

# Quality Control Manual

---

## FUNCTION and OBJECTIVE

1. Maintain a quality control program in accordance with Mil - I - 45208 (Government) and other requirements by our customers.
2. Certify all precision measuring equipment used in determining end product accuracy.
3. Maintain surveillance over Inspection equipment. Per: Mil-STD-45662A.
4. Perform in-process inspection during fabrication, and control accuracy of Company owned instruments through periodic calibration.
5. Compile and maintain record of all inspection, from receipt of raw material through shipment.
6. Conduct sampling in accordance with the customer plan or government Mil-STD-105.
7. Employ and maintain a drawing and change control system per customers' requirements.
8. Package for assured safe delivery, considering configuration and destination, unless otherwise specified or controlled by customer.

---

## RECEIVING INSPECTION & CONTROL

1. PURPOSE: To provide a procedure for control of incoming material.
2. SCOPE: All raw material, purchased parts and sub-contracted processing.
3. Information such as manufacturing standards, military specifications, drawings and other pertinent data will be maintained by inspection for reference. (Drawing and change control, page 14.)
4. Special processing of raw material will be accompanied by chemical and/or physical certifications to specific blue-print requirements.
5. PROCEDURE:
  - 5.1. All materials received will be certified as to chemical analysis, heat treat or any other requirements of purchase order or drawings.

5.2. All certifications for material received will be kept on file along with purchase order for which the material was intended.

5.3. Under no circumstances will material be used on any job if it cannot be identified with certification.

5.4. If for any reason material should be used from one job to another, a copy of the certification will be forwarded to that particular file.

5.5. A receiving log will be kept on all incoming materials received for the purpose of manufacturing production parts. At a minimum the receiving log will include:

- A. Purchase order number that the material was ordered for.
- B. Certification Received (Yes or No)
- C. Date Received
- D. Accept or reject
- E. If Rejected (Reason)
- F. Signature of Receiver
- G. Quantity Received
- H. Material Lot Number

6. 5.6. If material does not meet all specifications or if certification is not received, it will go to the M.R.B. area immediately for disposition.

7. 5.7. If the material is acceptable to all specifications, it will then be put into the material storage area. At that time it will be identified with purchase order number and customer.

---

## **FIRST ARTICLE INSPECTION**

- A first article Inspection Report shall be conducted on the first manufactured lots of parts per each part number. A part will be selected at random and tagged for identification. The results will then be recorded in a First Article inspection Report Form or inspection report pending the contractual agreement of the customer.
  - First Article inspection Report Forms shall be reviewed by a Quality Assurance Representative before shipment. All First Article Inspection Reports will be filed in the job folders and kept on file for (7) seven years.
  - A First Article Inspection report will be done again if a drawing change has been made or the manufacturing process has been changed. Only those characteristics affected will need to be re-inspected.
-

## DETAILED INSPECTION PLAN

- A detailed inspection plan shall be prepared for each part number pending customer requirements of contract. It will identify the inspection requirements and techniques, as well as providing a plan to record the results of our findings.
  - If used, the detailed inspection plan shall be approved by a Quality Representative prior to the First Article Inspection and shipment. Any drawing changes made, are dimensional characteristics, shall be reviewed by a Quality Representative for update.
- 

## IN-PROCESS INSPECTION

1. To insure proper control of work in-process, production control will issue manufacturing planning sheets for each job (Traveler). Inspection points will be specified and space provided for first article acceptance stamping.
2. Should conditions indicate the requirement for screening at any point in process, the entire lot will be inspected.
3. Changes to manufactures plans are made by authorized personnel only, identified by stamp and date.
4. Inspection records will be reviewed and maintained for seven (7) years.

### PROCEDURE:

- A. Assure correct material is used.
  - B. Conduct First Article Inspection after each operation by stamping area provided on traveler.
  - C. Assure proper instruments are being used and that they are calibration dated.
5. Outside processing will be performed in compliance with specifications which include using customer approved sources.
  6. First Article samples will be delivered to the customer for approval, unless source witnessed.
  7. Production will not begin until customer approval of First Article, when required.
- 

## FINAL INSPECTION

1. Each lot of production will be inspected per Mil - STD - 105D sampling plan or per amended Dodge-Romig sampling table when required by Customer. All dimensional inspection will be performed prior to processing. visual and dimensional inspection when coatings affected tolerances will be accomplished after processing. In support, inspection must have the completed in-process traveler, purchase order and applicable drawing(s) and specifications.

