

MPL QUALITY MANUAL

Company Overview

MPL is a mature, privately held company founded in 1973. CEO and founder, Gerald F. Tucci, is intimately involved in the overall operation of the business and works closely with MPL president, Michael F. Tucci.

MPL manufactures miniature pressure, vacuum and differential switches for a variety of applications. The company's products are sold throughout the United States, Canada, Europe and the Far East.

Corporate HQ & Engineering Center

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Structure & Format of Quality Manual

This Quality Manual is structured in accordance with **ISO 10013** "Guidelines for developing quality manuals." It describes the MPL quality system, which is based on ISO-9001 requirements. The structure of the quality manual is as follows:

- Each element of the quality system is summarized within the Quality Manual.
 - References to existing **MPL Quality Assurance Procedures (QAP)** covering the detail requirements and conformance are given in Exhibit 1 "ISO 9001 Baseline."
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Quality Policy & Objectives

MPL will continuously improve its products to better satisfy the needs of its customers and will deliver to them, on time and every time, defect-free products.

It is the objective of MPL to be recognized as the premier source of electromechanical control solutions. It is also our objective to provide added value to our customers in their production process and final product performance.

- We pursue these objectives through:
- Listening to our customers and being in concert with their goals.
- Utilizing our capabilities in innovative components design and fabrication methods.

Quality & Policy Objectives (Continued)

- Emphasizing continuous improvement in cost reduction, feature enhancement, and total quality.
 - Emphasizing prevention of non-conformance rather than detection.
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Organizational Structure

The organizational structure of MPL is documented on formal Organizational Charts. The Quality function is executed by the Quality Manager who reports directly to the General Manager. Organizational chart for the Executive Staff is shown below.

Gerald F. Tucci, CEO

Michael F. Tucci, President

Steve Veselaski, VP Engineering

Daniel Bracewell, Sales & Marketing

Joseph Gabbay, Corporate Quality

Richard Bissell, MPL Quality

Michael McMahon, General Manager

Phil Uruburu, VP Logistics

Magda Posada, Engineering Services

Management Responsibility

The management of MPL provides leadership and participation in order to achieve an environment conducive to error-free work.

The responsibility, authority and the inter-relation of personnel who manage, perform and verify work affecting quality are defined and documented as follows:

- Organizational charts specify the delegated authority and interrelationships within the departments.
- The responsibilities of personnel are defined in the job descriptions for employees who manage, perform and verify work affecting quality.

Primary quality related responsibilities of the **Executive Staff** are as follows:

- **President** - Defines quality policy, objectives and management responsibilities relevant to the organizational goal.
- **General Manager** - Establishes quality system based on the quality policy and directs the management in pursuing them.
- **Quality Manager** - Coordinates overall activities pertaining to the quality system. Maintains control of Documentation and Data, Inspection and Testing, Calibration, Inspection and Test Status, Nonconforming Product, Corrective/Preventive Action, Quality Records, Internal Quality Audits, Training, and Statistical Techniques.
- **Engineering Manager** - Coordinates activities pertaining to Design Control.
- **Purchasing Manager** - Coordinates activities pertaining to purchasing.
- **Production Manager** - Coordinates activities pertaining to, Customer-supplied product, Product Identification and Traceability, Process Control, Handling, Storage, Packaging, Preservation and Delivery.
- **Sales/Marketing Manager** - Coordinates activities pertaining to Contract Review and Servicing.

Management Responsibility (Continued)

Resource requirements are developed within the budget schedule. They are based on the thorough evaluation of needs required to maintain adequate work performance and verification (including internal quality audits).

The **Quality Manager** is assigned as the **Management Representative** who has authority for ensuring that the quality system is established, implemented, and maintained.

Management reviews are conducted on a bi-annual basis to review the quality system and ensure its continuing conformance and effectiveness. Records of the Management Reviews are maintained.

Quality System

The **MPL Quality System** is designed in conformance to **ISO 9001** requirements. The structure of the MPL Quality System is summarized within this quality manual. Documented Quality Assurance Procedures (QAP) provide the required conformance to individual ISO 9001 system elements (see Exhibit 1).

Furthermore, when detailed work instructions are required for specific product or function, Product Assurance Procedures (PAP) or Work Instructions (WI) are generated.

Quality System Forms (QSF) are formal logs, records and/or forms that provide objective evidence of the quality system implementation. Responsible departments, retention time and indexing method are established.

Quality Assurance is responsible for Quality Planning. Quality Planning activities include the development and preparation of the Production Move Ticket (Process Flow Charts) and Quality

Control Plans (QCP). Production Move Ticket is developed at an early stage based on any process and inspection assumptions. QCP is developed during the design verification process. The Production Move Ticket and QCP are submitted to the customer as required during the final validation step.

