



EuroGutterUSA™ Product Guide

European Half-Round Gutter and Seamless-Weld Downspout System

1. Installation Guide
2. Technical Product Guide
3. Material Guide
4. Product Guide Specification

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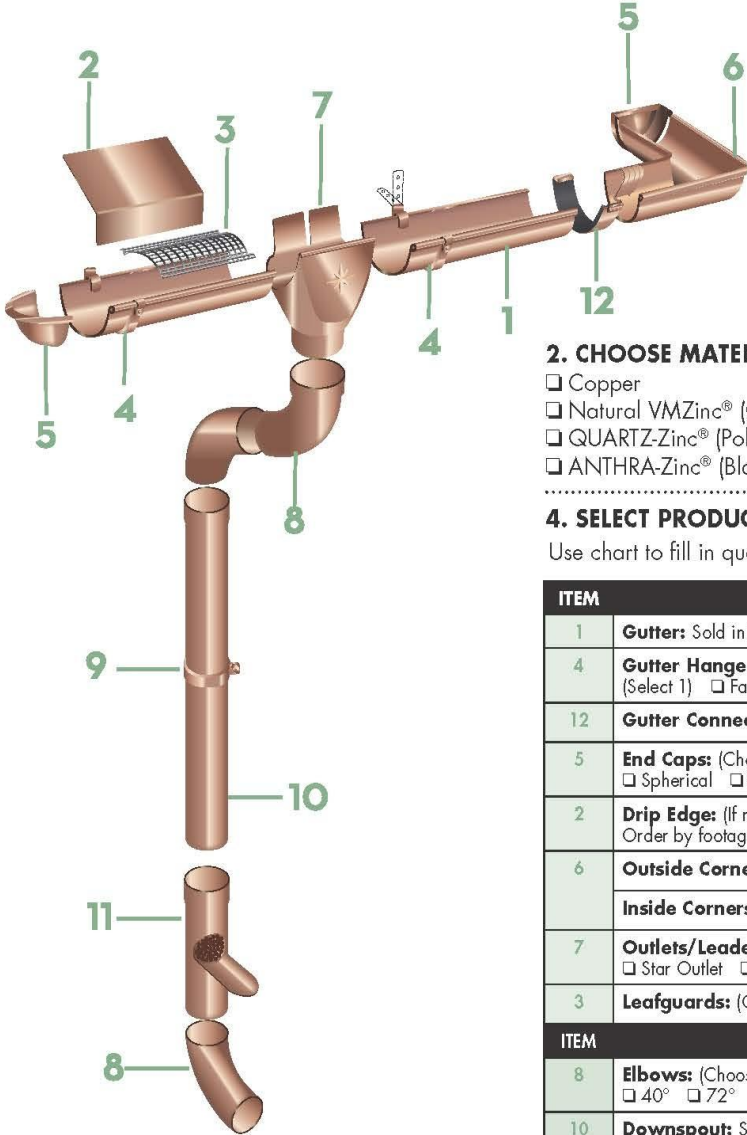
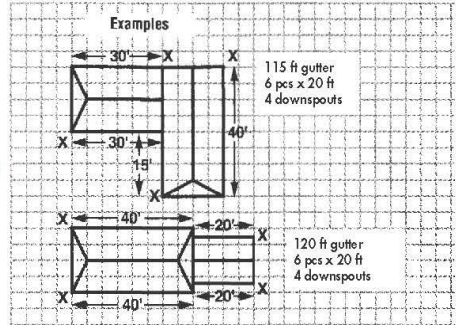
EuroGutterUSA™

A complete rainwater system by Ornametals

INSTALLATION GUIDE

1. SKETCH YOUR ROOFLINE

- Measure roofline where gutter will be installed
- Mark "X" where downspout is located



2. CHOOSE MATERIAL

- ☐ Copper
- ☐ Natural VMZinc® (Gray)
- ☐ QUARTZ-Zinc® (Polished Gray)
- ☐ ANTHRA-Zinc® (Black)

3. CHOOSE SIZE

- | Gutter | Downspout |
|-------------------------------|-------------------------------|
| <input type="checkbox"/> 5" | <input type="checkbox"/> 3.1" |
| <input type="checkbox"/> 6" | <input type="checkbox"/> 4.7" |
| <input type="checkbox"/> 7.6" | |

4. SELECT PRODUCTS

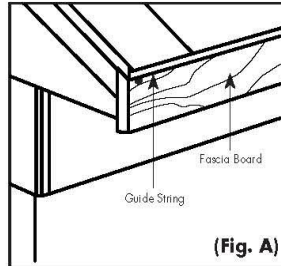
Use chart to fill in quantity of each item needed to complete your job.

ITEM	GUTTER	QTY
1	Gutter: Sold in 20 ft. sections.	
4	Gutter Hanger: 1 every 2 ft of gutter (Select 1) <input type="checkbox"/> Fascia <input type="checkbox"/> Roof Mount	
12	Gutter Connector: (as alternative to soldering gutter sections)	
5	End Caps: (Choose type) <input type="checkbox"/> Spherical <input type="checkbox"/> Soldered Right <input type="checkbox"/> Soldered Left <input type="checkbox"/> Box	
2	Drip Edge: (If needed) Order by footage	
6	Outside Corners/Miters	
	Inside Corners/Miters	
7	Outlets/Leaderheads: (Choose type) <input type="checkbox"/> Star Outlet <input type="checkbox"/> Basic Drop <input type="checkbox"/> Custom Order (Call for info)	
3	Leafguards: (Optional) 65.5 ft per box	
ITEM	DOWNSPOUT	QTY
8	Elbows: (Choose angle) <input type="checkbox"/> 40° <input type="checkbox"/> 72° <input type="checkbox"/> 85°	
10	Downspout: Sold in 10 ft sections	
9	Bracket: 1 at top / 1 at bottom / 1 every 10 ft (Choose type) <input type="checkbox"/> With pin <input type="checkbox"/> With bolt screw	
11	Inline Cleanout (Optional)	
ITEM	TOOLS	QTY
	Hanger Bending Tool	
	Setting Tool	

