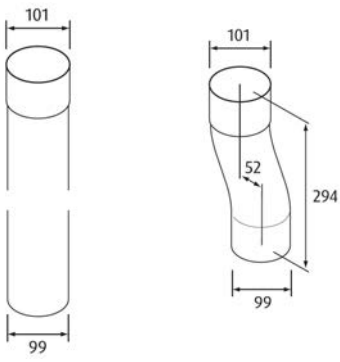
Box gutters are also available in the PIGMENTO® and AZENGAR® finishes, however these are non-standard products and therefore please consult us for further information. As the PIGMENTO® finish is only applied to one side of the zinc the front bead on gutters will have a QUARTZ-ZINC® aspect.

As with all zinc products some marks are possible on non-rinsed surfaces, especially in coastal environments. Whilst these marks will not adversely affect the integrity of the zinc they may affect its aesthetics.



Round downpipe 80
(1000,2000 or 3000 long)
and offset

Square downpipe 80
(1000,2000 or 3000 long)



Round downpipe 100
(1000,2000 or 3000 long)
and offset

Square downpipe 100
(1000,2000 or 3000 long)

Round downpipe 120
(1000,2000,3000 or 4000 long)

Square pipe bracket

All dimensions in mm

General recommendations for gutters

Flow rates using various gutter and downpipe combinations

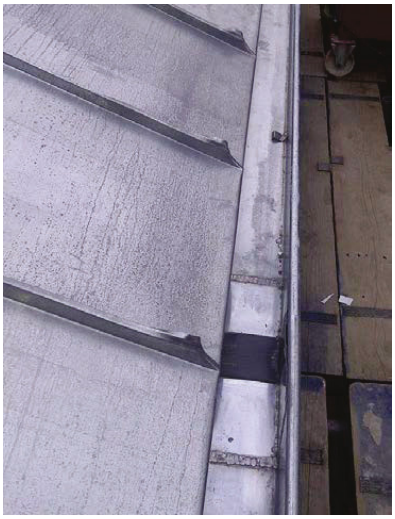
Gutter profile	Gutter size (mm)	Downpipe size* (mm)	Flow rate (l/s)	Maximum roof area** (m²)
Half round 250	60 radius	80 dia or 80 x 80	1.89	37
Half round 333	85 radius	80 dia or 80 x 80	2.6	52
Half round 333	85 radius	100 dia or 100 x 100	4.6	92
Half round 333	76.5 radius	80 dia or 80 x 80	2.6	52
Half round 333	76.5 radius	100 dia or 100 x 100	3.5	75
Box 250	85 x 66	80 dia or 80 x 80	1.0	20
Box 333	120 x 85	80 dia or 80 x 80	2.6	52
Box 333	120 x 85	100 dia or 100 x 100	2.61	52
Box 400	150 x 100	80 dia or 80 x 80	2.6	52
Box 400	150 x 100	100 dia or 100 x 100	4.6	92
Ogee 333	106 x 97	80 dia or 80 x 80	2.6	52
Ogee 333	106 x 97	100 dia or 100 x 100	3.2	64

*Note that the flow rates for round and square downpipes are the same:
i.e. round 80 and square 80 are both 2.6 l/s
i.e. round 100 and square 100 are both 4.6 l/s

**Based on rainfall of 0.05 l/s/m².

Correct design to BS EN 12056-3:2000, in conjunction with adequate maintenance, will ensure that the roof drainage system does not cause any problems during the life of the building.

Soldered gutters must allow for thermal movement. Traditional high point movement joints can be used as can soldered expansion joints. These must be installed between fixed points (eg outlets) with a maximum distance between expansion joints of 8m. Hanging gutters should include falls of at least 1:200. Internal box gutters must have minimum falls of 1:100 and include expansion joints and overflows. Other than internal gutters that combine a parapet in one piece, internal gutters should be 200mm deep.



Expansion joint soldered to gutter

Expansion joint

Downpipe outlet starter soldered to gutter

Specification guidelines

Half Round rainwater system, Box gutters and other profiles

Introduction

Specification guidelines for VMZINC® Half Round, Box gutters and other profiles are given below.

For full specification advice, contact VMZINC®. Bespoke specifications are also available.

Specification guidelines

SYSTEM PERFORMANCE

General
Design Standard: To BS EN 12056-3, clauses 3–7.

Collection and Distribution of Rainwater: Fully complete, and without leakage or noise nuisance.

Design Parameters: Design rate of rainfall as per BS EN 12056-3: 2000, National Annex NB.2 - Category 1.

PRODUCT DESCRIPTION

Half Round rainwater system, Box gutters and other profile rainwater systems

Gutters, downpipes and fittings to
EN 988: Zinc, copper and titanium

Manufacturer
VMZINC®, Collier House, Mead Lane, Hertford, Herts SG13 7AX.

Half Round rainwater system gutter profiles and sizes
Half round – 120mm, 170mm.

