



# Standard Guide for Editorial Procedures and Form of Product Specifications for Copper and Copper Alloys<sup>1</sup>

This standard is issued under the fixed designation B 950; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

## 1. Scope\*

1.1 This guide covers the editorial procedures and form and style for product specifications under the jurisdiction of ASTM Committee B05 on Copper and Copper Alloys.

NOTE 1—For standards other than product specifications, such as test methods, practices, and guides, see the appropriate sections of **Form and Style** for ASTM Standards (Blue Book).<sup>2</sup>

1.2 This guide has been prepared as a supplement to the current edition of the **Form and Style Manual**, and is appropriate for use by the subcommittees within ASTM Committee B05 on Copper and Copper Alloys. This guide is to be applied in conjunction with the **Form and Style Manual**. The Appendix contains a copy of the B05 electronic template which includes adopted language for various sections and provides a template for drafting B05 specifications.

NOTE 2—The contents of this guide were previously maintained as a white paper under the title, “ASTM Committee B05 Outline of **Form of Specifications**.”

1.3 Subcommittees preparing new product specifications or revising existing ones should follow the practices and procedures outlined herein, and be guided by the latest specifications covering similar commodities.

1.4 If a conflict exists between this guide and the mandatory sections of the current edition of the **Form and Style Manual**, the **Form and Style Manual** requirements have precedence. If a conflict exists between this guide and the nonmandatory sections of the current edition of the **Form and Style Manual**, the guide has precedence.

1.5 When patents are involved, the specifications writer should refer to the **Form and Style Manual** section on patents and trademarks. Also, refer to part F of the **Form and Style Manual** for trademark information and the safety hazards caveat.

## 2. Referenced Documents

2.1 *ASTM Standards*:<sup>3</sup>

- E 75** Test Methods for Chemical Analysis of Copper-Nickel and Copper-Nickel-Zinc Alloys
- B 170** Specification for Oxygen-Free Electrolytic Copper—Refinery Shapes
- B 194** Specification for Copper-Beryllium Alloy Plate, Sheet, Strip, and Rolled Bar
- B 216** Specification for Tough-Pitch Fire-Refined Copper—Refinery Shapes
- B 224** Classification of Coppers
- B 248** Specification for General Requirements for Wrought Copper and Copper-Alloy Plate, Sheet, Strip, and Rolled Bar
- B 248** Specification for General Requirements for Wrought Copper and Copper-Alloy Plate, Sheet, Strip, and Rolled Bar
- B 249/B 249M** Specification for General Requirements for Wrought Copper and Copper-Alloy Rod, Bar, Shapes and Forgings
- B 250/B 250M** Specification for General Requirements for Wrought Copper Alloy Wire
- B 251** Specification for General Requirements for Wrought Seamless Copper and Copper-Alloy Tube
- B 577** Test Methods for Detection of Cuprous Oxide (Hydrogen Embrittlement Susceptibility) in Copper
- B 601** Classification for Temper Designations for Copper and Copper Alloys—Wrought and Cast
- B 824** Specification for General Requirements for Copper Alloy Castings
- B 846** Terminology for Copper and Copper Alloys
- E 6** Terminology Relating to Methods of Mechanical Testing
- E 44** Definitions of Terms Related to Heat Treatment<sup>4</sup>
- E 53** Test Method for Determination of Copper in Unalloyed Copper by Gravimetry

<sup>1</sup> This guide is under the jurisdiction of ASTM Committee B05 on Copper and Copper Alloys and is the direct responsibility of Subcommittee B05.91 on Editorial and Publications.

Current edition approved Oct. 1, 2006. Published December 2006.

<sup>2</sup> Available from ASTM International Headquarters, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959.

<sup>3</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

\*A Summary of Changes section appears at the end of this standard.

**E 54** Test Methods for Chemical Analysis of Special Brasses and Bronzes<sup>4</sup>

**E 62** Test Methods for Chemical Analysis of Copper and Copper Alloys (Photometric Methods)

**E 75** Test Methods for Chemical Analysis of Copper-Nickel and Copper-Nickel-Zinc Alloys

**E 76** Test Methods for Chemical Analysis of Nickel-Copper Alloys<sup>4</sup>

**E 118** Test Methods for Chemical Analysis of Copper-Chromium Alloys

**E 121** Test Methods for Chemical Analysis of Copper-Tellurium Alloys

**E 478** Test Methods for Chemical Analysis of Copper Alloys

**E 1227** Terminology Relating to Chemical Analysis of Metals<sup>4</sup>

**E 1371** Test Method for Gravimetric Determination of Phosphorus in Phosphorus-Copper Alloys or Phosphorus-Copper-Silver Alloys<sup>4</sup>

## 2.2 Other ASTM Documents:<sup>5</sup>

### Form and Style for ASTM Standards

**Committee B05 Bylaws** Appendix III—Terminology Management Policy

## 2.3 ISO Documents:<sup>6</sup>

**ISO 4744** Copper and copper alloys -- Determination of chromium content -- Flame atomic absorption spectrometric method

**ISO 7602**

## 3. Terminology

3.1 For definitions of terms used in this guide, refer to the **Form and Style Manual** and Terminology **B 846**.

## 4. Significance and Use

4.1 The **Form and Style** for ASTM Standards manual provides mandatory requirements and recommended practices for the preparation and content of ASTM specifications. In order to promote consistency in the style and content of product specifications under its jurisdiction, Committee B05 recognizes the need to provide a supplementary document pertaining to the types of products and materials covered by specifications under its jurisdiction.

4.2 This guide contains a list of sections to be considered for inclusion in a specification for copper and copper alloys, recommended wording, or both, for such sections. An electronic template including committee adopted language is included in the Appendix.

4.3 Persons drafting new product specifications, or modifying existing ones, under the jurisdiction of Committee B05, should follow this guide and the requirements of the **Form and Style Manual** to ensure consistency.

## 5. Subject Headings of Text

5.1 The following is the heading sequence for the specifications text. The headings listed are those most generally used. Other headings may be included for specialized subjects when the information is pertinent to the document under development; in which case, all instructions and guidance for that particular section shall be applied, and these headings should appear in the most appropriate place and sequence depending on their relationship to other sections.

5.2 *Superscripts*—The headings identified as mandatory are required by the Society. The headings identified with an asterisk (\*) are guide for Committee B05 documents, where applicable, either by inclusion or by reference to a general requirements specification.

