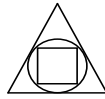


**Chamberlain Machine, Inc**  
9 Spencer Drive  
Bellows Falls, VT 05101  
TEL: (802) 463-3929  
FAX: (802) 463-3697



**CASCON, Inc**  
65 Forest Falls Drive  
Yarmouth ME, 04096  
TEL: (207) 646-6202  
FAX: (207) 646-6262



# Quality Assurance Manual

*Engineering and Manufacturing Excellence*

REV. F

DATED 6/2/03

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## Revision Control Record

<b>Date</b>	<b>REV</b>	<b>Section</b>	<b>Page</b>	<b>Description</b>
11/16/99	000	ALL	ALL	Original Draft, ISO Format
01/01/00	000	ALL	ALL	Changes per ISO Pre-assessment audit
01/25/00	A	ALL	ALL	Changes per 1/15/00 Internal Audit – Initial Issue/Release
6/13/00	B			Changes per ISO Audit Added TUV transfer stamping agreement Added note to Purchasing Section
5/8/03	C	ALL	ALL	Update to ISO 9001:2000
6/2/03	D	25	31	Included President/Production Manager evaluation and approval of employee competence.
9/18/07	E	7, 8, 14	12,13,	Section 7: Changed maintenance periods Section 8: Changed validation Section 14: Changed three digit numbers to numbers.
10/25/07	F	All	All	Updated to reflect current business practices

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## Introduction

Cascon was incorporated in the State of Maine in 1988, and was created through a joint business venture between Chamberlain Machine Inc., a precision contract machine shop located in Bellows Falls VT, and CSI, a Maine based technical consulting company. Cascon's primary business is the design, manufacture, sales, marketing and service of custom-engineered, positive displacement pumps for the OEM marketplace.

Chamberlain Machine Inc. (CMI) is a family owned/managed business that has been providing precision-machined products to a variety of markets since 1942. In addition to providing manufacturing services for Cascon, CMI also manufactures products for other customers in the heavy equipment, fluid power, industrial machinery, rail and medical industries.

CMI and Cascon are, in fact, two independently owned and managed companies that operate as a single organization for the purpose of meeting the requirements of Cascon's customers.

From a functional standpoint, Cascon is responsible for all direct customer contact, sales & marketing, product design/development/qualification, engineering, and technical/product service.

CMI has primary responsibility for purchasing, manufacturing, assembly & test, and quality assurance.

Cascon lends support to CMI in a number of critical areas including design and maintenance of test equipment and identification of manufacturing process control requirements.

All manufacturing services provided by CMI are purchased by Cascon through the issue of a Purchase Order accompanied by all necessary engineering drawings and specifications.

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## 1. Quality Policy

Cascon and Chamberlain Machine Inc. are committed to total customer satisfaction and continuous improvement. We will strive to provide superior quality and premium value in every product that we manufacture.

Together, our goal is to meet or exceed our customer's expectations with innovative products and services that contribute to the customer's overall success, and enhance the Company's reputation in the marketplace.

The entire management team is committed to and involved in the development and execution of our quality process. Management shall supply the necessary resources to implement this policy, and ensure that this commitment is understood at all levels within the organization.

Chamberlain Machine Inc. does not perform any design functions and is therefore excluded from ISO 9001:2000 Section 7.3.

*Robert E. Boynton*

President, Chamberlain Machine Inc.

*Edward H. Gervais*

President, Cascon Inc.

