ASME B18.18.2-2009
[Revision of ASME/ANSI B18.18.2M-1987 (R2005)]

Inspection and Quality Assurance for High-Volume Machine Assembly Fasteners

AN AMERICAN NATIONAL STANDARD

The American Society of Mechanical Engineers

ASME SETTING THE STANDARD

ASME B18.18.2-2009

[Revision of ASME/ANSI B18.18.2M-1987 (R2005)]

Inspection and Quality Assurance for High-Volume Machine Assembly Fasteners

AN AMERICAN NATIONAL STANDARD

The American Society of Mechanical Engineers

ASME SETTING THE STANDARD

Date of Issuance: September 15, 2009

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

CONTENTS

FOREWORD

American National Standards Committee B18 for the standardization of bolts, screws, nuts, rivets, and similar fasteners was organized in March 1922 as Sectional Committee B18 under the aegis of the American Engineering Standards Committee (later the American Standards Association, then the United States of America Standards Institute and, as of October 6, 1969, the American National Standards Institute, Inc.) with the Society of Automotive Engineers and the American Society of Mechanical Engineers as joint sponsors.

Subcommittee 18 of Committee B18 was established in September 1978 to develop a document to cover the quality assurance provisions for internally and externally threaded metric fasteners and accessories or associated parts.

At the March 1979 meeting of Subcommittee 18, it was agreed that the quality assurance document should be circulated for subcommittee consideration as a proposed standard. Subcommittee acceptance of the content ensued and the document was approved by letter ballot to the American National Standards Committee B18 on March 21, 1980.

The Standard was subsequently approved by the Secretariat and submitted to the American National Standards Institute for redesignation as an American National Standard it was designated ANSI B18.18.2M-1982 and approved on September 14, 1982.

A periodic review of the Standard, undertaken by the Subcommittee in 1985, resulted in agreement that the document be revised to allow it to be used for inch as well as metric products.

This was done by deleting the word "metric" from the title as well as from each place in the Standard where it would inhibit the use of the document for inch as well as metric products. By retaining the "M" in the designator, the Standard can be used for both inch and metric products without having to change any references made. A proposal containing these changes, as well as editorial corrections, was prepared and balloted by letter ballot to ASME Committee B18. Following approval by ASME, the proposal was submitted to the American National Standards Institute and designated an American National Standard on January 16, 1987.

A periodic review of the Standard, undertaken by the Subcommittee in 2008, resulted in agreement that the document be revised. The "M" in the designation has been removed because this Standard is not solely related to metric fasteners. The restriction of lot size of 250,000 pieces was removed. The sample sizes were revised to be aligned with those used in ASTM F 1470. This Standard is now intended to be directly related to determining the acceptability of dimensional characteristics and the acceptance of chemical and physical characteristics are directed to ASTM F 1470 when applicable. A proposal containing these changes, as well as editorial corrections, was prepared and balloted by letter ballot to ASME Committee B18.

This Standard was approved by the American National Standards Institute on July 14, 2009.

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.)

STANDARDS COMMITTEE OFFICERS

D. A. Clever, *Chair*
R. D. Strong, *Vice Chair*
R. L. Crane, *Secretary*

STANDARDS COMMITTEE PERSONNEL

V. Cartina, Continental-Aero
D. A. Clever, Deere & Co.
A. P. Cockman, Ford Motor Co.
B. D. Burnside, *Alternate,* Ford Motor Co.
R. L. Crane, The American Society of Mechanical Engineers
J. S. Foote, *Contributing Member,* Trade Association Management, Inc.
D. S. George, ND Industries
J. Greenslade, Industrial Fasteners Institute
J. J. Grey, *Contributing Member,* Fastener Consulting Services, Inc.
B. Hasiuk, *Contributing Member,* Defense Supply Center Philadelphia
A. Herskovitz, Consultant
J. Hubbard, Leland-Powell Fasteners, Inc.
J. Jennings, *Contributing Member,* Naval Surface Warfare Center
W. H. King, Porteous Fastener Co.
J. F. Koehl, *Contributing Member,* Spirol International Corp.
W. H. Kopke, Consultant
W. J. Lutkus, Emhart Teknologie
D. McCrindle, Canadian Fasteners Institute
M. D. Prasad, *Contributing Member,* Global M&F Solutions, Inc.
S. Savoji, ITW Medalist
W. Schevey, *Contributing Member,* BGM Fastener Co., Inc.
Q. M. Smith, Oregon DOT
W. R. Stevens, Ramco
R. D. Strong, General Motors Corp.
S. W. Vass, Consultant
C. B. Wackrow, *Contributing Member,* MNP Corp.
W. K. Wilcox, Consultant
P. Williamson, Fastenal Co.
C. J. Wilson, Consultant
R. B. Wright, *Contributing Member,* Wright Tool Co.
J. G. Zeratsky, National Rivet and Manufacturing Co.