5.3 Not all of the headings may be required for a particular standard specification. For example, when the specification does not contain reference to any other standard within the text, it is not required to include a section on Referenced Documents. Or, in the case where no physical property requirements are given, the physical property section is not required.

|                                                             |                                                 |
|-------------------------------------------------------------|-------------------------------------------------|
| Title <sup>ASTM</sup>                                       | Sampling <sup>B05</sup>                         |
| Designation <sup>ASTM</sup>                                 | Number of Tests and Retests <sup>B05</sup>      |
| Scope <sup>ASTM</sup>                                       | Specimen Preparation <sup>B05</sup>             |
| Referenced Documents <sup>B05</sup>                         | Test Methods <sup>B05*</sup>                    |
| General Requirements <sup>B05,A</sup>                       | Significance of Numerical Limits <sup>B05</sup> |
| Terminology <sup>B05</sup>                                  | Inspection <sup>B05</sup>                       |
| Classification                                              | Rejection and Rehearing <sup>B05</sup>          |
| Ordering information <sup>B05</sup>                         | Certification <sup>B05</sup>                    |
| Materials and Manufacture <sup>B05</sup>                    | Test Reports <sup>B05</sup>                     |
| Chemical Composition <sup>B05</sup>                         | Product Marking                                 |
| Temper <sup>B05</sup>                                       | Packaging and Package Marking <sup>B05</sup>    |
| Grain Size of Annealed Tempers                              | Keywords <sup>ASTM</sup>                        |
| Physical Property Requirements <sup>B05</sup>               | Summary of Changes <sup>B05</sup>               |
| Mechanical Property Requirements*                           | Supplementary Requirements                      |
| Performance Requirements                                    | Quality Assurance                               |
| Other Requirements                                          | Annexes                                         |
| Dimensions, Mass, and Permissible Variations <sup>B05</sup> | Appendixes                                      |
| Workmanship, Finish, and Appearance <sup>B05</sup>          |                                                 |

ASTM Mandatory ASTM Society requirement

B05 Guide for B05 specifications

<sup>A</sup> When reference is made to a general requirements specification, the sequence position of the General Requirements section in the product specification should be prior to the first section referenced, which is usually Terminology.

<sup>B</sup> Test methods that are detailed in specifications shall contain all of the mandatory headings shown in Part A, Section A1, of the Blue Book.

5.4 Subject Headings shall precede each section to orient the reader. Section and text paragraphs shall be numbered in accordance with the Guide for the Use of the Modified Numbering System in Part D of the **Form and Style** for ASTM Standards manual. The following is an example of how it should appear in a standard:

### 1. Scope

1.1 This specification establishes the requirements for... etc.

## 6. Section Contents

NOTE 3—Explanations of section content requirements are detailed in this section. In the Annex and published separately on the B05 web page, is an electronic template containing recommended language for each section. In this guide, the examples were removed to avoid redundancy and inconsistencies.

<sup>4</sup> Withdrawn.

<sup>5</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org).

<sup>6</sup>

## 6.1 *Title*<sup>ASTM</sup>

6.1.1 The title should be as concise as possible, yet complete enough to identify the material, product, system, or services for which the requirements are established by the document.

## 6.2 *Designation and Year of Issue*<sup>ASTM</sup>

6.2.1 *Designation*—The alphanumeric designation is assigned by ASTM Headquarters.

6.2.2 *Year Date*—After the designation, a hyphen is followed by the last two numbers of the year of acceptance or last revision. Reapprovals are the last date in parentheses. Footnote 1 is not changed with a reapproval.

NOTE 4—The Form and Style Manual includes definitions of date of issue and year date.

## 6.3 *Scope*<sup>ASTM</sup>

6.3.1 The Scope should be a brief summary of the product and product application.

6.3.2 A statement shall be included in this section as to whether inch-pound or SI units are the standard, if the specification has a companion specification or is a dual designation specification.

6.3.3 Include the prescribed caveat on safety hazards per mandatory blue book language, when one or more test methods are included other than by reference.

NOTE 5—The safety hazard caveat shall also appear in test methods, guides, and practices that involve the use of materials, operations, or equipment.

6.3.4 Related documents not referenced in the text may be included as a footnote, or listed as References at the end of the standard cited by number if more than five are cited.

## 6.4 *Referenced Documents*<sup>B05</sup>

6.4.1 List in alphanumeric sequence the designation and complete title of all standards and other documents referenced, including standards and codes of other organizations.

6.4.2 Provide footnotes to this section indicating the source of the documents. When referenced later in the text, use only the type of document (specification, test method, practice, guide, etc.) and the designation letter and number (for example, Test Methods **B 577**).

6.4.3 Do not use the year of issue when listing the referenced documents unless there is a technical reason for requiring a specific issue.

## 6.5 *General Requirements*<sup>B05.A</sup>

6.5.1 This section should be used for requirements that are available in a General Requirements specification and are included in the specification by reference. When a product specification refers to a general requirements specification for applicable requirements, the reference shall be made in this section so as to alert the user that the details of the requirement(s) shall be found in another document.

6.5.1.1 The utilization of a general requirements section in the drafting of a new specification or in the revision of a standard is not mandatory; however, it is recommended since considerable repetition within a group of similar documents would be avoided.

6.5.1.2 In the case where a section in the general requirements section has been referenced and the same titled section appears in the product specification with requirements that either supplement or supersede the referenced general requirements section, use the explanatory clause 3.2 in the electronic template.

## 6.6 *Terminology*<sup>B05</sup>

NOTE 6—For use of terminology in B05 standards, refer also to the **Committee B05 Terminology Management Policy**.

6.6.1 When applicable, refer to Terminology **B 846** for definitions of terms relating to copper and copper alloys, or to other existing ASTM terminology standards having general applications. Terms not appearing in other ASTM terminology standards and requiring other than dictionary definitions should be defined.

6.6.1.1 Examples of ASTM terminology standards having general application are: **E 44**, Definitions of Terms Relating to Heat Treatment; **E 6**, Definition of Terms Relating to Mechanical Testing; **E 1227** Terminology Relating to Chemical Analysis of Metals.

### 6.6.2 *Definitions*:

6.6.2.1 Definitions shall be in dictionary-definition form, following the guidelines of Part E of The Form and Style Manual and, when appropriate, include in this section definitions from any applicable terminology standard. The general requirements specifications **B 248**, **B 249**, **B 250**, **B 251**, and **B 824** are examples of specifications incorporating definitions.

### 6.6.3 *Definitions of Terms Specific to this Standard*:

6.6.3.1 Terms that are specific to the standard under development or revision shall appear in the Terminology section under this heading.

### 6.7 *Classification*

6.7.1 When more than one material, product or system is specified, each may be separated by type, and designated by Roman numerals. The first subdivision shall be based upon some major property, composition, or application of the product. Designate further subdivisions by grades according to pertinent property or properties and identify by Arabic numbers. When necessary, make additional divisions into classes identified by capital letters.

6.7.1.1 An example of a classification standard is **B 224**.

6.7.1.2 An example of material subdivided by grade is found in the Table of Chemical Composition of Specification **B 170**.

### 6.8 *Ordering Information*<sup>B05</sup>

6.8.1 This section shall appear in all product specifications as a checklist of items which should be included in an inquiry, contract, or purchase order.

6.8.2 When the specification provides choices for purchase, such as various types, grades, classes, materials, or tests, the inquiry, contract, or purchase order should state which particular types, grades, classes, materials, sizes, tests, etc., are required.

