

ASME B16.25-2012
(Revision of ASME B16.25-2007)

Buttwelding Ends

AN AMERICAN NATIONAL STANDARD



The American Society of
Mechanical Engineers

Copyright © 2012 by the American Society of Mechanical Engineers.
No reproduction may be made of this material without written consent of ASME.



INTENTIONALLY LEFT BLANK



ASME B16.25-2012
(Revision of ASME B16.25-2007)

Buttwelding Ends

AN AMERICAN NATIONAL STANDARD



**The American Society of
Mechanical Engineers**

Three Park Avenue • New York, NY • 10016 USA

Copyright © 2012 by the American Society of Mechanical Engineers.
No reproduction may be made of this material without written consent of ASME.



Date of Issuance: December 20, 2012

The next edition of this Standard is scheduled for publication in 2017.

ASME issues written replies to inquiries concerning interpretations of technical aspects of this Standard. Periodically certain actions of the ASME B16 Committee may be published as Cases. Cases and interpretations are published on the ASME Web site under the Committee Pages at <http://cstools.asme.org/> as they are issued.

Errata to codes and standards may be posted on the ASME Web site under the Committee Pages to provide corrections to incorrectly published items, or to correct typographical or grammatical errors in codes and standards. Such errata shall be used on the date posted.

The Committee Pages can be found at <http://cstools.asme.org/>. There is an option available to automatically receive an e-mail notification when errata are posted to a particular code or standard. This option can be found on the appropriate Committee Page after selecting “Errata” in the “Publication Information” section.

ASME is the registered trademark of The American Society of Mechanical Engineers.

This code or standard was developed under procedures accredited as meeting the criteria for American National Standards. The Standards Committee that approved the code or standard was balanced to assure that individuals from competent and concerned interests have had an opportunity to participate. The proposed code or standard was made available for public review and comment that provides an opportunity for additional public input from industry, academia, regulatory agencies, and the public-at-large.

ASME does not “approve,” “rate,” or “endorse” any item, construction, proprietary device, or activity.

ASME does not take any position with respect to the validity of any patent rights asserted in connection with any items mentioned in this document, and does not undertake to insure anyone utilizing a standard against liability for infringement of any applicable letters patent, nor assume any such liability. Users of a code or standard are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, is entirely their own responsibility.

Participation by federal agency representative(s) or person(s) affiliated with industry is not to be interpreted as government or industry endorsement of this code or standard.

ASME accepts responsibility for only those interpretations of this document issued in accordance with the established ASME procedures and policies, which precludes the issuance of interpretations by individuals.

No part of this document may be reproduced in any form,
in an electronic retrieval system or otherwise,
without the prior written permission of the publisher.

The American Society of Mechanical Engineers
Three Park Avenue, New York, NY 10016-5990

Copyright © 2012 by
THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS
All rights reserved
Printed in U.S.A.



CONTENTS

Foreword	iv
Committee Roster	v
Correspondence With the B16 Committee	vi
Summary of Changes	vii
1 Scope	1
2 Transition Contours	1
3 Welding Bevel Design	2
4 Preparation of Inside Diameter of Welding End	2
5 Tolerances	3
Figures	
1 Maximum Envelope for Welding End Transitions	4
2 Bevels for Wall Thickness Over 3 mm (0.12 in.) to 22 mm (0.88 in.), Inclusive	5
3 Weld Bevel Details for Wall Thickness Over 22 mm (0.88 in.)	6
4 Weld Bevel Details for GTAW Root Pass [Wall Thickness Over 3 mm (0.12 in.) to 10 mm (0.38 in.), Inclusive]	7
5 Weld Bevel Details for GTAW Root Pass [Wall Thickness Over 10 mm (0.38 in.) to 25 mm (1.0 in.), Inclusive]	7
6 Weld Bevel Details for GTAW Root Pass [Wall Thickness Over 25 mm (1.0 in.)]	8
Table	
1 Dimensions of Welding Ends	9
Mandatory Appendices	
I Inch Table	13
II References	18
Nonmandatory Appendix	
A Quality System Program	19



FOREWORD

In July 1953, the American Welding Society presented a proposal on Welding End Preparation to Sectional Committee B16 of the American Standards Association (ASA), with the recommendation that it be considered as a candidate for an American Standard. The proposal was expanded to include welding preparation for flanges and valves covered by ASA B16.5, Steel Pipe Flanges and Flanged Fittings, and for fittings covered by ASA B16.9, Buttwelding Fittings. Consideration was also given to Pipe Fabrication Institute Standard ES-1.

