

Revere Copper Products, Inc.



Revere *FreedomGray*[®] Z-T Alloy Coated Copper Questions & Answers

Since introducing *FreedomGray* Revere has been asked many questions regarding its nature and use. Following are the most often asked questions and answers. This is provided as a guide to assist you when promoting and marketing *FreedomGray*. This information is considered true and accurate as of May 15, 1998. However, as more information is obtained, answers may be changed or corrected and additional questions may added. Neither the questions nor the answers are to be interpreted as a warranty, recommendation, or endorsement for a particular use or application.

1) What is Revere *FREEDOMGRAY*?

FREEDOMGRAY is architectural sheet copper coated both sides with *Z-T Alloy*[™].

2) What is *Z-T Alloy*?

Z-T Alloy is the registered trade name for Follansbee Steel's patented zinc/tin alloy and method of applying it to copper.

3) How is *FREEDOMGRAY* produced (made)?

The *Z-T Alloy* is applied by the hot-dip process.

4) What is the significance of the name *FREEDOMGRAY*?

The name signifies freedom to design with a durable, environmentally friendly, gray metal.

5) What is the color of *FREEDOMGRAY*?

FREEDOMGRAY is supplied with a gray, "pre-weathered" wash coat. When exposed to the atmosphere, the wash coat breaks down and is replaced with a natural oxide film. In most environments *FREEDOMGRAY* weathers to an aesthetically pleasing slate gray color.

6) What is the function of the wash coat on *FreedomGray*?

The wash coat: a) reduces initial shine of the *Z-T Alloy* and
b) minimizes discoloration due to condensate during storage.

7) How thick is the *Z-T Alloy* on *FREEDOMGRAY*?

Minimum thickness is approximately 0.5 mills.

8) Can *FREEDOMGRAY* be supplied with the *Z-T Alloy* on one side only?

No

9) Has *FREEDOMGRAY* and the *Z-T Alloy* been tested? If so, what were the results?

Z-T Alloy has been tested in salt spray, salt fog, and other accelerated weathering tests. It has been exposed to industrial, seacoast, urban, and rural environments. There have been no failures.

10) How does *FREEDOMGRAY* differ from lead coated copper or terne coated stainless?

- 1) Both lead-coated copper ("LCC") and terne coated stainless ("TCS") contain lead; *FREEDOMGRAY* does not.
- 2) Formation of patina on lead and lead coatings is dependent upon sulfur compounds; *FREEDOMGRAY*'s patina depends upon oxygen.

11) How does *FREEDOMGRAY* differ from sheet zinc (Rhinezinc)?

Zinc cannot be formed at below 40° F (it fractures); the underside of zinc must be vented; zinc is subject to "creep" - *FREEDOMGRAY* can be formed and installed in the same as copper and is resistant to creep.

12) What applications is *FREEDOMGRAY* suitable for?

All applications that would use copper, lead-coated copper or TCS.

13) For what applications is *FREEDOMGRAY* not recommended?

Subject to above, none

14) Can gutters, downspouts, and other rainwater goods be made from *FREEDOMGRAY*?

Yes

15) Can *FREEDOMGRAY* be installed at below freezing temperatures?

Yes

16) Can *FREEDOMGRAY* be used in marine environments?

Yes

17) What conditions or environments will cause *FREEDOMGRAY* to weather to a red or orange color as occasionally seen with lead, LCC, and TCS?

None - there are no red oxides of tin or zinc.

18) What changes in physical properties can be expected as *FREEDOMGRAY* weathers?

None

19) What substances or materials can affect (corrode) *FREEDOMGRAY*?

Inorganic acids - although only unsightly stains usually result, care should be taken to minimize run-off from sulfur containing products, overspray of masonry cleaners, etc., onto *FREEDOMGRAY*.

20) Can *FREEDOMGRAY* be formed in the same manner as plain or lead-coated copper?

In general - Yes. As standing water may cause staining, flat seam roofing, gutters, etc. should be provided with positive drainage - minimum 1/8" per foot.

21) What underlayments are suitable for use with *FREEDOMGRAY*?

All commonly available, i.e., asphalt saturated felt with rosin-sized slip-sheet, self-sealing single-ply membranes, etc.

22) Can *FREEDOMGRAY* be installed over fire retardant treated ("FRT") lumber?

We have limited experience with FRT lumber. While we believe *FREEDOMGRAY* should be compatible with non-hygroscopic treatments, Revere and the lumber treater should be consulted before installing *FREEDOMGRAY* over FRT lumber.

23) Will the *Z-T Alloy* brake or flake off tight bends?

No

24) Can *FREEDOMGRAY* be soldered?