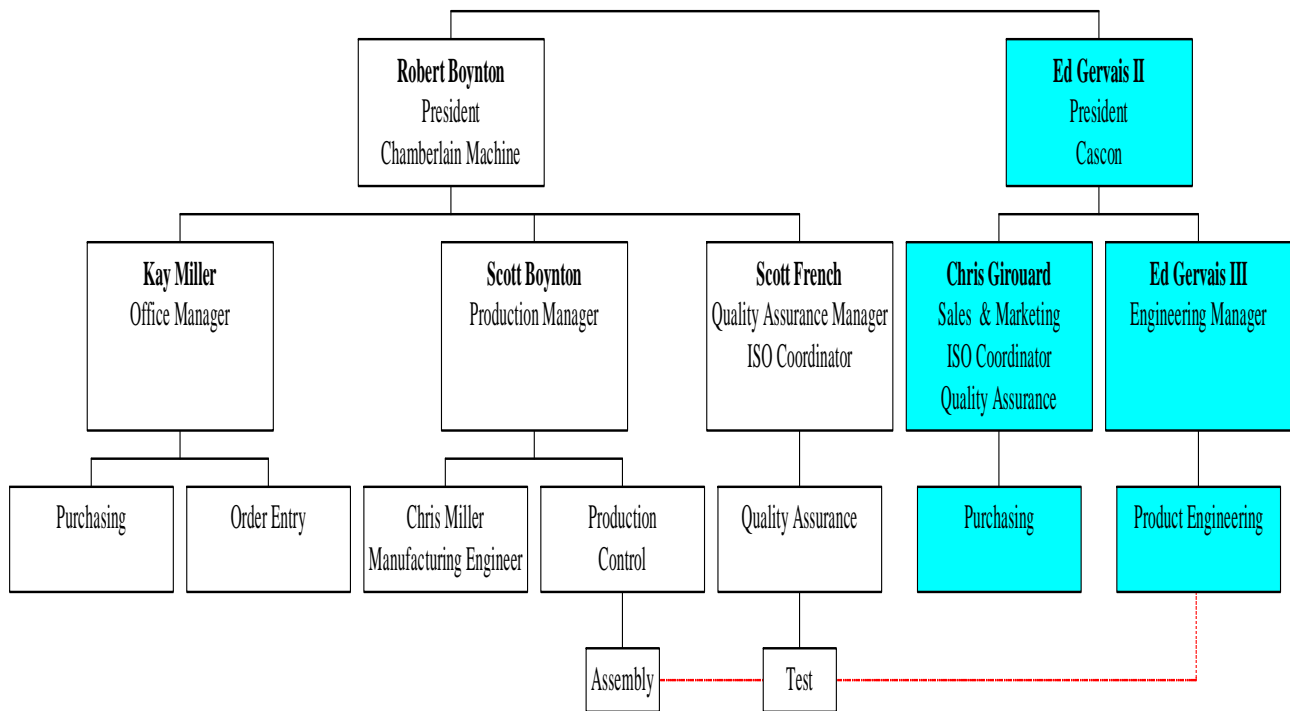
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## 2. Organization Chart



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## 3. Responsibility and Authority

The Presidents are responsible for the overall operation of CMI/Cascon. The managers of each key function report directly to their respective President. The Presidents shall appoint an ISO Coordinator, who is responsible for ensuring that the requirements of ISO 9001 are established and maintained.

The ISO Coordinator will act to prevent nonconformances relating to product, process and quality system, and identify and record any problems relating to the product, process and quality system.

The Office Manager is responsible for, and has authority over, all accounting functions, order processing, document control, purchasing and inventory management for CMI. This position reports to the President of CMI.

The Production Manager is responsible for, and has authority over, all aspects of the manufacturing process, including: scheduling, process feasibility studies, development of job travelers, manufacturing engineering, development of manufacturing control plans, coordination of outside processes, and overall product quality. This position reports to the President of CMI.

The Quality Assurance Manager supports the manufacturing process by ensuring compliance with all aspects of the Quality Assurance system. This responsibility includes communication of quality policies and procedures throughout the organization, preparation, maintenance and review of quality records, supplier quality assurance, periodic internal audits, and maintenance/calibration of all inspection and test equipment.

QA has the following responsibilities:

- Initiate action to prevent the occurrence of nonconformities relating to product, process and quality system;
- Identify and record any problems relating to the product, process and quality system;
- Initiate, recommend or provide solutions through designated channels;
- Verify the implementation of solutions;
- Control further processing, delivery or installation of nonconforming product until the deficiency or unsatisfactory condition has been corrected.

Quality Assurance Representatives report to the Presidents.

The Sales & Marketing Manager is responsible for, and has authority over, customer service, market development, contract review, contract amendments, purchasing and advertising for Cascon. This position reports to the President of Cascon.

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The Engineering Manager is responsible for, and has authority over, all aspects of product development, document control, engineering, design, engineering change orders and development of acceptance test procedures for Cascon. This position reports to the President of Cascon.

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## 4. Management Review

The Presidents of Cascon and CMI, in conjunction with their respective departmental managers, shall be responsible for establishing quality objectives for the company, reviewing the continuing suitability and effectiveness of the quality system at prescribed intervals and initiating corrective action to correct deficiencies.

