

REVERE. THE WORLD'S COPPER LEADER FOR OVER TWO HUNDRED YEARS.



Continental Bronze[®]

Revere's Newest Architectural Copper

A "pre-aged" natural
oxide finish provides
subtle beauty.



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ContinentalBronze®

ContinentalBronze – Revere’s newest architectural copper – is standard architectural copper produced to ASTM B370 that has been “pre-aged” to a natural brown/bronze oxide finish under controlled conditions – without chemicals. The oxide is essentially the same as the one that forms on plain, “red” copper within two to five years after it is exposed to the local micro-environment. (It is **not** an alloy and does not contain tin or other elements. Likewise, it is **not** a paint or resin-based coating such as Kynar 500®.)

The aesthetics of *ContinentalBronze* are similar to those of plain copper that has been exposed to the atmosphere for several months or years. *ContinentalBronze* will not appear as a uniform, monochromatic surface but rather “alive” and vivid with variations of shade or hue within and between sheets or coils. In essence, what we have done is to “leap ahead” in time.

The oxide is not a permanent finish; rather, it is an advancement of natural weathering. As it is exposed to the elements, *ContinentalBronze* will continue to age and eventually assume a mature, green patina. The time required for this to occur cannot be predicted as the process depends on local (micro) environmental conditions and severity of exposure. In most cases, ten or more years will be required for the oxide to convert to a green (sulfate) patina, although the time required will vary.



Why Use *ContinentalBronze*?

This “leap in time” can be especially appealing for wall claddings (which typically age slowly), soffits (which age slower still), interior applications (which may not age at all), and locations where the reflectivity of new, bare copper is prohibited by codes or might be aesthetically objectionable.



Need Caption/commentary.

Given sufficient time and continued weathering all copper will develop a more or less uniform brown/bronze coloration. However, in some cases the time frame is too long and/or the transitional appearance is unacceptable.

ContinentalBronze can solve these problems!



Need Caption/commentary.

Environmentally Sound

As with all Revere architectural coppers *ContinentalBronze* is very environmentally friendly. It is made from 90% to 95% recycled copper that has been harvested from within 500 miles of our facility in Rome, NY. It is an ideal material for roofing, wall cladding, rain-water goods, and similar applications. For LEED projects you gain the durability, sustainability, beauty and recyclability of copper.



Need Caption/commentary.

All Revere architectural coppers are made from “number 1, bare-bright” scrap only. Coated wire and/or other materials that emit VOCs or similar compounds are never used during melting or fabrication (rolling).

Market conditions dictate when and where recyclable copper is available. Nevertheless, well over 75% of this material is obtained from sources within 500 miles of our plant. Most of these facilities are located in New York State, Pennsylvania, Massachusetts, Connecticut, Rhode Island, and Southern Ontario. Smaller amounts of copper are obtained from facilities in Southern Maine, New Hampshire, and the “manufacturing belt” that encompasses Detroit, Toledo, and Cleveland. Due to the competitive nature of the scrap copper market we cannot disclose individual locations (or cities) from which we obtain copper.

Depending upon market conditions the exact percentage of recycled copper and mix of post-consumer and post-industrial material will vary. Since market conditions vary constantly Revere cannot accurately identify the ratio of post-consumer to post-industrial copper in a given order. Therefore, Revere uses the conservative position that its copper contains only post-industrial material.

All of Revere’s architectural sheet copper is made in Rome, NY – approximately 95 miles west of Albany, NY.

Durability/Weathering of Oxide

ContinentalBronze maintains all the positive features of working with bare copper – ease of forming, bending, and general installation practices.

To insure the most aesthetically pleasing application, Revere suggests standard industry sheet metal practices, such as those presented in the Eighth Edition of *Copper & Common Sense*, be applied. This includes, but is not limited to: the use of clean gloves during forming and installation of copper, minimizing traffic on installed copper, soldering techniques, and more.

The oxide is a hard and durable surface, and is able to withstand most normal forming, bending, and installation practices. Nevertheless, bends or breaks can result in loss of oxide crystals and produce “pencil lines” of bare copper. The oxide may be scratched if subjected to a combination of pressure and abrasion, and may exhibit fingerprints.



As installed



10 months exposure in a Northeastern coastal environment

For additional information about *ContinentalBronze* or any of the Revere family of architectural coppers, contact Revere’s Architectural Services Department at (800) 448-1776, extension 2554; fax (315) 338-2105; e-mail archcopper@reverecopper.com.



