



Designation: B208 – 14 (Reapproved 2021)

Endorsed by  
American Foundrymen's Society

# Standard Practice for Preparing Tension Test Specimens for Copper Alloy Sand, Permanent Mold, Centrifugal, and Continuous Castings<sup>1</sup>

This standard is issued under the fixed designation B208; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

*This standard has been approved for use by agencies of the U.S. Department of Defense.*

## 1. Scope\*

1.1 This practice establishes procedures for preparing test coupons and specimens (machined and unmachined) for tension tests of copper alloys for sand, permanent mold, centrifugal and continuous castings.

1.2 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.3 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

## 2. Referenced Documents

2.1 *ASTM Standards:*<sup>2</sup>

**B846 Terminology for Copper and Copper Alloys**

## 3. Terminology

3.1 Definitions of terms relating to copper alloys can be found in Terminology **B846**.

## 4. Significance and Use

4.1 The mechanical properties determined from test bars for sand, permanent mold, and centrifugal castings poured in accordance with this practice represent the properties of the metal going into castings poured from the same heat. These

mechanical properties may not be the same as the properties of the corresponding castings because of the solidification effects of varying size, section, and design.

4.2 Test bars for continuous castings are taken from the castings and therefore represent the properties of the castings.

## 5. Test Coupons

5.1 *Sand Castings*—The test bar coupons shall be made by the same manufacturing process as the castings they represent wherever possible. If the castings are cast entirely in green sand, partial cores shall be permitted for the test bars but in no case shall chills be permitted. Unless otherwise agreed upon between the manufacturer and purchaser, test bars may be poured in cores on a production line. The use of filters in the gating system is permitted.

5.1.1 *High-Shrinkage Sand-Cast Alloys*—The test specimen coupons for copper casting alloys exhibiting high shrinkage during freezing and cooling shall be cast to the form and dimensions shown in **Fig. 1** (a or b) or 2 (a or b). If specimens having threaded ends are to be used in the tension tests, the length of the keel blocks in **Fig. 1a** may be reduced to 6¼ in. (159 mm). See **Appendix X1** for SI equivalents.

5.1.2 *Low-Shrinkage Sand-Cast Alloys*—The test specimen coupons for copper casting alloys exhibiting low shrinkage during freezing and cooling shall be cast to the form and dimensions shown in **Fig. 2** (A or B), **Fig. 3**, or **Fig. 4** or as may be prescribed in the casting specifications.

5.2 *Centrifugal Castings*—Unless otherwise specified by the purchaser, the manufacturer shall pour the test bars in the same type of mold as the castings themselves. That is, test bars for sand mold castings shall be poured in sand molds, and test bars for chill mold castings shall be poured in chill molds.

5.2.1 The centrifugally cast test specimen coupons shall be cast to the form and dimensions of **Fig. 5a**.

5.2.2 Static test bar coupons shall be cast in open keel block molds as dimensioned in **Fig. 5b**.

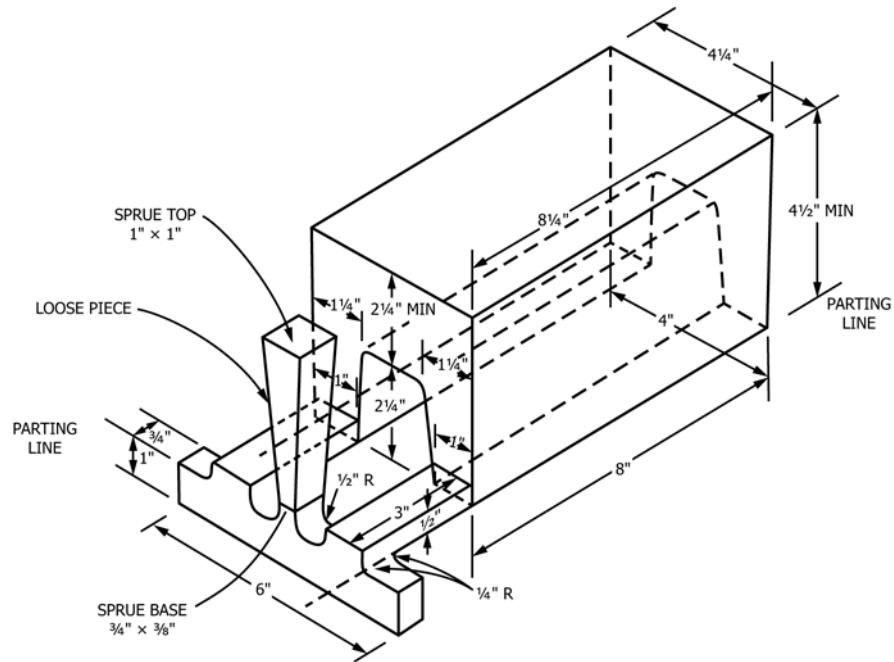
5.3 *Continuous Castings*—Test bars shall be taken from the continuous cast product. Test bars may be taken before mechanical straightening.

<sup>1</sup> This practice is under the jurisdiction of ASTM Committee B05 on Copper and Copper Alloys and is the direct responsibility of Subcommittee B05.05 on Castings and Ingots for Remelting.

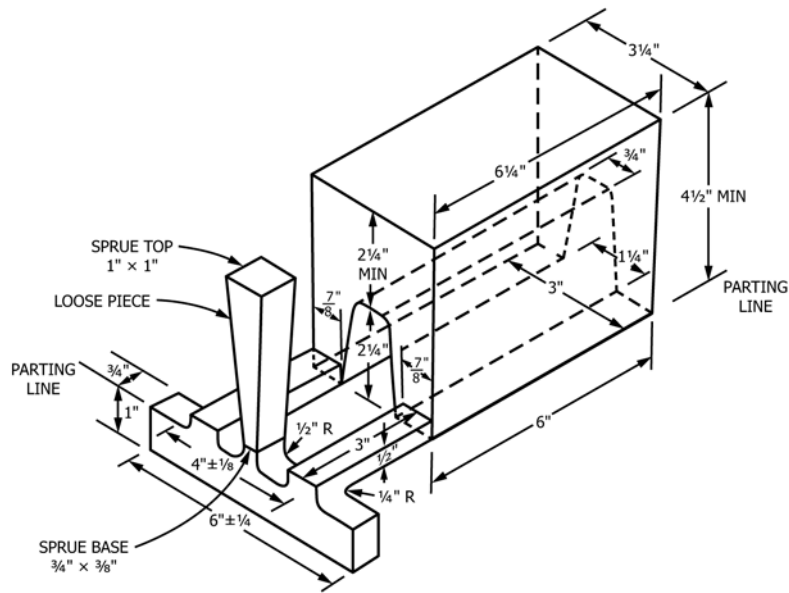
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<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

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



(a) Bottom Gating



(b) Bottom Gating (Lower Weight Version)

NOTE 1—Where this type of test bar design is used, bottom gating is recommended for alloys such as aluminum bronze, where turbulence and oxidation are factors.

FIG. 1 Double Keel Block Test Bar