

Revere Copper Products, Inc.



Revere *FreedomGray*® T-Z 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 08/15/16. However, as more information is obtained, answers may be changed or corrected and additional questions may be 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 *T-Z Alloy*

2) What is *T-Z Alloy*?

T-Z Alloy trade name for Revere Copper Product's patented Tin/Zinc alloy and method of applying it to copper

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

The *T-Z Alloy* is applied by the hot-dip process to architectural sheet copper produced to ASTM B 370

4) What is the significance of the names *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 micro-embossed surface. When exposed to the atmosphere, the *T-Z Alloy forms* a natural oxide film. In most environments *FREEDOMGRAY* weathers to an aesthetically pleasing slate gray color.

6) What is the function of the satin micro-finish on *FreedomGray*

The satin finish reduces initial glare and reflectivity of the *T-Z Alloy*.

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

Minimum thickness is approximately 0.0005".

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

No it is applied to both sides

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

T-Z 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. Note in some marine environments the T-Z alloy coating can corrode more rapidly.

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

- 1) Lead-coated copper ("LCC") coating contains lead; *FREEDOMGRAY* coating does not contain lead.
- 2) Formation of patina on lead and lead coatings is dependent upon sulfur compounds, lack of these compounds can cause unusual weathering; *FREEDOMGRAY'S* patina depends upon oxygen and CO₂.

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

Zinc cannot be formed at below 40^o F (it fractures); the underside of zinc must be vented; zinc is subject to "creep" - *FREEDOMGRAY* can be formed at most any temperature, installed easily using normal copper forming methods and is resistant to creep.

12) What applications is *FREEDOMGRAY* suitable for?

Applications that would use copper, except where acid runoff may be a concern (tannic acid leaching from some wood types). In some marine environments caution should be used.

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

Directly under roof run off, areas that may contain aggressive chemicals, tannic acid, and some marine environments, please consult with Revere

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 please check with Revere if the project is within 1 mile of saltwater

17) What conditions or environments will cause *FREEDOMGRAY* to weather to a red or orange color as occasionally seen with lead, Lead Coated Copper?

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 may 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 copper, or lead-coated copper?

In general - Yes. As standing water may cause staining (on any of the aforementioned metals), 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 underlayments, i.e., asphalt saturated felt with rosin-sized slip-sheet, self-sealing single-ply membranes, high temperature ice and water shield is required 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 *T-Z Alloy* break or flake off on tight bends?

No

24) Can *FREEDOMGRAY* be soldered?

Yes consult our informational bulletin specific to "Soldering *FreedomGray*

25) Are there special techniques or procedures required when soldering?

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. If a leaded solder is used 60% minimum tin content should be used.

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 however it may be helpful in some cases a tin bearing flux is often used.

30) What effect do masonry cleaners (muriatic acid) have on *FREEDOMGRAY*?

FREEDOMGRAY should be tarped or otherwise protected when masonry above, near, or adjacent to it is cleaned, spotting and staining will occur without proper protection. We have seen through wall flashing discolor if it is not protected.

31) Can the color of THE T-Z COATING be changed or varied?

No

32) Will *FREEDOMGRAY* stain other materials below it?

Minor to No stains occurred at most of our *T-Z Alloy* installations. The small stains so far have been light milk colored over darker brick. 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 does it take for *FREEDOMGRAY* to change color?

Weathering of the **T-Z Alloy coating** begins immediately upon exposure and varies with local environmental conditions. Usually, a mature slate gray patina develops in one to three years depending on the slope of the installation and environment.

35) Should gloves be worn when working with *FREEDOMGRAY*?

Gloves are not required for health reasons; however, gloves help provide protection from sharp edges of material, and are therefore suggested.

36) If gloves are not worn, will *FREEDOMGRAY* show fingerprints like standard copper?

Natural metals can show fingerprints if care is not taken to avoid them.

37) Is protective clothing required when working with *FREEDOMGRAY*?

Revere recommends standard protection such as gloves, eye protection, etc. be worn when forming, soldering, and/or installing any sheet metal. Beyond this, no special clothing or protection is required when working with *FREEDOMGRAY*.

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

Steps should be taken to prevent a potential reaction with other architectural metals. However, Revere should be contacted about specific metals with respect to nobility and electro-chemical potential.

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

We only coat our copper

40) Can *FREEDOMGRAY* be painted?

Yes, we suggest contacting a reputable paint manufacturer for proper selection. Rapidri paint has been used for many years.

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

Test sites, including full-scale roof surfaces, since the early 1990's.
FreedomGray was first installed in 2000

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

Yes Standard copper setups can be used .

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

Yes Downloadable from our website.

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

The Copper substrate's are produced to ASTM specifications, while the **T-Z Alloy** coating is a proprietary process.

45) Is *FREEDOMGRAY* available in coils?

Yes

46) What are stock sizes for *FREEDOMGRAY*?

FreedomGray: 16-ounce and 20-ounce: 36" by 96" or 120" sheets; 20" 24" and 36" coils

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

Minimum orders for stock sizes are one case (approximately 1,000 lbs.) or 500' lineal foot coils.

- 48) 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.
- 49) 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.
- 50) How will *FREEDOMGRAY* be sold?**
FREEDOMGRAY will be sold through recognized Revere sheet copper distributors around the globe.

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

No

53) What is the warranty for *FREEDOMGRAY*?

25-year warranty same as other copper products except in coastal applications a 10 year warranty applies.

54) Where can I obtain *FREEDOMGRAY*?

FREEDOMGRAY is available from authorized Revere roofing or metal distributors. For the names of Authorized Distributors, call Customer Support at **(800) 448-1776**.