Records of this annual review will be maintained for management and customer review.

The following information, which will be provided by the ISO Coordinator / QA Manager, will be used to evaluate the effectiveness of the Quality System.

- Internal audit summary
- Product quality data: customer returns, scrap rate analysis.
- Review of corrective and preventive actions.
- Supplier quality review
- Long term quality planning
- Training requirements
- Review customer feedback: supplier performance report cards, direct customer communication, customer complaints/returns
- Quality policy and objectives

Ref QPF15.6	Management Review Form
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## 5. Quality System

The Chamberlain Machine/Cascon QA system is a documented program of planned activities designed to ensure that we consistently meet or exceed our customers expectations concerning quality, delivery, reliability and overall product value. The documented procedures that support this system provide evidence of compliance with regulations, codes and standards, and other specifications that may be required by the customer. The system is intended to comply with the ISO 9001 quality system standard.

Quality related activities are supported by up to three levels of documentation: the **QA manual** which is used to guide all employee activities relating to product quality, **work procedures and instructions** that are used to carry out specific tasks (such as Gage Calibration and Acceptance Test Procedures) and **data/records/reports**, which are collected throughout the manufacturing, inspection and testing process.

The department managers will determine the level of documentation that is required to support a particular job function/work activity. This will depend on the criticality of the task, as well as the skills, education, experience, and training of the personnel who perform the task.

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## 6. Quality Planning

A baseline quality plan shall be maintained for all items manufactured at CMI. This plan shall establish points of inspection, inspection procedures, frequency of inspection, and the extent of documentation. The baseline plan will generally be applicable during manufacturing where other quality plans are not specified by the customer.

During contract review, Manufacturing will examine quality standards, process feasibility and other requirements to determine if these fall within the scope of the baseline quality plan. Manufacturing will also define any additional quality requirements should a specific contract require quality related resources outside the scope of the baseline quality plan (for example, manufacturing control plans, specific final inspection requirements, or special inspection/test equipment). Manufacturing shall then be responsible for the development of processes and documentation necessary to meet those requirements.

Any component or assembly with an identified key product characteristic must have an associated manufacturing control plan. Key Product Characteristics are those considered critical to the form, fit, or function of the product. Their conformance must be assured by methods described in the manufacturing control plan.

Long term quality planning issues, such as: QA department staffing, purchase of new test/inspection equipment, revisions/additions/deletions to the QA system, suitability of applicable standards, etc, will be addressed during the annual management review.

Ref QP1	Baseline Quality Plan
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## 7. Contract Review

The Sales Manager or President shall review all quotations and new sales orders/contracts for the following prior to committing to supply product:

- a) Requirements specified by the customer, including delivery and post delivery activities.
- b) Unspecified requirements necessary for intended use, where known.
- c) Statutory and regulatory requirements related to the product.
- d) Any additional requirements such as part marking etc. determined by the organization.
- e) Contract or order requirements differing from those previously expressed are resolved.
- f) The organization has the ability to meet the specified requirements.

Completed quotations are initialed and dated by the reviewing party.

Sales orders/contracts are signed by the Sales Manager/President. The initialed documents shall serve as the record of determination and review.

Order Acknowledgment's are returned to the customer upon request. Sales/Order Entry shall be responsible for resolving discrepancies between quote and order. Purchase Order revisions/amendments are treated in the same manner as new orders.

After review and acceptance, all new orders (or amendments) are released to Manufacturing for processing. Documentation, in the form of quotes, orders or change orders shall be maintained as specified on QPF 1.3.

Chamberlain Machine handles contract review in the following manner:

- 1) Quotation reviewed and approved
- 2) Purchase order received.
- 3) Order Acknowledgement sent if required
- 4) Job Issued
- 5) Job routing written and entered
- 6) Production begins.

