

# *Huffman Machining Solutions, LLC*

*Est. 2022, Newland N.C.*

## **Machine Shop Quality Manual**

**Rev. A**

## **Table of Contents**

**Section 1.0-** Company Introduction and Scope of Quality Manual

**Section 2.0-** Workmanship Standards

**Section 3.0-** Equipment Calibration

**Section 4.0-** Order Processing

**Section 5.0-** Engineering Drawings and Models

**Section 6.0-** Job Tracking and Identification

**Section 7.0-** Incoming Inspection Process

**Section 8.0-** Material Inventory Control

**Section 9.0-** In-process and Final Inspections

**Section 10.0-** Billing

**Section 11.0-** Packaging and Shipping

**Section 12.0-** Corrective Action

**Section 13.0-** Employee Training

**Section 14.0-** Revisions

## **Section 1.0- Company Introduction and Scope of Quality Manual**

### **1.1- Company Introduction**

- Huffman Machining Solutions, LLC (HMS LLC) was founded in early 2022 in Newland, North Carolina by owner Christopher (Chris) Huffman. The goal of this company is to provide competitive machining solutions for our customers while maintaining strict manufacturing processes in order to maintain quality that our customers expect.
- HMS takes pride in being one of the few machine shops with CNC machining capabilities in the North-Western part of North Carolina. We also take pride in supplying and servicing the rail-preservation industry with quality components that are no longer produced or hard to obtain. We are able to stay competitive by keeping our overhead as low as possible while investing in the right machinery, tooling, and equipment to do the best job possible.
- We appreciate your interest in working with us for your machining needs.

### **1.2- Scope of Quality Manual**

- The general scope of this manual is to provide an understanding for customers on what we as a company strive for in terms of quality and workmanship, while providing a guideline so customers know what to expect from us. This manual also serves as a training aid and reference for future employees on the standards that we expect for them to conform with on a daily basis.
- The quality control practices, and operating practices described in this manual apply to all aspects of our work, from the inception of a project from a customer all the way through the shipment of the project to the customer.
- HMS LLC values continuous improvement in all aspects of our business. Whether those issues are related to quality, communication, or selection of a vendor, are a direct indication of the need to improve using the corrective action plan set forth in this manual.

## Section 2.0- Workmanship Standards

- 2.1 Unless otherwise indicated on engineering drawings, all shop work is to conform to the following workmanship standards.
- 2.2 Machining (Milling and Turning)
- All Sharp Edges are to be broken and de-burred
  - All machined components are to be free of dings, nicks, or scratches.
  - All machined surfaces are to have a 125 Ra surface finish or better.
  - Dimensional Tolerances shall be held to  $\pm .005$ " unless stated otherwise.
  - Angular Tolerances shall be held to  $\pm 1$  Degree unless stated otherwise.
- 2.3 Disassembly/Reassembly:
- All components to be dimensionally checked for proper fits prior to assembly.
  - When installing bearings and seals, all manufacturer-recommended standard practices are to be observed. This includes recommended bearing fits.
  - Service-removable thread locking compound is to be used on all fasteners as a standard practice. Other types of thread locking compounds may be used depending on customer requests and the application.
- 2.4 At this time, Huffman Machining Solutions does not offer welding, grinding, or coating/plating services. This page will be updated when/if those services are added. If a customer is seeking some of these services, they will be referred to an outside vendor or we will go to an outside vendor for these services.

## **Section 3.0- Equipment Calibration**

- 3.1- All equipment, specifically measuring equipment, will be subject to calibration twice yearly, as well as random checks.
- 3.2- A master set of gauge blocks will be used to calibrate measuring tools. These gauge blocks will be set aside and not used on the shop floor, being kept in our tool room. These will serve as our company standards.
- 3.3- Measuring tools such as micrometers, calipers, bore micrometers, depth gauges, and indicators will be inspected and checked periodically to ensure they are measuring accurately against the master gauge blocks.
- 3.4- Measuring tools such as Hard gauges, gauge pins, shop floor gauge blocks, and thread gauges will be inspected for general wear and accuracy in house. If it is found a gauge is no longer accurate, it will be retired and replaced or sent out for correction.
- 3.5- NIST traceability certificates provided with new measurement tools will be kept and documented accordingly.
- 3.6- Measuring tools that are outside our scope of calibration will be sent to a third part for calibration and documentation.
- 3.7- A record of all measuring tools used in production will be kept and maintained/updated when new tools are added or calibrated.