EuroGutterUSA™

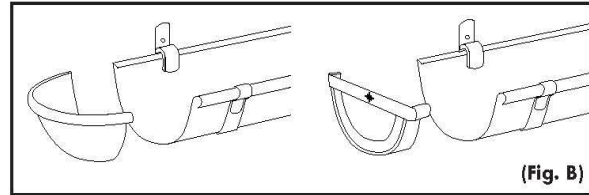
INSTALLATION INSTRUCTIONS

Step 1: REMOVE old gutters and inspect fascia board. REPLACE IF NEEDED. Tack a string to fascia board and level. Drop string about 1/4 in. per 20 ft. and retack string. This is sloped toward downspout. (Fig. A)



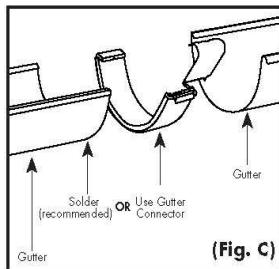
(Fig. A)

Step 2: Assemble gutter. Begin at opposite downspout side of gutter run. Snap end cap to gutter and solder. (Fig. B)



(Fig. B)

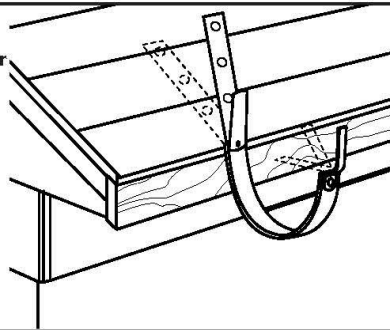
Step 3: Join two gutter sections. Rivet and solder (recommended) or use gutter connectors. (Fig. C)



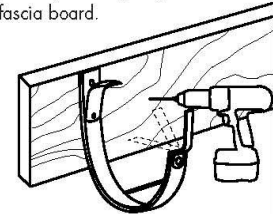
(Fig. C)

Step 4: Decide which hanger you will use.

(Fig. D) Roof Mount Hanger
(1 every 2 ft of gutter)
Installed on roof (not fascia) under shingles. Used for new construction or when fascia board not available. Use Hanger Bending Tool to install.



(Fig. E) Fascia Mount Hanger
(1 every 2 ft of gutter) Installed on fascia board.

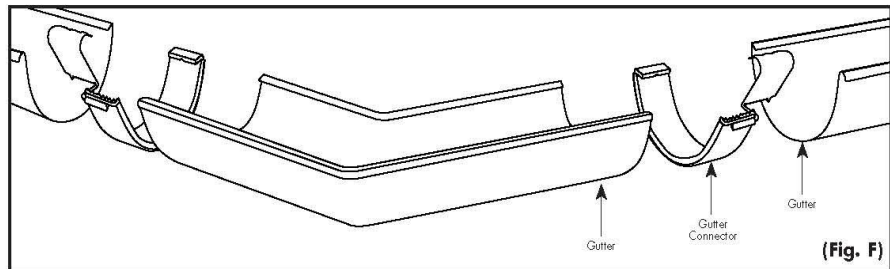


Step 5:

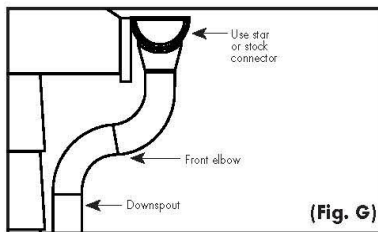
Attaching Corners/Miters

If turning a corner with a gutter, use an inside or outside corner/miter. (Fig. F)

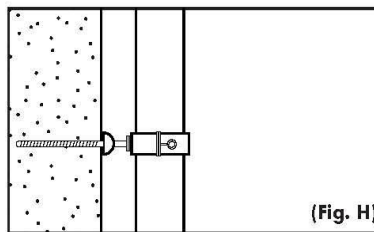
Solder (recommended) to connect corners/miters to gutter OR use gutter connector. (For VMZinc®, solder only.)



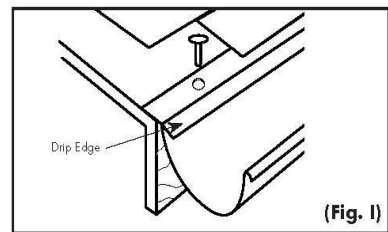
(Fig. F)



(Fig. G)



(Fig. H)



(Fig. I)

Step 6:

Attaching Spout and/or Elbows

Each downspout and elbow has one end expanded. Parts are joined by fitting the larger end of one over the smaller end of the other, forcing them together tightly. (Fig. G)

Downspouts should be set approximately 1 inch from building. Attach a front or side elbow at the downspout's bottom to direct water away from foundation.

Step 7:

Attaching Downspout

Fasten downspouts against wall. (Fig. H)

Use 1 bracket at top; 1 bracket at bottom; and 1 every 10 ft.

Step 8:

Installing Drip Edge

Help direct roof run-off into gutters (optional). To install, lift shingles and insert drip edge under shingles. Push back until drip edge projects approx. 1/2 in. beyond fascia. Nail under shingles every 5 ft. (Fig. I)

A. Gutter and Downspout Installation – additional instructions

For more installation instructions, see EuroGutter USA Installation Video available by request (info@ornametals.com) or online at www.ornametals.com.

1. Gutters

- a. Hanging gutters -- Attach hanger at 24" O.C. maximum to solid substrate.
- b. Install and secure gutter with hangers. Minimum slope of 1/16:12.
 - i. Roof mount hangers: one every two feet of gutter; installed on roof under roof material (shingles).
 - ii. Fascia mount hangers: one every two feet of gutter; installed on fascia board.
- c. Snap end caps to gutter and solder.
- d. Junctions (joining two gutter sections).
 - i. Soldering with 2" overlap makes junctions between the different gutter elements. The welds must be barred and reinforced.
 - ii. In lieu of soldering (copper only), can use gutter connectors.
- e. Overflow -- Allow overflow to prevent ingress into the building.
- f. Install EuroGutterUSA star outlet at low point (can be used as expansion joint).
- g. Expansion Joint – Maximum length of gutters shall not exceed 40 feet from the fixed point. If the work includes internal and external angles, the maximum distance is then 20 feet. Solder expansion joint to adjacent gutters at the high point OR substitute outlet /downspout as expansion joint, as appropriate, without soldering.
- h. Attach corners/miters: solder (recommended) to connect corners/miters to gutter or use gutter connector (copper only).
- i. Drip edge: Helps direct roof run-off into gutters (optional). Lift shingles and insert drip edge under shingles. Push back until drip edge projects approx. ½ inch beyond fascia. Nail under shingles every five feet.