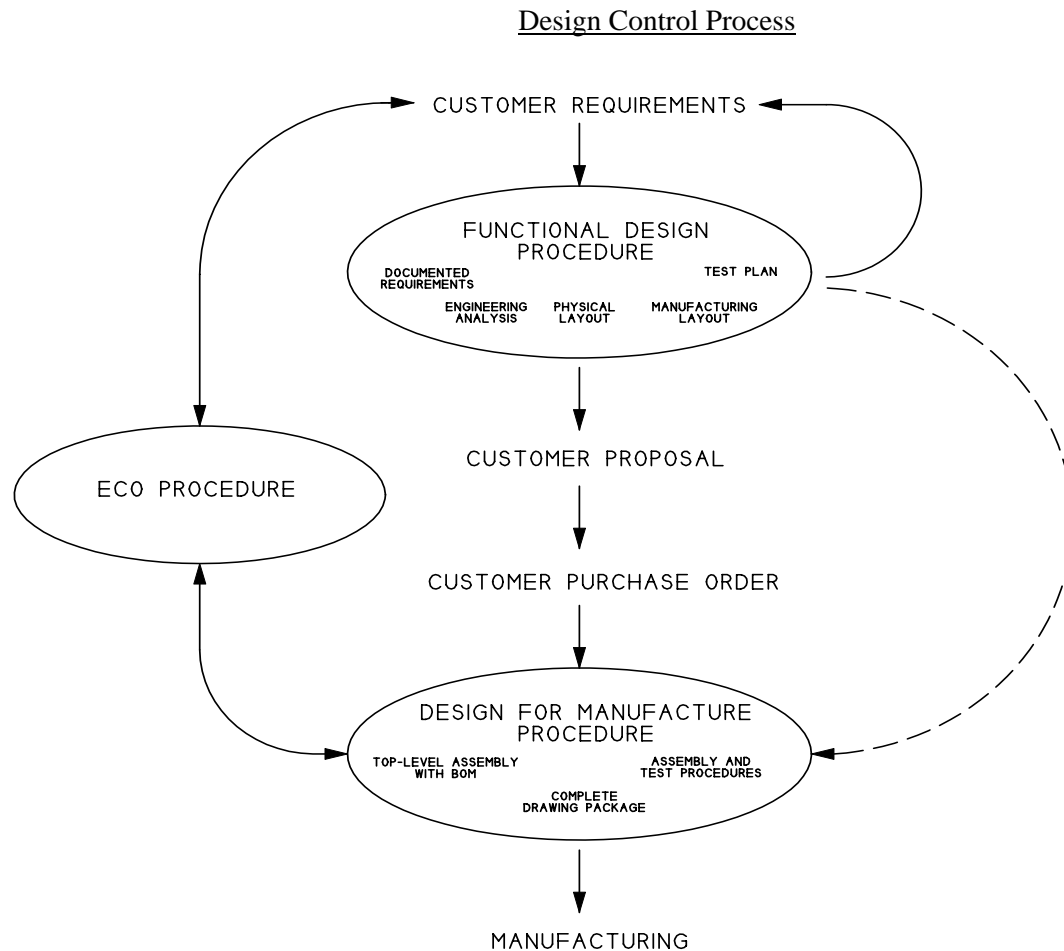
Chamberlain Machine handles contract amendments in the following manner:

- 1) Contract amendment received.
- 2) Acknowledgment sent if required.
- 3) Acknowledgment reviewed against current purchase order.
- 4) Job(s) updated

## 8. Design Control (applies to Cascon products)

The purpose of design control is to ensure the accurate translation of all customer requirements, including any regulatory requirements, into the design of the product to be manufactured. It is the responsibility of Engineering to maintain documented procedures to control and verify the design of all Cascon products.

The design and development controls include the Functional Design Procedure, the Design for Manufacturing Procedure, and Engineering Change Orders (ECO). The Functional Design process is intended to support a proposal to a customer for the development of a new pump or other product. The Design for Manufacturing process is intended to support the manufacture of a pump or other product. The ECO process is used to control changes to a completed design. These three components relate to each other as shown in Figure below.



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Design verification for finished product is performed to ensure that the product meets the acceptance criteria defined by the customer. Prior to shipment, testing is performed under controlled conditions in accordance with the methods outlined in the Acceptance Test Procedure.

Ref QP2	Functional Design Procedure
Ref QP3	Design for Manufacture Procedure
Ref QP4	Engineering Change Order Procedure

## 9. Manufacturing Process Control

Job Travelers are used to define and control the processing sequence for manufactured parts and assemblies. The job traveler acts as the central information point for all jobs in production including processing and inspection status, specific manufacturing or quality information, drawings and references to other specifications. The Production Manager is responsible for selecting the most appropriate process necessary to meet product specifications and will generate the job traveler upon request from Order Entry. Manufacturing Engineering selects suitable equipment and defines the part features to be controlled at each operation in the process, including tooling and fixtures, rates of production and when appropriate, special inspection or processing instructions.

