

# Dirty Penny Copper™

Zahner's Dirty Penny Copper features a rich array of colors, from reddish-brown to orange and yellow shades — even deep hues of purple. These tones intermingle and create an intriguing mottled effect, initially exhibiting a slight iridescence. These enigmatic colors provide a stunning copper surface unlike any other.

## MAIN FEATURES AND CHARACTERISTICS

- A lustrous and enigmatic finish in a luxurious material.
- Slow-to-mature patina; the Dirty Penny impedes the tendency of the copper ions to combine with oxygen.
- Available in a wide variety of sheet thicknesses and order quantities to fit almost any project and budget.
- 100% metal construction means familiar and common fabrication techniques, a non-combustible surface, and easy recyclability at end-of-life.

## AVAILABLE ALLOYS, THICKNESSES AND SIZES

Dirty Penny Copper is a single-sided product and is available in a variety of sheet thicknesses.

Refer to the table below for more detailed information.

THICKNESS AND SIZE AVAILABILITY

Gauge ["]	Sheet Sizes	
	3' x 10'	
20 oz [0.027"]	available single-sided only	
24 oz [0.032"]		
32 oz [0.043"]		
48 oz [0.065"]		

## DIMENSIONS AND TOLERANCES

Dimensional tolerances for Dirty Penny Copper are provided in the table below.

DIMENSIONAL TOLERANCES

Property	Unit	Value
Width	in	+/- 1/16
Length	in	+ 1/4, -0

## PATTERN AND COLOR

Dirty Penny Copper is made to order by Zahner artisans, using an accelerated patination process that results in an oxide layer that is subject to natural variations in color and pattern.

No two sheets of Dirty Penny Copper are identical. If anticipating the need for additional sheets in the future, it is recommended to order these at the time of initial order to minimize batch-to-batch variation.

## MATERIAL AND PHYSICAL PROPERTIES

Dirty Penny Copper contains a minimum copper content, including silver, of 99.5%. It is supplied in an H00 temper. Select material and physical properties are presented in the table below.

SELECT MATERIAL AND PHYSICAL PROPERTIES

Property	Unit	Value
Density	lbs/ft³	558
Coefficient of Thermal Expansion	in/in/°F	9.8 × 10 <sup>-6</sup>

## FLAMMABILITY

Dirty Penny Copper is 100% monolithic copper and is a non-combustible material.

## OUTDOOR USE AND LIMITATIONS

Dirty Penny Copper can be used in most exterior applications. Certain horizontal applications, such as exterior counters or seating, are discouraged due to the potential for water to pool and create spotting or other staining effects.

## FABRICATION GUIDELINES

Please follow the guidelines for fabricating sheets of Dirty Penny Copper.

### General notes for all fabrication

- Follow best-practices in regards to proper occupational health and safety measures, such as the wearing of eye protection, and the use of respirator devices when grinding or polishing.
- Prior to fabrication for your project, it is strongly recommended that any fabrication steps be tested on sample material or fall-off.

### Cutting and Drilling

Use high-speed steel, heavy-duty machine drill bits at the proper speed when drilling holes.

Dirty Penny Copper may be cut using a shear for simple linear cuts. The use of cardboard or other surface protection measures are recommended to protect the surface from oils and other debris.

For the cutting of simple curves and forms, the use of manual cutting methods appropriate for copper sheet, eg, a bandsaw, jigsaw with proper blade, or snips, will suffice.

For the cutting of complex and/or detailed shapes, CNC methods, such a laser cutting machine capable of cutting copper, or waterjet, is recommended. For appropriate cutting parameters (speed, power, etc), please reference the manufacturer's recommended settings for copper.

### Bending

Dirty Penny Copper can be bent to a variety of forms using commonly practiced sheet-metal bending techniques. To maintain the appearance of the Dirty Penny surface, the following best-practices are recommended:

- DO use a brake-press with a properly sized punch and die.
- DO use Rhino Hide or an equivalent aid to protect the surface.
- DO NOT bend to an outside radius less than 2.5x the thickness of the sheet.

### Welding and Soldering

Dirty Penny Copper is compatible with copper soldering methods.

Note that the Dirty Penny Copper surface in the vicinity of the soldering will need to be removed prior to soldering. Therefore, it is recommended that designs that require soldering take this into account and locate the soldered connection where they will be hidden from view.

### Gluing

Dirty Penny Copper is compatible with a variety of common adhesives designed for metals. Follow the manufacturer's recommended procedures for copper/metal when bonding Dirty Penny Copper to other materials.

## STORAGE AND HANDLING

Dirty Penny Copper should be stored in its original packaging in a dry, indoor location away from direct sunlight. Store the product on flat, level ground. Keep in a low-traffic location to help protect all edges from incidental damage. Any protective masking, if applied, should be removed within 6 months of the date of shipment.

- Do not store outside, in direct sunlight, or in wet environments.
- Do not stack objects on top of the products or packaging.

### Handling

When handling Dirty Penny Copper, the wearing of cotton, nitrile or latex gloves is recommended to prevent dirt and oils from contaminating the finish. When carrying or manually transporting, take all necessary precautions to prevent denting, scratching or other damage to the finish. If temporarily setting sheets of Dirty Penny Copper on an edge, the use of wood blocking and/or shop towels is recommended between the sheet's edge and the ground in order to prevent denting or deforming of the edge.

## CLEANING

Clean Dirty Penny Copper at least once per year to ensure the initial appearance is retained. Use warm soapy water and a clean, soft cotton cloth, followed by a thorough rinse using clean water. Wipe dry with a clean, soft cotton cloth.

If a more aggressive cleaning solution is required, Isopropyl Alcohol, Windex® Original Glass Cleaner, or Windex Vinegar Glass Cleaner can also be used. Clean and wipe dry with a clean, soft cotton cloth.

**Do not** use cleaners that contain abrasives, as these will damage the Dirty Penny finish.

Whenever cleaning Dirty Penny Copper for the first time, test in an inconspicuous area. If no damage to the finish occurs, proceed with cleaning. Clean the entire surface equally - clean all the way to any edge or joint - to avoid visible differences in appearance.

## END OF LIFE AND DISPOSAL

Dirty Penny Copper is 100% monolithic copper and can be recycled at end of life using existing scrap and recycling streams for metals.