2. Downspouts (10 ft sections).

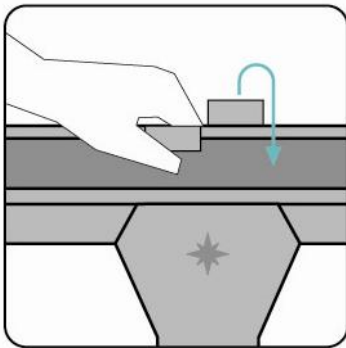
- a. Elbows: Seamless weld (no crimping); available in 40, 72 and 85 degrees.
- b. Hold the pipes on place using brackets (with pin or with bolt screw). Install one at the top; one at the bottom; and one every 10 feet. Install approx. 1-inch from building. Attach a front or side elbow at end of downspout to direct water away from foundation.
- c. Inline cleanout – optional.

B. Star Outlet Installation

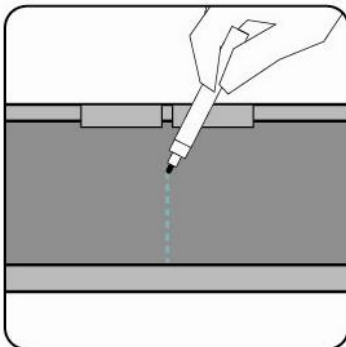
Step 1: Install the star outlet by hanging it on the gutter, which is already formed to fit with the outlet. Hang the front part of the outlet first, and then move to Step 2.



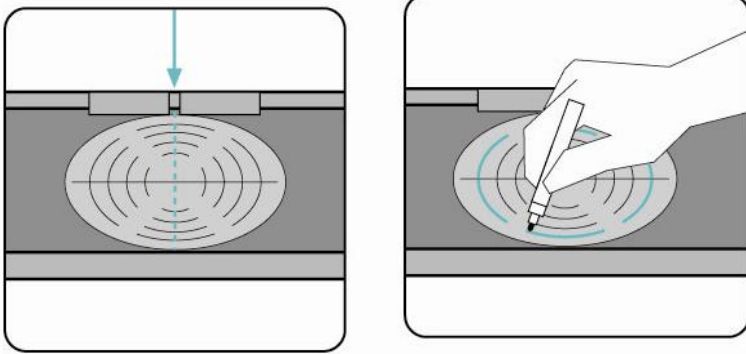
Step 2: Bend the clips (first the left, and then the right) to the top of the back flange of the gutter to fasten outlet, and move to Step 3.



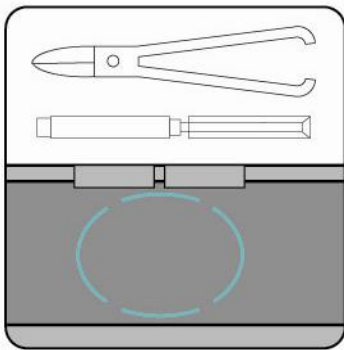
Step 3: Mark the mid-point of the gutter (the point between the outlet clips), and move to Step 4.



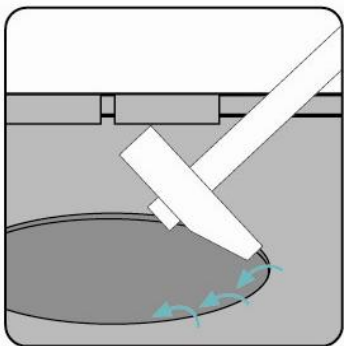
Step 4: Place the cutting template (available in this document on p. 8) at the mid-point (the point between the outlet clips). Using the template, trace the outline for the opening to be cut into the outlet, according to gutter size (5", 6" or 7.6").



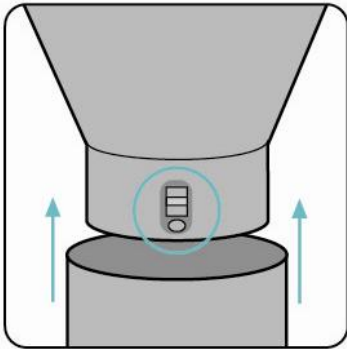
Step 5: Cut along the lines with metal-shears or chisel to create the opening.



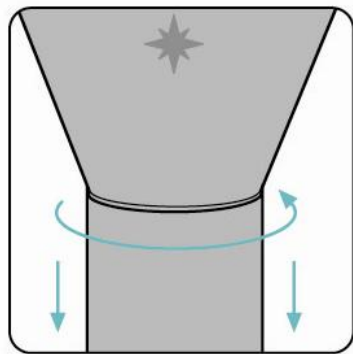
Step 6: Bend down the edges of the opening with a hammer, leaving an overhang of ½".



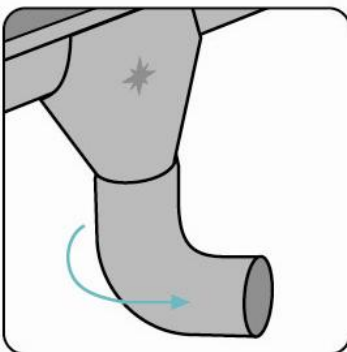
Step 7: The outlet connects to the downspout