The job traveler provides a sequential list of each operation and work center with detailed instructions for each processing step, customer information, production quantity, drawing number and revision, etc. The job traveler will be reviewed by QA at each processing sequence as part of first piece inspection to assure that processing and inspection requirements are met. The sequences listed on a job traveler are marked with quantity accepted, rejected, initials of operator, and date of completion. These sequences serve to indicate the manufacturing status of each item as it is processed.

In the event that a job has to be split the manufacturing process routing shall be amended as follows:

- All operations shall be complete and endorsed on the job traveler up to the split batch operation.
- The job traveler shall signify the qty split off and shall be endorsed.
- Traceability and correlation of serial numbers shall be maintained at all times.

Changes to the job traveler of any kind during production must be initialed and dated by the Production Manager or an authorized representative. These changes will be reviewed by the Production Manager upon completion of the job who will decide whether to make the change permanent.

Equipment maintenance normally performed at Chamberlain Machine is not used as a control mechanism for product quality and is therefore not part of the quality system. All product quality is controlled by appropriate methods of inspection.

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## 10. Document and Data Control

Documents and software, which provide instructions or requirements that must be met to maintain quality, including product drawings, specifications, bills of material, job travelers, quality procedures, and work procedures, shall be controlled to ensure that current and accurate information is available to the appropriate personnel at all times. These documents shall remain legible and readily identifiable.

Document and data control includes three specific areas of responsibility; Order Entry, QA, and Engineering. Sales/Order Entry shall be responsible for releasing all purchase orders, including associated drawings and specifications, to production. QA shall be responsible for issuing, maintaining, and revising all QA documents, such as the quality manual, quality procedures and forms. Engineering shall be responsible for issuing, maintaining, and revising all Cascon product drawings and specifications.

Prior to release, Order Entry will compare all drawings and specifications against the Purchase Order (or Change Order) for the appropriate drawing number and revision level. The Job Traveler will then be attached and initialed confirming that the information on the drawing, job traveler and purchase orders agree. Order Entry shall communicate change order information to Manufacturing to update inprocess orders.

After completion of a job, Order Entry is responsible for removing all pertinent drawings and specifications from use. This information will be destroyed or filed for historical reference only. Should it be necessary to reuse a particular drawing or specification, Order Entry will review and reissue as noted above.

The QA Manager shall issue controlled copies of the quality manual and procedures to appropriate personnel within the organization. The issued copies shall be recorded on the Employee Training Matrix to facilitate replacement if the document is superseded. Manuals issued outside the organization shall be marked uncontrolled. Changes to the quality manual or any procedure referenced by the manual shall be authorized by management and implemented by the QA Manager. Changes shall be recorded in the revision control section of the particular document. The QA Manager shall be responsible for replacing all issued copies of the changed document.

Manufacturing control plans shall be issued by the Production Manager at the time of order release. A manufacturing control plan number shall be referenced on the job traveler and a current copy shall be attached. Changes to the manufacturing control plan shall be the responsibility of the Production Manager. Changes shall be recorded in the revision control record.

Quality documents such as inspection reports and other forms shall be issued by the QA Manager. A master list of current revision levels for all quality forms shall reside with the QA Manager.

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Changes to these forms shall be at the discretion of the QA Manager who will be responsible for replacing changed documents within the system.

All documents necessary for the manufacture and testing of Cascon pumps and other Cascon products shall be controlled in accordance with QP5. All documents will have a unique number that follows the Cascon Document Numbering Convention (QPF 5.1). The revision level of each document shall be stored on the Cascon computer system. Paper copies should be considered reference only.

Ref QP5	Cascon Document and Data Control
Ref QP10	Employee Training Procedure
Ref QPF 15.1	Quality Procedure & Form Master List

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## 11. Purchasing

Purchasing shall communicate, via purchase order, all requirements pertaining to purchased material including drawings, specifications, and special inspection or packaging instructions. QA shall assist purchasing in defining specific quality requirements, if applicable.