Half Round rainwater system downpipe profiles and sizes
Round – 80mm, 100mm

Box gutters and other profiles - gutters
- Half round – 153mm
- Box – 85 x 66mm, 120 x 85mm, 150 x 100mm
- Ogee – 106 x 97mm

Box gutters and other profiles - downpipes
- Round – 80mm, 100mm, 120mm
- Square – 80mm, 100mm

Material
EN 988: Zinc, copper and titanium

Finishes
ANTHRA-ZINC®, QUARTZ-ZINC®, PIGMENTO®

Accessories
- Concealed brackets for gutter fixing
- V-lock/self-locking bracket assembly for downpipe fixing
- Gutter stop ends
- Internal, external gutters
- Running outlets
- Bends, offsets
- Y branches
- Hopper heads
- Rainwater diverters

Jointing methods for Half Round rainwater system
- Gutters – glued with VMZINC-G adhesive
- Downpipes – loose-fitted, not glued

Jointing methods for Box gutters and other profiles
- Gutters soldered in accordance with manufacturer's recommendations.
- Downpipes loose-fitted.

EXECUTION PROCEDURES

Preparation
Before commencing work on the rainwater systems, ensure:
- Below ground drainage is ready to receive rainwater. Alternatively, make temporary arrangements for dispersal of rainwater without damage or disfigurement of the building fabric and surroundings.
- Painting of surfaces which will be concealed or inaccessible, is completed.

Installation generally
- Avoid contact with copper or areas washed by copper to prevent possibility of electrolytic corrosion.
- Compatible and incompatible timber species are given on page 46.
- Other rainwater systems only – Allow for thermal and building movement.
- Adequately protect gutters/pipework from damage and distortion during construction.
- Fit purpose-made temporary caps to downpipes to prevent ingress of debris.

Setting out gutters
- Set out to a true line and even gradient of at least 1 in 200 to prevent ponding or backfall. Position high points of gutters as close as practical to the roof and low points 50 mm (maximum) below the roof.
- Align outlet positions with connections to below ground drainage, unless shown otherwise on drawings.

Fixing and jointing gutters
Half Round rainwater system
- Clip concealed brackets to gutters at 400mm centres and fold in tabs to secure.
- Use two concealed brackets to secure running outlets.
- Apply VMZINC-G adhesive to each clean and dry gutter joint.
- Slide and twist gutter sections together.
- Screw-fix bracket/gutter assemblies to supporting background.
- Ensure roofing underlay is dressed into gutter.

Box gutter and other profile rainwater systems
- Underslung brackets should be at maximum 600mm centres.
- Soldered – see soldering recommendations.

Fixing and jointing downpipes
Half Round rainwater system
- Using the v-locks and self-locking brakets, fix securely with minimum of 3 brackets per pipe.
- Provide additional supports as necessary to support junctions and changes in direction.
- Tighten fixings as work proceeds so that every storey-length of pipework is self supporting.
- Push-fit downpipe sections together without adhesive to allow joints to accommodate thermal movement.

Box gutter and other profile rainwater systems
- Push-fit downpipe sections together, as Half Round rainwater system, to allow joints to accommodate thermal movement.
- For method of fixing to supporting structures, consult VMZINC® for recommendations.

Jointing gutters and pipework generally
- Cut ends of pipes and gutters clean and square.
- Remove burrs and swarf.
- Clean gutter joints before gluing together.

Gutter test
- Temporarily block all outlets.
- Fill gutters to overflow level and after 5 minutes closely inspect for leakage.

Care and maintenance
- Provide printed instructions of the recommended inspection, cleaning (generally once per year) and repair procedures.
- All VMZINC® gutters and downpipes develop a self-protecting surface patina that does not require frequent maintenance.

Further technical information

General for all zinc products

Zinc aesthetics

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 or soffit it is possible that the zinc may exhibit some superficial stains. These stains will not 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 the risk of superficial staining in these areas increases. Whilst stains are possible on QUARTZ-ZINC® and the PIGMENTO® range the visual effect is greatly reduced and therefore these finishes may be more appropriate for some specific locations, however in a severe non-rinsed marine environment (1km from the sea), staining is still possible and therefore PIGMENTO® should not be used in this application.

VMZINC® manufacturing uses a colour 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

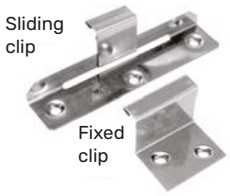
Clips have a dual function:

- 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 70mm 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 three 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.

Centre to centre distance between clips:

- 330mm on the main part of the roof
- 200mm on perimeter of the roof (at least 1100mm or 1/8 of the projected roof)
- 150mm in the corners



All standing seam panels require a minimum of 5 fixed clips. When attaching PV panels, snow guards, etc it may be necessary to further increase the number of these clips. Standard panel width is 600mm, however for aesthetic or wind up lift reasons 530mm or even 430mm wide panels can be used. Please consult us for further information.

VMZINC® Membrane

VMZINC® Membrane is a breather layer that allows water vapour to pass through it but is water proof to liquid water (up to a column of 2m). For roof pitches above 22° (40%) the membrane should be overlapped by 150mm. Below this slope the overlap should be increased to 200mm. For pitches between 3° (5%) and 14° (25%) the overlap should be 200mm. VMZINC® Membrane has an incorporated tape.

NOTE : Contact with limestone

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 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 contac t 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

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