



# **Langham Creek Machine Works, Inc.**

**A “Can Do” Company**

**Specializing in the Machining  
of Exotic Materials**

## **Quality Assurance Manual**

**UNCONTROLLED COPY**

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Langham Creek Machine Works  
Quality Control Manual

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## **2 Introduction**

### **2.1 Introduction**

Established in 1989, Langham Creek Machine Works (LCMW) is a contract manufacturing facility supplying precision machining services to industry. Our “Can Do” philosophy describes the level of our commitment to customer needs at all echelons of our corporate structure. Our corporate goal is to meet or exceed our customer’s needs in the areas of:

- Quality
- Timely Delivery
- Competitive Pricing

### **2.2 Purpose**

This manual describes the basic procedures, processes, and policies employed at Langham Creek Machine Works.

### **2.3 Scope**

The scope of this manual is intended for all processes performed by Langham Creek Machine Works. All employees of Langham Creek Machine works are empowered and responsible for ensuring quality product. The scope of this manual may be expanded to any other program at the discretion of the individual customer after evaluation of this established program.

### **3 Organization**

- 3.1 The quality control system is under the direction of the Owner/President. This individual is solely responsible to make decisions and to take necessary actions to assure that established quality requirements are maintained. Our quality process is continually reviewed on an on-going basis to ensure that our quality program meets customer requirements and addresses continuous improvement.
  
- 3.2 The quality system provides guidelines for all processes relating to the manufacture of quality product. An adequate number of capable personnel shall be assigned as necessary to ensure that the control of quality for all quality related processes are met.
  
- 3.3 Due to the nature of the work performed by the company, on the job training, is the primary source of training, for all employees. New hires, or personnel changing positions, will be subject to a 90 probationary period, under the guidance of trained employees. Specialized training, other than on the job, may be conducted by an outside source if required. Quality system, safety, and other pertinent training performed in house shall be documented and maintained in employee training files.

## **4 Purchased Materials**

- 4.1 All materials purchased by Langham Creek Machine Works will be purchased to the customer's specifications. When required, customer approved suppliers shall be utilized. All documentation relating to the material shall be made available for customer review.
- 4.2 Materials selection is the responsibility of the customer and shall include both selections of the proper material and the material specification, unless otherwise specified.
- 4.3 The customer has complete responsibility for preparation of standards for all material. Responsibility for preparation, maintenance, and distribution of specifications shall be the customer's.

## 5 Document Control

### 5.1 Quality Manual

Printed copies of the Quality Manual are uncontrolled. The electronic Quality Manual is maintained on the LCMW company server. It is maintained by the Quality Manager at the direction of the company President.

### 5.2 Shop Traveller

Upon receipt of a customer purchase order, a review of the drawings, specifications, and other pertinent data is made by LCMW management to determine all manufacturing and quality requirements. A Shop Traveller is then developed detailing the processes and inspection verification sequences required to adequately manufacture the product to customer specifications.

The Shop Traveller shall also include as a minimum:

- Customer Part Number and Revision
- Description
- Customer Name
- Purchase Order Number
- Quantity on Order
- Delivery Date
- Material, Including Heat/Lot Number

### 5.3 Inspection

The Shop Traveller acts as the LCMW Inspection Plan and is maintained as a Quality Record. Modifications to Shop Travellers shall be made to improve processes and quality. Modifications to the engineering master shall be made by authorized personnel only.

#### 5.4 Quality Records Retention

Upon order completion, the Shop Traveller, drawings, and any other pertinent data shall be filed. These files shall be maintained for a minimum of (5) years, or as required by customer.



## **6 Receiving Inspection**

### **6.1 Verification**

Upon receipt of a shipment, the receiving documents shall be reviewed to assure correctness of item, count, etc.

### **6.2 Inspection**

Visual inspection will be made prior to acceptance for any apparent discrepancies. Dimensional reading will be taken when deemed necessary by the Shop Management.

### **6.3 Marking**

All purchased raw materials shall be marked with material type and control number to assure correct material type identification and traceability.

### **6.4 Storage**

Raw material is stored in bins or on racks designated for raw material.

### **6.5 Non Conforming Items**

Non conforming items will be marked "REJECT" and reported to management for disposition.