The Purchase Order, and related drawings and specifications will clearly define what is expected from the supplier. At a minimum, the PO shall describe the product being purchased, the date purchased and requested delivery date, quantity of units purchased, delivery and shipping instructions, and any other special conditions or requirements.

The following general guidelines apply to the purchasing function:

1. Prior to issuing purchase order / quote the supplier status shall be verified. If the supplier has to be added to the quality management system the QA manager shall be notified. QA shall evaluate the supplier as stated in Section 12 of the QA Manual.
2. All purchase orders will be reviewed, approved, and signed by trained personnel.
3. A copy of the appropriate drawings or specifications will accompany all purchase orders.
4. Other requirements, such as certifications, test reports or quality system requirements will be stated on the purchase order.
5. If there is a drawing or specification change after the purchase order has been issued, Purchasing will update all internal copies and send the vendor a revised purchase order with a copy of the new drawing or specification.
6. Each item on a purchase order will be related to a specific job, if applicable, for traceability purposes. All raw material and hardware purchase orders shall be forwarded to Receiving for incoming inspection.
7. All purchase orders and related drawings shall remain on file until completed. Closed purchase orders shall be maintained for a minimum of one year.

Ref. QPF 15.7	Supplier Approval Form
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## 12. Evaluation of Suppliers and Verification of Purchased Products

Suppliers that have had a satisfactory quality history prior to 1/1/00 shall be approved based on past performance. New suppliers of raw material, manufactured parts or other critical items shall be entered into the purchasing system and evaluated via one of the following criteria by QA;

- Supplier Quality Questionnaire
- on-site survey
- customer directed
- single/sole source
- ISO/QS certification
- recommendation/reputation
- trial method
- past performance

New suppliers are considered to be on trial until three consecutive shipments have been inspected and accepted. Suppliers shall be monitored through incoming inspection and their status changed at the discretion of the QA Manager. Results of the monitoring of suppliers shall be forwarded to management to be used during management review to assess supplier performance.

If an on-site supplier assessment is performed a record of the audit shall be documented on the suppliers approval form.

On-site supplier assessments/inspections to verify product are generally not required, however, in the event that is necessary the supplier shall specify verification arrangements and method of release on the Purchase Order.

It may also be necessary in some cases for the customer to verify product at the subcontractors premises. In cases, where this is required by contract (or otherwise) the customer (or customers representative) will be afforded the right to verify product at the subcontractor's premises.

Ref QPF 15.2	Supplier Quality Questionnaire
Ref. QPF 15.7	Supplier Approval Form

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## 13. Control of Customer Supplied Product

Customer supplied products shall be received and stored in the same manner as incoming product. Any customer supplied product that is lost, damaged or otherwise considered unsuitable for use is routed through the nonconformance procedures outlined in this manual and reported to the customer by QA. Customer supplied products shall be so noted on the appropriate job traveler.

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## 14. Product Identification and Traceability

All products shall be identified and lot traceability maintained according to customer requirements. Such instructions shall be included on the job traveler or assembly drawing. At a minimum, all products shall be identified with part number and pertinent information on the shipping container.

Material requiring lot traceability per Hamilton Sundstrand SVHS3717 Class 1 shall be traceable to the raw material manufacturer's heat. If multiple heats are required to meet the specified quantity on the purchase order the heats shall be clearly identified and traceability maintained.

Raw material requiring lot traceability per TÜV shall be processed according to the Transfer Stamping Agreement (D980.0127.01 MAT-TSA.AGR).

Manufactured parts requiring TÜV certification shall have a test plan supplied by TÜV corresponding to the customers print.

Serialization of products, if necessary shall be handled as follows, unless otherwise specified by the customer:

- 1) The QA Manager shall assign sequential numbers that are discrete to each pump produced in the manufacturing lot.
- 2) A serial # list shall be documented and maintained electronically.
- 3) The serial #'s are vibro-peened on metal nameplates which are permanently affixed to the pump assembly.

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## 15. Incoming Material Control

Receipt and disposition of incoming material is limited to authorized personnel only. Items purchased to a specific drawing shall be forwarded by Receiving to QA for inspection. Sample size shall be determined according to ANSI Z 1.4, up to a 30-piece maximum sample size, unless otherwise specified by applicable control plans. Acceptance criteria are determined by the drawing or appropriate specification.