Contract Review

MPL performs a detailed review of any applicable quotation requests and all customer purchase orders and specifications. The review of the quotation request, purchase order or contract begins with the Sales Representative who has the responsibility for initiating the review cycle, coordinating and disseminating contractual information. This responsibility is focused to ensure that the customer's requirements are adequately defined and documented and that MPL has the capability to meet the contractual requirements.

Any differences between proposals and purchase orders shall be resolved. Any changes to initial contracts shall be documented, reviewed and approved prior to acceptance.

Channels for communication and interface with our customers are established and coordinated through the Sales/Marketing department.

Design Control

All elements of the design control process are initiated through the contract review system. Each new product design requires a detailed plan for all design activities.

Design Control (Continued)

Elements of the design activities are assigned to qualified personnel which have direct responsibility to complete their respective tasks. The design development progress is monitored on a Design Developer Tracking Record (DDTR) which is updated as required.

The design control process begins with the evaluation of design input requirements which may include customer specification, product usage and functional characteristics, design simulation such as Finite Element Analysis (FEA), prototype development, and results of the contract review activities. From the design inputs, MPL converts the customer and product requirements into internal standards known as design outputs.

The design inputs are thoroughly evaluated and retained during the design review process. The inputs are utilized to develop the design output package which will be composed of MPL product prints, Production Move Tickets, Quality Control Plans and any other document required to assure product conformance.

Design outputs are verified during critical stages of the design development cycle.

Representatives from Sales, Engineering, Production, Purchasing and Quality departments participate in the design review. The applicable design output is verified to the design inputs as well as the requirements of the Design Failure Mode and Effect Analysis (DFMEA). Finally, the design validation is performed to the customer requirements. This includes a formal Production Part Approval Process (PPAP) submission when required.

Any design changes which occur after the final product validation step are processed through the MPL document control system.

Document & Data Control

The MPL document and data control system is an integral part of the quality system. Each document that forms a critical part of the quality system is reviewed and approved by authorized representatives from the relevant departments. A list of all relevant documents is utilized to illustrate the approved document status, revision level and all outstanding Engineering Change Notices (ECNs).

Documentation and data control is the responsibility of the Engineering and Quality Assurance departments. Document Control Administrator maintains control over all document processing, distributing and filing activities.

The document and data control system assures that up-to-date documents are implemented and maintained, updated drawings are distributed promptly to all concerned users, and that out-of-date drawings are removed and destroyed upon receipt of the new drawings.

Any change to the original qualified baseline requires a formal Engineering Change Notice (ECN) prior to implementation. Major process and/or configuration changes that affect product form, fit or function require customer's participation and approval.

Purchasing

The Purchasing department is responsible for the generation and issuance of all vendor purchase orders along with corresponding documentation. Procurement specifications are generated for all piece parts and raw materials. The Purchasing department ensures that

Purchasing (Continued)

pertinent quality requirements are clearly stipulated and only suppliers listed on the Approved Vendor List (AVL) have been selected.

MPL verification of purchased product at subcontractor's premises and customer verification of subcontracted product are specified and controlled as required.

The Quality Assurance department is responsible for maintaining the Vendor Rating System on the basis of on-time delivery and product acceptance. Regular vendor surveys and evaluation of potential and current suppliers are performed. This provides the continued assurance regarding supplier capability to comply with MPL requirements.

Control of Customer Supplied Product

Customer supplied product is separately identified and controlled by the Materials department. Except for the special identification, customer-supplied product is processed and controlled in the same manner as other supplied materials.

Product Identification & Traceability

MPL maintains a detailed identification and traceability system starting from receipt of procured material and through product fabrication and final delivery to the customer.

Purchased material is identified with a unique "Tag Number". All produced product is assigned a unique Work Order Number listed on the Production Move Ticket.

Process Control

All manufacturing processes which affect product quality have documented process control procedures. Critical parameters are defined for each process and continuously monitored. Product/process control books which include documents, logs, charts, etc. required to produce specific product are developed for each part series. All processes performed in-house meet county, state and federal regulations regarding air contamination, sewer discharge and waste removal.

A Preventive Maintenance program is implemented and maintained for all tooling and equipment which directly affect the quality of MPL product.

Inspection & Testing

MPL maintains a strict Quality Control System for all inspection and testing activities. The overall inspection requirements for a specific part are documented in the Quality Control Plan (QCP).

Taking into account specifics of the various inspection areas and product type, separate procedures are developed for:

- Receiving Inspection and Testing for raw material, piece parts, and outside services.
- In-process Inspection and Testing for Stamping, Molding, and Assembly
- Final Inspection and Testing includes Final Quality Control Inspection of the parts and Final Quality Audit upon completion of packaging and prior to shipment.

Inspection and Test records are maintained and controlled by Quality Assurance.

Control of Measuring & Test Equipment

MPL has a documented system for control, calibration and maintenance of inspection, measuring and test equipment utilized to verify product conformance or critical process characteristics. The calibration system is controlled and maintained by Quality Assurance.

