FreedomGray & IndependenceGray

IndependenceGray is TCS II / TCS II Satin Z-T Alloy™ Coated Stainless Steel

For durability, attractiveness, reduced staining, and environmental friendliness, Z-T coatings perform

Photo: Capital Square – TCS II

Revere Z-T® Products Are Coated on Both Sides: Durable, Attractive and Easy on the Environment.

Revere Z-T® products are coated on both sides with a unique, patented Z-T Alloy™ (zinc-tin alloy). It offers all the advantages of copper or stainless steel with a naturally weathering earthtone gray color. Revere's Z-T® coated products are rugged, environmentally friendly and aesthetically appealing, for use in virtually all architectural metal applications.

The three layers of FreedomGray and IndependenceGray / TCS II / TCS II Satin Z-T Alloy™.

1. Zinc-tin alloy with satin finish
2. Intermetallic layer
3. Copper (99.5% pure) or 304 stainless steel

The zinc-tin alloy is applied to both sides of our sheets and coils, using the hot-dip process. This ensures complete coverage and eliminates voids.

A satin finish is factory-applied to FreedomGray and IndependenceGray / TCS II / TCS II Satin Z-T Alloy™, to reduce initial reflectiveness and provide a natural, weathered appearance. The uncovered satin-finished tin/zinc alloy begins to darken immediately upon exposure. Environmental conditions and severity of exposure dictate how long this will take.

As with plain and pre-patinated copper, FreedomGray and IndependenceGray / TCS II / TCS II Satin Z-T Alloy™ will always display differences in the shades and hues of their natural patina. These are **NOT** an indication of defective material. In many respects it is the variations that give Z-T® coated products their unique life, vitality and aesthetics.

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Zinc-Tin Coated Products

Z-T® Alloy Coatings vs. Zinc: A Revealing Comparison.

When a durable gray architectural metal roof is called for, FreedomGray or IndependenceGray / TCS II / TCS II Satin Z-T Alloy™ offers numerous advantages over zinc. Like all architectural copper, FreedomGray and IndependenceGray / TCS II / TCS II Satin Z-T Alloy™ is easier to form, simpler to install and more durable in most environmental conditions.

These are the facts:

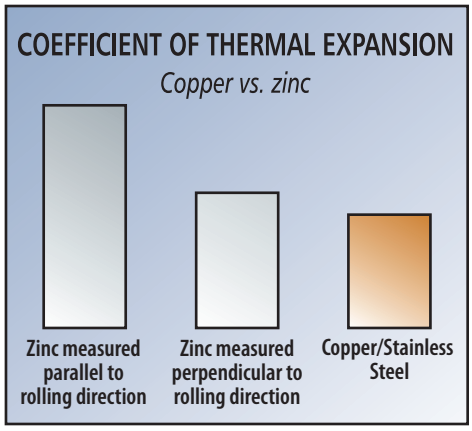
• **More versatile forming** – At temperatures below 45°F, zinc becomes brittle and may break or split when bent, formed or subjected to stress or loads.

Our Z-T® coated products can be formed, installed and subjected to sub-freezing temperatures with no adverse effects.

Sharp, zero-radius bends, which are typical with all architectural metal work, can stress zinc to the point that it cracks or splits. Expansion movement caused by daily and seasonal temperature changes can aggravate minor splits and make them "run" or grow.

FreedomGray can be formed and installed with the same bends as plain copper. IndependenceGray / TCS II / TCS II Satin Z-T Alloy™ will form easily; however, it does have increased physical properties when compared to copper.

• **Less restrictive installation** – Moisture on the reverse side of zinc can cause severe and rapid corrosion. In extreme conditions it can "rust through" in less than a year. To avoid this problem, the underside of zinc must be ventilated – installed above the roof deck. This difficult, costly installation is not necessary with our Z-T® coated products, which can be applied directly over roof decks.



• **Greater durability** – Ice dams, in valleys and along eaves, are a common winter occurrence in much of the country.

Water trapped behind these dams can (and does) penetrate locks and seams.