6.8.3 A listing of each such choice, together with a reference to the applicable section of the specification, will be of assistance in the wording of the inquiry, contract, or purchase order. This list should include the ASTM specification designation and year of issue to avoid possible misunderstandings.

between the contracting parties. The purchaser's attention should be directed to what product would be furnished by the manufacturer or supplier when the purchaser fails to specify one or more of the options.

6.8.4 Under a subsection, list optional items to be specified at the time of the order.

#### 6.9 *Material(s) and Manufacture*<sup>B05</sup>

6.9.1 This section should contain general statements regarding the material(s) from which the product is produced and the acceptable method(s) of manufacture.

6.9.2 All statements should be meaningful. It is recommended that the alloys involved and kinds of processes used to achieve the properties should be stated.

6.9.2.1 The past practice of using the following sentence should be discontinued: "The material shall be of such quality and purity that the finished product shall have the properties and characteristics prescribed in this specification."

#### 6.10 *Chemical Composition*<sup>B05</sup>

6.10.1 Detailed chemical composition requirements and other chemical characteristics to which the material, product, or system must conform shall be provided. These requirements are usually presented in tabular form. It is most important that the following information be clearly indicated: (a) name of each constituent specified, (b) whether the requirement is a maximum or a minimum, (c) whether an allowance for measurement error is incorporated in these limits, (d) the measurement units applicable, and (e) references to notes or footnotes for further clarification.

##### 6.10.2 *Product (Check) Sample:*

6.10.2.1 When it is desirable to state a permissible analytical variance for a specific product, an introductory statement should be used to indicate the requirements. See 8.1.1 in the electronic template for recommended wording.

6.10.2.2 The permitted variances may be incorporated in the chemical composition table or given a separate table.

##### 6.10.3 *Limits for Nonspecified Elements:*

6.10.3.1 Include a disclaimer statement regarding limits for nonspecified elements for all specifications containing chemical composition sections. See 8.2 of the electronic template. See 8.3 for language required for stating the limit for one of the specified elements to be listed as remainder.

6.10.4 When presenting chemical limits, it is recommended to use the "—" symbol in the tables (for example, 89.0–91.0), and to use "to" in the text (for example, 89.0 to 91.0).

6.10.5 In drafting or revising a standard specification, it is essential to identify a test procedure for determining conformance to each requirement. See 6.22.4 for reference information about which chemical analysis methods are referenced for various elemental constituents.

6.10.6 When restricting limit for one of the specified elements, it is given as "remainder" in the chemical composition table. Select the appropriate wording in the electronic template depending on what alloys are specified in the standard.

#### 6.11 *Temper*<sup>B05</sup>

6.11.1 The standard temper(s) of the products specified shall be stated in this section. Refer to Classification B 601 for temper designations for copper and copper alloys.

6.11.2 If former designations are included, the former designations shall be used in conjunction with designations detailed in Classification B 601 designations when applicable.

6.11.3 If tempers not classified in B 601 are used in the specification, details of the temper requirements must be explicitly stated.

#### 6.12 *Grain Size for Annealed Tempers*

6.12.1 Use this section when grain size is the standard requirement for a copper or copper alloy in an annealed (OS) temper.

NOTE 7—In drafting a new document or revising a standard, it is essential to identify in the specification a test procedure for determining conformance to each requirement.

#### 6.13 *Physical Property Requirements*<sup>B05</sup>

6.13.1 If specified, the requirements for electrical resistivity, coefficient of thermal expansion, specific gravity and similar properties are presented in this section; usually in tabular form.

6.13.2 When a requirement is optional, it should be so stated and noted that it should be so specified in the contract or purchase order. An example is included in 11.1.2 of the electronic template.

#### 6.14 *Mechanical Property Requirements*<sup>B05</sup>

6.14.1 The requirements for tensile strength, yield strength, elongation, and hardness are included in this section. The property requirements are frequently placed in a table.

6.14.1.1 When a requirement is optional, or when the requirement of performance of the test is optional, it should be so stated.

6.14.1.2 In the case where the approximate Rockwell hardness values are used as a quick test to indicate general conformance to a specification requirement, see 12.2 of the electronic template for an example of how it should appear.

#### 6.15 *Performance Requirements*

6.15.1 Include in this section functional, environmental, and similar requirements (for example, Microscopic Examination, Cuprous Oxide [Hydrogen Embrittlement Susceptibility], Expansion Test, Flattening Test, and Mercurous Nitrate Test).

6.15.1.1 When a requirement is optional, it should be so stated and so specified in the contract or purchase order.

#### 6.16 *Other Requirements*

6.16.1 Requirements not covered elsewhere, such as Non-destructive Testing (Electromagnetic eddy current Examination, Hydrostatic Test, Pneumatic Test), Cleanliness Test, Weld Quality Test, Orders for U.S. Government Agencies, etc., should be located in this part of the specification. These additional requirements should follow the performance requirements and should not be intermixed with the other sections.

6.16.1.1 *Purchases for U.S. Government*—When product is purchased for agencies of the U.S. Government, the specification shall include this section. The section should appear immediately prior to the Dimensions, Mass, and Permissible Variations section of the specification.

#### 6.17 *Dimensions, Mass, and Permissible Variations*<sup>B05</sup>

6.17.1 Only that part of the title which is applicable to the product need be addressed. The section may be self contained or it may reference another document such as a general requirements specification.



6.17.2 This section shall be used for the details as to standard shape, mass, and size ranges which are usually presented in tabular form with a brief reference in the text. Separate sections may be necessary with the individual tables. The tables shall clearly indicate where divisions are made for the dimension ranges. For example ranges from 0 to 1 in., 1 to 2 in., 2 to 3 in. shall be more properly stated as 1 in. and under, over 1 to 2 in. inclusive, over 2 to 3 in., inclusive, etc.

6.17.3 The permissible variations in dimensions, mass, etc., may be included in the same tables with minimal sizes. It shall be made clear that the tolerances specified are plus and minus or apply only in one direction.

6.17.4 The specific tables in referenced General Requirements should be noted by table number to avoid confusion. As most dimensions are contained in more than one table, be sure to reference the one that is applicable to the product.

6.17.5 For new or revised documents, the Title headers of the appropriate tables in the referenced document should be checked to insure that the product specification, and alloys if applicable, are properly listed. Advise the ASTM Editor of any corrections or additions needed, when finalizing the product specification.

#### 6.18 *Workmanship, Finish, and Appearance*<sup>B05</sup>

6.18.1 Workmanship, finish, and appearance may be addressed separately for better clarity or a general statement may be used. Requirements for workmanship, finish, and appearance include (but are not limited to) the type of finish, the general appearance or color, the temper, and whether the product is clean, sound, and free of scale or defects which would render it unsuitable for the intended application. To avoid misunderstanding, these requirements should be clearly stated. Provisions for removal or repair of minor surface imperfections that are not considered cause for rejection should also be addressed.

#### 6.19 *Sampling*<sup>B05</sup>

6.19.1 This section shall include lot size, portion size, selection of portion pieces, and the manner by which the sample shall be taken from the portion pieces selected.