## **7 In-Process Inspection**

- 7.1 The machinist is responsible for the over-all quality of the parts produced. This includes all blueprint parameters, including the application and transfer of markings. Marking data includes heat numbers, job numbers, etc.
  
- 7.2 The machinist works and inspects to the latest blueprint specifications issued along with the shop order. The first part completed for the applicable sequence shall be brought to the inspection department for a First Article Inspection. If any deviations are found, the subsequent part shall be inspected after corrections are made.
  
- 7.3 Upon completion of the manufacturing operation and in-process inspection, the machinist fills in the shop order with his initials, date, and the quantity completed.
  
- 7.4 During manufacturing, parts may be randomly inspected from all operations being performed to assure compliance to customer requirements. An Inspector conducts this operation.

## **8 Final Inspection**

- 8.1 When required by the customer, final inspection shall be conducted on 100% of all products to the latest customer supplied specifications and drawings.
- 8.2 All final inspection operations will be completed using gages and measuring equipment of the desired accuracy.
- 8.3 Final marking data will be applied in compliance with drawing specifications.
- 8.4 After final acceptance by the inspection department, the shop management releases the product for shipment by preparing a delivery ticket. All records are then filed to become company records.

## **9 Non-Conforming Materials**

## 9.1 Raw Materials

Material found discrepant during receiving inspection will be reported to the shop management for dispositions. Materials rejected by them will be immediately returned to the customer for credit or replacement.

## 9.2 In-Process

When a parameter is found to be discrepant, a QC inspection report or reject report will be initiated. The parts will be tagged with a reject slip and segregated until disposition can be made.

In the event that a discrepancy cannot be re-worked to conform to the blueprint and/or a specification, the customer will be contacted for a disposition of the part.

If approval is given, the necessary information such as person contacted, results, and the date shall be noted on the reject report and included with the order shipment.

If approval is not given, the unusable material will be marked "SCRAP" and removed from the immediate work area. The only exception being to use the part for setup of subsequent operations.

All reworked material originally rejected by an inspection will be completely inspected again prior to final acceptance and release for shipment.

## **10 Control & Calibration of Measuring Test Equipment**

- 10.1 Langham Creek Machine works Quality Control personnel are responsible to assure that all company owned tools; gages, instruments, and test lab equipment are of consistent accuracy required to uphold product quality.
- 10.2 The Inspection Lab shall calibrate all tools, gages, and instruments within their capability. A Certified Supplier traceable to National Standards will calibrate company owned masters.
- 10.3 Company owned gages will be electronically tracked by serial number to indicate next calibration due date.
- 10.4 A Certified Company traceable to National Standards shall calibrate hardness testers on an annual basis per ASTM E-18.
- 10.5 Historical calibration data shall be maintained via electronic gage cards.
- 10.6 Electronic gage cards shall include a link to the specific gage calibration procedure. Additionally, calibration frequency, pass / fail, recall and other pertinent information is included on the electronic gage cards.
- 10.6 Calibration certificates from outside services shall be maintained in the Quality department.

## 11 Packaging & Shipping Procedures

- 11.1 All parts shall be marked and packed according to customer's instructions.
- 11.2 Upon final acceptance all products will be properly packaged and stored in a manner that ensures product integrity and traceability.
- 11.3 Where no specific instructions from customers are indicated, the following checklist will be utilized. (see below)
- 11.4 Shipping Check List

- \_\_\_ Inspection Data Sheet (as required by customer P.O.)
- \_\_\_ Certificate of Compliance (as required by customer)
- \_\_\_ Heat Treat and Certificate of Heat Treat
- \_\_\_ Finish and Certificate of Finish
- \_\_\_ Marking
- \_\_\_ Packing
- \_\_\_ Delivery Ticket
- \_\_\_ Shipping Label
- \_\_\_ Material Certification
- \_\_\_ Envelope to Hold all Certifications

## **12 Corrective Preventative Action**

- 12.1 Corrective action will be taken on know problems in products and processes as determined through the first article, in-process, and final inspection results. After determination of the root cause, corrective action will be taken on all in-process jobs, completed jobs, and inventory.
- 12.2 Preventive action will be taken on both potential and known problems. Preventive action may consist of correcting engineering masters, procedures, program changes, machine maintenance/calibration, tooling changes, training, new fixtures, etc.
- 12.3 Corrective action will be evaluated for effectiveness through the first article, in process, and final inspection process.