With zinc roofs, this can lead to "underside corrosion." Moisture trapped on the underside of copper, on the other hand, has no negative effects, making Z-T® coated products a better choice for long-term durability.

• **Physical properties** – Properties of sheet zinc (coefficient of thermal expansion, tensile strength, creep rate, etc.) depend upon temperature and direction of rolling. The chart shown here compares the coefficients of thermal expansion for zinc, stainless steel and copper.

• **Soldering** – Zinc anneals at 212°F and melts at 784°F. Standard solder begins to flow at 420°F. As a result, soldering changes the grain size of zinc (anneals it) and weakens it at the seam. If too much heat is applied, a hole can easily be burned through zinc.

The melting point of architectural copper is 1,981°F. At 700°F, it takes almost an hour for copper to begin to anneal. 300 series stainless steel melting and annealing temperatures are well above copper and will not be compromised by soldering. It should be noted that zinc-tin coated stainless steel is not as easily soldered as the same coating over copper. As discussed later in this brochure, FreedomGray is soldered similar to plain copper.

In Any Environment, Z-T® Coated Copper or Z-T® Coated 304 Stainless Steel Fits.

FreedomGray and IndependenceGray / TCS II / TCS II Satin Z-T Alloy™ are appropriate for use in any application that would use copper or lead-coated copper. They may be used not only for roofs, but also to form most architectural accents, gutters, downspouts and other rainwater carriers.

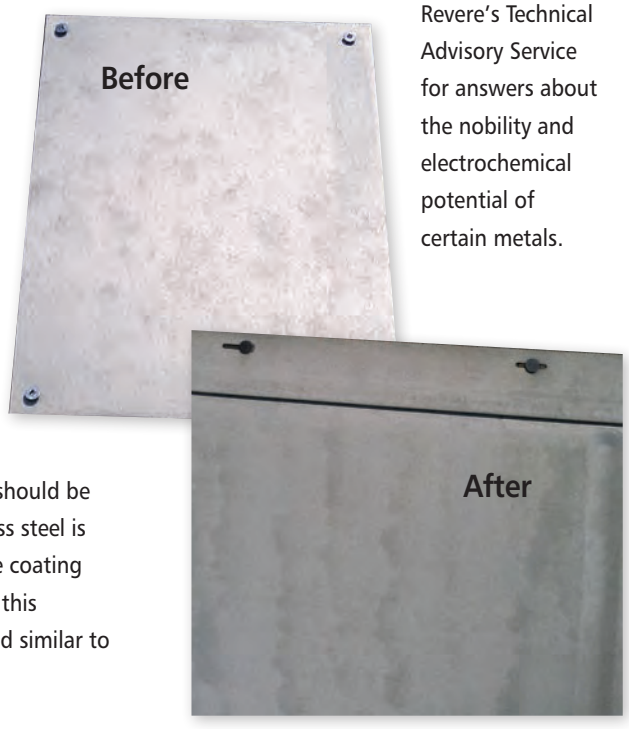
Roofs and flashings using these patented zinc-tin alloys have been exposed to industrial, seacoast, urban and rural environments without failure. Salt spray, salt fog and other accelerated weathering tests have also had no adverse effects.

FreedomGray and IndependenceGray / TCS II / TCS II Satin Z-T Alloy™ are a practical choice for today's environmentally conscious clients.

Handling Considerations

Compatibilities

FreedomGray and IndependenceGray / TCS II / TCS II Satin Z-T Alloy™ are basically inert, allowing them to be used with most other architectural metals. When in doubt, contact Revere's Technical Advisory Service for answers about the nobility and electrochemical potential of certain metals.



In most environments and applications, FreedomGray and IndependenceGray / TCS II / TCS II Satin Z-T Alloy™ will not stain other materials below them. However, drips and overhangs should still be designed to minimize water staining.

If desired, FreedomGray and IndependenceGray / TCS II / TCS II Satin Z-T Alloy™ may be painted without altering their physical properties.

Inorganic acids, including hydrochloric acid, can damage FreedomGray and IndependenceGray / TCS II / TCS II Satin Z-T Alloy™. Care should be taken to protect against runoff from acid-leaching substances, overspray from masonry cleaners (muriatic acid), etc.