The third draft reviewed by Subcommittee 3, Subgroup 6 (now Subcommittee F), of the B16 Sectional Committee was forwarded to the Committee, cosponsor organizations, and then ASA for approval. Final approval was given on September 14, 1955, with the designation ASA B16.25-1955.

Revisions were developed as a need for clarification and improvements became known and were approved as ASA B16.25-1958 and ASA B16.25-1964. After ASA reorganized as the American National Standards Institute (ANSI) and the Sectional Committee became American National Standards Committee B16, a further revision was approved as ANSI B16.25-1972.

Subcommittee F immediately began work on a major expansion and updating of the Standard, adding illustrations and requirements for welding end configurations applicable to a number of specific circumstances, including cast steel and alloy valves. When a draft had been developed that overcame the many problems and conflicting demands, the Standards Committee, cosecretariat organizations, and ANSI concurred in approval of ANSI B16.25-1979 on July 18, 1979.

In 1982, American National Standards Committee B16 was reorganized as an ASME committee operating under procedures accredited by ANSI. In the 1986 edition, inch dimensions were established as the standard, and numerous changes in text and format were made. Notes for illustrations were also clarified. Following approval by the Standards Committee and ASME, approval as an American National Standard was given by ANSI on October 8, 1986, with the new designation ASME/ANSI B16.25-1986.

In 1992, the subcommittee revised the requirements for the preparation of the inside diameter of welding end. The references in Annex B were also updated. After public review and approval by ASME, this edition was approved by ANSI on October 26, 1992, with the new designation ASME B16.25-1992.

In the 1997 edition, metric dimensions were added as an independent but equal standard to the inch units. An Annex was also added to reference quality system requirements. Following approval by the Standards Committee and ASME, this revision to the 1992 edition of B16.25 was approved as an American National Standard by ANSI on April 17, 1997, with the new designation ASME B16.25-1997.

In the 2003 edition, the reference standard dates were updated. There were clarifications to text made to address inquiries. Tolerances on bevel angles were modified slightly. Following approval by the Standards Committee and ASME, this revision to the 1997 edition of B16.25 was approved as an American National Standard by ANSI on December 17, 2003, with the new designation ASME B16.25-2003.

In the 2007 edition, buttwelding end data were extended to cover requirements for sizes up to NPS 48 (DN 1200). The reference data were updated, and the interpretation section was removed from the Standard.

In this 2012 edition, the references in Mandatory Appendix II have been updated, and notes have been updated in the included tables. This revision was approved by ANSI on October 22, 2012.

Requests for interpretation or suggestions for revision should be sent to the Secretary, B16 Committee, The American Society of Mechanical Engineers, Three Park Avenue, New York, NY 10016-5990.



ASME B16 COMMITTEE

Standardization of Valves, Flanges, Fittings, and Gaskets

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

STANDARDS COMMITTEE OFFICERS

W. B. Bedesem, *Chair*
G. A. Jolly, *Vice Chair*
C. E. O'Brien, *Secretary*

STANDARDS COMMITTEE PERSONNEL

A. Appleton , Alloy Stainless Products Co., Inc.	G. A. Jolly , Vogt Valves/Flowserve Corp.
R. W. Barnes , ANRIC Enterprises, Inc.	M. Katcher , Haynes International
W. B. Bedesem , Consultant	W. N. McLean , B&L Engineering
R. M. Bojarczuk , ExxonMobil Research & Engineering Co.	T. A. McMahon , Emerson Process Management
D. F. Buccicone , Elkhart Products Corp.	M. L. Nayyar , Consultant
A. M. Cheta , Shell Exploration and Production Co.	C. E. O'Brien , The American Society of Mechanical Engineers
M. A. Clark , NIBCO, Inc.	W. H. Patrick , Dow Chemical Co.
G. A. Cuccio , Capitol Manufacturing Co.	R. A. Schmidt , Canadoil
C. E. Davila , Crane Energy	H. R. Sonderegger , Fluoroseal, Inc.
D. R. Frikken , Becht Engineering Co., Inc.	W. M. Stephan , Flexitallic LP
R. P. Griffiths , U.S. Coast Guard	F. R. Volgstadt , Volgstadt & Associates, Inc.
	D. A. Williams , Southern Co. Generation