6.19.2 This subject is too complex to be addressed in this document. However, the Sampling section of Specification **B 249/B 249M**, General Requirements for Wrought Copper and Copper Alloy Rod, Bar, and Shapes, is an example of how this section should appear in the standard.

#### 6.20 *Number of Tests and Retests*<sup>B05</sup>

6.20.1 *Tests*—This section shall state the number of test specimens required to determine conformance to specification product property requirements.

6.20.2 *Retests*—If the specification permits retesting, after the product fails to conform to specification requirements when tested by the purchaser, state the conditions and rules under which the retesting is permitted.

#### 6.21 *Specimen Preparation*<sup>B05</sup>

6.21.1 Where special test specimen preparation is required, this section shall be included. Refer to a standard test method when possible and when an acceptable reference is not available, include sufficient information to allow acceptable reproduction of test results.

6.21.2 This subject is too complex to be further addressed in this document; however, the Specimen Preparation section of Specification **B 249/B 249M**, General Requirements for Wrought Copper and Copper Alloy Rod, Bar, and Shapes, is an example of how this section should appear in a standard.

#### 6.22 *Test Methods*<sup>B05</sup>

6.22.1 In this section identify specific test methods by which conformance with the specification requirements may be determined. In addition to identifying the specific test method, include any additional information necessary for the proper application of the identified test method.

6.22.2 There are some copper alloys whose chemical compositions include element(s) with specified limiting values for which no recognized analytical test method is known to be published in the literature. When such a test method can not be obtained from the manufacturer of a product produced from such an alloy, who obviously has the in-house analytical capability, for inclusion in the specification, the following statement should appear immediately after the list of test methods:

X.X.1 Since no recognized test method is known to be published, the determination of [specify the element or elements] shall be subject to agreement between the manufacturer and the purchaser.

6.22.2.1 When such a needed test method has been published by a recognized authority for a particular element, the above statement is no longer valid for that element, and the published test method shall be referenced, Table 1.

6.22.3 Most, if not all, standard specifications permit an agreement between the manufacturer and the purchaser to establish limits and required analysis for unnamed element(s); however, since it cannot be predetermined which element(s) may be subject to this agreement, test method(s) for such element(s) do not have to be identified within the standard.

6.22.4 List reference test methods in case of disagreement. Refer to the following table on Chemical Analysis Methods for aid in determining appropriate reference chemical analysis methods.

6.22.4.1 *General*—**Table 1** is a guide compilation of available chemical analysis methods for coppers and copper alloys listed by elemental alloy constituent or impurity and applicable range (by weight %). The applicable test methods should be specified in the Test Methods section of a product specification for use in cases of dispute. The Committee B05 Liaison to Committee E01 on Methods of Analysis may be consulted if there are any questions about the listed methods.

NOTE 8—Commonly accepted methods not included here are frequently used for routine chemical analysis.

6.22.4.2 *Special Cases*—The following special cases exist whereby the reference chemical analysis method for the desired impurities is included in an annex in the standard:

(1) *Tough-Pitch Fire-Refined Copper*—Refer to the Annex of **B 216**.

(2) *Cathode Copper Impurities*—Refer to the Annex of **B 170**.

(3) *Copper-Beryllium Alloys*—Refer to the Annex of **B 194**.

**TABLE 1 Compilation of Chemical Analysis Methods for Coppers and Copper Alloys**

| Element                        | Range or % max                   | Test Method(s)                                          | Applicability <sup>A</sup>               |
|--------------------------------|----------------------------------|---------------------------------------------------------|------------------------------------------|
| Aluminum (Al)                  | 2–12<br>>0.10                    | E 478; Titrimetric<br>E 54; Gravimetric                 | General<br>General                       |
| Antimony (Sb)                  | 0.05–0.70                        | E 62                                                    | General                                  |
| Arsenic (As)                   | 0.0–0.50                         | E 62                                                    | General                                  |
| Cadmium (Cd)                   | 2–25 ppm                         | E 53                                                    | Coppers                                  |
| Carbon (C)                     | 0.0–0.50                         | E 76                                                    | Nickel-Copper alloys                     |
| Chromium (Cr)                  | 0.003–2.0<br>0.30–0.70           | ISO 4744<br>E 118                                       | General<br>General                       |
| Cobalt (Co)                    | 0.01–0.5                         | E 75; Photometric                                       | 7xxx series alloys                       |
| Copper (Cu)                    | >50<br>99.75–99.99               | E 478; Electrolytic & Photometric<br>E 53; Electrolytic | General<br>Coppers                       |
| Iron (Fe)                      | 0.003–1.25<br>1.0 max<br>0.0–5.0 | E 478; Photometric<br>E 75; Atomic Absorption<br>E 54   | General<br>7xxx series alloys<br>General |
| Lead (Pb)                      | 0.002–15.0<br>2.0–30.0           | E 478; Atomic Absorption<br>E 478; Titrimetric          | General<br>General                       |
| Manganese (Mn)                 | 0.10–12.0<br>0.10–12.0<br>28–32  | E 62<br>E 75; Photometric<br>E 581 Titrimetric          | General<br>7xxx series alloys<br>General |
| Nickel (Ni) (incl Cobalt (Co)) | 0.03–5.0<br>4.0–50.0             | E 478; Photometric<br>E 478; Gravimetric                | General<br>General                       |
| Phosphorus (P)                 | 0.01–1.2<br>1–15                 | E 62<br>E 1371; Gravimetric                             | General<br>Phosphor coppers              |
| Silicon (Si)                   | 0.005–5.50<br>0.1–5.0            | E 54; Perchloric Acid Dehydration<br>E 62               | General<br>6xxx series alloys            |
| Silver (Ag)                    | 0.01–5.0<br>0.01–0.12            | E 54<br>E 478; Atomic Absorption                        | General<br>Silver Bearing Copper         |
| Sulfur (S)                     | 0.05–0.08<br>0.001–0.5           | E 76; Direct Combustion<br>E 76; Gravimetric            | Nickel-Copper alloys                     |
| Tellurium (Te)                 | 0.003–0.05<br>0.4–1.0            | ISO 7602 Part 1 E/F<br>E 121                            | General<br>Copper-Tellurium Alloys       |
| Tin (Sn)                       | 0.01–1.0<br>0.50–20.0            | E 478; Photometric<br>E 478; Titrimetric                | General<br>General                       |
| Zinc (Zn)                      | 0.02–2.0<br>2.0–40.0             | E 478; Atomic Absorption<br>E 478; Titrimetric          | General<br>General                       |

<sup>A</sup> Always, refer to the test method involved for the scope, specific details and limitations.

6.22.5 *Flattening Test for Seamless Copper and Copper Alloy Tubing*—Refer to examples in applicable specifications.

#### 6.23 Significance of Numerical Limits

6.23.1 This section provides the rounding procedures for numerical limits associated with specification requirements. See the table included in the electronic template for standard requirements.