All commonly available underlayments may be used with these products. Before installing FreedomGray and IndependenceGray / TCS II / TCS II Satin Z-T Alloy™ with treated lumber, consult Revere and the lumber treater.

For safety, Revere always recommends the use of gloves and eye protection whenever handling any architectural metal.

Photo: Private Residence, Montana – FreedomGray

Photo: Mollie Dodd Anderson Library at George School in Newtown, PA– TCS II

IndependenceGray / TCS II / TCS II Satin Z-T Alloy™ – Product Data:

Basic Use: IndependenceGray / TCS II / TCS II Satin Z-T Alloy™ is used for all types of roofing (standing seam, batten seam, Bermuda seam and flat lock), for perimeters, mansards, fascia, coping, gravel stops, wall covering and all flashing, exposed or concealed. IndependenceGray / TCS II / TCS II Satin Z-T Alloy™ is suitable for all types of weather sealing and draining (gutters, all styles and downspouts).

IndependenceGray / TCS II / TCS II Satin Z-T Alloy™ is zinc-tin coated type 304 (non-magnetic) stainless steel, produced per ASTM A240/A240m, A480/A480m. Our material is covered on both sides with a Z-T® Alloy (50% tin, 50% zinc) to a minimum thickness of .0005" per side. IndependenceGray / TCS II / TCS II Satin Z-T Alloy™ is micro-embossed under high-pressure rollers to create a low-reflective surface.

The chromium-nickel content and the tightly specified satin properties make IndependenceGray / TCS II / TCS II Satin Z-T Alloy™ one of the most versatile and corrosion resistant roofing and flashing materials available today.

Sizes: Sheet-widths 20", 24", and 36". Lengths 96" and 120". Special sizes available up to 36" wide, mill minimums will apply. Coils are also available in 500-foot lengths, and stocked in many gauges and widths.

Gauges: 24 (0.024"), 26 (0.018") and 28 (0.015") plus coating.

Weight: 28 gauge – 0.67# per sq. foot; 26 gauge – 0.77# per sq. foot; 24 gauge – 1.02# per sq. foot.

Note: All weights are theoretical, and could vary.

Color: Under most atmospheric conditions, IndependenceGray / TCS II / TCS II Satin Z-T Alloy™ will weather to an attractive, warm gray. However, since the weathering of IndependenceGray / TCS II / TCS II Satin Z-T Alloy™ is accomplished through atmospheric exposure, color may vary relative to the local environment. IndependenceGray / TCS II / TCS II Satin Z-T Alloy™ does not require painting.

Specifications

Architectural Guide Specifications

Revere FreedomGray® and IndependenceGray / TCS II / TCS II Satin Z-T Alloy™ 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.*

MATERIALS:

Sheet Copper

All FreedomGray sheet copper shall be standard, ounce-weight material conforming to ASTM specification B370. The 304 Stainless Steel substrate is produced to ASTM A240/A240M and Revere's exacting internal specifications.

Where FreedomGray and IndependenceGray / TCS II / TCS II Satin Z-T Alloy™ coated material is specified or noted on the drawings, copper shall be coated both sides with zinc-tin alloy a minimum of 0.0005" thick per side. Composition of the alloy shall be approximately 50% zinc and 50% tin with trace elements controlled for durability, corrosion resistance and color.

The Z-T Alloy™ shall be applied by the hot-dip process. All Z-T Alloy™ coated copper shall have a satin finish.

Solder

Where used on Z-T Alloy™ coated copper, solder shall conform to ASTM specification B32 and shall be pure tin **OR** lead-free, high-tin.

WORKMANSHIP:

Handling & Storage

Store FreedomGray and IndependenceGray / TCS II / TCS II Satin Z-T Alloy™ coated copper sheets, coils and formed shapes off the ground, in an enclosed structure. Do **NOT** store in a manner or location that would allow water or moisture to 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. Caution must be taken to avoid moisture in storage of sheets, coils, pans, gutters or fascia. Storage in wet conditions, high-moisture areas or where condensation occurs may cause surface staining or corrosion.