SUBCOMMITTEE 18 - INSPECTION AND QUALITY ASSURANCE FOR FASTENERS

C. B. Williamson, *Chair,* Fastenal Co.
W. H. King, *Vice Chair,* Porteous Fastener Co.
A. L. Guzman, *Secretary,* The American Society of Mechanical Engineers
V. Cartina, Continental-Aero
D. A. Clever, *Contributing Member,* Deere & Co.
C. A. Dugal, TSP
D. S. George, ND Industries
J. Greenslade, Industrial Fasteners Institute
J. J. Grey, *Contributing Member,* Fastener Consulting Services, Inc.
A. Herskovitz, Consultant
J. Hubbard, Leland-Powell Fasteners, Inc.
J. Jennings, *Contributing Member,* Naval Surface Warfare Center
M. Keller, Consultant
W. H. Kopke, Consultant
J. F. McCarrick, Defense Supply Center Philadelphia
D. McCrindle, Canadian Fasteners Institute
R. B. Meade, Atrona Material Testing Laboratories, Inc.
S. Savoji, ITW Medalist
L. C. Schroeder, Kansas Department of Transportation
R. M. Serabin, Freundlich Supply Co.
D. F. Sharp, GMS Structural Engineers
G. M. Simpson, Semblex Corp.
W. R. Stevens, Ramco
R. D. Strong, General Motors Corp.
S. W. Vass, Consultant
C. B. Wackrow, MNP Corp.
P. H. Werner, Safety Socket Screw Corp.
W. K. Wilcox, Consultant
C. J. Wilson, Consultant

CORRESPONDENCE WITH THE B18 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, B18 Standards Committee
The American Society of Mechanical Engineers
Three Park Avenue
New York, NY 10016-5990

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.

INSPECTION AND QUALITY ASSURANCE FOR HIGH-VOLUME MACHINE ASSEMBLY FASTENERS

1 GENERAL INFORMATION

1.1 Basic Plan Structure

This Standard outlines a Quality Assurance Plan for internally and externally threaded fasteners and accessories or associated parts. Provisions are included for sampling plans, inspection frequencies, control procedures, and record keeping.

Included in this plan are fasteners such as those where a more detailed inspection would enhance mass assembly operation. The quality assurance plan for these fasteners relies primarily on increased final inspection rather than on documented in-process control.

This Standard will be used in conjunction with other accepted standards for product, testing, gaging, and material and, therefore, those provisions as well as packaging are not included herein.

1.2 Inspection Levels

The substantial difference in importance to the user of various characteristics and the dissimilar degrees of control in manufacture make impractical the subjecting of all characteristics to the same degree of inspection. Therefore, three inspection levels have been provided.

Any additional characteristics deemed applicable by the user that do not appear in the plan shall be explicitly designated by the user, preferably on engineering drawings and related specifications by the appropriate code letter at the time of ordering (see Nonmandatory Appendix B). To assist in arriving at the most appropriate inspection level, Fig. A-1 included in Nonmandatory Appendix A is recommended for guidance.

1.3 Measuring and Testing Equipment

All measuring and testing equipment shall be systematically maintained and controlled as specified in ISO 17025.

1.4 Basic Plan Outline

The basic plan outline as shown in Fig. 1 is included to enhance understanding and use.

2 FASTENERS FOR HIGH-VOLUME MACHINE ASSEMBLY APPLICATIONS

2.1 Scope

This Standard is an Acceptance Sampling Plan for high-volume machine assembly fasteners, accessories, and associated parts. It establishes specific inspection functions that must be performed on the finished product or at the appropriate stage of manufacturing with the objective of ensuring that the accepted product conforms to all the requirements of engineering drawings, related standards, and/or specifications.

This plan does not necessitate in-process control; however, the producer, at his discretion, may apply in-process control. Adherence to the requirements of this plan does not release the contractor from the responsibility of exercising due care in the production of all parts to the requirements established for all characteristics shown on engineering drawings and related specifications.

2.2 Applicable Characteristics

Unless designated characteristics are specifically specified in the product standard, the applicable characteristics include all characteristics of a part that are described by engineering drawings and related specifications. Three levels of inspection — A, B, and C — are provided in the plan. Alternate levels may be designated by the user if required. Refer to Fig. A-1 in Nonmandatory Appendix A to establish alternate levels as required. Any additional characteristic(s) deemed applicable by the user and not appearing in the general plan, or characteristics for which the user requires an inspection level other than that designated in the plan, must be explicitly requested by the user and shown on drawings or specifications by the appropriate code letter at the time of ordering (see Nonmandatory Appendix B).

2.3 Lot Definition

A lot is a quantity of product of one part number made from one heat of raw material by the same production process and subsequently submitted for final inspection at one time. In the case of fasteners assemblies, such as screw and washer assemblies, the manufacturer shall maintain lot traceability for all components.