



Standard Specification for Borated Dispersion Strengthened Copper Plate, Sheet, Strip, and Rolled Bar for Nuclear Application¹

This standard is issued under the fixed designation B 876; 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 specification establishes the requirements for plate, sheet, strip, and rolled bar of copper alloy UNS No. C15815, dispersion strengthened copper (DSC), which has been modified by the addition of natural or enriched boron for absorption of neutrons.

1.1.1 The products made to this specification are under consideration for use in storage containers for spent nuclear fuel.

NOTE 1—Dispersion strengthened copper is a thermally stable high-strength copper which retains a high percentage of its strength at elevated temperature. In addition, it does not recrystallize or soften after exposure to high temperatures almost to the melting point of copper. Since dispersion strengthened copper uses inert aluminum oxide particles to strengthen the copper matrix, the thermal conductivity of the copper is not significantly decreased.

NOTE 2—Borated dispersion strengthened coppers covered by this specification, because of their particular structure and specialized properties, may require special care in their fabrication and welding.

1.2 The values stated in inch-pound units are the standard. SI units are provided for information only.

2. Referenced Documents

2.1 The following documents in the current issue of the Book of Standards form a part of this specification to the extent referenced herein:

2.2 ASTM Standards:

B 248 Specification for General Requirements for Wrought Copper and Copper-Alloy Plate, Sheet, Strip, and Rolled Bar²

B 249 Specification for General Requirements for Wrought Copper and Copper-Alloy Rod, Bar, and Shapes²

B 601 Practice for Temper Designations for Copper and Copper Alloys—Wrought and Cast²

B 846 Terminology for Copper and Copper Alloys²

E 8 Test Methods of Tension Testing of Metallic Materials³

¹ This specification is under the jurisdiction of ASTM Committee B-5 on Copper and Copper Alloys and is the direct responsibility of Subcommittee B05.01 on Plate, Sheet, and Strip.

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² Annual Book of ASTM Standards, Vol 02.01.

³ Annual Book of ASTM Standards, Vol 03.01.

E 255 Practice for Sampling Copper and Copper Alloys for Determination of Chemical Composition⁴

E 478 Test Methods for Chemical Analysis of Copper Alloys⁵

3. Terminology

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

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *bursts, n*—surface breaks caused by pressure from within.

3.2.2 *copper, dispersion strengthened, n*—a material consisting of copper and a finely dispersed, substantially insoluble, metallic or nonmetallic phase such as aluminum oxide.

3.2.3 *cracks, n*—narrow breaks or opening in the surface.

3.2.4 *laps, n*—surface defects, appearing as seams, caused by folding over hot metal, fins, or sharp corners and then rolling or forging them into the surface, but not welding them.

4. Ordering Information

4.1 The purchase order or contract for product under this specification should include the following information:

4.1.1 ASTM designation and year of issue,

4.1.2 Copper UNS designation,

4.1.3 Temper (Section 7) or condition (Section 10),

4.1.4 Dimensions: thickness and width, or diameter,

4.1.5 Type of edge, if required (Section 9),

4.1.6 Length,

4.1.7 How furnished: straight lengths or coils,

4.1.8 Quantity, and

4.1.9 Total weight, each size.

4.2 The following options are available under this specification and should be specified in the purchase order or contract when required:

4.2.1 Stress relief treatment, (5.3),

4.2.2 Certification (Specification B 248),

4.2.3 Mill test report (Specification B 248),

4.2.4 Condition or finish requirement (10.2), and

4.2.5 The composition, thickness, and condition of the

⁴ Annual Book of ASTM Standards, Vol 03.05.

⁵ Annual Book of ASTM Standards, Vol 03.06.