



Davan Manufacturing Company
500 Crile Road, Washington, PA 15301 Phone: (412)228-0115 Fax: (412)228-0190
Precision Parts Manufacturing

Quality Control

Manual

Approved By: _____ Date: _____

Control No.: _____ Assigned to: _____

INTRODUCTION

This manual describes our quality control system for our customers, employees and suppliers. The system applies to all items manufactured and/or purchased.

As dictated by the complexity of product design, manufacturing techniques used, and customer requirements, more specific written procedures may be required to implement the policies set in this manual.

No changes may be made to this manual or any supplementary quality control procedures unless approved by the ownership of Davan Manufacturing Company.

TABLE OF CONTENTS

<u>DESCRIPTION</u>	<u>SECTION</u>
SCOPE	1.0
RESPONSIBILITIES	2.0
REVIEW OF CUSTOMER REQUIREMENTS	3.0
SUPPLIER CONTROL PRACTICES	4.0
MANUFACTURING AND QUALITY PLANNING	5.0
MATERIAL IDENTIFICATION AND ROUTING	6.0
DRAWING AND SPECIFICATION CHANGE CONTROL	7.0
RECEIVING INSPECTION	8.0
RAW MATERIAL CONTROL	9.0
IN PROCESS INSPECTION	10.0
ASSEMBLY INSPECTION AND FUNCTIONAL TESTING	11.0
FINAL INSPECTION AND TESTING	12.0
NON-CONFORMING MATERIAL CONTROL	13.0
TOOL AND GAGE CONTROL	14.0
OVERRUN STOCK CONTROL	15.0
PACKING AND SHIPPING	16.0
SYSTEM CONFORMANCE	17.0
RECORD RETENTION	18.0
REVISION HISTORY	
APPENDIX A	ORGANIZATION CHART
APPENDIX B	CERTIFICATE OF COMPLIANCE FORM
APPENDIX C	MANUFACTURING PLANNING FORM
APPENDIX D	MANUFACTURING/INSPECTION FORM (Shop Work Order)
APPENDIX E	CORRECTIVE ACTION FORMS
APPENDIX F	ENGINEERING CHANGE FORM
APPENDIX G	SHOP WORK ORDER
APPENDIX H	CALIBRATION SCHEDULE
APPENDIX I	MATERIAL CONTROL TAGS

1.0 SCOPE

- 1.1 The quality control system is designed to ensure Customer satisfaction by providing a policy that will produce continued high levels of quality.
- 1.2 The quality control system employs controls throughout the business; from receipt of customer's order to the delivery and use of the products.
- 1.3 Written manufacturing, inspection, and test procedures will be prepared to supplement drawings and other specifications, as necessary.
- 1.4 The quality program is designed to meet the requirements of MIL-Q-9858A with inspection system requirements to MIL-I-45208A and calibration system requirements to MIL-STD-45662.
- 1.5 Statistical Process Control will be used where applicable. Control Chart techniques will be used to analyze a process or its output so as to take appropriate actions to achieve and maintain a state of statistical control and to improve the capability of the process.

2.0 **RESPONSIBILITIES**

- 2.1 The manager of Quality Control reports directly to the Plant Manager.
- 2.2 The Quality Control/Tooling Coordinator's responsibilities include:
 - 2.2.1 Planning how to meet customers' quality requirements.
 - 2.2.2 Reviewing customer drawings and specifications.
 - 2.2.3 Determining inspection points.
 - 2.2.4 Writing inspection and test procedures.
 - 2.2.5 Establishing the most effective and efficient quality assurance procedures possible.
 - 2.2.6 Monitoring procedures to assure compliance.
 - 2.2.7 Keeping adequate quality assurance records.
 - 2.2.8 Reviewing quality assurance records and overseeing follow-up for correction and prevention of defects.
 - 2.2.9 Assuring that our suppliers' quality control and follow-up are adequate.
 - 2.2.10 Inspecting all special and standard gages, test equipment, and tooling used to manufacture products when acquired and calibrating them on a regularly scheduled basis.
 - 2.2.11 Coordinating in-plant and supplier correction of items rejected by customers, advising customers of corrective action taken, and evaluating the actions for effectiveness.
 - 2.2.12 Maintaining a list of company "approved" suppliers.