## **Section 4.0- Order Processing**

- 4.1 All jobs, both quoted and time plus material, require the customer to furnish a purchase order or written authorization before work can begin. This can be in the form of a Work Order or Email.
- 4.2 HMS LLC must be provided all necessary documentation including solid models, drawings, or other requirements/specifications before the quoting process can begin.
- 4.3 Once all job information is reviewed, a quote is sent to the customer for review, confirming the scope of the work to be done, expected completion dates, and price if applicable (Quote Template available in Appendix A1).
- 4.4 Once the customer has reviewed and excepted the quote, a Purchase order must be placed with HMS LLC for the work required. Customers may furnish HMS LLC with their own Purchase Order form, if the customer does not have their own P.O. form, the HMS LLC P.O. form will be used (See Appendix A2).
- 4.5 A job number will be assigned to the job when the Purchase Order is received/created.
- 4.6 It may be requested that the customer provide a deposit on the job to cover material expenses. This will be discussed with the customer during the quoting process if it is required. Deposit requirements will generally be stated on the initial quote and deducted from the final invoice.
- 4.7 Jobs specifically for research and development purposes will feature an “R” designation at the end of the job number.
- 4.8 In the event that a customer wants to modify the scope of work, or the component(s) being manufactured, a Change Order form must be completed. Any and all changes must be listed on the Change Order form, allowing a revision to be made to the original work order form. Any documentation such as job travelers, engineering drawings, etc. will be pulled from production and replaced with updated documents (See Appendix A3).
- 4.9 If a customer requires a job to be done under Non-Disclosure (NDA), an NDA form will be signed and completed during the quoting process.

## **Section 5.0- Engineering Drawings and Models**

- 5.1 All engineering drawings and 3D models are kept in our drawing files. These drawing files are managed and maintained on our computer system with our various CAD and CAM systems.
- 5.2 When customers send their CAD models or Engineering drawings to us, they will be kept on file for one year in our system, unless the customer requests otherwise. Customer engineering information that is sent to us is never sold or shared with other customers.
- 5.3 Customer engineering information such as sketches, models, or 2D drawings will be assigned a number for tracking purposes, this will typically match the Job number assigned to the rest of the job.
- 5.4 Copies of drawings or 3D Models are distributed to the floor and are collected at the completion of each job. Shop sketches or drawings made to aid in manufacturing will also be collected and kept on file for one year as mentioned in 5.2.
- 5.5 If a customer does not supply a 3D model or 2D drawing for a job, HMS LLC may be contracted to create that information for the customer if desired.
- 5.6 In the event that drawings for a job are unavailable and are not made by us, work will be performed in accordance with the specifications provided from the customer.

## **Section 6.0- Job Tracking and Identification**

- 6.1 All jobs will be assigned a Job number; this number will help identify the job as it goes through the manufacturing process. The number(s) will be identified on the Purchase Order and final invoice.
- 6.2 Orders with more than one part number will have unique Job numbers while orders with only one part may share the same number from the Purchase Order.
- 6.3 Work Orders, Job Travelers, and Set-Up sheets will be created once the scope of work is determined. (See Appendix B for Job Traveler).
- 6.4 The traveler is to be sleeved and attached to the job on the floor. It is to stay with the work throughout the manufacturing process. In the event that a job is divided among work centers, multiple copies of the traveler are to be distributed so that each person working on the job has an available copy.



## **Section 7.0- Incoming Inspection Process**

- 7.1 All incoming materials, supplies, or hardware that is being sourced from a third party for a customer project will be subject to an inspection to ensure it matches the customer specifications.
- 7.2 In the event a customer sends us a component or assembly for remanufacture or rebuild, the assembly/component will go through a teardown and inspection process to ensure we know what the scope of work needs to be. Inspection reports of this process will be provided at the customers requested.
- 7.3 HMS LLC Inspection Reports used for regular part inspection will be used for the inspection of components sent to us, unless a customer provides us with their own inspection reports. (See Appendix C).

## **Section 8.0- Material Inventory Control**

- 8.1 Employees shall verify all incoming stock materials for correct dimensional accuracy and match material requirements set forth on the P.O. or Engineering Drawing
- 8.2 Once verified, all materials are to be received into inventory, and stored in their designated locations.
- 8.3 All incoming materials ordered for specific jobs are to be identified with a description, a job number and are to be placed in a staging area, away from standard material stock.
- 8.4 Raw material certifications will be provided to the customer at their request basis. Requests for certifications must be made prior to the pricing of the job and ordering of materials.
- 8.5 Materials kept in inventory that have material certifications will be identified with a tag or other marking to help differentiate them from materials that do not have certifications. This material inventory is checked and updated periodically.