After initial inspection has demonstrated dimensional integrity, production tooling may be used as a basis of acceptance for castings and forgings. Customer supplied castings or forgings shall be inspected as required by the customer.

Receiving is responsible for identifying and inspecting all raw material such as bar stock. All material will be checked against the purchase order to ensure that all requirements such as material certification, chemical analysis, nondestructive test reports, etc. have been received. Confirmation of material certification shall be conducted as required by the customer. All material will be clearly and suitably identified with vendor name and purchase order number at a minimum. The purchase order number will be used as a method of traceability for the material throughout the manufacturing cycle. Material is then forwarded to production for processing.

Receiving is responsible for inspecting all hardware. All hardware will be checked against the purchase order to ensure requirements have been met and forwarded to stores. All items shall be suitably identified.

Accepted material will be issued to production with suitable lot identification. Nonconforming material shall be separated, identified, and dispositioned.

Where incoming product is released for urgent production purposes prior to verification, it shall be positively identified and recorded in order to permit immediate recall and replacement in the event of a nonconformance to the specified requirement.

Ref QP7	Nonconforming Material Procedure
Ref. QPF 1.2	Lot Follower Form

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## 16. First Piece and Inprocess Inspection

All manufactured products shall be monitored and inspected during processing according to the baseline quality plan unless otherwise specified on the job traveler or control plan. All products shall have evidence of appropriate inspections and tests before moving to subsequent processing. Nonconforming material shall be separated, identified, and dispositioned.

Ref QP1	Baseline Quality Plan
Ref QP7	Nonconforming Material Procedure

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## 17. Final Inspection

All manufactured products shall be subjected to final inspection according to the baseline quality plan. All products shall have documented evidence of required incoming, inprocess or other required tests being completed and authorized. This documentation shall be maintained according to customer requirements. Nonconforming material shall be separated, identified, and dispositioned.

Ref QP1	Baseline Quality Plan
Ref QP7	Nonconforming Material Procedure

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## 18. Control of Inspection, Test, and Measuring Equipment

Procedures shall be established to identify, calibrate and maintain inspection, test and measuring equipment used to demonstrate product conformity. All inspection, test and measuring equipment shall be used in accordance with manufacturers specifications and be of suitable accuracy for the required measurement. QA shall maintain a calibration recall system including all company owned and personal tools. All inspection, test and measuring equipment that is not included in the calibration system shall be marked “ for reference only” and is not used for acceptance of product.

Ref QP6	Calibration Procedures
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## 19. Inspection and Test Status

All material in current production shall be suitably identified as to inspection and test status as it moves through the manufacturing cycle. The job traveler serves to identify inspection status at each manufacturing sequence. Product identification shall consist of lot followers, tags, inspection records or physical location.

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## 20. Control of Nonconforming Material

Procedures to control nonconforming product shall provide for the identification and disposition of material at all stages of manufacturing.

Ref QP7	Nonconforming Material Procedure
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## 21. Corrective and Preventive Action

Procedures have been documented to take corrective actions for actual nonconformances and preventive actions for potential nonconformances to eliminate their causes. The decision to take corrective or preventive action is evaluated in terms of the impact the nonconformance will have on costs, product performance, reliability, safety, quality system effectiveness and customer satisfaction. Corrective and preventive actions shall be initiated by QA.

Nonconforming product generated during a particular manufacturing sequence shall be immediately analyzed to determine root cause. Action in the form of program changes, machine tool adjustments, tooling adjustments, etc. shall be implemented as required to correct the nonconformance. These actions will be documented in set up sheets, part programs and the job traveler as appropriate.

Nonconforming product that is identified by a customer shall cause a formal corrective action to be generated with documented root cause analysis, action plan, proof of implementation, and measure of effectiveness.

Nonconformances identified at the systems level during a scheduled internal audit (or customer audit) shall also cause corrective action to be initiated. A root cause analysis, action plan, proof of implementation, and measure of effectiveness shall be performed.

Ref QP7	Nonconforming Material Procedure
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**THE FOLLOWING APPLIES TO CASCON PRODUCTS:** All material that is returned from the customer will be assigned an RMA # (Return Material Authorization) for purposes of tracking and disposition. Results of any corrective/preventive actions and measures of effectiveness will be forwarded to the customer.