3.0 **REVIEW OF CUSTOMER REQUIREMENTS**

- 3.1 All shop work orders are routed through the Plant Manager to the Quality Control/Tooling Coordinator.
- 3.2 The Quality Control/Tooling Coordinator conducts a complete review of the requirements to identify and make provisions for the special controls, processes, test equipment, fixtures, tooling and skills necessary.
- 3.3 Inspection techniques and work instructions are reviewed to assure compatibility of manufacturing, inspection, testing and documentation.
- 3.4 All applicable drawings, specifications and special purchase order requirements are reviewed.
- 3.5 Any exceptions to customer requirements are resolved and documented prior to beginning production.

4.0 **SUPPLIER CONTROL PRACTICES**

- 4.1 An “approved” list of suppliers is maintained by the Quality Control/Tooling Coordinator. The list contains types of products or services approved for, and includes any restrictions dictated by customer requirements.
- 4.2 Evaluation criteria for approved suppliers includes.
 - 4.2.1 Type of product or service furnished.
 - 4.2.2 Suppliers’ quality control system.
 - 4.2.3 Supplier’s past performance.
 - 4.2.4 Customer requirements.
 - 4.2.5 Relative importance of items.
 - 4.2.6 Results of Q.C. audits.
- 4.3 All purchase orders to suppliers must be issued and signed by approved personnel.
- 4.4 Customer requirements are checked before a purchase order is issued to assure approved sources are used.
- 4.5 When the purchase order is released, the buyer will send our supplier all specifications and other customer requirements with the P.O.
- 4.6 If there is a drawing or specification change after our order is placed with the supplier, our buyer will send the supplier a purchase order change, including the latest drawings or specifications.
- 4.7 Copies of all purchase orders are kept on file.
- 4.8 All purchase orders for non-destructive testing will specify and require certifications of 100 percent testing unless otherwise specified by the customer.

5.0 **MANUFACTURING AND QUALITY PLANNING**

- 5.1 When necessary, a manufacturing/quality plan with detailed "how to do it" instructions is provided.
 - 5.2 During development of the planning, consideration is given to customer requirements, process capability, types of equipment, skills, and the system of control used.
 - 5.3 The sequence of manufacturing is specified including machines, processes, and special methods to be used.
 - 5.4 Planning is reviewed for necessary changes when drawing or specification revisions are received.
-

6.0 **MATERIAL IDENTIFICATION AND ROUTING**

- 6.1 A shop work order number is assigned to each lot of parts that is traceable back to the customer's P.O.
- 6.2 An individual protective plastic folder is made for each part number containing the current drawing, specifications, work instructions, special processes, special requirements, delivery requirements, and all inspection forms. This folder remains with the parts throughout production process.
- 6.3 Parts will be handled in a manner to avoid damage and retain lot identification. Special containers are provided, when necessary.
- 6.4 Operators sign and date the manufacturing/inspection forms for operations performed completely and in sequence.
- 6.5 Serial numbers are assigned, if necessary, to customer specifications.

7.0 **DRAWING AND SPECIFICATION CHANGE CONTROL**

- 7.1 We manufacture to customer drawings and specifications. These are filed by customer name.
 - 7.2 Changes are reviewed by the Quality Control/Tooling Coordinator before incorporation to assure affected areas are changed properly and documented.
 - 7.3 Revision history is maintained so that the date, order, lot, or serial number where incorporation began can be determined.
 - 7.4 Changes are not made without the proper documentation and approval.
 - 7.5 A system will be maintained to obtain the latest revisions of required government/industry standards and specifications (MIL, AMS, etc.).
-

8.0 **RECEIVING INSPECTION**

- 8.1 All parts and materials will be received and logged in by the Shipping/Receiving Manager.
- 8.2 All parts and materials will be sent to the Receiving Inspection area after logging in.
- 8.3 The Shipping/Receiving Manager will assure that proper certification, physical and chemical test data, special process certifications, or source inspection certifications are with the items to be inspected.
- 8.4 The Quality Control/Tooling Coordinator must approve all inspection documentation completed by the Shipping/Receiving Manager.
- 8.5 Inspection will identify accepted lots and send to the next operation.
- 8.6 Rejected lots will be identified and set aside until disposition is made by the buyer and Quality Control.
- 8.7 Corrective Action Reports (CAR) will be initiated as required.
- 8.8 The Purchasing Department has the responsibility of assuring that a pattern of continually receiving faulty items from any supplier does not develop and assuring supplier corrective action.
- 8.9 The Quality Department will follow up to assure corrective action is effective.
- 8.10 Unless otherwise specified, Receiving Inspection will be to MIL-STD-105D.
- 8.11 All inspection records will show the number inspected, the number rejected, and the name of the inspector.

