ASME B18.2.9-2010
(Revision of ASME B18.2.9-2007)

# Straightness Gage and Gaging for Bolts and Screws

REAFFIRMED 2017

AN AMERICAN NATIONAL STANDARD

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(Revision of ASME B18.2.9-2007)

# Straightness Gage and Gaging for Bolts and Screws

AN AMERICAN NATIONAL STANDARD

ASME
SETTING THE STANDARD

Three Park Avenue • New York, NY • 10016 USA

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This Standard will be revised when the Society approves the issuance of a new edition. There will be no addenda issued to this edition.

ASME issues written replies to inquiries concerning interpretations of technical aspects of this Standard. Periodically certain actions of the ASME B18 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.



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

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# FOREWORD

In May 2001, the ASME B18 Standards Committee, Standardization of Bolts, Nuts, Rivets, Screws, Washers, and Similar Fasteners, authorized B18 Subcommittee 2, Externally Driven Fasteners, to proceed with the development of a standard covering straightness gage and gaging for bolts and screws. As a result, ASME B18.2.9 was approved as an American National Standard on March 7, 2007.

In late 2008, B18 Subcommittee 2 undertook the addition of a set of default straightness limits to apply to externally threaded inch and metric fasteners for which straightness limits are not stated in the applicable product standard.

This revision was approved as an American National Standard on July 26, 2010.

# ASME B18 COMMITTEE
# Standardization of Bolts, Nuts, Rivets, Screws, Washers, and Similar Fasteners

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

Secretary, B18 Standards Committee
The American Society of Mechanical Engineers
Three 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 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 B18 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 B18 Standards Committee.

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. |
| 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 may be rewritten in the appropriate 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 B18 Standards Committee regularly holds meetings, which are open to the public. Persons wishing to attend any meeting should contact the Secretary of the B18 Standards Committee.

# STRAIGHTNESS GAGE AND GAGING FOR BOLTS AND SCREWS

## 1 SCOPE

This Standard describes the gage and procedure for checking bolt and screw straightness at maximum material condition (MMC) and provides default limits when not stated in the applicable product standard.

## 2 COMPARISON WITH ISO 4759-1:2000

This Standard uses an adjustable gage, instead of plain sleeve gages like the example shown in ISO 4759-1 Annex C, Fig. C.24. The adjustable gage avoids the necessity of a different gage for each diameter–length combination, and for each difference in the specified tolerances on diameter, or straightness, or both, of the fastener.

## 3 REFERENCED STANDARDS

For undated references, the most recent issues of the referenced standards apply.

ASME B18.12, Glossary of Terms for Mechanical Fasteners

ASME Y14.5M, Dimensioning and Tolerancing

Publisher: The American Society of Mechanical Engineers (ASME), Three Park Avenue, New York, NY 10016-5990; Order Department, 22 Law Drive, P.O. Box 2900, Fairfield, NJ 07007 (www.asme.org)

ISO 4759-1:2000 Tolerances for fasteners — Part 1: bolts, screws, studs, and nuts — Product grades A, B and C[1]

Publisher: International Organization for Standardization (ISO), 1, ch. de la Voie-Creuse, Case Postale 56, CH-1211 Geneve 20, Switzerland/Suisse (www.iso.org)

## 4 TERMINOLOGY

For definitions of terms relating to fasteners or features thereof used in this Standard, refer to ASME B18.12.

## 5 DIMENSIONS

For definitions of terms relating to dimensioning and tolerancing, refer to ASME Y14.5M.

[1] May also be obtained from American National Standards Institute (ANSI), 25 West 43rd Street, New York, NY 10036.

## 6 GAGE

The gage consists of a stationary rail, an adjustable rail, micrometers that indicate the distance between the rails at each end, and a means to secure the adjustable rail in place. A typical gage is illustrated in Fig. 1.

## 7 PROCEDURE

*(a)* The excluded length, illustrated in Fig. 2, is the length in any that is to be excluded from the straightness gage as specified by the product standard.

*(b)* The gaged length, illustrated in Fig. 2, is calculated as the bolt or screw length minus the excluded length.

*(c)* The straightness tolerance at MMC for the product to be inspected is calculated for the gaged length by the formula specified in the product standard.

*(d)* The resultant condition is calculated as the larger of the maximum major diameter of the thread or the maximum body diameter of the bolt or screw, plus the straightness tolerance at MMC.

*(e)* The adjustable rail of the gage is adjusted to provide a parallel space between the rails equal to the resultant condition by obtaining common readings on both micrometer heads, and is secured in place.

*(f)* The gaged length of the product to be inspected is inserted between the rails, then rotated by hand through a full 360 deg. Any interference occurring between the product and the gage sufficient to prevent rotation indicates that the specified straightness is not met.

## 8 STRAIGHTNESS LIMITS

Unless otherwise specified in the product standard or by the purchaser, the straightness limits for all types of screws and bolts are listed in Table 1.