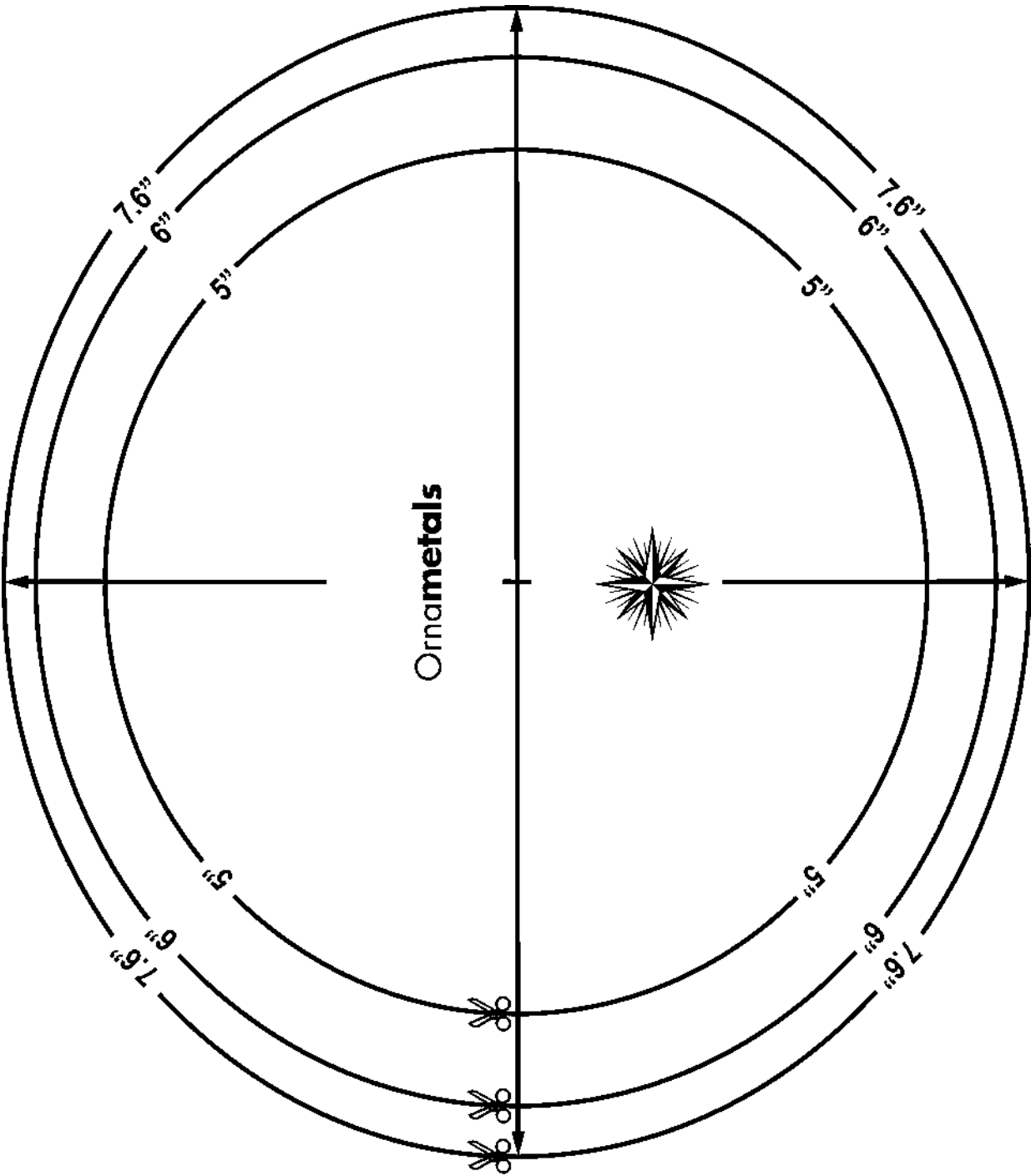
Step 8: To ensure the connection between outlet and downspout, just turn the downspout onto the outlet.



Step 9: If necessary, install an elbow to divert water away from structure before installing downspout.