## **Section 9.0- In process and Final Inspections**

- 9.1 All work completed is to be done to customer specifications provided on their engineering drawings, purchase order, work change order, or other customer instructions.
- 9.2 Upon completion, all work must be inspected and qualified by the employee performing the work. Customer-supplied final inspection sheets will be used provided the request is made prior to quoting the job. In the event that no inspection sheet is supplied by the customer, the standard HMS LLC Inspection sheet will be used (See Appendix Section C).
- 9.4 Final Inspection reports will be provided to the customer once the job is completed. In Process inspection reports will be kept for internal use and record keeping, unless the customer requests this information as well.
- 9.5 For orders totaling one component, a full part inspection will be completed with dimensions and tolerances recorded where applicable.
- 9.6.1 Orders with more than one component or Part Number will be subject to a 10% inspection sampling in general. These inspection reports will check all critical dimensions. The customer may request a different inspection sampling (5%, 15%, every 10<sup>th</sup> component, etc.), but this must be requested before the job is quoted.
- 9.6.2 Full component inspections will be performed after each tooling/insert change, or after the machine has been sitting for more than 30 minutes.
- 9.7 Orders with more than one component or part number will be subject to random spot checks on critical dimensions, or every 10<sup>th</sup> component off the machine.
- 9.8 In the event parts contain features which cannot be measured with conventional measuring tools, shop management will develop a plan for inspection.
- 9.9 If components are found to be out of specification, they will be returned to the shop floor for rework or will be remade. *See Section 12.0, Corrective Action*

## **Section 10.0- Billing**

- 10.1 Our goal is to provide the best service possible; we do not consider our job to be completed until the final invoice is sent to the customer. Invoices will be sent to the appropriate contact in a timely fashion with accurate information.
- 10.2 Each bill or invoice will have a clear description of the services provided to the customer with accurate pricing for the stated services.
- 10.3 On time and material jobs, a price update is available at any time upon request by the customer.
- 10.4 Customers may be required to submit a deposit to purchase materials for a specific job. This deposit will be accurately deducted from the final invoice before it is sent to the customer. *See Section 2.6*

## **Section 11.0- Packaging and Shipping**

- 11.1 On completion, all work will be packaged in accordance with purchase order instructions. In the event that no specific packaging instructions are specified on the P.O., HMS LLC will package the equipment using industry standard methods such as heavy duty boxes, pallets, or crates.
- 11.2 A rust preventative compound or oil will be applied to all machined or ground surfaces as a standard practice, unless requested otherwise by the customer.
- 11.3 Work received in a customer-supplied container will be returned in the same container.
- 11.4 The planned method of shipping jobs is outlined on the Order Acknowledgement, which is sent to each customer at the onset of a job. Elements such as shipping method, carrier, etc. will be listed on the quote. Additional shipping charges may apply for jobs outside of our standard delivery region or for jobs that require transport on a semitrailer.
- 11.5 When a job is delivered to a customer, they are given a copy of a packing list documenting the parts shipped to them, including inspection reports, MTRs, etc. as requested by the customer. A copy of the packing list will be kept on record for HMS LLC.

## **Section 12.0- Corrective Action**

- 12.1 We make every effort and take every precaution at HMS LLC to ensure that we do not have quality control issues in the first place. In the event that quality control issues do occur while manufacturing components, our number one priority is to get a quality part to our customer no matter what.
- 12.2 When quality issues do occur, they present an opportunity for us to improve our processes. These issues will be documented and recorded on the form listed in Appendix D.
- 12.3 While we intend to catch issues before they happen or before we ship components to our customers. In the event a part that does not meet spec is shipped to a customer and is rejected, we will make every effort to correct the issue by remaking the component. We will work with our customer to ensure we uphold their requirements and uphold our commitment to quality.
- 12.4 When it is determined that quality has not been met and an issue is present, an analysis will be conducted to determine what the root cause of the issue is, and the best way to correct it.
- 12.5 Hours spent on reworking or remanufacturing components will be noted for internal record keeping.
- 12.6 Production jobs that yield scrapped components will be noted on inspection reports, with notes made about what caused the component to become scrap.

## **Section 13.0- Employee Training**

- 13.1- Employees will be trained on the contents of this manual when they are hired on.
- 13.2- Each employee will have access to a copy of this manual and the related forms for reference when needed.
- 13.3- As revisions are made to this manual, further training or may be required for employees so they can have a proper understanding of the changes made.

### Section 14.0- Revisions

<b>Version</b>	<b>Date</b>	<b>Section</b>	<b>Description</b>
Rev. A	5/30/2022	ALL	Document Placed into Service



## **Appendix**

**A1- Quoting Template**

**A2- P.O. Template**

**A3- Change Order Form**

**B- Job Traveler**

**C- In Process and Final Inspection Sheet**

**D- Corrective Action Form**