#### 6.24 Inspection<sup>B05</sup>

6.24.1 This section should contain general information regarding the inspection requirements of the product.

#### 6.25 Rejection and Rehearing<sup>B05</sup>

6.25.1 This section should describe the conditions under which rejection shall be permitted and the basis for reconsideration when requested by the manufacturer or supplier.

#### 6.26 Certification<sup>B05</sup>

6.26.1 This section should be included in all specifications, and when included, the following is how it shall appear in the standard. Use the template language or blue book mandatory wording. Refer to the ASME Boiler and Pressure Vessel Code where appropriate.

#### 6.27 Test Report<sup>B05</sup>

6.27.1 This section *shall* be included in all specifications containing a Certification section. Use the mandatory wording included in the electronic template.

6.27.2 For some products it may be desirable to identify this section as “Mill Test Report,” “Foundry Test Report,” etc.

#### 6.28 Product Marking

6.28.1 When this section is used, the wording to be used will be dictated by the product and the circumstances of the application.

#### 6.29 Packaging and Package Marking<sup>B05</sup>

6.29.1 This section should be included in all standards.

#### 6.30 Keywords<sup>ASTM, B05</sup>

6.30.1 Keywords may be added editorially at any time to a standard. Select keywords from title and scope, products involved, etc.

6.30.1.1 It is recommended that the copper or copper alloy UNS designations involved be included in the key words for the purposes of indexing and electronic searches.

#### 6.31 Summary of Changes<sup>B05</sup>

6.31.1 This unnumbered section shall be included in all revised standards when published. The information in this section identifies the principle changes made to the standard since the last publication.

6.31.1.1 The inclusion of this section is identified with an asterisk item in the Scope with the following first page footnote: “A Summary of Change section appears at the end of this standard.”

#### 6.32 Supplementary Requirements

6.32.1 For some product specifications, supplementary requirements may be specified. These requirements usually apply only when specified by the purchaser in the inquiry, contract or purchase order. Include an introductory qualifying statement about the requirements.

6.32.2 Instead of including the details of the supplementary requirements in the product specification, the Supplemental Requirements section of a related general requirements specification, when available, may be referenced in the General Requirements section of the product specification.

### 6.33 *Quality Assurance*

6.33.1 This requirement, when included, shall be qualified by the statement, “When specified in the contract or purchase order.” Reference to a suitable document, such as ASTM, ANSI, MIL, or other, may be made by agreement between the manufacturer or supplier and the purchaser.

### 6.34 *Annexes and Appendixes*

6.34.1 Additional information may be included in one or more annexes or appendixes to the specification. The words, “Mandatory Information” shall appear directly under the title of the annex, and “Nonmandatory Information” shall appear directly under the title of the appendix.

#### 6.34.2 *Annexes:*

6.34.2.1 Include in annexes any detailed test methods or information such as that on equipment or material that is a *mandatory* part of the specification, but too lengthy for inclusion in the main text. Annexes precede appendixes.

#### 6.34.3 *Appendixes:*

6.34.3.1 There are times when it is desirable to include in a specification additional information for general use and guidance, but does *not* constitute a mandatory part of the specification. It is appropriate to include such material in appendixes. Examples of such materials are tables showing the approximate relationship between tensile strength and hardness, lists of preferred thicknesses of plate, sheet, strip, and strip reproduced from other documents, tables of standard mass and standard sizes, etc.

## 7. **Keywords**

7.1 copper; copper alloys; copper alloy specifications; editorial procedures

## ANNEX

### (Mandatory Information)

#### A1. B05 ELECTRONIC TEMPLATE

A1.1 The Committee B05 Electronic Template is published on the B05 committee web page on the astm.org web site. The electronic template includes the language recommended by B05 for standard specifications under its jurisdiction. A copy of the electronic template attached to this guide follows.

THIS DOCUMENT IS NOT AN ASTM STANDARD; IT IS UNDER CONSIDERATION WITHIN AN ASTM TECHNICAL COMMITTEE BUT HAS NOT RECEIVED ALL APPROVALS REQUIRED TO BECOME AN ASTM STANDARD. IT SHALL NOT BE REPRODUCED OR CIRCULATED OR QUOTED, IN WHOLE OR IN PART, OUTSIDE OF ASTM COMMITTEE ACTIVITIES EXCEPT WITH THE APPROVAL OF THE CHAIRMAN OF THE COMMITTEE HAVING JURISDICTION AND THE PRESIDENT OF THE SOCIETY. COPYRIGHT ASTM, 100 BARR HARBOR DRIVE, WEST CONSHOHOCKEN, PA 19428. ALL RIGHTS RESERVED.

ASTM Committee B05 Electronic Template for Drafting Standard Specifications (see footer below for detailed guidelines for use)

ASTM Task Group # XXX  
Revision of B 000/B000M-XX  
Draft # X – Date XX/XX/XX  
Page x of y

Note: This electronic template is an Appendix of ASTM B 950, which provides guidelines for preparing B05 draft documents.

Guidelines for template use: Editable manuscript text is included in Times New Roman font 12 pt double-spaced. The text includes B05-adopted or example language for some sections. The task group will need to edit this text to suit the needs of the standard under development. ASTM society-mandated (Blue Book) wording appears in italics. Instructions and information not intended to be included in the text appear in royal parentheses in Courier New font. For example: {Instructions and information}. These instructions should be deleted prior to submitting the draft for ballot. ASTM Society-mandated (Blue Book) sections are superscripted as “ASTM.” Committee B05-required sections are superscripted “B05.” Delete these superscripts and this instructional footer when editing is complete. Note, the auto-numbering feature is activated in this template.

**ASTM B 000/B 000M-XX<sup>ASTM</sup>**

**Standard Specification for ... Xxx Xxx<sup>ASTM</sup>**

This standard is issued under the fixed designation B 000/B 000M; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (g) indicates an editorial change since the last revision or reapproval.

**1. Scope\***<sup>ASTM</sup> {The following footnote is to appear at the bottom of the first page when in print:} “\*A Summary of Changes appears at the end of this specification.”

1.1 This specification establishes the requirements for {include the details of the scope of the standard}.

1.2 The following safety hazard caveat pertains only to the test method(s) described in this specification.

1.2.1 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and to determine the applicability of regulatory limitations prior to use.*

1.2.2 {For Inch-Pound Specification with SI Statement} Units—Values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units, which are provided for information only and are not considered standard.

{For SI Companion Specification Statement} Units—This specification is the companion specification to SI specification B 000M; therefore, no SI equivalents are shown in this specification.

{Inch-pound SI Companion Specification Statement} Units—This specification is the companion specification to inch-pound specification B 000.

{For Combined Specification Standard Statement} Units—Values stated in either inch-pound units or SI units are to be regarded separately as standard. Within the text, SI units are shown in brackets. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard.

