



Standard Test Methods for Chemical Analysis of Copper-Chromium Alloys¹

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1. Scope

1.1 These test methods cover procedures for the chemical analysis of chromium-copper alloys having chemical compositions within the following limits:

Copper, %	98 and over
Chromium, %	0.6 to 1.2
Silicon, %	0 to 0.10
Iron, %	0 to 0.10

1.2 The analytical procedures appear in the following order:

	Sections
Copper by the Electrolytic Method	8-11
Chromium by the Dichromate (Potentiometric) Method	12-15
Silicon by the Perchloric Acid Dehydration Method	16

2. Referenced Documents

2.1 ASTM Standards:²

- E 29 Practice for Using Significant Digits in Test Data to Determine Conformance With Specifications
- E 50 Practices for Apparatus, Reagents, and Safety Precautions for Chemical Analysis of Metals
- E 54 Test Methods for Chemical Analysis of Special Brasses and Bronzes
- E 55 Practice for Sampling Wrought Nonferrous Metals and Alloys for Determination of Chemical Composition
- E 60 Practice for Photometric and Spectrophotometric Methods for Chemical Analysis of Metals
- E 62 Test Methods for Chemical Analysis of Copper and Copper Alloys (Photometric Methods)

3. Significance and Use

3.1 These test methods for the chemical analysis of metals and alloys are primarily intended to test such materials for compliance with compositional specifications. It is assumed that all who use these test methods will be trained analysts

¹ These test methods are under the jurisdiction of ASTM Committee E01 on Analytical Chemistry for Metals, Ores, and Related Materials and are the direct responsibility of Subcommittee E01.05 on Cu, Pb, Zn, Cd, Sn, Be, their Alloys and Related Metals.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

capable of performing common laboratory procedures skillfully and safely. It is expected that work will be performed in a properly equipped laboratory.

4. Apparatus, Reagents, and Photometric Practice

4.1 Apparatus and reagents required for each determination are listed in separate sections preceding the procedure. The apparatus, standard solutions, and certain other reagents used in more than one procedure are referred to by number and shall conform to the requirements prescribed in Practices E 50, except that photometers shall conform to the requirements prescribed in Practice E 60.

4.2 Photometric practice prescribed in these test methods shall conform to Practice E 60.

5. Hazards

5.1 For hazards to be observed in these test methods, reference shall be made to Practices E 50.

6. Sampling

6.1 Wrought products shall be sampled in accordance with Practice E 55.

7. Rounding Calculated Values

7.1 Calculated values shall be rounded to the desired number of places in accordance with the rounding method given in 3.4 and 3.5 of Practice E 29.

COPPER BY THE ELECTROLYTIC TEST METHOD

8. Apparatus

8.1 *Electrodes for Electroanalysis*—Apparatus No. 9.

9. Reagents

9.1 *Sulfuric-Nitric Acid Mixture*—Add slowly, while stirring, 500 mL of H₂SO₄ to 1700 mL of water. Cool, and add 300 mL of HNO₃.

9.2 *Hydrogen Peroxide* (3 %).

10. Procedure

10.1 Transfer 2.0000 g of the sample to a 250-mL electrolysis beaker, cover, and dissolve in 60 mL of the H₂SO₄-HNO₃ mixture. Allow the beaker to remain on a steam bath until