SUBCOMMITTEE F — STEEL-THREADED AND WELDING FITTINGS

G. A. Cuccio , <i>Chair</i> , Capitol Manufacturing Co.	D. R. Frikken , Becht Engineering Co., Inc.
A. Appleton , <i>Vice Chair</i> , Alloy Stainless Products Co., Inc.	D. Hunt, Jr. , Fastenal
F. Huang , <i>Secretary</i> , The American Society of Mechanical Engineers	G. A. Jolly , Vogt Valves/Flowserve Group
W. J. Birkholz , Ezeflow USA, Inc.	D. H. Monroe , Consultant
K. W. Doughty , Shaw Alloy Piping Products, Inc.	J. P. Tucker , Flowserve Corp.
J. P. Ellenberger , Retired	G. T. Walden , Wolsley
B. G. Fabian , Pennsylvania Machine Works	M. M. Zaidi , Jacobs Engineering Group, Inc.



CORRESPONDENCE WITH THE B16 COMMITTEE

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, and attending Committee meetings. Correspondence should be addressed to:

Secretary, B16 Standards Committee
The American Society of Mechanical Engineers
Three Park Avenue
New York, NY 10016-5990

As an alternative, inquiries may be submitted via e-mail to: SecretaryB16@asme.org.

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 for the purpose of providing 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, 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 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.

The request for 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.
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. 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 this format will be rewritten in this format by the Committee prior to being answered, which may inadvertently change the intent of the original request.

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, which are open to the public. Persons wishing to attend any meeting should contact the Secretary of the B16 Standards Committee.



ASME B16.25-2012 SUMMARY OF CHANGES

Following approval by the ASME B16 Committee and ASME, and after public review, ASME B16.25-2012 was approved by the American National Standards Institute on October 22, 2012.

ASME B16.25-2012 includes the following changes identified by a margin note, **(12)**.

<i>Page</i>	<i>Location</i>	<i>Change</i>
9	Table 1	Note (2) added
14	Table I-1	Note (2) added
18	Mandatory Appendix II	Updated



INTENTIONALLY LEFT BLANK



BUTTWELDING ENDS

1 SCOPE

1.1 General

This Standard covers the preparation of butt welding ends of piping components to be joined into a piping system by welding. It includes requirements for welding bevels, for external and internal shaping of heavy-wall components, and for preparation of internal ends (including dimensions and tolerances). Coverage includes preparation for joints with the following:

- (a) no backing rings
- (b) split or noncontinuous backing rings
- (c) solid or continuous backing rings
- (d) consumable insert rings
- (e) gas tungsten arc welding (GTAW) of the root pass

Details of preparation for any backing ring must be specified when ordering the component.

1.2 Application

This Standard applies to any metallic materials for which a welding procedure can be satisfactorily qualified but does not prescribe specific welding processes or procedures. Unless otherwise specified by the purchaser, it does not apply to welding ends conforming to ASME B16.5, B16.9, or B16.47.

1.3 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. Within the text, the U.S. Customary units are shown in parentheses or in a separate table that appears in Mandatory Appendix I. 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.

1.4 Size

Nominal pipe size (NPS), followed by a dimensionless number, is the designation for nominal fitting size. NPS is related to the reference nominal diameter (DN) used in international standards. The relationship is typically as follows:

NPS	DN
$\frac{1}{2}$	15
$\frac{3}{4}$	20
1	25
$1\frac{1}{4}$	32
$1\frac{1}{2}$	40
2	50
$2\frac{1}{2}$	65
3	80
4	100

For $NPS \geq 4$, the related $DN = 25 \times NPS$.

1.5 Referenced Standards

Standards and specifications adopted by reference in this Standard are shown in Mandatory Appendix II. 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 II. A product made in conformance with a prior edition of referenced standards will be considered to be in conformance, even though the edition reference may be changed in a subsequent revision of the standard.

1.6 Quality Systems

Nonmandatory requirements relating to the manufacturer's quality system program are described in Nonmandatory Appendix A.

1.7 Convention

For determining conformance with this Standard, the convention for fixing significant digits where limits (maximum and minimum values) are specified shall be as defined in ASTM E29. This requires that an observed or calculated value be rounded off to the nearest unit in the last right-hand digit used for expressing the limit. Decimal values and tolerances do not imply a particular method of measurement.

2 TRANSITION CONTOURS

Figure 1 delineates the maximum envelope in which transitions from welding bevel to the outer surface of the component and from the root face to the inner surface of the component must lie. Except as specified in Note (5) to Fig. 1, and as otherwise specified by the purchaser, the exact contour within this envelope is the manufacturer's option, provided it maintains the specified minimum