Yes

- 25) **Are there special techniques or procedures required when soldering *FREEDOMGRAY*?**
Use non-lead, tin solders, i.e., pure tin or zinc/tin alloys, and the same procedures as with plain copper: mechanically clean (wire brush) area to be soldered, flux, solder with well heated soldering coppers, neutralize with mild baking soda/water solution, and thoroughly wash remaining flux from completed seam.
- 26) **What flux should be used for soldering *FREEDOMGRAY*? Is "Ruby Fluid" acceptable?**
Zinc-chloride (killed acid) flux is suggested. Revere does not suggest Ruby Fluid.
- 27) **Can *FREEDOMGRAY* be soldered with an open flame on it?**
Revere does **not** recommend soldering sheet copper with an open flame. Solder *FREEDOMGRAY* with well-heated irons or coppers.
- 28) **Can *FREEDOMGRAY* be brazed or welded?**
Intended applications for *FREEDOMGRAY* do not normally require welding or brazing.
- 29) **Is it necessary to pre-tin *FREEDOMGRAY* before soldering?**
No
- 30) **What effect do masonry cleaners (muriatic acid) have on *FREEDOMGRAY*?**
Not good - *FREEDOMGRAY* should be tarped or otherwise protected when masonry above or adjacent to it is cleaned.
- 31) **Can the color of *FREEDOMGRAY* be changed or varied?**
No
- 32) **Will *FREEDOMGRAY* stain other materials below it?**
No stains were evident in development tests or early *Z-T Alloy* installations. However, proper design requires drips and overhangs to minimize water stains.
- 33) **Will the color of *FREEDOMGRAY* change in time?**
Yes - initial color will be replaced with a pleasing "earth-tone" gray.
- 34) **How long will it require for *FREEDOMGRAY* to change color?**
Weathering of *FREEDOMGRAY* begins immediately upon exposure and varies with local environmental conditions. Usually, a mature slate gray patina develops in one to five years.
- 35) **Should gloves be worn when working with *FREEDOMGRAY*?**
Gloves are not required for health reasons; however, gloves provide protection from cuts and scratches and are therefore suggested.
- 36) **If gloves are not worn, will *FREEDOMGRAY* show fingerprints like standard copper?**
No
- 37) **Does cutting *FREEDOMGRAY* with snips cause "burrs" typical of stainless steel?**
No - if the snips are sharp, burrs should not be a problem.
- 38) **Is protective clothing required when working with *FREEDOMGRAY*?**
Revere recommends eye protection be worn when forming, soldering, and/or installing any sheet metal. Beyond this, no special clothing or protection is required when working with *FREEDOMGRAY*.

39) Can *FREEDOMGRAY* be used with other metals?

Yes - the *Z-T Alloy* is basically inert allowing *FREEDOMGRAY* to be used with most other architectural metals. However, Revere should be contacted about specific metals with respect to nobility and electro-chemical potential.

40) Is the *Z-T Alloy* available on other metals and copper alloys?

Only through Revere or Follansbee Steel through exclusive arrangements.

41) Can *FREEDOMGRAY* be painted?

Yes

42) What is the oldest project on which *FREEDOMGRAY* was used? What is the oldest project that used the *Z-T Alloy*?

Follansbee constructed test sites, including full-scale roof surfaces, are approximately seven years old.

43) Can *FREEDOMGRAY* be formed on portable pan forming machines?

Yes

44) Is there an MSDS available for *FREEDOMGRAY*?

Yes

45) Is *FREEDOMGRAY* produced to an ASTM specification?

Revere and Follansbee Steel will begin work with ASTM to develop a standard specification that will apply to *FREEDOMGRAY*.

46) What sizes are *FREEDOMGRAY* available in?

At this time: 16-ounce, 20-ounce, and 24-ounce sheet and coil

47) Is *FREEDOMGRAY* available in coils?

Yes

48) What are stock sizes for *FREEDOMGRAY*?

16-ounce and 20-ounce: 36" by 120" sheets; 20" and 36" coils

49) What is the minimum order quantity for *FREEDOMGRAY*?

Minimum orders for stock sizes are one case or coil (approximately 1,000 lbs.).

50) Will Revere accept orders for *FREEDOMGRAY* in other than stock sizes or thicknesses?

Inquiries for other than stock sizes and thicknesses will be reviewed and determined on an individual basis.

51) What is the lead-time for non-stock sizes of *FREEDOMGRAY*?

Lead times for non-stock sizes of *FREEDOMGRAY* will be according to Revere's published schedule.

52) How will *FREEDOMGRAY* be sold?

FREEDOMGRAY will be sold through, recognized Revere sheet copper distributors throughout the United States, Canada, and South America.

53) Can *Z-T Alloy* be applied to copper obtained from other sources on a "toll" basis?

No

54) Will Revere "drop-ship" *FREEDOMGRAY* to job sites?

No - Revere will ship only to distributor locations.

55) Can *FREEDOMGRAY* be combined with other roofing copper for quantity discounts?

No

56) What is the warranty for *FREEDOMGRAY*?

25-year warranty same as other copper products

57) Where can I obtain *FREEDOMGRAY*?

FREEDOMGRAY is available from authorized Revere roofing or metal distributors. For the names of Authorized Distributors, call (800) 950-1776.