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ASME B18.18.6M-1998

Quality Assurance Plan for Fasteners Produced in a Third Party Accreditation System

AN AMERICAN NATIONAL STANDARD

The American Society of Mechanical Engineers

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FOREWORD

(This Foreword is not part of ASME B18.18.6M-1998)

The diversity of manufacturing processes is significant when addressing high conformance expectations. Such significance is observed in the use of increasingly adopted methods and control systems that reflect a distinct departure from older systems. These methods and controls focus on prevention at the process level where product features are conferred, with a concurrent removal of dependence on or need for final inspection.

These strategies are applied to process variables and process output and are developed by manufacturers. They are often determined in the framework of quality planning, and while the approaches taken are often quite unique by respective manufacturers, they are all designed to satisfy the same quality intent. Such quality system standards and increased customer expectation has resulted in a need for standards that reflect self management and best practices while providing for future developments as the natural result of continuous improvement.

In 1996, an effort to address these ideas by an IFI task force produced such a quality standard for fasteners: IFI-150 Quality Assurance Plan for Fasteners Produced in a Third Party Accreditation System. The framework for this ASME Standard is based upon that IFI standard and the increased utilization of third party accreditation to based standards as a means for recognizing planning content and manufacturing system competence, and the increasing awareness of consumers for high purity fasteners, with the increase of manufacturer accountability in material supply.

Meeting in December of 1996, Subcommittee 18 of B18 approved the submission of an ASME draft for simultaneous letter ballot.

Following approval by ASME, this Standard was submitted to the American National Standards Institute, which approved it on January 6, 1998.

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Proposing Revisions. Revisions are made periodically to the Standard to incorporate changes which 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.

Interpretations. On request, the B18 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 Main Committee.

The request for interpretation should be clear and unambiguous. It is further recommended that the inquirer submit his request in the following format:

Subject: Cite the applicable paragraph number(s) and a concise description.

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 which are necessary to explain the question; however, they should not contain proprietary names or information.

Requests which 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.

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QUALITY ASSURANCE PLAN FOR FASTENERS PRODUCED IN A THIRD PARTY ACCREDITATION SYSTEM

1 GENERAL INFORMATION

1.1 Basic Plan Structure

This plan is for a quality system that has been certified by a third party process utilizing independent audits under the provisions of a third party accreditation program administered by a consensus standards organization. It is intended to serve as a Quality Assurance Plan for externally and internally threaded fasteners and accessories or associated parts. It is to be used in conjunction with other part-specific quality plans which have been agreed to between manufacturer and purchaser. The Basic Plan Outline is included in Fig. 1. This Standard requires that manufacturers must be qualified under provisions of third party accreditation included in the referenced standards.

2 REFERENCED STANDARDS

2.1 Third Party Accreditation Standards

QS 9000, Quality System Requirements

Publisher: Automotive Industry Action Group, Department 77839, P.O. Box 77000, Detroit, MI 48277

FAP-1 Quality Assurance Program Requirements for Fastener Manufacturers, Distributors, and Testing Laboratories

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

ISO/IEC Guide 25 for testing areas

Publisher: International Organization for Standardization (ISO), 1 rue de Varembé, Case postale 56, CH-1121, Genevé 20, Switzerland/Suisse

2.2 Related Standards

See Appendix A.

3 THIRD PARTY ACCREDITATION SYSTEM

3.1 Scope

For the purpose of this Standard, third party registration is the successful conclusion of a structured auditing and approval board process that has verified compliance of an audited quality system to a specified quality system standard. Such compliance is determined by the documented auditing of the defined system and its scope of activities (in its various documented and implemented forms) by an agency (registrar) that has the authority, conferred by an accreditation process itself, to audit and grant registration status. Registrars are recognized by the American National Standards Institute and/or the American Society for Quality Control.

3.2 Lot Controls

3.2.1 Raw material shall be supplied to the manufacturer traceable to a mill heat of material.

3.2.2 Subcontracted processes including plating and heat treating shall be controlled to avoid product lot contamination.

