

Quality Control Standard For Suppliers

**2007.5
Edition**



NORTH AMERICAN OPERATIONS

QUALITY CONTROL STANDARD FOR SUPPLIERS

This standard is being issued by Mazda North American Operations to all Suppliers. All revisions to this standard must be approved by the Director of Mazda North American Operations. Mazda North American Operations reserves the right to modify or change the content of this manual at any time without prior notice.

Note: Mazda North American Operations is abbreviated in this manual as MNAO.

FORWARD

The 2007.5 edition of the Quality Control Standard for Suppliers has been revised by Mazda North American Operations to adopt the use of AIAG QS-9000 Quality System Requirements and Reference Manuals. All previous editions of the Quality Control Standard for Suppliers are obsolete effective June 1, 2007.

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1.0 INTRODUCTION

1.1 Preface

Mazda's success is based on the quality, performance, and affordability of our products and is impacted heavily by the quality of the products purchased from our suppliers. Because of this, Mazda views its supply-base as key members of the Production Team.

The Quality Control Standard for Suppliers outlines the fundamental quality control concepts and discusses the responsibilities of both MNAO and its suppliers. All material supplied to MNAO for production shall be developed, produced, controlled, inspected and tested in accordance with the requirements set forth in this document and other applicable documents.

1.2 Purpose

This standard defines the minimum Quality System requirements which the supplier shall establish, document and implement during all phases of part/product development and mass production (MP).

1.3 Applicability

This standard applies to all suppliers of parts, product or services to Mazda North American Operation (MNAO).

2.0 QUALITY SYSTEM REQUIREMENTS

2.1 QS-9000 Standard-Based Requirements

MNAO requires that suppliers establish, document and implement effective Quality Systems based on QS-9000 Quality System Requirements. All the QS-9000 based requirements and MNAO/Mazda specific requirements discussed in this manual are to be incorporated in the supplier's Quality System and described in the supplier's Quality Manual.

The supplier should obtain and utilize the following reference manuals from the Automotive Industries Action Group (AIAG) at (810) 358-3003.

- Quality System Requirements - QS-9000
- Advanced Product Quality Planning and Control Plan - APQP
- Production Part Approval Process - PPAP
- Potential Failure Mode and Effects Analysis - FMEA
- Measurement Systems Analysis - MSA
- Statistical Process Control - SPC

2.2 MNAO/Mazda-Specific Requirements



This section discusses MNAO/Mazda specific requirements supplemental to the QS-9000 Based Requirements. These specific requirements are organized in order of the QS-9000 Elements.

[Element 4.2 - Quality System]

Advanced Product Quality Planning

The supplier shall utilize the APQP status report methodology described in Section 3.0 Advanced Product Quality Planning of this manual to facilitate communication with everyone involved in the development of a part/product and to assure that all the required steps are completed on time.

Special Characteristics and Symbols

Quality Rank Nomenclature	Quality Rank Symbol	Definition
A - Rank Critical Characteristic (CC)	 or "A" noted in the applicable Quality Rank column	A-Rank characteristics are those product requirements (Dimensions, specifications, tests) or process parameters which can affect compliance with safe vehicle operation. These characteristics require specific assembly, shipping, manufacturing or monitoring techniques to be incorporated and included onto the Control Plan.
AR - Rank Critical Characteristic (CC)	 or "AR" noted in the applicable Quality Rank Column	AR-Rank characteristics are those product requirements (Dimensions, specifications, tests) or process parameters which can affect compliance with government regulations. These characteristics require specific assembly, shipping, manufacturing or monitoring techniques to be incorporated and included onto the Control Plan.
B - Rank Significant Characteristic (SC)	"B" noted in the applicable Quality Rank Column	B - Rank characteristics are those product, process and test requirements that are important to customer satisfaction and for which Quality Planning Actions shall be included in the Control Plan.

Note: Characteristics with "C" Rank are also used by Mazda on drawings and engineering standards. "C" Ranked Characteristics are all other characteristics required to meet the specification but not ranked A, AR or B characteristics.

Note: "B" ranked characteristics which are not identified on Mazda's design records shall be determined by MNAO Supplier Quality Assurance Group.

Special Requirement for A -and AR- Ranked Parts

A-ranked Quality characteristics relate to the safety of the vehicle's passengers, other passengers of other vehicles or pedestrians. AR-ranked quality characteristics relate to government regulations. Mazda Product Engineering will specify A- and AR-ranked characteristics on the Specification Drawings and Mazda Engineering Standards (MES) by placing A and AR symbols next to the characteristics and part numbers. To assure that these characteristics meet the required specifications, the supplier shall incorporate the intentions of these characteristics into all phases of product development and mass production. The supplier is also responsible for maintaining and continually improving the manufacturing process to eliminate potential problems.