Handle sheets and shapes so as to minimize scratches, dents, etc.

COMMENTARY:

In the absence of oxygen, standing water may cause water stains and, in severe cases, corrosion. Water stains and surface scratches should not affect the life or durability of FreedomGray and IndependenceGray / TCS II / TCS II Satin Z-T Alloy™; however, they can be aesthetically unattractive.

Soldering

Before soldering Z-T Alloy coated copper or IndependenceGray / TCS II / TCS II Satin Z-T Alloy™, surfaces to receive soldering should be chemically and/or mechanically cleaned to produce clean, bright alloy.

COMMENTARY:

To ease soldering, a tin-bearing flux may be applied to all surfaces to receive solder.

Installation

Except as noted elsewhere, form and install FreedomGray and IndependenceGray / TCS II / TCS II Satin Z-T Alloy™ as noted on the drawings and in the same manner as described for plain copper in Revere's sheet copper design manual *Copper & Common Sense,* latest edition.

Protection

FreedomGray and IndependenceGray / TCS II / TCS II Satin Z-T Alloy™ shall be protected during installation and cleaning of masonry with tarps, polyethylene sheeting or similar impervious materials. To prevent water stains due to condensation trapped on the metal's surface, protection must be removed at the end of each workday.

Cleaning

Remove excessive dirt and construction debris by washing thoroughly with clear water. Grease, oils, etc. may be removed by washing with alkaline commercial cleaning agent in hot water. Do not otherwise chemically or mechanically clean FreedomGray or IndependenceGray / TCS II / TCS II Satin Z-T Alloy™.

Available Forms of FreedomGray

Types	Sheets and coils
Weights	16-oz.; 0.0216" thick
	20-oz.; 0.027" thick
Temper	H00 – cold rolled
Stock sizes	36"x 120" x 16-oz. sheets
	36"x 96" x 16-oz. sheets
	36"x 120" x 20-oz. sheets
	36"x 96" x 20-oz. sheets
	500 lin. ft. coils of 20" and
	24" wide, 16-oz.

NOTE: *Other sizes and corresponding lead times available on request.*

ORDERING INFORMATION:

Price

FreedomGray and IndependenceGray / TCS II / TCS II Satin Z-T Alloy™ are priced at a premium above Revere's Classic Copper finish. Contact your local Revere distributor for prices and lead times.

Minimum Order Quantity

One standard case or coil

Availability

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

FreedomGray and IndependenceGray / TCS II / TCS II Satin Z-T Alloy™ Warranty

Revere warrants that, for a period of 25 years after delivery, with the exception of coastal areas within 1 mile of a salt water environment, FreedomGray and IndependenceGray / TCS II / TCS II Satin Z-T Alloy™ will comply with the written specifications accepted by Revere and will be free of defects in workmanship and materials for a period of 10 years.

Call Revere for complete warranty details.

Technical Guidance

If you have questions or concerns about the use of FreedomGray and IndependenceGray / TCS II / TCS II Satin Z-T Alloy™ on a particular project, please call (800) 448-1776, ext. 2554.

Do NOT Use FreedomGray or IndependenceGray / TCS II / TCS II Satin Z-T Alloy™

1) Below plain or pre-patinated copper
2) In areas subject to impingement (e.g., in areas where water falls off a higher roof onto FreedomGray or IndependenceGray / TCS II / TCS II Satin Z-T Alloy™)
3) In areas of concentrated or abrasive flow (such as in valleys on slate or tile roofs)
4) Below or next to Cedar, or any natural acid bearing woods without a surface protection of a temporary clear or colored latex paint. This paint should provide suitable protection for the Tin / Zinc coating for 1 year minimum.
5) Where treated lumber is in contact with our material or where runoff from treated lumber flows onto our material.
6) Consult your wood manufacturers and follow their recommendations for product suitability. Wood treatments applied by manufacturers change frequently, you must make sure to follow current recommendations.

Cautionary Uses

1) Interior applications where oxidation of the Z-T alloy coating may not occur in a short period of time due to its limited exposure.
2) Soffits and similar "protected" applications where weathering will be extremely slow (if at all)

REVERE

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