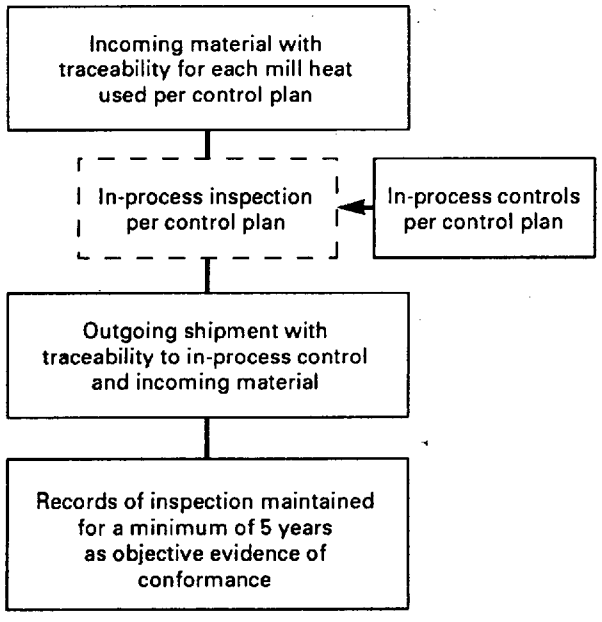
3.2.3 Finished lots shall be traceable to raw material supplier and subcontracted processes.

3.3 Inspection and Records

3.3.1 Inspection Plan and Inspection Points. The manufacturer shall have a document to indicate those points within the manufacturing process where fastener sampling and inspection is carried out. In-process control plans relating frequency of inspection, corrective action for nonconforming characteristics, and sample sizes shall be documented prior to production. The in-process control plan shall include those characteristics specified by the quality system standard, characteristics specifically indicated by the product standard, or those characteristics normally accepted as appropriate for evaluating product functionability. This plan shall be made available to the customer on his request.

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Fasteners Produced in a Third Party Accreditation System Using Advanced Quality Planning



Maximum Lot Size — 250,000 Pieces

FIG. 1 BASIC PLAN OUTLINE

3.4 Inspected Features and Frequency of Inspection

Unless indicated otherwise in the customer's fastener standard, the features to be verified and the frequency of inspection is controlled by the supplier's approved manufacturing plan.

3.5 Records of Inspection/Compliance

Records shall be maintained in such a manner to preserve original data, and be collated as required into a final form, sufficient to satisfy customer and legal requirements. Such reports shall be provided upon request. Appropriate records shall be retained for the time period specified by the customer or 5 years, whichever is longer. Evidence of these records and a valid third party certificate shall be deemed compliance to this Standard.

3.6 Methods of Verification

Actual inspection data, obtained in-process, shall be provided for examination and used to produce a report when required. Data used for verification purposes shall be examined to ensure that it complies with the requirements of the quality system standards and that it contains the necessary traceability identifiers to correlate it to a given lot of shipped material.

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APPENDIX A
RELATED STANDARDS

(This Appendix is not part of ASME B18.18.6M-1998 and is included for information only.)

A1 GENERAL

This Appendix provides a list of related standards prepared by ASME, ASTM, and ISO. This listing is intended to assist users of this Standard in locating additional information about Fastener System Quality. They are not intended as a requirement of this Standard.

