ASTM B75 / B75M Standard Specification for Seamless Copper Tube

GNEE's main copper products include copper tubes, copper rods, copper plates, copper wires, copper strips, etc.

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1. Standard Overview & Scope

ASTM B75 (inch-pound units) / B75M (SI units) is the fundamental, general-purpose standard for seamless copper tube intended for a wide variety of applications where dimensional accuracy, cleanliness, and soundness are required. It serves as the baseline specification from which many other application-specific tube standards (like B88 for water, B280 for ACR) are derived or referenced.

Key Concept: B75 defines the common requirements for drawn, seamless copper tube. It is NOT a product specification by itself for a specific end-use. Instead, it is invoked by other standards or specified directly by users who need generic copper tube for custom fabrication, OEM parts, or applications not covered by other dedicated standards (e.g., instrumentation, gas lines (non-fuel), hydraulic lines, shell-and-tube heat exchangers, etc.).

Core Purpose: To ensure the tube is seamless, commercially clean, and reasonably straight.

2. Material Requirements

The standard covers multiple copper grades, allowing selection based on required properties like conductivity, formability, or weldability.

Primary Copper UNS Numbers:

C10200, C10300, C10800, C12000, C12200: Various oxygen-free and phosphorus deoxidized coppers. C12200 (DHP) is the most commonly supplied grade due to its excellent combination of formability and resistance to hydrogen embrittlement.

C14200: Phosphorus deoxidized, arsenical copper. Offers improved corrosion resistance in certain environments.

Temper: Available in a wide range of tempers to suit fabrication needs:

Drawn (Hard) Tempers: H58 (light drawn), H80 (hard drawn). High strength, low elongation.

Annealed (Soft) Tempers: O50 (light anneal), O60 (soft annealed). High ductility, easy to bend and flare.

Specific temper is subject to agreement between purchaser and supplier.

3. Dimensions, Tolerances, and Forms

This is the core of B75, as it is a dimension-focused standard.

3.1 Standard Size Ranges

B75 covers an extremely wide range of sizes, broader than most application-specific standards.

Outside Diameter (OD): Typically from 1/32 inch (0.8 mm) up to 12-5/8 inches (321 mm) or larger by agreement.

Wall Thickness: Ranges from very thin-walled (e.g., 0.010 in / 0.25 mm) to heavy-walled schedules.

Notable: It includes sizes and wall combinations that may not be listed in B88 or B280, making it essential for custom engineering.

3.2 Dimensional Tolerances (Key Excerpts)

Tolerances are strict and vary by size. Below are representative values for common sizes.

Dimension	Tolerance (for sizes up to 2" OD)	Notes
Outside Diameter	± 0.004 in (± 0.10 mm)	Tighter than many plumbing standards.
Wall Thickness	± 10% of nominal wall	Applies to most sizes.
Concentricity	The wall thickness shall not vary by more than 10% of the average wall.	Critical for even strength and machining.
Length (Straight)	+1/4 in, -0 in for random lengths; closer tolerances for cut lengths.	
Straightness	Maximum deviation of 0.020 in/ft (1.7 mm/m) for hard temper; 0.040 in/ft (3.3 mm/m) for annealed.	

3.3 Forms and Conditions

Lengths: Supplied in straight lengths (typically 12 ft, 20 ft, or cut to length) or coils (for smaller diameters in soft temper).

Ends: Plain ends, squared and deburred, unless otherwise specified.

Cleanliness: Internally and externally commercially clean, free of scale, dirt, and excessive drawing lubricant.

4. Mechanical and Performance Properties

Properties are highly dependent on copper grade and temper.

Typical Mechanical Properties (Annealed Temper O60 - C12200):

Tensile Strength: Min. 30 ksi (205 MPa)

Yield Strength (0.5% extension): Min. 8 ksi (55 MPa)

Elongation: Min. 40% in 2 inches

Typical Mechanical Properties (Hard Temper H80 - C12200):

Tensile Strength: 40 - 52 ksi (275 - 360 MPa)

Yield Strength: Min. 40 ksi (275 MPa)

Elongation: Min. 10% in 2 inches

Hydrostatic Test (or Nondestructive Electric Test):

Option A (Hydrostatic): Each tube must withstand a minimum hydrostatic pressure calculated by a formula: P = 2St / (D - 0.8t), where S = fiber stress (e.g., 3000 psi / 20.7 MPa for annealed), D = OD, t = min wall. Test duration min. 5 seconds.

Option B (Nondestructive Electric Test): An eddy-current or ultrasonic test performed to detect defects. This is increasingly common.