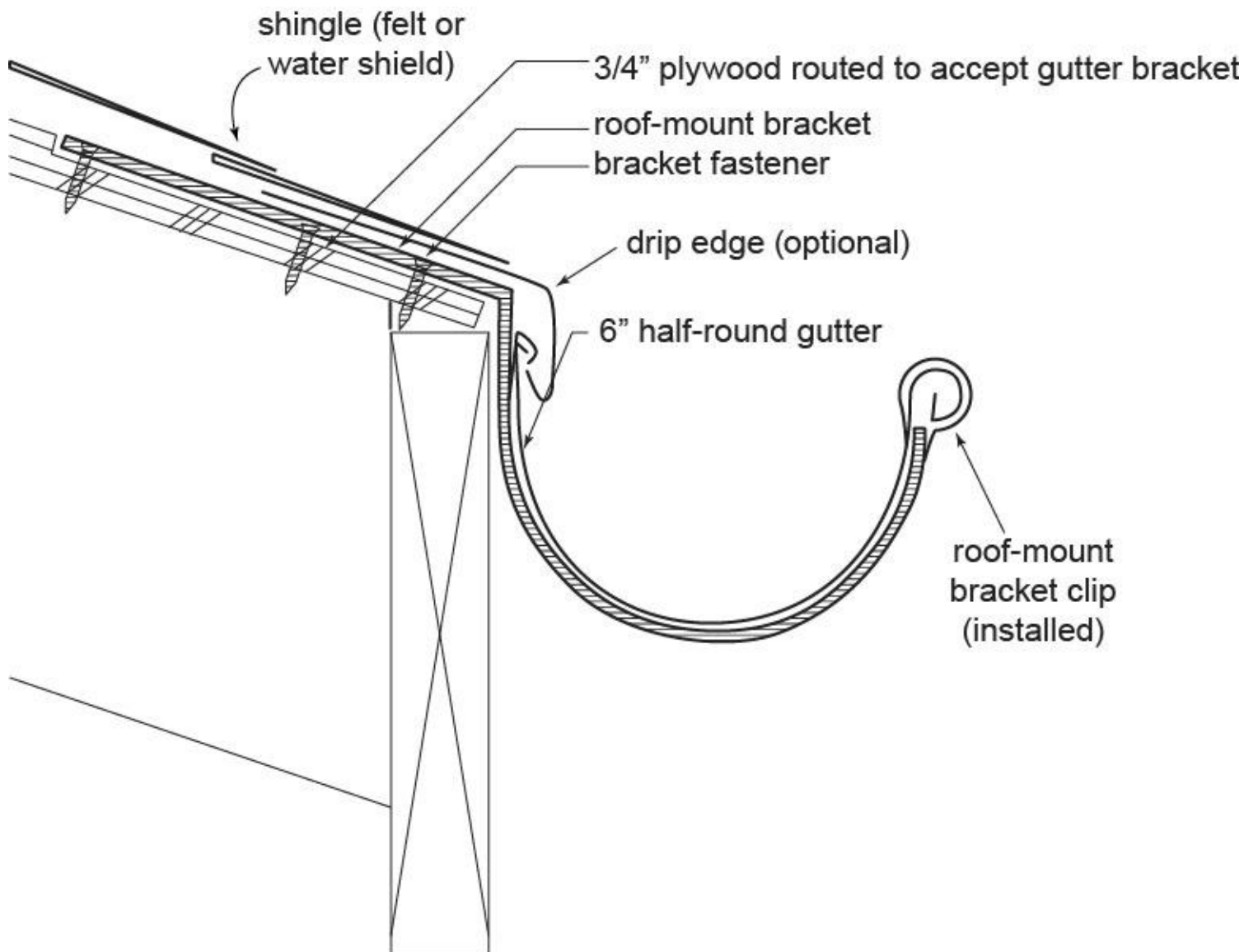


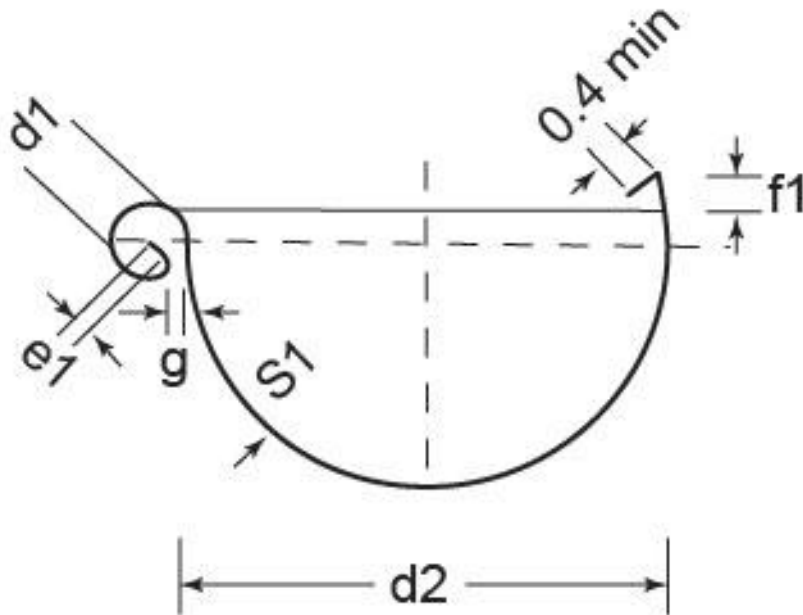
C. Cutting Template



2. Technical Product Guide

A. HALF-ROUND GUTTER ASSEMBLY



B. HALF-ROUND GUTTER DIMENSIONS

Size d2 (in inches)	5"	6"	7.6"
d 1	0.7	0.79	0.86
e 1	0.27	0.35	0.35
f 1	0.43	0.43	0.43
g	0.23	0.23	0.23
Cross-section (cm(2))	63	92	145

C. DOWNSPOUT DIMENSIONS – Seamless Weld**Copper:**

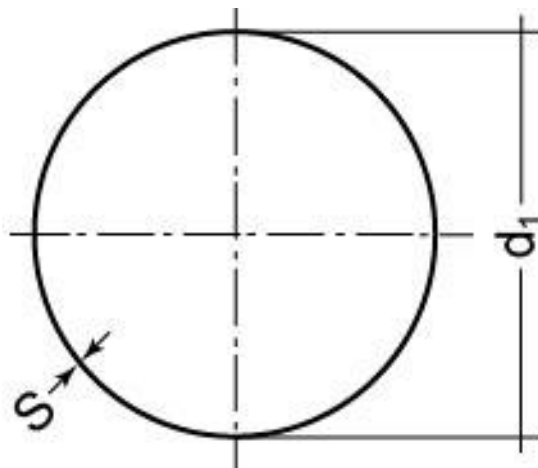
d 1	Diameter	3.1"	4"	4.7"
S	Thickness: 16oz, 18oz, 20oz			
	Length: 10 ft			

Natural Zinc (VMZINC®)

d 1	Diameter	3.1"	4"	4.7"
S	Gauge: 20 to 26			
	Length: 10 ft			

Prewheathered Zinc (QUARTZ-ZINC®; ANTHRA-ZINC®)

d 1	Diameter	3.1"	4"	4.7"
S	Gauge: 20 to 26			
	Length: 10 ft			



3. Material Guide

The EuroGutterUSA roof drainage system is available in:

Copper

Natural Zinc (VMZINC®)

Pre-Weathered Zinc (QUARTZ-ZINC® and ANTHRA-ZINC®)

Aluminum

A. Material Properties, Processing, Measurements and Application

COPPER

Alchemists associated copper's beautiful red-gold metal with Venus in part because the first mirrors were made from this material. Together with gold, silver and tin, it was one of the first metals to be worked by humanity about 9000 years ago. Christopher Columbus' ship was covered in copper plates to protect it from algae infestation. The Statue of Liberty consists of about 80 tons of copper. During excavations in Egypt 5000 year old copper mines were found -- still operational.