A2 ASME RELATED STANDARDS

B18.18.1M, Inspection and Quality Assurance for General Purpose Fasteners

B18.18.2M, Inspection and Quality Assurance for High-Volume Machine Assembly Fasteners

B18.18.3M, Inspection and Quality Assurance for Special Purpose Fasteners

B18.18.4M, Inspection and Quality Assurance for Fasteners for Highly Specialized Engineered Applications

B18.18.5M, Inspection and Quality Assurance Plan Requiring In-Process Inspection and Controls

B18.18.7M, Quality Assurance Plan for Fasteners Produced in a Customer Approved Control Plan

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

A3 ASTM RELATED STANDARDS

ASTM F 1470, Standard Guide for Fastener Sampling for Specified Mechanical Properties and Performance Inspection

American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428

A4 ISO RELATED STANDARDS

ISO 9000, Quality Management and Quality Assurance Standards—Guidelines for Selection and Use

ISO 9001, Quality Systems—Model for Quality Assurance in Design/Development, Production, Installation, and Servicing

ISO 9002, Quality Systems—Model for Quality Assurance in Production and Installation

ISO 9003, Quality Systems—Model for Quality Assurance in Final Inspection and Test

ISO 9004, Quality Management and Quality System Elements—Guidelines

Publisher: International Organization for Standardization, 1 rue de Varembé, Case postale 56, CH-1121, Genevé 20, Switzerland/Suisse

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AMERICAN NATIONAL STANDARDS FOR BOLTS, NUTS, RIVETS, SCREWS, WASHERS, AND SIMILAR FASTENERS

Small Solid Rivets ..... B18.1.1-1972(R1995)
Large Rivets ..... B18.1.2-1972(R1995)
Metric Small Solid Rivets ..... B18.1.3M-1983(R1995)
Square and Hex Bolts and Screws (Inch Series) B18.2.1-1996
Square and Hex Nuts (Inch Series) ..... B18.2.2-1987(R1993)
Metric Hex Cap Screws ..... B18.2.3.1M-1979(R1995)
Metric Formed Hex Screws ..... B18.2.3.2M-1979(R1995)
Metric Heavy Hex Screws ..... B18.2.3.3M-1979(R1995)
Metric Hex Flange Screws ..... B18.2.3.4M-1984(R1995)
Metric Hex Bolts ..... B18.2.3.5M-1979(R1995)
Metric Heavy Hex Bolts ..... B18.2.3.6M-1979(R1995)
Metric Heavy Hex Structural Bolts ..... B18.2.3.7M-1979(R1995)
Metric Hex Lag Screws ..... B18.2.3.8M-1981(R1991)
Metric Heavy Hex Flange Screws ..... B18.2.3.9M-1984(R1995)
Square Head Bolts (Metric Series) B18.2.3.10M-1996
Metric Hex Nuts, Style 1 ..... B18.2.4.1M-1996
Metric Hex Nuts, Style 2 ..... B18.2.4.2M-1979(R1995)
Metric Slotted Hex Nuts ..... B18.2.4.3M-1979(R1995)
Metric Hex Flange Nuts ..... B18.4.4.4M-1982(R1993)
Metric Hex Jam Nuts ..... B18.2.4.5M-1979(R1990)
Metric Heavy Hex Nuts ..... B18.2.4.6M-1979(R1990)
Fasteners for Use in Structural Applications B18.2.6-1996
Socket Cap, Shoulder, and Set Screws, Hex and Spline Keys (Inch Series) B18.3-1998
Socket Head Cap Screws (Metric Series) ..... B18.3.1M-1986(R1993)
Metric Series Hexagon Keys and Bits ..... B18.3.2M-1979(R1990)
Hexagon Socket Head Shoulder Screws (Metric Series) ..... B18.3.3M-1986(R1993)
Hexagon Socket Button Head Cap Screws (Metric Series) ..... B18.3.4M-1986(R1993)
Hexagon Socket Flat Countersunk Head Cap Screws (Metric Series) ..... B18.3.5M-1986(R1993)
Metric Series Socket Set Screws ..... B18.3.6M-1986(R1993)
Round Head Bolts (Inch Series) B18.5-1990
Metric Round Head Short Square Neck Bolts B18.5.2.1M-1996
Metric Round Head Square Neck Bolts B18.5.2.2M-1982
Round Head Square Neck Bolts With Large Head (Metric Series) B18.5.2.3M-1990
Wood Screws (Inch Series) ..... B18.6.1-1981(R1991)
Slotted Head Cap Screws, Square Head Set Screws, and Slotted Headless Set Screws ..... B18.6.2-1972(R1993)
Machine Screws and Machine Screw Nuts ..... B18.6.3-1972(R1983)
Thread Forming and Thread Cutting Tapping Screws and Metallic Drive Screws (Inch Series) ..... B18.6.4-1981(R1991)
Metric Thread Forming and Thread Cutting Tapping Screws ..... B18.6.5M-1986(R1993)
Metric Machine Screws ..... B18.6.7M-1985(R1993)
General Purpose Semi-Tubular Rivets, Full Tubular Rivets, Split Rivets and Rivet Caps ..... B18.7-1972(R1992)
Metric General Purpose Semi-Tubular Rivets ..... B18.7.1M-1984(R1992)
Clevis Pins and Cotter Pins (Inch Series) B18.8.1-1994
Taper Pins, Dowel Pins, Straight Pins, Grooved Pins, and Spring Pins (Inch Series) B18.8.2-1995
Spring Pins — Coiled Type (Metric Series) B18.8.3M-1995
Spring Pins — Slotted (Metric Series) B18.8.4M-1994
Machine Dowel Pins — Hardened Ground (Metric Series) B18.8.5M-1994
Cotter Pins (Metric Series) B18.8.6M-1995
Headless Clevis Pins (Metric Series) B18.8.7M-1994
Headed Clevis Pins (Metric Series) B18.8.8M-1994
Grooved Pins (Metric Series) B18.8.9M-1998
Plow Bolts (Inch Series) B18.9-1996
Track Bolts and Nuts ..... B18.10-1982(R1992)