2. The parts and travelers will be stamped to indicate acceptance and the quantity rejected, if applicable.
  3. Rejected parts will be stamped and forwarded to the material review board.
  4. Accepted parts will be forwarded to shipping.
  5. A daily log will be maintained by final inspection showing part number, number of pieces accepted and rejected.
  6. All inspection records will be retained for a period of seven (7) years.
- 

## **SHIPPING**

1. Shipping inspection will be responsible for final identification of all production parts, including conformance to customer conditions and specifications, packaging and destinations.
  2. Assurance that necessary individual part processes have been applied, i.e., magnetic particle, penetrant, zygo, heat treat have been accomplished as dictated by the required certification.
  3. Emberton's Machine & Tool. Inc. will package for assured safe delivery considering configuration and destination, unless otherwise specified or controlled by customer.
- 

## **CERTIFICATIONS**

1. To be supported by certifications:
    - A. Penetrant inspection.
    - B. Magnetic particle.
    - C. Rocwell hardness.
    - D. Other special processes.
    - E. Material.
  2. Emberton's Machine & tool, Inc. will use customer approved sources, when specified.
- 

## **DISCREPANT PARTS OR MATERIALS**

1. Material Review board area (MRB) and MRB holding area are provided with rejected material and/or parts held for final disposition. This area or enclosure is restricted and only accessible to MRB members and shall be isolated.
2. Parts which depart from requirements shall be identified with a red (rejection) or hold (rework or repair) tag and placed in the MRB area, Reference paragraph 1 for review and disposition.

3. After an internal review the customer will be notified of all discrepancies for approval of possible Rework or Use-As-Is disposition.
4. If any parts are beyond marginal disposition, they will be presented to the customer by means of a deviation request for the final disposition. If scrap, they will be physically destroyed.

---

## **CORRECTIVE ACTION**

1. Information generated from paragraph 2 above is used to maintain a corrective action procedure.
2. Q.C. will be responsible for immediate action on all rejected parts in conjunction with production. Prompt action to correct discrepancies will be implemented.
3. It will be a Q.C. responsibility to maintain adequate records of corrective action.

---

## **CALIBRATION SYSTEMS CONTROL PER MIL-STD-45662A**

1. It will be the responsibility of quality control to maintain a system for the calibration of all measuring instruments.
2. It will be the responsibility of quality to check or have checked by an independent laboratory which is certified by the National Bureau of standards all instruments which cannot be calibrated.
3. Measuring standard care. All standards will be maintained in an environment which will insure protection.
4. Standards will be calibrated by an approved N.B.S. Laboratory per Mil - STD - 45662A.
5. Standards will be checked every twelve (12) months by a traceable laboratory and the certs retained on file. A calibration sticker will be affixed to the standard container.
6. Customer furnished and shop gauges will be issued from the inspection department, checked each time returned to determine condition and rework or repair, or replaced as necessary.
7. A schedule of calibration will be logged and kept on file. It will consist of a list that will provide identification of the equipment, the date of calibration, by whom it was calibrated and when re-calibration is due.

---

## **CALIBRATION SCHEDULE**

- Calibration of inspection equipment will be traceable to the National bureau of Standards. Our schedule of calibration is as follows:

90 days.....The first week of March, June, Sept. and Dec.

6 months....The first week of June.

1 year.....The first week of January.

- Equipment calibrated by comparison with certified controls.

Height Master.....1 year.

Height Gauges.....1 year.

90 degree angle plates.....1 year.

Indicators..... 90 days.

Depth micrometers.....90 days.

Thread micrometers.....90 days.

Micrometers dia: calipers.....90 days.

- Equipment calibrated by independent laboratories certified to the National Bureau of Standards.

CMM..... 1 year.

Surface plates.....1 year.

Gauge blocks.....1 year.

Pin gauges.....1 year.

Thread gauges.....1 year.

Ring gauges.....1 year.

Bore gauges.....1 year.

---

## **DRAWING AND CHANGE CONTROL**

1. The customer supplies all drawings, therefore, changes to drawings are under their control.

A complete set of drawings to which the contracted tooling or job manufactured is maintained for reference.

2. In the event the ordered parts are to a different change than paragraph 2, it will be the customer's responsibility to authorize, in writing, all necessary changes.

When changes are authorized and made, the latest changes will then be incorporated into our files.

---

## **MATERIAL STORAGE AND HANDLING**

1. All material for production parts will be kept in the material control area and identified by customer purchase order number, part number and customer.
2. Material issued for a particular job will be verified by information on the traveler. The traveler will contain the purchase order number, part number and customer.
3. All remnants left over from a job will be returned to the material control area and identified.