Special requirements which the supplier shall perform to achieve 100% Quality Assurance for the duration of the life of the product production are as follows:

- The supplier shall provide certification for regulated part/product to prove that they conform to relevant laws and regulations. Mazda recommends that the supplier(s) obtain this certification from an official laboratory when applicable.
- The supplier shall carefully incorporate the A- and AR-ranked characteristics identified on Mazda specification drawing and Engineering Standard (MES) into all stages of product and process development as well as Mass Production (MP). The supplier shall assure that all A- and AR-ranked characteristics are being controlled through all manufacturing and inspection operations by rank identification (A- and AR- characteristic symbols or supplier's equivalent symbols) on all quality documents such as design records, control plans, and work instructions.
- The process capability of A- and AR- ranked characteristics shall be CPK 1.33 or greater. If CPK 1.33 is not achieved, 100% inspection is mandatory.
- The supplier shall develop and implement a detailed procedure of product identification and trace ability that will provide records of material receiving, manufacturing, assembly, testing, inspection and shipping as well as records of design and process change implementation and effectiveness.

Control Plan Special Characteristics List

Control Plan Special Characteristics List shall be developed by the supplier to identify critical and significant characteristics. This list shall be approved by MNAO Supplier Quality Assurance Group. All critical and significant characteristics identified in the Control Plan Special Characteristics List shall be incorporated into the Pre-Launch and Production Control Plan for inspection, testing and preliminary process capability studies. Whenever any change is made that affects a special characteristic, the supplier shall resubmit the Control Plan Special Characteristic List to MNAO Supplier Quality Assurance Group for approval.

Refer to Section 3.0 Advanced Product Quality Planning in this manual for the procedure.

Prototype Control Plan

Prototype Control Plans are not required for parts or services to MNAO. Follow instructions in the Prototype Quality Control Standard for Suppliers set forth by Mazda Prototype Fabrication Group for inspection/testing data submission requirements for prototype parts.

Note: For air conditioning and accessory parts, consult MNAO Engineering Group for specific requirements related to each part and/or program.

[Element 4.4 - Design Control]

Rust Prevention Requirement

For overseas export parts/product shipped to Mazda Japan, adequate rust prevention requirements (e.g. surface treatment, rust preventative, oil, coatings etc.) are one of the design inputs which shall be identified on drawing(s). Packaging design shall be based on the rust prevention requirement. Refer to MNAO Packaging Guide reference manual for this requirement.

Engineering Approval of Supplier Drawing

Engineering approval utilizing the supplier's drawings for agreement is applicable for all parts or services supplied to MNAO except U.S installed air conditioning/accessory parts and when the Supplier is not responsible for the design of a part/product. The supplier shall develop a supplier's drawing(s) for agreement incorporating Mazda's design specifications and engineering standards and shall obtain drawing approval from Mazda Product Engineering Group.

Note: For air conditioning and accessory parts, consult MNAO Engineering Group for specific requirements related to each part and/or program.

The supplier shall submit the following to MNAO Purchasing Group on the designated date specified by MNAO:

- Two (2) copies of "Submission of Drawing(s) [Final/Prototype] for Agreement and Permission for Taking Out Transmittal Notice" form (see MES BA 302A for blank forms)
- One (1) Mylar and four (4) copies of the "Supplier Drawing(s)"

MNAO Purchasing Group will then forward the "Supplier Drawing(s)" to Mazda's Product Engineering Group for review and approval. If the "Supplier Drawing(s)" is found satisfactory, Mazda Product Engineering Group will sign and stamp the drawing(s) (see stamp below). If the drawing(s) is found unsatisfactory, Mazda will describe the problem in the reason for rejection space on the Transmittal Notice and contact the supplier to quickly revise the "Supplier Drawing(s)" and resubmit to MNAO Purchasing Group.

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Whenever the supplier receives an Engineering Change Notice (ECN) from MNAO, the "Supplier Drawing(s)" for agreement shall be revised to reflect the change(s) and resubmitted to MNAO Purchasing Group. Refer to MES BA 302A, Agreed Drawing Standards and Application Essentials for complete drawing submission requirements.

Supplier Request for Engineering Approval (SREA)

When the supplier wants to change the design, the supplier shall obtain Mazda Product Engineering approval using the Request for Engineering Approval and Reply sheet (REA) form. Refer to MES BA 401A Standard for Engineering Drawing Change Proposal for complete submission requirements. The supplier shall submit the REA to MNAO Purchasing Group who will then forward it to Mazda Product Engineering Group for their review. Approval shall be obtained prior to the implementation of the change.

Note: For VE/VA item(s), consult MNAO Purchasing group for specific procedure.

Mazda Engineering Standard (MES) Performance Test Requirements

The goal of Mazda Engineering Standard testing is to verify that parts meet the design intent. The MES specifies required inspection, testing items and test methods including the sample size and frequency for each development and mass production (MP) stage. The supplier shall perform inspection and testing per the MES requirement unless Mazda waives these requirements. All inspection and testing required by the MES shall be clearly identified in the

Control Plans. Appendix Table 1 of Mazda MES indicates the sample size and frequency for each production stage.

Acronym	Stage
S-1	Prototype-1
S-2	Prototype-2
PV	Production Validation
IP-1	In Process-1 Process capability has not been verified
IP-2	In Process-2 The process is stable and capable ($Cpk \geq 1.33$)

MES test failures shall be immediately informed to MNAO Supplier Quality Assurance Group. Production shipments shall stop immediately pending analysis of the process and corrective action.