Abbreviation	Cu
Form of Delivery	Cu-DHP – oxygen-free, phosphorus-deoxidized
Purity	Min 99.9% Cu
Density	8.9 g / cm(3)
Expansion coefficient	0.0000098" per degree of Fahrenheit
Resistance state	R240 (half hard)
Properties	Excellent malleability, no cold brittleness Very high durability due to lowest deterioration rates (mean 0.1 to 0.5 microns per year) Good thermal conductivity, high melting point (1083 C degrees) Typical Appearance – formation of brown and later, green patina High recycling rate; high scrap value
Joining techniques	Brazing Soldering and riveting Fold
Processing information	Sequence traces to brickwork (red-brown discoloration) Avoid contact with washouts from unprotected bitumen Thoroughly remove flux residues (green color)

Contact with other metals	Copper is not affected by other metals due to its high electrochemical properties. Other metals may be endangered by copper (See Instructions for Use With Different Metals in Section 2B (following page))
Dimensions	Cut 0.375" – 36" wide / 16 oz, 18 oz, 20 oz
Applications	Entire roof, roof drainage system and façade Especially applicable in restoration and historic preservation due to specific requirements for appearance and durability
Discoloration	As copper forms its patina, color anomalies can occur in the initial stage – blue to purple. There are a wide variety of external causes, and some anomalies may be difficult to avoid. With further weathering, the entire surface turns copper-brown.

ZINC: Natural Zinc (VMZINC®)

Natural VMZINC® is the original zinc; shiny and smooth when it comes out of the mill. When installed on an exterior, natural VMZINC® will weather and form a beautifully textured grey patina. The patina's evolution can take several years based on the location of the panels. The transformation of the zinc surface allows for dynamic and striking results. For installations in which a visible weathering process is not desired, a different VMZINC® option should be selected.

If properly installed, Natural VMZINC® may maintain its beauty for well over fifty years. Natural VMZINC® requires no scheduled maintenance.

ZINC: Preweathered (QUARTZ-ZINC®)

Preweathered Zinc (QUARTZ-ZINC®) combined with air and moisture forms a matte blue-gray to blue-green surface. This patina develops over time and protects the zinc from corrosion. The material obtains a unique glow that is particularly well-suited for sophisticated architecture and historic buildings.

The pre-weathered grey of QUARTZ-ZINC® is achieved by a factory process that mimics the matte patina that zinc naturally develops over time. No other pre-weathered zinc captures the depth of texture of an evolved patina like QUARTZ-ZINC®. The durability and beauty of QUARTZ-ZINC® is unparalleled, especially when compared to zinc products of light hues. In applications that will have varying exposures to the elements and will therefore weather at different rates, this reliability of appearance is a tremendous asset. On the luminance scale of measuring colors, QUARTZ-ZINC®

falls into a Y-Factor range of 22-25. Every batch of QUARTZ-ZINC® gets measures and the results are documented. QUARTZ-ZINC® blends harmoniously with other building materials, making it ideal for both traditional and contemporary designs, as well as for historical restoration and new construction.

If properly installed, QUARTZ-ZINC® may maintain its beauty for well over fifty years. QUARTZ-ZINC® requires no scheduled maintenance.

ZINC: Preweathered (Charcoal Black) (ANTHRA-Zinc)

Originally designed for flashing and roof drainage for slate roofs, architects have come to appreciate the velvety look of ANTRHA-ZINC® and use it increasingly on walls and roofs. ANTRHA-ZINC® can be combined with timber, glass or concrete for impressive results. ANTRHA-ZINC® is protected by an organic coating which prevents damage during transport and installation. Over the decades, the black aspect will lighten to a very dark gray.

If properly installed, ANTRA-ZINC® may maintain its beauty for well over fifty years. ANTRHA-ZINC® requires no scheduled maintenance.

Abbreviation	Zn
Form of Delivery	Zinc titanium (titanium content from 0.06 to 0.2% with further minimal alloying of copper and aluminum)
Purity	Base fine grade zinc Z1, 99.995 purity
Density	7.2 g / cm(3)
Expansion coefficient	12 in/in F x 10-6
Resistance state	Min 100 N / mm(2) (0,2% proof stress)
Properties	<p>Good formability above 40 F degrees</p> <p>High durability due to low removal rates (depending on environmental conditions <1-4 microns / year)</p> <p>Lower spec. weight than copper</p> <p>Similarly cost-effective</p> <p>Preweathered material for aesthetic reasons available in all sizes (QUARTZ-ZINC®; ANTHRA-ZINC®)</p>

Joining techniques	Soldering
Processing information	Process without preheating until about 50 F degrees Prevent corrosion due to effects of permanent wetness on the underside Strong acidic or alkaline media can also lead to corrosion damage
Contact with other metals	See Instructions for Use With Different Metals in Section 2B (following page)
Dimensions	Cut 6.5" – 39.4", thickness from 26 gauge to 20 gauge
Applications	Strong presence in new architecture, new construction. Entire roof, roof drainage system and façade – use pre-weathered for steep slope & facades Also applicable in restoration and historic preservation due to specific requirements for appearance and durability
Discoloration	White rust (white discoloration) can occasionally be observed in new zinc components or on roof or wall surfaces. Occurs most often after a temporary wetness. Zinc hydroxide causes bright, loose, porous corrosion that affects neither thickness nor mechanical properties.

Aluminum

When exposed to the air, the pure aluminum alloy quickly forms a dull silver-gray appearance due to the formation of a thin oxide layer. This tough oxide layer makes aluminum resistant to corrosion.

Abbreviation	Al
Form of Delivery	AW-1050A
Purity	99.5% aluminum
Density	2.7 g / cm(3)
Expansion coefficient	1/K 24 10-6
Resistance state	Min 85 N / mm(2) (0.2% proof stress

Properties	Good formability High durability through the formation of stable protective layers in the pH range from 4.0 to 8.5 Lowest specific gravity metal with low cost
Joining techniques	Stick Rivets with sealant (weather-resistant silicone) Fold
Processing information	Prevent corrosion due to permanent wetness on the underside Strongly acidic or alkaline media can lead to corrosion damage
Contact with other metals	See Instructions for Use With Different Metals on page 19
Dimensions	Cut 7.8" – 19.7", thickness 0.032" – 0.040"
Applications	Roof drainage Cost-effective

B. Instructions for Use with Different Metals

Possible corrosion (galvanic corrosion and corrosion in the direction of rainwater flow) can occur if the metals used are not compatible. The following table provides an overview of the acceptable combinations

	Aluminum	Lead	Copper	Zinc	Stainless Steel	Galvanized Steel
Aluminum	✓	✓	X	✓	✓	✓
Lead	✓	✓	✓	✓	✓	✓
Copper	X	✓	✓	X	✓	X
Zinc	✓	✓	X	✓	✓	✓
Stainless Steel	✓	✓	✓	✓	✓	✓
Galvanized Steel	✓	✓	X	✓	X	✓

4. Product Guide Specification (Half-Round)

Specifier Notes: This product guide specification is written according to the Construction Specifications Institute (CSI) 3-Part Format, including *MasterFormat*, *SectionFormat*, and *PageFormat*, as described in *The Project Resource Manual—CSI Manual of Practice, Fifth Edition*.