9.0 **RAW MATERIAL CONTROL**

- 9.1 Raw materials, bar stock, sheet stock, castings, and forgings will be marked so they can be traced back to their order and certification.
- 9.2 Raw materials will be stored in a designated area until released for production.
- 9.3 Copies of all certifications will be filed with other pertinent documents relating to the order and are available for customer review.
- 9.4 Certified stock will be issued from its storage area only for job order requirements.
- 9.5 Only raw material accepted by the Quality Control/Tooling Coordinator will be released for production.
- 9.6 Verification of suppliers' certifications will be ordered from independent testing laboratories when deemed necessary by the Quality Control/Tooling Coordinator or to meet customers' requirements.
- 9.7 All certifications will be traceable to purchase order, the date of receipt of the material, and the inspector of the material.

10.0 **IN-PROCESS INSPECTION**

- 10.1 The Quality Control/Tooling Coordinator will make first-piece inspection after setup is completed and approved by Production. The first-piece inspection part will then be tagged and used for reference during the production process.
- 10.2 No production runs will be made until first-piece inspection is accepted.
- 10.3 After first-piece inspection acceptance, in-process inspections will be the responsibility of the operator made at intervals adequate for early detection of processes producing material that doesn't meet standards.
- 10.3.1 A random "spot" inspection of work in-process may be authorized only by the Quality Control/Tooling Coordinator at times warranted by the complexity of the production process.
- 10.4 When necessary, the in-process inspection includes checking for compliance to the manufacturing planning.
- 10.5 First-piece and in-process inspections will be logged on the manufacturing/inspection forms and will list:
- The customer's part number,
 - part rejection or acceptance,
 - kind of defects and basic causes of rejection
 - date of inspection, and
 - the inspector's signature
- 10.6 All inspection records will be stored in the job folder and will be available for customer review.
- 10.7 Rejected items will be tagged or otherwise identified and removed from the normal flow of in-process materials.
- 10.8 CARs will be initiated, when necessary, and the Quality Control/Tooling Coordinator will follow up to prevent recurrence of faulty material.
- 10.9 Special processes will require appropriate inspections and controls, including qualifications and certification of personnel and equipment.

11.0 **ASSEMBLY INSPECTION AND FUNCTIONAL TESTING**

- 11.1 Production personnel will make assembly inspections and do functional testing as required.
- 11.2 The Quality Control/Tooling Coordinator will check functional tests under an established sampling plan.
- 11.3 Inspections will be logged on the manufacturing/inspection forms and will list:
- The customers part number,
 - part rejection or acceptance,
 - kind of defects and basic causes of rejection,
 - date of inspection, and
 - the inspector's signature
- 11.4 Inspection records will be stored in the job folder and will be available for customer review.
- 11.5 All faulty (discrepant) assemblies will be marked and set apart so they won't accidentally be used.
- 11.6 CARs will be initiated, when necessary, and the Quality Control/Tooling Coordinator will follow up to prevent recurrence of faulty material.

12.0 **FINAL INSPECTION AND TESTING**

- 12.1 Final inspection and tests will be performed either on 100 percent or on a sample of the items. The number of items sampled will depend on the complexity of the items, customer requirements, and the process capability producing the item.
- 12.2 Product acceptance will be based upon customer requirements. When necessary, the manufacturing/quality planning will specify exact requirements for product acceptance.
- 12.3 When not otherwise specified, final inspection and product acceptance will be to MIL-STD-105D.
- 12.4 Final inspections will be logged on the manufacturing/inspection forms and will list:
- The customers part number,
 - part rejection or acceptance,
 - kind of defects and basic cause for rejection,
 - date of inspection, and
 - the inspector's signature
- 12.5 Final inspection records will be stored in the job folder and will be available for customer review.
- 12.6 CARs will be initiated, when necessary, and the Quality Control/Tooling Coordinator will follow to prevent recurrence of faulty material.
- 12.7 All faulty material will be marked and set apart from the normal flow of finished material.
- 12.8 Faulty material will not be shipped to the customer without specific customer instructions to submit such non-conforming material.
- 12.9 Rejected material which has been repaired, reworked, or sorted must be resubmitted to final inspection to make sure it meets requirements.