## 2. Referenced Documents<sup>B05</sup>

2.1 *ASTM Standards:* {List ASTM standards referenced in the text in alphanumerical order, without the year-date. Include the title.}

2.2 *Other Documents:*

**3. General Requirements** {Note—When reference is made to a General Requirements specification, the sequence position of the General Requirements section in the product specification should be prior to the first section referenced, which is usually Terminology.}

3.1 The following sections of Specification B 000/B 000M constitute a part of this specification.

3.1.1 Terminology

3.1.2 Materials and Manufacture

3.1.3 Sampling

3.1.4 Number of Tests and Retests

3.1.5 Specimen Preparation

3.1.6 Certification

3.1.7 Test Reports

3.2 In addition, when a section with a title identical to that referenced in X.1, above, appears in this specification, it contains additional requirements which supplement those appearing in Specification B 000/B 000M.

## 4. Terminology<sup>B05</sup>

4.1 For definitions of terms related to copper and copper alloys, refer to Terminology B 846.

4.2 *Definitions of Terms Specific to this Standard:*

4.2.1 {List terms in alphabetic order. Example (term, n – a word that identifies a precise meaning or concept.)}

## 5. Classification

5.1 {Use this section if needed to classify products covered under the specification}

## 6. Ordering Information<sup>B05</sup>

6.1 Include the following information when placing orders for product under this specification, as applicable:

6.1.1 ASTM designation and year of issue,

6.1.2 Copper [Alloy] UNS No. designation,

6.1.3 Temper (Section 8),

6.1.4 Dimensions, diameter, and wall thickness (Section 13) {For tube or pipe: specify either O.D./I.D., O.D./wall, or I.D./wall unless standard sizes such as type K are ordered; for flat products: thickness, width, and edges; for rod, bar, or shapes: by diameter or distance between parallel surfaces},

6.1.5 How furnished: straight lengths or coils,

6.1.6 Quantity—total weight or total length or number of pieces of each size, and

6.1.7 If product is purchased for agencies of the U.S. Government (see the Supplementary Requirements section of {this specification or the general requirements section} for additional requirements, if specified).

6.2 The following options are available and should be specified at the time of placing of the order when required:

6.2.1 Heat identification or traceability details,

6.2.2 Electromagnetic (eddy current) examination,

6.2.3 Embrittlement test,

6.2.4 Expansion test,

6.2.5 Flattening test,

6.2.6 Certification,

6.2.7 Mill Test Report, and

6.2.8 When product is ordered for ASME Boiler and Pressure Vessel Code Application (See Certification Section xx).

## 7. Materials and Manufacture<sup>B05</sup>

7.1 Materials:

7.1.1 The material of manufacture shall be a form (cast bar, cake, slab, et cetera) of Copper Alloy UNS No. C00000 or C00001 of such purity and soundness as to be suitable for processing in to the products prescribed herein.

7.1.2 In the event heat identification or traceability is required, the purchaser shall specify the details desired.

Note X—Due to the discontinuous nature of the processing of castings into wrought products, it is not always practical to identify a specific casting analysis with a specific quantity of finished material.

7.2 *Manufacture:*

7.2.1 The product shall be manufactured by such hot working, cold working, and annealing processes as to produce a uniform wrought structure in the finished product.

7.2.2 The product shall be hot or cold worked to the finished size, and subsequently annealed when required, to meet the temper properties specified.

7.3 *Edges:*

7.3.1 Slit edges shall be furnished unless otherwise specified in the contract or purchase order.

## 8. Chemical Composition<sup>B05</sup>

8.1 The material shall conform to the chemical composition requirements in Table X for the copper [alloy] UNS No. designation specified in the ordering information.

8.1.1 Results of analysis on a product (check) sample shall conform to the composition requirements within the permitted analytical variance specified in Table X.

8.2 These composition limits do not preclude the presence of other elements. By agreement between the manufacturer and purchaser, limits may be established and analysis required for unnamed elements.

8.3 For alloys in which copper is listed as “remainder,” copper is the difference between the sum of results of all elements determined and 100 %. When all elements in Table X are determined, the sum of results shall be XX.X % min, or as shown in the following table:

8.4 For alloys in which zinc is listed as “remainder,” either copper or zinc may be taken as the difference between the sum of results of all other elements determined and 100 %. When all elements in Table X are determined, the sum of the results shall be XX.X % min, or as shown in the following table.

8.5 For standards which have multiple alloys where zinc is specified as remainder in some and copper is specified as remainder in others, both statements (8.3 and 8.4) may be used.

## 9. Temper<sup>B05</sup>

9.1 The standard tempers for products described in this specification are given in Tables X and Y.

9.1.1 Hot rolled temper M20 {Note—Task Group to assign appropriate temper designations}

9.1.2 Cold rolled tempers H01 to H10

9.1.3 Annealed tempers OS015 to OS120

9.1.4 Annealed-to-temper O80, O81 or O82

**10. Grain Size for Annealed Tempers** {Note—This section should appear in standards which specify grain size(s) for annealed tempers, which generally applies only to wrought products documents}

10.1 Grain size shall be the standard requirement for all product in the annealed tempers.

10.2 Acceptance or rejection based upon grain size shall depend only on the average grain size of a test specimen taken from each of two sample portions, and each specimen shall be within the limits prescribed in Table X when determined in accordance with Test Methods E 112.

## 11. Physical Property Requirements<sup>B05</sup>

11.1 *Electrical Resistivity Requirement:*

11.1.1 The product furnished shall conform to the electrical mass resistivity requirement prescribed in Table X, when tested in accordance with Test Method B 193.

11.1.2 When specified in the contract or purchase order, the product furnished shall conform to the electrical mass resistivity requirement prescribed in Table X, when tested in accordance with Test Method B 193.

## 12. Mechanical Property Requirements<sup>B05</sup>

12.1 *Tensile Strength Requirements:*

12.1.1 Product furnished under this specification shall conform to the tensile requirements prescribed in Table X, when tested in accordance with Test Methods E 8 [or E 8M].

12.1.2 Acceptance or rejection based upon mechanical properties shall depend only on tensile strength.

12.2 *Rockwell Hardness Requirement:*

12.2.1 When specified in the contract or purchase order, the product shall conform to the Rockwell hardness requirement prescribed in Table X, when tested in accordance with Test Methods E 18.

12.2.2 The approximate Rockwell hardness values given in Table X are for general information and assistance in testing, and shall not be used as a basis for product rejection.

Note X—The Rockwell hardness test offers a quick and convenient method of checking for general conformity to the specification requirements for temper, tensile strength, and grain size.

## 13. Performance Requirements

13.1 *Expansion Test Requirements:*

13.1.1 When specified in the contract or purchase order, tube furnished in the soft- annealed (O60) temper shall withstand expansion in accordance with Test Method B 153 to the following extent: {The following is an example}

| Outside Diameter<br>in. (mm) | Expansion of Outside<br>Diameter, % |
|------------------------------|-------------------------------------|
| ¾ (19.1) and under           | 40                                  |
| Over ¾ (19.1)                | 30                                  |

13.1.2 The expanded tube shall show no cracking or other defects visible to the unaided eye.

13.2 *Flattening Test:*

13.2.1 When specified in the contract or purchase order, the flattening test described in the Test Method section in xx.x shall be performed.