This section must be carefully reviewed and edited by the Architect to meet the requirements of the project and local building code. Coordinate this section with other specification sections and the Drawings. Delete all “Specifier Notes” after editing this section.

Section numbers and titles are from *MasterFormat 2010 Update*.

SECTION 07 71 23

MANUFACTURED GUTTERS AND DOWNSPOUTS

Specifier Notes: This section covers Ornametals Manufacturing, LLC “EuroGutterUSA™” European half-round gutter and seamless downspout system in copper or zinc. Consult Ornametals Manufacturing, LLC for assistance in editing this section for the specific application.

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. European half-round gutter and seamless downspout system.

1.2 RELATED REQUIREMENTS

Specifier Notes: Edit the following list of related sections as necessary. Limit the list to sections with specific information that the reader might expect to find in this section, but is specified elsewhere.

- A. Section 07 61 00 – Sheet Metal Roofing.
- B. Section 07 62 00 – Sheet Metal Flashing and Trim.

1.3 REFERENCE STANDARDS

Specifier Notes: List standards referenced in this section, complete with designations and titles. Delete standards not included in the edited section.

- A. ASTM B 69 – Standard Specification for Rolled Zinc.

- B. ASTM B 370 – Standard Specification for Copper Sheet and Strip for Building Construction.
- C. SMACNA Architectural Sheet Metal Manual.

1.4 SUBMITTALS

Specifier Notes: Edit submittal requirements as necessary. Delete submittals not required.

- A. Comply with Section 01 33 00 – Submittal Procedures.
- B. Product Data: Submit manufacturer's product data, including installation instructions.
- C. Samples:
 - 1. Submit manufacturer's samples of gutters and downspouts, minimum 6 inches long, for each material and size specified.
 - 2. Submit manufacturer's samples of each accessory specified.
- D. Manufacturer's Certification: Submit manufacturer's certification that materials comply with specified requirements and are suitable for intended application.

1.5 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Manufacturer regularly engaged, for past 5 years, in manufacture of gutter and downspout systems of similar type to that specified.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Delivery and Acceptance Requirements: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
- B. Storage and Handling Requirements:
 - 1. Store and handle materials in accordance with manufacturer's instructions.
 - 2. Keep materials in manufacturer's original, unopened containers and packaging until installation.
 - 3. Store materials in clean, dry area indoors.
 - 4. Do not store materials directly on ground.
 - 5. Prevent contact with other materials during storage, handling, and installation which may cause discoloration, staining, or damage.
 - 6. Protect materials and finish during storage, handling, and installation to prevent damage.

PART 2 PRODUCTS

2.1 MANUFACTURER

- A. Ornametals Manufacturing, LLC, 140 County Road 1311, Cullman, Alabama 35058. Phone 256-255-0190. Fax 256-255-0195. www.ornametals.com. info@ornametals.com.

2.2 MANUFACTURED GUTTERS AND DOWNSPOUTS

Specifier Notes: Consult Ornametals Manufacturing, LLC for information regarding custom gutter and downspout systems.

- A. Gutters and Downspouts: “EuroGutterUSA” European half-round gutter and seamless downspout system.

Specifier Notes: Fill in number of years for storm occurrence.

1. Conform to SMACNA Architectural Sheet Metal Manual for sizing components for rainfall intensity determined by a storm occurrence of 1 in _____ years and as required by local building code.

Specifier Notes: Specify material for the gutter and downspout system.

2. Material: [Copper] [VMZinc Natural] [VMZinc Quartz] [VMZinc Anthra].
3. Compliance:
 - a. Copper: ASTM B 370.
 - b. Zinc: ASTM B 69.

Specifier Notes: Specify material and size for gutters and downspouts.

- B. Half-Round Gutters:
1. Material: [Copper, 16 oz (0.55 mm)] [Copper, 18 oz (0.6 mm)] [Copper, 20 oz (0.7 mm)] [VMZinc, 0.65 mm (25 gauge)] [VMZinc, 0.7 mm (24 gauge)].
 2. Size: [5 inches (280 mm)] [6 inches (333 mm)] [7.6 inches (400 mm)].
 3. Length: 20 feet (6.10 m).
- C. Round Downspouts:
1. Material: [Copper, 16 oz (0.55 mm)] [Copper, 18 oz (0.6 mm)] [Copper, 20 oz (0.7 mm)] [VMZinc, 0.65 mm (25 gauge)] [VMZinc, 0.7 mm (24 gauge)].
 2. Diameter: [3.1 inches (80 mm)] [4 inches (100 mm)] [4.7 inches (120 mm)].
 3. Length: 10 feet (3.05 m).

2.3 GUTTER ACCESSORIES

Specifier Notes: Specify gutter accessories. Delete gutter accessories not required.

- A. Radius Gutters:
1. Material: Match gutters.
 2. Size: Match gutters.
 3. Length: 3.28 feet (1 m).
- B. Corners:
1. Inside Corners:
 - a. Material: Match gutters.
 - b. Size: Match gutters.

2. Outside Corners:
 - a. Material: Match gutters.
 - b. Size: Match gutters.

C. Extensions:

1. Circular Extensions:
 - a. Material: Match gutters.
 - b. Size: Match gutters and downspouts.
2. Tri-Section Extensions:
 - a. Material: Match gutters.
 - b. Size: Match gutters and downspouts.
3. Corner Extensions with Outlet:
 - a. Material: Match gutters.
 - b. Size: Match gutters and downspouts.
4. Corner Extensions without Outlet:
 - a. Material: Match gutters.
 - b. Size: Match gutters.