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Miniature Screws ..... B18.11-1961(R1992)
Glossary of Terms for Mechanical Fasteners ..... B18.12-1962(R1991)
Screw and Washer Assemblies — Sems (Inch Series) B18.13-1996
Screw and Washer Assemblies — Sems (Metric Series) B18.13.1M-1991
Forged Eyebolts ..... B18.15-1985(R1995)
Mechanical and Performance Requirements for Prevailing-Torque Type Steel Metric Hex Nuts and Hex Flange Nuts ..... B18.16.1M-1979(R1995)
Torque-Tension Test Requirements for Prevailing-Torque Type Steel Metric Hex Nuts and Hex Flange Nuts ..... B18.16.2M-1979(R1995)
Dimensional Requirements for Prevailing-Torque Type Steel Metric Hex Nuts and Hex Flange Nuts ..... B18.16.3M-1982(R1993)
Wing Nuts, Thumb Screws, and Wing Screws ..... B18.17-1968(R1983)
Inspection and Quality Assurance for General Purpose Fasteners ..... B18.18.1M-1987(R1993)
Inspection and Quality Assurance for High-Volume Machine Assembly Fasteners ..... B18.18.2M-1987(R1993)
Inspection and Quality Assurance for Special Purpose Fasteners ..... B18.18.3M-1987(R1993)
Inspection and Quality Assurance for Fasteners for Highly Specialized Engineered Applications ..... B18.18.4M-1987(R1993)
Inspection and Quality Assurance Plan Requiring In-Process Inspection and Controls B18.18.5M-1998
Quality Assurance Plan for Fasteners Produced in a Third Party Accreditation System B18.18.6M-1998
Quality Assurance Plan for Fasteners Produced in a Customer Approved Control Plan B18.18.7M-1998
Lock Washers (Inch Series) B18.21.1-1994
Lock Washers (Metric Series) B18.21.2M-1994
Metric Plain Washers ..... B18.22M-1981(R1990)
Plain Washers ..... B18.22.1-1965(R1990)
Part Identifying Number (Pin) Code System Standard for B18 Externally Threaded Products B18.24.1-1996
Square and Rectangular Keys and Keyways B18.25.1M-1996
Woodruff Keys and Keyways B18.25.2M-1996
Helical Coil Screw Thread Inserts (Inch Series) B18.29.1-1993

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