13.2.1.1 During inspection, the flattened areas of the test-specimen shall be free of defects, but blemishes of a nature that do not interfere with the intended application are acceptable.

## 14. Other Requirements

14.1

## 15. Dimensions, Mass, and Permissible Variation<sup>B05</sup>

15.1 The dimensions and tolerances for product described by this specification shall be as specified in Specification B 000/B 000M {Note—Reference is to a General Requirements specification such as B 249/B 249M, etc.} with particular reference to the following Tables and related paragraphs:

15.2 *Thickness*—Table X.

15.3 *Width:*

15.3.1 *Slit Metal and Slit Metal with Rolled Edges*—Table X.

15.3.2 *Square Sheared Metal*—Table X.

15.4 *Length:*

15.4.1 *Length Tolerance for Straight Lengths*—Table X.

15.4.2 *Schedule for Minimum Lengths and Maximum Weights of Ends for Specific Lengths with Ends, and Stock Lengths with Ends*—Table X.

15.4.3 *Length Tolerance for Square Sheared Metal*—Table X.

15.4.4 *Length Tolerance for Sawed Metal*—Table XX.

15.5 *Straightness:*

15.5.1 *Slit Metal or Slit Metal Either Straightened or Edge Rolled*—Table XX.

15.5.2 *Square Sheared Metal*—Table XX.

15.5.3 *Sawed Metal*—Table XX.

15.6 *Edges Contours:*



- 15.6.1 *Square Corners*—Section Y.Y.  
 15.6.2 *Rounded Corners*—Section Y.Y.  
 15.6.3 *Rounded Edges*—Section Y.Y.  
 15.6.4 *Full-Rounded Edges*—Table XX.

## 16. Workmanship, Finish, and Appearance<sup>B05</sup>

16.1 The product shall be free of defects, but blemishes of a nature that do not interfere with the intended application are acceptable.

## 17. Sampling<sup>B05</sup>

17.1 Refer to sampling section in Specification B 248/ B 248M (or B 249/B 249M, etc.). {Note—List any sampling requirements different from or in addition to the Sampling section in the applicable General Requirements Specification.}

## 18. Number of Tests and Retests<sup>B05</sup>

### 18.1 Test:

18.1.1 *Chemical Analysis*—Chemical composition shall be determined as per the element mean of the results from at least two replicate analyses of the sample(s).

### 18.2 Other Tests:

18.2.1 *Electrical Resistivity*—Results shall be reported as the average obtained from at least two test specimens, each taken from a separate test piece where possible.

18.2.2 *Hydrogen Embrittlement Test and Microscopical Examination*—All specimens tested must meet the requirements of the specification.

### 18.3 Retest:

18.3.1 When requested by the manufacturer or supplier, a retest shall be permitted when results of tests obtained by the purchaser fail to conform to the requirements of the product specification.

18.3.2 The retest shall be as directed in the product specification for the initial test, except the number of test specimens shall be twice that normally required for the specified test.

18.3.3 All test specimens shall conform to the product specification requirement(s) in retest. Failure to conform shall be cause for rejection.

## 19. Specimen Preparation<sup>B05</sup>

19.1 *Flattening Test*—{Note—This is an example of a test which could appear in this section, the flattening test is not a required section.}

19.1.1 A test specimen shall be cut to a length that will allow the tube to be flattened at three (3) places along the length, with each flattened area to be at least 2 in. or 50 mm in length. When the temper is other than annealed, the sample may be annealed prior to testing.

20. **Test Methods<sup>B05</sup>** {Note—Test methods that are detailed in specifications shall contain all of the mandatory headings shown in Part A, Section A1, of the Blue Book.}

### 20.1 Chemical Analyses:

20.1.1 In cases of disagreement, determine the composition using the following methods:

| Element    | Method |
|------------|--------|
| Copper     | E 53   |
| Phosphorus | E 62   |
| Arsenic    | E 62   |

20.1.2 Test method(s) to be followed for the determination of element(s) resulting from contractual or purchase order agreement shall be as agreed upon between the manufacturer or supplier and purchaser.

### 20.2 Other Tests:

20.2.1 The product furnished shall conform to specified requirements when subjected to test in accordance with the following table:

| Element                | Method |
|------------------------|--------|
| Grain Size             | E 112  |
| Electrical Resistivity | B 193  |
| Tensile Strength       | E 8    |
| Expansion              | B 153  |
| Hardness               | E 18   |
| Eddy Current           | E 243  |

20.2.2 *Grain Size*—In case of dispute, the intercept method of Test Method E 112 shall be followed.

20.2.3 *Electrical Resistivity*—The limit of measurement uncertainty for Test Method B 193 shall be  $\pm 0.15\%$  when followed as a referee method.

20.2.4 *Yield Strength*—The yield strength shall be determined by the extension-under-load method of Test Method E 8. When test results are obtained from both full-size and machined specimens, and they differ, the test results from the full-size specimens shall prevail.

### 20.2.5 Flattening Test:

20.2.5.1 Each test specimen shall be flattened in a press at three (3) places along the length, each new place to be rotated on its axis approximately on third turn from the last flattened area. Each flattened area shall be at least 2 in. or 500 mm in length. A flattened test-specimen shall allow a micrometer caliper set a three (3) times the wall thickness to pass freely over the flattened area. The flattened area of the test specimen shall be inspected for surface defects.

20.2.5.2 {Note—The following statement should be used when there are no recognized test method(s) available.}

X.X.1 Since no recognized test method is known to be published, the determination of [specify the element or elements] shall be subject to agreement between the manufacturer and the purchaser.

## 21. Significance of Numerical Limits<sup>B05</sup>

21.1 For the purpose of determining compliance with the specified limits for requirements of the properties listed in the following table and for dimensional tolerances, an observed value or a calculated value shall be rounded as indicated in accordance with the rounding method of Practice E 29:

| Property                | Rounded Unit for Observed or Calculated Value                                               |
|-------------------------|---------------------------------------------------------------------------------------------|
| Chemical Composition    | Nearest unit in the last right-hand significant digit used in expressing the limiting value |
| Hardness                |                                                                                             |
| Electrical Resistivity  |                                                                                             |
| Electrical Conductivity |                                                                                             |
| Tensile Strength        | Nearest ksi [5 MPa]                                                                         |
| Yield Strength          |                                                                                             |
| Elongation              | Nearest 1 %                                                                                 |
| Grain Size              | Nearest multiple of 0.005 mm                                                                |
| Under 0.060 mm          |                                                                                             |
| 0.060 mm and over       |                                                                                             |
|                         | Nearest 0.01 mm                                                                             |



## 22. Inspection<sup>B05</sup>

22.1 The manufacturer, or supplier, shall inspect and make tests necessary to verify the furnished product conforms to specification requirements.