D. End Caps:

1. Seamed End Caps:
 - a. Material: Match gutters.
 - b. Size: Match gutters.
2. Soldered End Caps, Right:
 - a. Material: Match gutters.
 - b. Size: Match gutters.
3. Soldered End Caps, Left:
 - a. Material: Match gutters.
 - b. Size: Match gutters.
4. Flat End Caps, Right:
 - a. Material: Match gutters.
 - b. Size: Match gutters.
5. Flat End Caps, Left:
 - a. Material: Match gutters.
 - b. Size: Match gutters.
6. Spherical End Caps:
 - a. Material: Match gutters.
 - b. Size: Match gutters.

E. Hangers:

1. Half-Round Hangers, Roof:
 - a. Material: [Copper] [Zinc-clad steel] [Galvanized steel] [Powder-coated steel].
 - b. Size: Match gutters.
2. Half-Round Hangers, Fascia:
 - a. Material: [Copper] [Zinc-clad steel] [Galvanized steel] [Powder-coated steel].
 - b. Size: Match gutters.
3. Heavy-Duty Hangers:
 - a. Material: Copper-wrapped steel.
 - b. Size: 6 inches (333 mm).
 - c. Length: [18.9 inches (480 mm)] [21.6 inches (550 mm)].
4. Decorative Leaf Hangers, Roof:
 - a. Material: Match gutters.

- b. Size: Match gutters.
- 5. Decorative Leaf Hangers, Fascia:
 - a. Material: Match gutters.
 - b. Size: Match gutters.
- F. Outlets:
 - 1. Half-Round Outlets:
 - a. Material: Match gutters.
 - b. Size: Match gutters and downspouts.
 - 2. Half-Round Drop Outlets:
 - a. Material: Match gutters.
 - b. Size: Match gutters and downspouts.

Specifier Notes: Specify leaderhead model and size. Consult Ornametals Manufacturing, LLC for information regarding custom leaderheads.

- G. Leaderheads:
 - 1. Model: _____.
 - 2. Material: Match gutters and downspouts.
 - 3. Width: _____ inches (_____ mm).
 - 4. Height: _____ inches (_____ mm).
 - 5. Diameter: _____ inches (_____ mm).
- H. Expansion Joints:
 - 1. Expansion Coils:
 - a. Material: [Copper] [Stainless steel] [Zinc].
 - b. Size: [10.24 inches (260 mm)] [15.35 inches (390 mm)].
 - c. Length: 118 inches (3,000 mm).
 - 2. Half-Round Expansion Joints:
 - a. Material: Match gutters.
 - b. Size: Match gutters.
 - c. Length: 10.24 inches (260 mm).
- I. Strainers:
 - 1. Material: [Copper] [Stainless steel].
 - 2. Size: Match downspouts.
- J. Leaf Guards:
 - 1. Material: Stainless steel.
 - 2. Size: [5 inches (280 mm)] [6 inches (333 mm)].

2.4 DOWNSPOUT ACCESSORIES

Specifier Notes: Specify downspout accessories. Delete downspout accessories not required.

- A. Brackets:
 - 1. Downspout Brackets with Square Pins:
 - a. Material: [Copper] [Zinc-clad steel] [Powder-coated steel].
 - b. Size: Match downspouts.

2. Downspout Brackets with Bolt Screws:
 - a. Material: [Copper] [Zinc-clad steel] [Powder-coated steel].
 - b. Size: Match downspouts.

B. Bolt Screws:

1. Yellow Chromated Bolt Screws:
 - a. Size: [3.9 inches (100 mm)] [7.9 inches (200 mm)].
2. Blue Chromated Bolt Screws:
 - a. Size: [3.9 inches (100 mm)] [7.9 inches (200 mm)].

C. Elbows:

1. Seamless Round Elbows, 40 degrees:
 - a. Material: Match downspouts.
 - b. Size: Match downspouts.
2. Seamless Round Elbows, 72 degrees:
 - a. Material: Match downspouts.
 - b. Size: Match downspouts.
3. Seamless Round Elbows, 85 degrees:
 - a. Material: Match downspouts.
 - b. Size: Match downspouts.
4. Seamless Offset/Double Elbows:
 - a. Material: Match downspouts.
 - b. Size: Match downspouts.

Specifier Notes: Swiss elbows are not available in VMZinc Quartz or VMZinc Anthra.

5. Swiss Elbows:
 - a. Material: Match downspouts.

Specifier Notes: Specify size of Swiss elbows.

- b. Size: _____ inches to _____ inches (_____ mm to _____ mm).
- c. Diameter: Match downspouts.

Specifier Notes: Seamless swan neck elbows are not available in VMZinc Quartz or VMZinc Anthra.

6. Seamless Swan Neck Elbows:
 - a. Material: Match downspouts.
 - b. Size: Match downspouts.

D. Inline Cleanouts/Dropouts:

1. Material: Match downspouts.
2. Size: Match downspouts.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine roof, fascia board, and walls to receive half-round gutter and seamless downspout system.
- B. Examine fascia board to ensure that substrate alignment is straight, level, plumb, and adequate for fastening to transfer structural loads.
- C. Notify Architect of conditions that would adversely affect installation or subsequent use.
- D. Do not begin installation until unacceptable conditions are corrected.

3.2 INSTALLATION

- A. Install half-round gutter and seamless downspout system in accordance with manufacturer's instructions at locations indicated on the Drawings.
- B. Slope gutters 1/4 inch per 20 feet toward downspouts.
- C. Install downspouts plumb and securely fasten to wall.
- D. Attach elbow at bottom of downspouts to direct water away from foundation.
- E. Install gutters and downspouts in lengths as long as possible, unless indicated otherwise on the Drawings.

3.3 WASTE MANAGEMENT

- A. Recycling: Collect, store, and return copper and VMZinc scraps to local metal recycler.

3.4 PROTECTION

- A. Protect installed half-round gutter and seamless downspout system to ensure that, except for normal weathering, materials will be without damage or deterioration at time of Substantial Completion.
- B. Repair or replace damaged components of gutter and downspout system.

END OF SECTION