[Element 4.9 - Process Control]

Preliminary Process Capability Requirements

Preliminary process capability studies shall be required for each supplier/ MNAO designated special characteristics at an early stage of process preparation (prototype parts, trial production, pilot parts build etc.) A PPK value of 1.67 or greater should be achieved. See Section 4.0 Production Part Approval Process (PPAP) for details procedure.

Ongoing Process Monitoring

The supplier is responsible for selecting the appropriate inspection methods to assure that all dimensions and characteristics meet Mazda's specifications. The following shall be utilized for quality control of special characteristics.

Condition of CPK or PPK	Reaction Plan
<ul style="list-style-type: none"> CPK value for critical and significant characteristics is <u>less than 1.33</u> for a stable process with normally distributed data. PPK value for critical and significant characteristics is <u>less than 1.67</u> for chronically unstable process with output meeting specifications and a predictable pattern. 	100% inspection Identify and correct causes
<ul style="list-style-type: none"> CPK value for critical and significant characteristics is <u>1.33 or greater</u> for a stable process with normally distributed data. PPK value for critical and significant characteristics is <u>1.67 or greater</u> for chronically unstable process with output meeting specifications and a predictable pattern. 	Sampling Continue to reduce variation in process output

Change Control

After mass production of a part has begun, it is not uncommon for modifications to be made due to quality improvements, productivity improvements or adjustments of production quantities, etc.. The supplier shall pay special attention to the effect

on quality when modifications are made. Refer to Section 4.0 Production Part Approval Process (PPAP) for details.

[Element 4.10 - Inspection and Testing]

Acceptance Sample Criteria

The acceptance sample is a physical sample developed by the supplier and approved by MNAO/Mazda to clarify quality acceptance criteria of specific items. Refer to Section 4.0 Production Part Approval Process (PPAP) and Appendix A - Completion of "Acceptance Sample Application" for details.

[Element 4.13 - Control of Nonconforming Product]

Interim Action Requirement

If a nonconformance of a part/product occurs, the supplier shall contain all suspect material to assure 100% quality compliance.

When a nonconformance is found by the supplier and there is a possibility that defective product has been shipped or delivered to MNAO/Mazda, the supplier shall immediately notify MNAO Supplier Quality Assurance Group for appropriate interim action.

When MNAO or Mazda discovers a nonconformance, the supplier will be notified through a Quality Defect Notification (QDN) issued by MNAO Supplier Quality Assurance Group requesting appropriate interim action.

When the supplier receives a Quality Defect Notification, within 24 hours the supplier shall respond by fax with the interim action information to MNAO Supplier Quality Assurance Group. The Mazda interim action responses from suppliers for nonconformance's include:

- 100% inspection
- Rework
- Additional production (including replacement of returned or scrapped parts)

If there is no response from the supplier within 24 hours, MNAO/Mazda will take appropriate interim action at their sites at the supplier's expense.

When sorting of the defective material is required at MNAO or Mazda, the supplier will be charged for the associated costs of material handling, sorting, reworking etc.

Note: When required, the supplier shall visit MNAO/Mazda for disposition of nonconformance parts/product including sorting and/or rework. If the supplier requests, sorting and minor rework may be carried out by an independent sorting company at the supplier's expense. MNAO requires a supplier representative to be present on site when exercising this option.

The supplier shall certify the shipments to MNAO/Mazda after implementing the interim action until permanent corrective action is in place. Certified labels shall be placed on each package/container. Refer to Appendix F - Forms and Labels for the Certified Label.

Request for Deviation

A Request for Deviation is a written temporary authorization by MNAO / Mazda to deliver a specified quantity of parts/product which does not comply with the approved design drawing or MES. Deviations will be considered for approval only when the nonconformance will not affect the following:

- Mazda's image and/or Marketability of product
- Function, performance or durability of the parts/product (evidence shall be provided.)
- Assembly of parts/product at Mazda assembly line

A Request for Deviation will not be approved if adequate inventory is available (i.e. through sorting of suspect inventory). A Request for Deviation will be limited to: a specific part number, quantity and/or time period. A approved Request for Deviation is not to be considered a permanent change to design drawings or MES.

The supplier shall fully complete the Request for Deviation form and submit it to the MNAO Purchasing Group. Refer to Appendix B - Completion of "Request for Deviation" for details.

The supplier shall clearly identify all discrepant material and quarantine it in a location that will prevent shipping or possible usage of the material.

The Request for Deviation will be reviewed and the supplier will be notified of the result by MNAO Supplier Quality Assurance Group via the MNAO Purchasing Group. Rejected requests will be marked "rejected" and returned to the supplier.

All deviated parts shall be identified with a jointly agreed upon (supplier and MNAO SQA) deviation mark. The method of marking shall be described on the approved Request for Deviation form or attachment. Each skid or container of deviated parts shall be clearly identified by attaching a copy of the approved Request for Deviation form to them. All deviated parts shall be delivered on the date specified in the request for deviation