22.2 Source inspection of the product by the purchaser may be agreed upon between the manufacturer, or supplier, and the purchaser as part of the purchase order. In such case, the nature of the facilities needed to satisfy the inspector, representing the purchaser, that the product is being furnished in accordance with the specification shall be included in the agreement. All testing and inspection shall be conducted so as not to interfere unnecessarily with the operation of the works.

22.3 When mutually agreed upon, the manufacturer, or supplier, and the purchaser shall conduct the final inspection simultaneously.

## 23. Rejection and Rehearing<sup>B05</sup>

### 23.1 *Rejection:*

23.1.1 Product that fails to conform to the specification requirements when tested by the purchaser or purchaser's agent shall be subject to rejection.

23.1.2 Rejection shall be reported to the manufacturer or supplier promptly. In addition, a written notification of rejection shall follow.

23.1.3 In case of dissatisfaction with results of the test upon which rejection is based, the manufacturer, or supplier, shall have the option to make claim for a rehearing.

### 23.2 *Rehearing:*

23.2.1 As a result of product rejection, the manufacturer, or supplier, shall have the option to make claim for a retest to be conducted by the manufacturer, or supplier, and the purchaser. Samples of the rejected product shall be taken in accordance with the product specification and subjected to test by both parties using the test method(s) specified in the product specification, or alternately, upon agreement of both parties, an independent laboratory may be selected for the test(s) using the test method(s) specified in the product specification.

## 24. Certification<sup>B05</sup>

24.1 When specified in the purchase order or contract, the purchaser shall be furnished certification that samples repre-

senting each lot have been either tested or inspected as directed in this specification and requirements have been met.

24.2 When identified in the ordering information that product is purchased for ASME Boiler and Pressure Vessel Code applications, certification to this specification is mandatory.

## 25. Test Report<sup>B05</sup>

25.1 When specified in the contract or purchase order, a report of test results shall be furnished.

**26. Product Identification** {Note—This is an example of how this section is used.}

26.1 The name or trademark of the manufacturer and the mark indicative of Type G tube shall be permanently marked (incised) on the tube at intervals not greater than 18 in. (460 mm). Straight length tube in H58 (drawn general purpose) temper shall be further identified throughout the length by a continuous yellow colored stripe, symbol, or logo not less than  $\frac{3}{16}$  in. (4.75 mm) in height, including a legend repeated at intervals not greater than 36 in (910 mm). The legend shall include the type of tube, name, or trademark of the manufacturer, or both, and the country of origin. Other information may be included at the option of the manufacturer.

26.1.1 The yellow color marking is not applicable for annealed tube in straight lengths or coils.

## 27. Packaging and Package Marking<sup>B05</sup>

### 27.1 *Packaging:*

27.1.1 The product shall be separated by size, composition, and temper, and prepared for shipment by common carrier, in such a manner to afford protection from the normal hazards of transportation.

### 27.2 *Package Marking:*

27.2.1 Each shipping unit shall be legibly marked with the purchase order number, metal or alloy designation, temper, size, shape, gross and net weight, and name of supplier. The specification number shall be shown when specified.

## 28. Keywords<sup>ASTM</sup>

28.1 {Note—It is advisable to include the alloys specified in the standard.}

## SUMMARY OF CHANGES<sup>B05</sup>

Committee B05 has identified the principal changes to this specification that have been incorporated since the {identify the year of last issue, i.e. 2006} issue as follows:

- (1) Scope section reworded to more clearly state purpose.
- (2) Test Methods section revised to identify individual test methods for determination of chemical composition in case of dispute.



## **SUPPLEMENTARY REQUIREMENTS**

The following supplementary requirements shall apply only when specified by the purchaser in the contract or purchase order. Details of the supplementary requirements shall be agreed upon in writing, between the manufacturer and the purchaser. Supplementary requirements shall in no way negate any requirement of the specification itself.

### **ANNEX**

#### **(Mandatory Information)**

##### **A1.**

###### **A1.1**

###### **A1.1.1**

### **APPENDIX**

#### **(Nonmandatory Information)**

##### **X1.**

###### **X1.1**

###### **X1.1.1**

## **REFERENCES**

### **(1)**

### **(2)**

### **APPENDIX**

#### **(Nonmandatory Information)**

##### **X1. THE EDITORIAL REVIEW PROCESS**

X1.1 The Editorial subcommittee B05.91 is an administrative subcommittee that provides the service of editorial review to Committee B05 task groups in preparing draft documents for ballot. Items subject to editorial review prior to ballot are new documents, major revisions of standards (such as five-year reviews), and standards for reapproval without change.

X1.2 It is highly recommended that the B05 electronic template, available on the committee web page, be used as a starting point in preparing drafts of new standards or in major revisions. The template contains the major items of B05 wording and language for many sections.

X1.3 When a new document or a major revision is submitted for editorial review, it is requested that an electronic copy of the draft be submitted to the chairman of the Editorial Subcommittee for distribution and review. The task group will be returned an electronic copy with all the editorial comments. A hard copy will be provided if desired.

X1.4 All documents submitted for editorial review are to be identified by draft number and date so they can be properly tracked. How a draft revision is prepared must be determined on an individual basis since the requirements are unlikely to be the same for any two documents. However, revisions shall always be based upon the most recent issue of the standard, which is available from ASTM in electronic format upon the request of the task group chairman.

X1.5 In the case of standards to be balloted for reapproval without change, the Editorial Subcommittee Chairman need only be notified of intent and provided a copy of the latest issue of the standard.

X1.6 The editorial review shall consist of, but not limited to, checking for:

- (1) Required sections and content,
- (2) Clarity of statements,
- (3) Redundancy,



- (4) Errors in grammar and spelling,
- (5) Open-ended statements, and
- (6) Misuse of notes in text.

X1.6.1 Recommendations and comments may be offered concerning technical content; however, the technical correctness of the submitted document is the responsibility of the subcommittee with jurisdiction.

X1.7 Subcommittee and Task Group members may call upon ASTM editors at Committee Weeks for editorial help, and throughout the year, they can call upon the B05 Editor for editorial assistance.

## **SUMMARY OF CHANGES**

The publication of B 950-06 is a new ASTM standard guide. The contents of this guide were previously maintained as a white paper under the title, “ASTM Committee B05 Outline of Form of Specifications.”

*ASTM International takes no position respecting the validity of any patent rights asserted in connection with any item mentioned in this standard. Users of this standard are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, are entirely their own responsibility.*

*This standard is subject to revision at any time by the responsible technical committee and must be reviewed every five years and if not revised, either reapproved or withdrawn. Your comments are invited either for revision of this standard or for additional standards and should be addressed to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee, which you may attend. If you feel that your comments have not received a fair hearing you should make your views known to the ASTM Committee on Standards, at the address shown below.*

*This standard is copyrighted by ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959, United States. Individual reprints (single or multiple copies) of this standard may be obtained by contacting ASTM at the above address or at 610-832-9585 (phone), 610-832-9555 (fax), or [service@astm.org](mailto:service@astm.org) (e-mail); or through the ASTM website ([www.astm.org](http://www.astm.org)).*