Maintaining a Statuary Brown Color

There are a number of methods and products used to protect statuary finishes. In Revere’s experience, periodic oiling is usually the easiest and least expensive.

Oiling does **not** create or hasten the development of a statuary color. Rather it may improve the uniformity of the oxide film and impart richness and depth of color that could not be produced by natural weathering alone.

Oils used for this purpose are many and varied. They include linseed oil (raw or boiled); lemon oil; lemon-grass oil (an expensive, rare, aromatic nectar imported from the West Indies); paraffin oil; castor oil; and sometimes vegetable oil. Our experience indicates that either raw or boiled linseed oil is as good as any, and has the added advantages of low cost and ample supply. Boiled linseed oil dries more quickly upon application than the raw type of oil. Because it is less prone to pick up dust particles from the air, it seems to be used more often than raw oil.

After installation of the copper we suggest that it be allowed to weather for several weeks before the oil is applied. This time interval offers the advantage of natural weathering to remove residual rolling lubricants, hand or foot prints, and other surface

marks on the sheet. It also gives the metal an opportunity to develop a degree of the cuprous oxide (brown) film which, upon oiling, will produce a deeper brown or bronze coloration than if the metal were oiled immediately after installation.

Under ordinary circumstances it is not necessary to clean the metal, either chemically or mechanically, prior to oiling if the time can be allowed.

The oiling procedure is not at all complicated. It consists of applying a liberal coating of oil to the metal surface with a brush or rag and then wiping off the excess oil with a clean, dry rag to leave a thin, even film. Additional coatings may be applied at any time desired or deemed required. Local atmospheric conditions tend to influence the durability of the coating or the number of coatings required to produce the desired effect. There are reports of installations varying in age from one to almost 20 years that are still giving satisfactory performance with only one application of oil. For the average installation we suggest two coats be used initially.

Periodic oiling is the method that has been (and still is) used to maintain the statuary color of the Seagram’s Building in New York City for over 50 years.

Specifications

Architectural Guide Specifications

Revere's ContinentalBronze® is cut, bent, formed, and installed using the same tools and techniques as with mill-finished copper. Complete details and specifications for the installation of architectural sheet copper are contained in the Revere manual, *Copper & Common Sense*, Eighth Edition.

Materials

ContinentalBronze

Pre-oxidized sheet copper shall be Revere standard, ounce-weight (16-ounce and/or 20-ounce as noted on drawings) architectural copper sheet and/or coil conforming to ASTM B370 that has been oxidized to a uniform, brown-black/statuary finish under controlled conditions in a copper-rolling mill. Unless otherwise noted, temper shall be H00.

Artificially/chemically "aged" and/or coated coppers shall **NOT** be allowed.

COMMENTARY:

Since the phrase "uniform, brown-black/statuary finish" is subject to personal interpretation, Revere suggests architects review samples of **Continental Bronze** and discuss applications of pre-oxidized copper with Revere's Architectural Services Department prior to specifying this product.

The color and aesthetics of **ContinentalBronze** are the result of the thin oxide film on the copper's surface. As with any such product, exposure, lighting conditions, angle from which the copper is viewed, etc. will affect and result in changes in the appearance of **ContinentalBronze**.

Solder

Where used on **ContinentalBronze** copper, solder shall conform to ASTM specification B32.

COMMENTARY:

To minimize human exposure to lead and runoff from lead to the environment, Revere suggests only "lead-free" solders be used for architectural applications of copper. Based on testing of various lead-free solder alloys, Revere suggests consideration of Johnson #497 SuperFlo™ by Johnson Manufacturing Company, Princeton, Iowa.

For information regarding Johnson's fluxes and solders contact Johnson Manufacturing Company, 114 Lost Grove Road, Princeton, IA 52768; phone (563) 289-5123, fax (563) 289-3825, or e-mail johnsonmfg@aol.com.

Handling and Storage

Store **ContinentalBronze** copper sheets, coils and formed shapes off the ground in an enclosed structure. Do NOT store in a manner or location so that water or moisture may remain between sheets or shapes prior to installation. Do NOT store on bare ground under a tarp or in another manner that may cause condensation to form on or between sheets or shapes.

