ASME B16.23-2021
(Revision of ASME B16.23-2016)

Cast Copper Alloy Solder Joint Drainage Fittings: DWV

AN AMERICAN NATIONAL STANDARD

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Two Park Avenue • New York, NY • 10016 USA

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FOREWORD

Standardization work on solder joint fittings began in 1936 in Subcommittee 11 of Sectional Committee A40, Minimum Requirements for Plumbing and Standardization of Plumbing Equipment, organized within the American Standards Association (ASA). It resulted in the publication, in January 1941, of ASA A40.3-1941. That standard covered only supply (pressure) fittings.

In 1949, responsibility for solder joint fittings was transferred to newly formed Subcommittee 9 of Sectional Committee B16 on Standardization of Pipe Flanges and Fittings. The next revision of A40.3 appeared as ASA B16.18-1950, Cast-Brass Solder-Joint Fittings. During its development, however, the need for separate standards for wrought copper and wrought bronze supply fittings and for solder joint drainage fittings was recognized.

Work on the wrought fitting standard was undertaken by a joint committee of the Copper and Brass Research Association and the Manufacturers' Standardization Society of the Valve and Fittings Industry (MSS). That work, properly reviewed and approved, was published as ASA B16.22-1951.

Concurrently, in June 1949, at the request of Subcommittee 9, a task group organized by MSS began work on a standard for cast brass solder joint drainage fittings. Representatives of all U.S. and Canadian manufacturers were invited to participate. The Report of the Coordinating Committee for a National Plumbing Code was taken into account; special research on wall thickness and depth of solder joint was conducted; and coordination with other standards was sought, to avoid inconsistency. After working through nine drafts to reach consensus, the group submitted an April 1952 draft to Subcommittee 9. After committee, sponsor, and ASA approval, the standard was approved as ASA B16.23-1953, Cast Brass Solder Joint Drainage Fittings, on January 30, 1953.

Work soon began on a revision, to include additional sizes, reducing sizes, and additional types of fittings. A March 1955 draft was approved by the B16 Committee, sponsors, and ASA, and published as ASA B16.23-1955. Starting in 1958, responding to requests for further revision and expansion, the MSS task group developed a 1959 draft that was approved by Subcommittee 9, the B16 Committee, sponsors, and ASA, and was published as ASA B16.23-1960.

In 1967 and 1968, a complete revision was undertaken, including engineering studies to verify that a user request for shorter soldering cups was justified. The resulting draft, after approval by Subcommittee 9, USA Standards Committee B16, sponsors, and the (then-called) USA Standards Institute, was published as USAS B16.23-1969. An addenda, dated 1973, lengthened the cups on the three smallest sizes to overcome assembly problems.

The subcommittee, now Subcommittee I, began a new revision in 1974, resulting in the inclusion of the 1973 addenda, addition of metric equivalents, and change of "bronze" to "copper alloy." The draft, finally approved by the (again renamed) American National Standards Institute (ANSI), was published as ANSI B16.23-1976.

In 1982, a new edition updating dimensional tables and metric equivalents was developed. Following approval at all levels, the revision was published as ANSI B16.23-1984.

Also in 1982, American National Standards Committee B16 became the ASME B16 Standards Committee, operating with the same scope, under ASME procedures accredited by ANSI. Subsequently, Subcommittee I merged with Subcommittee J, which had a related scope.

The 1992 edition removed metric units, establishing U.S. Customary units as the standard. Clarifications and updating changes were made to improve the text. The 2002 edition of B16.23 added SI units of measure in the main body of text and moved U.S. Customary units to Mandatory Appendix I. A Nonmandatory Appendix for Quality System Programs was added, plus editorial changes were made to improve text. Following approval by the Standards Committee and ASME, approval as an American National Standard was given on February 6, 2002, with the designation, ASME B16.23-2002.

In the 2011 edition, references to ASME standards were revised to no longer list specific edition years. Following approval by the Standards Committee and the ASME Board on PTCS, the revision to the 2002 edition was approved as an American National Standard by ANSI on September 23, 2011, with the new designation ASME B16.23-2011.

