HMT-220 Copper Bright Cleaner

Brightening · Oxide Removal · Degreasing

HMT-220 is an alkaline copper alloy cleaner formulated with various builders and surfactants. It is suitable for degreasing copper alloys and removing oxide scale from copper alloy surfaces. After treatment, the copper alloy surface becomes uniform and bright.

Physicochemical Indicators

Appearance	Light yellow or slightly milky white liquid
Odor	None
Specific Gravity	1.05–1.15
pH Value	12.0–13.0

Typical Process

Degreasing 1 (HMT-220) → Water rinse 1 → Water rinse 2 → Anti-oxidation → Pure-water rinse 3 → Air knife → Drying

After cleaning, anti-oxidation treatment is required, with or without water rinsing.

Product Features

The product is safe and does not over-corrode metals. It provides excellent cleaning capability, brightens metals while degreasing, has low odor, offers a long service life, and is easy to rinse without residue.

Recommended Use

6%; 5%–10% (W/V)

Applications

- Cleaning and degreasing of red copper and brass.
- Oxide-scale removal and brightening of red copper and brass.

Treatment Conditions

Temperature	40–70°C
Time	1–20 minutes

The temperature and time may be adjusted according to the amount of oil contamination and the degree of surface oxidation. Only 10 seconds are required to remove slight oil contamination and oxide scale.

Packaging and Storage

Packaging	25 kg/drum
Storage	Keep the package tightly sealed and store in a cool place below 40°C. Prevent leakage and keep away from children.

Concentration Analysis

Take 10 mL of working solution and place it into a 250 mL conical flask. Add approximately 30 mL of deionized water, then add 2–3 drops of P.P. (phenolphthalein) indicator. Titrate with 0.1 N HCl standard solution until the red color of the test solution in the conical flask just disappears. The mL number of 0.1 N HCl standard solution consumed at this point is the free alkalinity (FAL), expressed as the PT value.

> **HMT-220 concentration % = 1.32 × FAL**

Remark: Each liter of chemical solution can brighten approximately 0.5–1 ton of oxidized copper material. The treatment capacity depends on the oxidation degree and shape of the part surface.

Appendix I. Preparation of 0.1 N HCl Standard Solution

a. Preparation of Standard Solution

Use a 10 mL pipette to take 8.3–8.5 mL of concentrated hydrochloric acid (analytical reagent) and dilute to 1000 mL. Store the solution in a glass-stoppered narrow-mouth bottle and shake thoroughly to mix.

b. Standardization

Accurately weigh three portions of anhydrous sodium carbonate that have been dried at 260–270°C for 30 minutes, each approximately 0.1–0.2 g, and place them into three 250 mL conical flasks. Add approximately 30 mL of water, warm the solution, and shake to dissolve. Use bromophenol blue (B.P.B.) as the indicator, and titrate with 0.1 N HCl standard solution until the solution changes from blue-violet to orange. The volume of HCl standard solution consumed at this point is V_{HCl}.

c. Calculation

> **HCl standard solution concentration: $C_{HCl} = 2000 \times M_{\text{sodium carbonate}} / (106 \times V_{HCl})$**

Remark: For general requirements, a NaOH solution of known concentration may also be used for standardization.

Appendix II. Preparation of 1% Phenolphthalein (P.P.) Indicator

Dissolve 1 g of phenolphthalein in 90 mL of ethanol, then add water to 100 mL.