5. Testing and Inspection

Chemical Analysis: Performed to confirm copper grade.

Tension Tests: To verify mechanical properties for the specified temper.

Hydrostatic or Nondestructive Electric Test: Mandatory for every tube.

Flaring Test (for annealed tube): A sample must withstand flaring to a diameter 25% greater than the original OD for tube under 1-1/8" OD, or 20% for larger sizes, without cracking.

Dimensions & Visual Inspection: Performed to verify compliance with tolerances and surface quality.

6. Purchasing Information & Applications

6.1 How to Order/Specify:

A complete purchase order should specify:

Standard: ASTM B75 or B75M (specify units).

Material: Copper UNS Number (e.g., C12200).

Temper: (e.g., O60 annealed, H80 hard drawn).

Dimensions: Exact Outside Diameter and Wall Thickness (in inches or mm). This is critical.

Length & Quantity: (e.g., 100 pieces, 20 ft cut length).

Test Requirements: If special tests (e.g., certified chemical analysis, specific NDT) are needed.

End Condition / Packaging.

6.2 Common Applications of ASTM B75 Tube:

OEM Components: Manifolds, bushings, sleeves, spacers, machined parts.

Heat Exchangers & Condensers: Custom shell-and-tube designs.

Instrumentation and Sensing Lines: For air, gas, or vacuum.

Hydraulic and Pneumatic Lines: For low to medium pressure systems.

General Fluid Conduit: For oils, coolants, non-potable water in industrial machinery.

Architectural & Decorative Uses: Handrails, structural elements (where specified).

Base Material for further fabrication (e.g., bending, spinning, plating).

7. Related Standards and Comparison

ASTM B88 (Water Tube): A subset of B75 with specific, fixed OD/Wall combinations (Types K, L, M) approved for plumbing/potable water. B75 allows any OD/wall combo.

ASTM B280 (ACR Tube): A subset of B75 with specific tempers (annealed), cleanliness (capped/dry), and a focused size range for refrigeration.

ASTM B68 / B68M (Seamless Copper Bright Annealed): For higher surface finish requirements.

ASTM B251 (General Requirements for Wrought Seamless Copper Tube): This companion standard provides additional test methods and definitions often referenced by B75.

About Us

Plant And Equipment

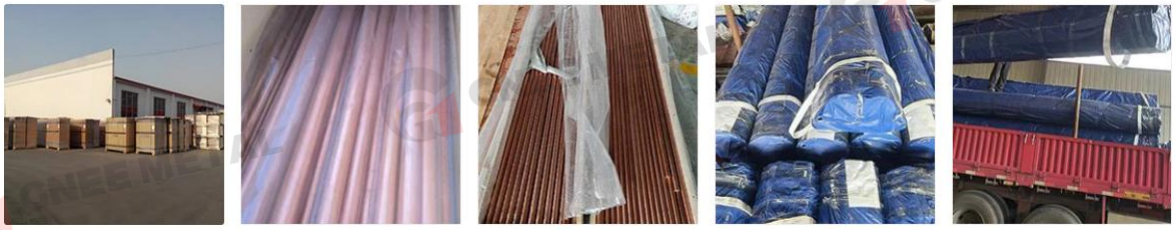
We rely on a full-process production line of melting, extrusion, drawing, heat treatment and finishing. Our core equipment includes medium-frequency induction furnaces, extruders, cold drawing machines and annealing furnaces, and are equipped with intelligent detection systems to ensure that the copper we produce is of first-class quality and stable performance.





Packaging And Shipping

To ensure our products arrive in perfect condition, we use robust packaging:
Protective End Caps: Prevent damage to tube ends.
Waterproof Wrapping: Protects against moisture and corrosion during transit.
Secured Bundling: Tubes are bundled and strapped onto wooden crates or pallets.
Clear Labeling: Each bundle is clearly labeled with material grade, heat number, and dimensions.



Founded in 2008, GNEE has many years of experience in copper product export. Headquartered in Henan Province, China, adjacent to the Beijing-Hong Kong-Macao Expressway, the company has over 200 dedicated employees, registered capital of RMB 10 million, and covers an area of over 350,000 square meters. GNEE is

SGS-certified.
We provide high-quality copper products, excellent service, and highly competitive pricing. We specialize in the production and manufacturing of copper tubes, rods, sheets, coils, and wire.
Our products are exported to over 160 countries worldwide and are widely used in key sectors such as large-scale pipeline construction, petrochemicals, shipbuilding, the automotive industry, and large power plants.

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