In the 2016 edition, provisions have been made to update verbiage and readings. Following approval by the ASME B16 Standards Committee, ASME B16.23-2016 was approved as an American National Standard by ANSI on October 21, 2016.

In ASME B16.23-2021, the U.S. Customary tables in former Mandatory Appendix I have been merged with the SI tables in the main text. The tables and figures have been redesignated, former Mandatory Appendix I has been deleted, and the subsequent Mandatory Appendix has been redesignated and updated. Cross-references have been updated accordingly. Following approval by the ASME B16 Standards Committee, ASME B16.23-2021 was approved by ANSI on November 12, 2021.

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Standardization of Valves, Flanges, Fittings, and Gaskets

(The following is the roster of the Committee at the time of approval of this Standard.)

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General. ASME Standards are developed and maintained with the intent to represent the consensus of concerned interests. As such, users of this Standard may interact with the Committee by requesting interpretations, proposing revisions or a case, and attending Committee meetings. Correspondence should be addressed to:

Secretary, B16 Standards Committee
The American Society of Mechanical Engineers
Two Park Avenue
New York, NY 10016-5990
http://go.asme.org/Inquiry

Proposing Revisions. Revisions are made periodically to the Standard to incorporate changes that appear necessary or desirable, as demonstrated by the experience gained from the application of the Standard. Approved revisions will be published periodically.

The Committee welcomes proposals for revisions to this Standard. Such proposals should be as specific as possible, citing the paragraph number(s), the proposed wording, and a detailed description of the reasons for the proposal, including any pertinent documentation.

Proposing a Case. Cases may be issued to provide alternative rules when justified, to permit early implementation of an approved revision when the need is urgent, or to provide rules not covered by existing provisions. Cases are effective immediately upon ASME approval and shall be posted on the ASME Committee web page.

Requests for Cases shall provide a Statement of Need and Background Information. The request should identify the Standard and the paragraph, figure, or table number(s), and be written as a Question and Reply in the same format as existing Cases. Requests for Cases should also indicate the applicable edition(s) of the Standard to which the proposed Case applies.

Interpretations. Upon request, the B16 Standards Committee will render an interpretation of any requirement of the Standard. Interpretations can only be rendered in response to a written request sent to the Secretary of the B16 Standards Committee.

Requests for interpretation should preferably be submitted through the online Interpretation Submittal Form. The form is accessible at http://go.asme.org/InterpretationRequest. Upon submittal of the form, the Inquirer will receive an automatic e-mail confirming receipt.

If the Inquirer is unable to use the online form, he/she may e-mail the request to the Secretary of the B16 Standards Committee at SecretaryB16@asme.org, or mail it to the above address. The request for an interpretation should be clear and unambiguous. It is further recommended that the Inquirer submit his/her request in the following format:

Subject:	Cite the applicable paragraph number(s) and the topic of the inquiry in one or two words.
Edition:	Cite the applicable edition of the Standard for which the interpretation is being requested.
Question:	Phrase the question as a request for an interpretation of a specific requirement suitable for general understanding and use, not as a request for an approval of a proprietary design or situation. Please provide a condensed and precise question, composed in such a way that a “yes” or “no” reply is acceptable.
Proposed Reply(ies):	Provide a proposed reply(ies) in the form of “Yes” or “No,” with explanation as needed. If entering replies to more than one question, please number the questions and replies.
Background Information:	Provide the Committee with any background information that will assist the Committee in understanding the inquiry. The Inquirer may also include any plans or drawings that are necessary to explain the question; however, they should not contain proprietary names or information.

Requests that are not in the format described above may be rewritten in the appropriate format by the Committee prior to being answered, which may inadvertently change the intent of the original request.

Moreover, ASME does not act as a consultant for specific engineering problems or for the general application or understanding of the Standard requirements. If, based on the inquiry information submitted, it is the opinion of the Committee that the Inquirer should seek assistance, the inquiry will be returned with the recommendation that such assistance be obtained.

