

SPECIFICATIONS FOR COIL & SHEET METAL GOODS USED IN THE PRODUCTION OF GUTTER & DOWNSPOUT

1. Aluminum

A. Mill Finished Aluminum

- i. Metal:* ASTM B209 – Temper & Alloy 3105 H14
- ii. Finish:* None

B. Painted Aluminum

- i. Metal:* ASTM B209 – Temper & Alloy 3105 H14
- ii. Finish:* .65 - .70 Mil Thick Polyester Finish

C. Kynar 500® Painted Aluminum

- i. Metal:* ASTM B209 – Temper & Alloy 3003 / 3105 H14
- ii. Finish:* Contact Berger for Technical Data on Kynar 500® Coating

2. Steel

A. Galvanized Steel

- i. Metal:* ASTM A653 – LFQ (Lock Form Quality)
- ii. Finish:* Hot Dipped Galvanized Zinc Coating

B. Paintgrip Galvanized Steel

- i. Metal:* ASTM A653 – LFQ (Lock Form Quality)
- ii. Finish:* Hot Dipped Galvanized Zinc Coating with a Bonderized / Phosphatized Finish

C. Painted Galvanized Steel

- i. Metal:* ASTM A653 – LFQ (Lock Form Quality)
- ii. Finish:* Hot Dipped Galvanized Zinc Coating with a .20 - .30 Mil Thick Epoxy and a .70 - .80 Mil Polyester Finish

D. Stainless Steel

- i. Metal:* 304 Alloy
- ii. Finish:* 2B

3. Copper

A. Natural Copper

- i. Metal:* ASTM B370 – CDA110 or CDA 122 Alloy – Cold Rolled
- ii. Finish:* None

B. Lead Coated Copper

- i. Metal:* ASTM B101 – Class A Type 1 & Type 2
- ii. Finish:* Lead Coating

C. Revere Freedom Gray® Zinc Coated Copper

- i. Metal:* ASTM B370 – CDA110 or CDA 122 Alloy – Cold Rolled
- ii. Finish:* Z – T Alloy (Zinc – Tin)

D. Revere Ever Green® Pre-Patinated Copper

- i. Metal:* ASTM B370 – CDA110 or CDA 122 Alloy – Cold Rolled
- ii. Finish:* Artificially Accelerated Crystalline Patina

GALVANIC CORROSION

The selection of gutter material must account for the potential of Galvanic or Electrolytic Corrosion at contact points with other metals and at supports. Also, special selection is required for corrosive environments such as coastal or polluted industrial atmospheres. Galvanic or Electrolytic Corrosion can occur when dissimilar metals are in contact in the presence of an electrolyte. An electrolyte is any non-metal substance that will conduct an electric current, especially a liquid solution. Water, particularly rainwater, is a good electrolyte.

A galvanic scale has been developed for metals. Metals that are more electropositive (anodic) will corrode more easily and metals that are more electronegative (cathodic) are more corrosion resistant. When two dissimilar metals are in contact in the presence of an electrolyte, the electropositive metal will corrode. The farther the two metals are from each other on the galvanic scale, the speed and effect of the reaction will increase.

GALVANIC SCALE
Electropositive / Anodic End
Zinc
Aluminum
Galvanized Steel
Cadmium
Mild Steel, Wrought Iron
Cast Iron
Stainless Steel, types 304 and 316 (active)
Tin - Lead Solder
Lead
Brass, Bronze
Copper
Stainless Steel, types 304 and 316 (passive)
Electronegative / Cathodic End

To reduce the tendency for galvanic corrosion to occur between dissimilar metals one or more of the following actions can be taken:

1. Avoid contact between metals that are farther apart on the scale.
2. Do not couple a small exposed area of a more electropositive (anodic) metal with a large area of a more electronegative (cathodic) metal. Fasteners are a particular concern in this regard.
3. Coat the electropositive (cathodic) metal with a suitable paint or other non-metallic coating (or coat both surfaces at their interface). Zinc chromate or bituminous coatings are often used.
4. Separate the metals by tape, gasket, waterproof paper, elastomeric sheet, sealant or other non-absorbent, non-conductive material.
5. Do not allow moisture runoff from a more electronegative (cathodic) metal to drain on a more electropositive (anodic) metal, even if the metals are not in contact.
6. Remove metal particles that are deposited from steel dies on formed metals (or prevent the deposits from occurring).

Miscellaneous Information about Galvanic Corrosion:

1. Passivated stainless steel has been chemically cleaned, usually with an acid solution.
2. Anodized aluminum is considered compatible with all other metals.
3. Salts increase the electrical conductivity of water.
4. The discharge from drain pipes on rooftop air-conditioning units can be very corrosive, particularly if the piping is copper and the drainage goes into galvanized steel scuppers, conductor heads or gutters.
5. Copper nails / fasteners should not be used for fastening galvanized steel roof panels even though the contact area of the more electropositive (anodic) zinc coating is small compared to the more electronegative (cathodic) copper metal. Galvanized steel nails / fasteners will corrode rapidly if used on copper roofing.
6. Many organizations and individuals have published corrosion tables. All of them tend to rank corrosion rates in non-quantitative terms such as mild, moderate and severe. Rates of corrosion are also affected by conditions such as seacoast, dry inland, acid rain and polluted industrial atmospheres.

Additional information on galvanic corrosion prediction is found in ASTM Standard G82 and ASTM STP 576.

PATINA CHEMICAL SOURCES

Copper will Patina naturally in most areas within 7 years when exposed to normal air quality and moisture. Areas that are dry or at high altitudes will take longer or not react to environmental surface oxidation.

Berger Building Products, Inc provides this information as a service with the understanding that the results of the chemical patina will vary and Berger assumes no liability.

Berger cautions the user that the user is responsible for the results. The user also must comply with all manufacturer safety recommendations on handling and disposing of chemicals in accordance with all Local, State and Federal EPA Guidelines.

User can check for other sources on the internet, phone and industrial directories.

Triple-S Chemical Products, Inc
Los Angeles
800-862-5958

Patina Solutions
800-882-7004

Jax Chemical Co
Floral Park, NY
718-347-0057

The Copper Development Association (CDA) provides information on the use of copper for every purpose known to man at the website:

<http://www.copper.org>

For specific information on architectural copper finishes go directly to:

<http://www.copper.org/applications/architecture/finishes.html>