13.0 **NON-CONFORMING MATERIAL CONTROL**

- 13.1 All non-conforming material will be placed in a "DO NOT USE" area. The items will be clearly marked with job number, part number, revision, lot size, defect, inspector's name, and any other information necessary.
- 13.2 The specific reason an item has been rejected will be clearly written on a rejection tag attached to each part or container.
- 13.3 No one may remove items from the "DO NOT USE" area until disposition is determined by the Quality Control/Tooling Coordinator or the Plant Manager.
- 13.4 Non-conforming material will not be shipped unless the customer approves it. The parts will be tagged with the discrepancy and approval. All shipping documents will be marked with the discrepancy and approval.
- 13.5 The Quality Control/Tooling Coordinator will control all lots submitted for acceptance inspection. Each lot will be kept as a unit, apart from other lots, and out of the normal flow of material
- 13.6 During the processing of material all production and inspection operations must be kept in proper order. Each step must be completed before the next step is begun.
- 13.7 Unidentified material will be taken out of the normal flow of production until it is inspected to ensure that it meets all specifications.
- 13.8 Reworked material will be segregated from other material until the Quality Control/Tooling Coordinator determines its status.

14.0 **TOOL AND GAGE CONTROL**

- 14.1 All special tools, jigs, fixtures, gages, and measuring equipment must be properly identified.
- 14.2 Each new or reworked tool, jig, fixture, gage, and item of measuring equipment will be inspected by the Quality Control/Tooling Coordinator before issue for use. (i.e. it is shop practice to measure all variable measuring devices with a gage block prior to use.).
- 14.3 All gages, measuring and test equipment will be calibrated, maintained, and certified in accordance with MIL-C-45662, and to standards set by the National Bureau of Standards.
- 14.4 A written schedule for calibrating gages, measuring and test equipment will be set and strictly followed. Frequency of calibration will be based on type and purpose of the equipment and severity of usage.
- 14.5 A strict system of issue control and return will be set and followed.
- 14.6 If the customer supplies special gages, they will be checked at the intervals the customer sets. If the customer supplies no inspection schedule, the equipment will be checked according to a schedule that takes into account type, purpose, and severity of use.
- 14.7 Tools and gages will be identified to show the last date of calibration and the due date of the next calibration.
- 14.8 Personal, as well as company owned production and inspection tools, must be properly and regularly calibrated.
 - 14.8.1 Personal inspection tools must be logged and calibrated according to a company calibration schedule. The Quality Control/Tooling Coordinator has the option to check calibration at any interval during the manufacturing process.
 - 14.8.2 Company owned production and inspection tools is the responsibility of the Quality Control/Tooling Coordinator. The operator has the option to request a check of calibration at any interval during the manufacturing process.

15.0 **OVERRUN STOCK CONTROL**

- 15.1 The Plant Manager or Quality Control/Tooling Coordinator will oversee overrun stock.
 - 15.2 The Quality Department will ensure that any overrun parts sent to stock are properly marked "accepted". The customer, part number, latest drawing, and specification revision, date of inspection, job number, and quantity of parts will be shown. The Quality Control/Tooling Coordinator will periodically check to see that the parts are properly packed to prevent deterioration and damage.
 - 15.3 No overrun parts will be shipped to a customer until they are re-inspected and found to be in acceptable condition and that they meet the latest drawing and specification revision.
-

16.0 **PACKING AND SHIPPING**

- 16.1 No order will be shipped to a customer until all shipping papers are stamped or signed and dated by the Quality Control/Tooling Coordinator.
 - 16.2 No order will be shipped until all required certifications, test reports, special samples, etc. have been packed with the material in accordance with the customer's requirements and accepted by the Quality Control/Tooling Coordinator.
 - 16.3 All material will be packed to prevent damage, deterioration, and substitution.
 - 16.4 The customer will be identified on the packaging, parts, and as otherwise necessary to prevent lost and misdirected shipments.
 - 16.5 The order will be packed as directed by the customer, if applicable.
-

17.0 **SYSTEM CONFORMANCE**

- 17.1 Periodically, management knowledgeable of the system will perform system conformance audits.
- 17.2 All related systems and sections will be audited.
- 17.3 Records will be maintained on audit findings and action will be taken to correct deficiencies.
- 17.4 The frequency of the audits will be adjusted based on audit findings.

18.0 **RECORD RETENTION**

18.1 Quality records relating to a specific order or lot of material will be retained for three years unless otherwise specified.

18.2 If specified by the customer, records will be retained in accordance with his requirements.

REVISION HISTORY

1 - 05 - 82	Initial Quality Manual issued
7 - 30 - 82	Revision #1 Change MIL-C-45662 to MIL-STD-45662
12 - 15 - 83	Revision #2 Add Engineering Change Form & Statistical Process Control Addendum
7 - 15 - 96	Revision #3 Edit section 14.2 clarifying standard shop practice.
3 - 07 - 97	Revision #4 Edit various sections in the manual to comply with a new position with-in the company.