ASME procedures provide for reconsideration of any interpretation when or if additional information that might affect an interpretation is available. Further, persons aggrieved by an interpretation may appeal to the cognizant ASME Committee or Subcommittee. ASME does not "approve," "certify," "rate," or "endorse" any item, construction, proprietary device, or activity.

Attending Committee Meetings. The B16 Standards Committee regularly holds meetings and/or telephone conferences that are open to the public. Persons wishing to attend any meeting and/or telephone conference should contact the Secretary of the B16 Standards Committee.

ASME B16.23-2021
SUMMARY OF CHANGES

Following approval by the ASME B16 Standards Committee and ASME, and after public review, ASME B16.23-2021 was approved by the American National Standards Institute on November 12, 2021.

In ASME B16.23-2021, the U.S. Customary tables in former Mandatory Appendix I have been merged with the SI tables in the main text. The tables and figures have been redesignated, former Mandatory Appendix I has been deleted, and the subsequent Mandatory Appendix has been redesignated. Cross-references have been updated accordingly. In addition, this edition includes the following changes identified by a margin note, **(21)**. The Record Number listed below is explained in more detail in the "List of Changes in Record Number Order" following this Summary of Changes.

Page	*Location*	*Change*
1	2.1	Editorially revised
35	Table 6-51	Title editorially revised
40	Mandatory Appendix I	Updated *(20-2576)*

LIST OF CHANGES IN RECORD NUMBER ORDER

Record Number	Change
20-2576	Updated references in Mandatory Appendix I (former Mandatory Appendix II).

CAST COPPER ALLOY SOLDER JOINT DRAINAGE FITTINGS: DWV

1 SCOPE

This Standard establishes specifications for cast copper alloy solder joint drainage fittings, designed for use in drain, waste, and vent (DWV) systems. These fittings are designed for use with seamless copper tube conforming to ASTM B306, Copper Drainage Tube (DWV), as well as fittings intended to be assembled with soldering materials conforming to ASTM B32, or tapered pipe thread conforming to ASME B1.20.1.

This Standard is allied with ASME B16.29, Wrought Copper and Wrought Copper Alloy Solder Joint Drainage Fittings — DWV.

It provides requirements for fitting ends suitable for soldering. This Standard covers

(a) description
(b) pitch (slope)
(c) abbreviations for end connections
(d) sizes and methods for designing openings for reducing fittings
(e) marking
(f) material
(g) dimensions and tolerances

2 GENERAL

(21) 2.1 Relevant Units

This Standard states values in both SI (Metric) and U.S. Customary units. These systems of units are to be regarded separately as standard. In this Standard, the U.S. Customary units are shown in parentheses. The values stated in each system are not exact equivalents; therefore, it is required that each system of units be used independently of the other. Combining values from the two systems constitutes nonconformance with the Standard.

2.2 References

Standards and specifications adopted by reference in this Standard are shown in Mandatory Appendix I, which is part of this Standard. It is not considered practical to identify the specific edition of each standard and specification in the individual references. Instead, the specific edition reference is identified in Mandatory Appendix I.

2.3 Quality Systems

Requirements relating to the product manufacturer's quality system programs are described in Nonmandatory Appendix A.

3 DESCRIPTION

(a) These fittings are designed for drainage and vent systems using the solder joint method of connection. The fitting cups (C), are provided with stops so that the ends of the tube, when assembled, meet the stops, thereby forming essentially smooth passageways.

(b) The sketches and designs of fittings are illustrative only. The dimensions specified herein shall govern in all cases.

4 PITCH (SLOPE)

All nominal 90-deg fittings shall be pitched to result in a slope of 21 mm/m (0.25 in./ft) (2.1%) of length of horizontal tube with reference to a horizontal plane (see Figure 4-1).

5 ABBREVIATIONS

The following symbols are used to designate the type of fitting end:

C = solder-joint fitting end made to receive copper tube diameter (female)
F = internal ANSI Standard taper pipe thread (female) NPT

Figure 4-1
Typical Laying Lengths of DWV 90-deg Elbows