A unique ID number is assigned to all measuring and test equipment which require calibration.

All equipment is calibrated at specified intervals with traceability to the National Institute of Standards and Technology (NIST). Any equipment requiring calibration is automatically recalled from point of usage before the calibration due date using a Calibration Transaction Record. Equipment is calibrated in accordance with specific Calibration Instructions. Accuracy verification is performed to cover the full gauge application range. Descriptive labels are used to identify equipment calibration status.

Inspection & Test Status

The inspection and test status of materials, parts and assemblies is recorded on the applicable paperwork accompanying the product through the use of the quality inspection and identification stamps. All stamps have unique identifying numbers and are controlled by Quality Assurance.

Control of Nonconforming Product

MPL maintains a formal system for identifying, reporting, segregating and controlling nonconforming product. The system requires the generation of a Non Conformance Report (NCR) for every non-conformance occurrence throughout the production process. Subsequent to generating the NCR, a technical evaluation is performed which includes root cause analysis and corrective action when applicable. All non-conforming product is quarantined until formal disposition by the Management Review Board (MRB) when appropriate.

The Management Review Board (MRB) is formed to review and properly disposition the nonconforming product. The MRB consists of disciplines of all applicable departments who are authorized to formally assign product disposition as: use as is, rework, 100% sort, and scrap. The Quality Assurance department coordinates all efforts of the MRB activities. When applicable, the customer is notified and participates in the decision making process. Any material dispositioned for rework, or 100% sort, is resubmitted for reinspection in accordance with the Quality Control Plan.

Corrective & Preventive Action

MPL has an effective Internal, Supplier and Customer initiated corrective/preventive action system:

- If a non-conformance is related to the raw material and detected either during incoming inspection or in-line, the Supplier Corrective Action is initiated.
- If a non-conformance is related to the product and detected during set-up, in-process, or final inspection, the Corrective Action is initiated as part of the processing of a Non-Conformance Report (NCR).
- For system related and frequent product related non-conformance, the Internal Corrective Action is initiated.
- Preventive Action is taken when all other measures have failed to positively prevent recurrence of the non-conformance. Preventive Action activities are recorded on the

Corrective & Preventive Action (Continued)

- Eight-Discipline (8D) Report and the results reviewed at the regular Management Reviews.
 - For customer-initiated complaints, External Corrective Action Reports (ECAR) are prepared (unless otherwise specified by the customer).
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Handling, Storage, Packaging, Preservation & Delivery

All product is handled in a manner that prevents damage or deterioration from external handling and environmental effects. If standard handling methods are not sufficient, specific handling instructions are generated.

Designated storage areas are used for product pending use or delivery. Appropriate methods for authorizing receipt and dispatch from these areas are defined and documented. An inventory system is established to continuously optimize inventory turns over time, assure stock rotation and minimize inventory levels. All packaging requirements are identified and documented for individual part numbers.

Finished product prepared for shipment is preserved in accordance with specific packaging instructions. Finished product prepared for storage is preserved in the manner preventing contamination and damage of parts.

Control of Quality Records

All records that provide critical information assuring product conformance are identified and controlled. Responsible department, active file retention time, storage retention time and indexing method are established.

The quality records are stored and retained in a manner that prevents damage, loss and deterioration. Records containing company confidential or classified information are identified and maintained in second files accessible only to authorized personnel.

Obsolete legal documents (including prints) are retained for seven (7) years.

Internal Quality Audits

The Quality Assurance department regulates and maintains the internal audit program.

Internal Quality Audits are performed by Internal Quality Auditors independent of areas being audited.

An Internal Audit schedule is established. The audit process includes audit preparation, opening meeting, audit, closing meeting.

The Internal Audit Reports are documented and provided to responsible personnel. If applicable, Internal Corrective Actions Requests (ICAR) are assigned.

The auditor follows-up on the audit to evaluate both the response to corrective actions taken and to their effectiveness.

Training

MPL has a documented system for identifying training needs of all personnel performing activities affecting product quality and/or service.

Training (Continued)

The training program is designed to provide continuous knowledge of the latest available techniques to perform the individuals work function. There are four established training categories at MPL:

- Quality orientation
- Quality system training
- Operator/Inspector training
- Safety (regulatory)

All training activities are conducted per a formal Employee Training Matrix.

Servicing

In the event of a contract requirement for product servicing after shipment, a specific Product Assurance Procedure (PAP) is generated. A system for handling customer complaints and returns is established and maintained by Quality Assurance.

Statistical Techniques

Statistical techniques are utilized to establish, control, and verify critical process characteristics and capabilities. The selection of appropriate statistical tools for each process characteristic is determined and included in the Quality Control Plan. Basic Statistical Process Control (SPC) knowledge is an essential part of the company's training program. The Quality Assurance department is responsible for coordination and implementation of statistical techniques both in production and inspection.