Copper & Common Sense

Since 1945, Revere has published *Copper & Common Sense*, which is now the industry's most widely referenced sheet-copper design manual. To learn how to obtain the latest edition visit us at www.reverecopper.com.

Protection

Handle sheets and shapes in a manner to reduce scratches, dents, etc. Copper shall be protected during installation and cleaning of masonry, cutting and welding of steel, and similar activities above or adjacent to it with tarps, polyethylene sheeting, etc.

To prevent water stains, temporary protection shall be removed at the end of each workday.

COMMENTARY:

In the absence of oxygen, standing water may cause water stains. Water stains and surface scratches should not affect the life or durability of **ContinentalBronze**. However, they can be aesthetically unattractive.

Workmanship/Installation

Surfaces to be covered with copper shall be smooth and free from defects of every description. Surfaces shall be cleaned of dirt, rubbish and other foreign materials before copper work is started. Projecting nails shall be driven flush.

NOTE: Copper should **not** be installed over spaced framing or metal decks unless the flutes are filled or covered. Over time, copper will sag and "telegraph" at the voids.

Underlayments

Roofing Felts shall conform to ASTM D4869 or D6757 and shall have a minimum weight of (15)(30) pounds per 100 sq. ft. Only smooth surface felts shall be acceptable.

Membrane Underlayments shall be suitable for continuous in-service temperatures of not less than 250°F without deteriorating. Unless approved by manufacturer, membranes shall not be used under seams soldered in the field.

NOTE: Direct solar radiation can raise the temperature of copper to approximately 155°F. If sunlight is focused onto the copper from adjacent construction, i.e., roofs, windows, etc., or natural objects, the temperature of the copper can exceed 200°F. For proper soldering, the temperature of the copper must be raised to over 450°F.

Rosin-Sized Paper shall be smooth, unsaturated building paper weighing approximately three to four pounds (3 to 4 lb.) per 100 sq. ft.

Soldering

Before soldering **ContinentalBronze**, the oxidized surface must be mechanically removed and bare, bright copper exposed.

Tinning Prior to soldering, copper shall be mechanically cleaned of all oxides on both sides for a width of not less than 1-1/2". Then, cleaned copper shall be coated with solder on both sides for a width of not less than 1-1/2".

Flux shall be muriatic acid killed with zinc (zinc chloride), rosin flux, or approved brand of soldering flux. Immediately upon completion of soldering, residual flux shall be thoroughly washed off with clean water.

Soldering shall be done slowly with well-heated coppers – to heat the seam thoroughly and to sweat solder completely through the full width of the seam. Seams shall show at least one full inch (1") of evenly flowed solder. Whenever possible, all soldering shall be done in the flat position. Seams on slopes steeper than 45 degrees shall be soldered a second time.

Soldering Coppers Soldering shall be done with heavy, properly tinned coppers. For flat seam work and gutters, they shall weigh not less than 10 lbs. per pair. Except when an acetylene-heated soldering torch is used and ambient temperature is above 45°F, the copper itself shall weigh not less than 3/4 lb. When ambient temperature is below 45°F, the copper itself shall weigh not less than 1-1/4 lbs.

Cleaning

Upon completion, if necessary and only if instructed by the architect, **ContinentalBronze** shall be cleaned by washing with clean, fresh water only. Do not chemically or abrasively clean **ContinentalBronze**. Do not use soaps, detergents or other cleaning agents.

NOTE: Fingerprints and similar discolorations are normal on all copper installations. Revere strongly suggests that no attempt be made to clean or remove such discolorations from exterior copper installations. Attempts to clean exterior copper installations are usually unsatisfactory and only result in delaying natural weathering.

Ordering

ContinentalBronze is priced at a premium above Revere's *Classic Copper*. Contact your local distributor for prices and lead times.

Availability

Through Revere sheet copper distributors throughout the U.S. and Canada.

Warranty

Call Revere for complete warranty details.

Technical Guidance

If you have questions or concerns about the use of **ContinentalBronze** on a particular project, please call (800) 448-1776, Architectural Services.



Revere Copper Products, Inc.

One Revere Park, Rome, NY 13440-5561
1 (800) 448-1776
Fax: (315) 338-2105
www.reverecopper.com
e-mail: archcopper@reverecopper.com

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As a member of the U.S. Green Building Council, Revere is proud to offer environmentally friendly architectural coppers, including EverGreen.