Ref QP8	Returned Material Authorization
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## 22. Handling, Storage, Packaging, Preservation and Delivery

All products and materials will be protected from damage throughout the manufacturing process and while being held in inventory in advance of manufacturing or delivery to the customer.

Stored materials will be protected to prevent deterioration and ensure material integrity.

Packaging shall be sufficient to prevent damage and allow proper identification of product during shipment in accordance with customer requirements. Products will be shipped by the customers designated carrier. The shipping department will ensure that all paperwork received from QA is included with the shipment.

Preservation of product shall be maintained at all times using appropriate methods for each material.

Inventory shall be assessed quarterly for both quality and quantity. Any nonconformances found shall be documented by QA.

Products that are identified by the manufacturer, as having a shelf life shall be labeled with an expiration date upon receipt based upon the manufacturers recommendation.

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## 23. Quality Records

Quality records shall be stored, protected and retained according to the Records Control Matrix QPF 1.3.

Any records with undefined record retention periods shall be maintained for a period of 1 year.

The documents may be disposed of when the document retention period has expired.

Quality records shall remain retrievable for customer review as required.

Electronic data is backed up on a series of 10 tapes that are rotated daily.

Ref QP1	Baseline Quality Plan
Ref. QPF1.3	Records Control Matrix

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## 24. Internal Quality Audit

The QA Manager at Chamberlain Machine shall be certified in internal quality auditing techniques. Cascon's ISO Coordinator shall be trained and certified in the appropriate techniques by Chamberlain's QA Manager.

Internal quality audits shall be carried out to verify the effectiveness of the quality system and compliance with the ISO 9001 standard. This review will take the form of scheduled audits of various operational areas, based upon the status and importance of the activity to be audited. Status and importance of the activity to be audited shall be determined based upon factors such as scrap rate, customer audits, supplier evaluations, return material authorizations, etc.

Any audit results shall be documented and brought to the attention of the personnel having responsibility in the area audited. The management personnel responsible for the area audited shall coordinate any corrective action necessary in a timely manner.

Follow-up audits shall be conducted to ensure that corrective actions were implemented. Effectiveness of such corrective actions shall be determined during the management review.

Ref QP9	Internal Quality Audit Procedure
Ref. QPF 15.4	Internal Audit Schedule
Ref. QPF 15.10	Internal Audit Checklist

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## 25. Employee Training

Prior to employment, applicant competence shall be evaluated against the educational requirements specified on QPF10.2A. If the applicant is hired their educational history shall be documented on QPF 10.2B. The presidents may waive the educational requirements with sufficient justification.

Training shall be provided and documented for all personnel.

The Quality Assurance Manager shall complete the quality management system training for each employee. After the QMS training has been completed the Quality Assurance Manager and the employee shall sign and date QPF 10.1. The quality manual is available for review at any time.

After 6 months the President or the Production Manager shall review employee competence. If the management representative assesses the employee's training and feels that more training is required he shall document that on QPF 10.1. When the employee has been deemed competent the management representative shall sign and date QPF 10.1.

Continuing employee training needs shall be addressed at the annual management review.

Ref. QP10	Employee Training Procedure
Ref. QPF 10.1	Employee Training Matrix
Ref. QPF 10.2A	Employee Education and Experience Requirements
Ref. QPF 10.2B	Employee Education and Experience

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## 26. Servicing

Product servicing is normally not part of the Purchase Order or contractual requirements. Where servicing is required, procedures and documentation will be developed to ensure that the customers servicing requirements are met.

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## 27. Statistical Techniques

Statistical techniques may be used to validate the product, material, or process. Each production program will be reviewed for opportunities to use sampling plans and apply statistical tools for the purpose of improving process capabilities and overall product performance.

# *Quality Assurance Procedure*

SUBJECT: BASELINE QUALITY PLAN  
PROCEDURE #: QP1            REVISION: A  
APPROVED BY: SCOTT F. FRENCH

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DATE ISSUED: 1/25/00

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## **1.0 PURPOSE**

This procedure provides criteria for inspection procedures, frequency of inspection and the control of quality records for all manufactured products.

## **2.0 APPLICATION**

This procedure applies to all employees involved in manufacturing.

## **3.0 DEFINITIONS**

3.1 The baseline quality plan is the directive issued by management for establishing the minimum amount of inspection required for products manufactured at CMI.

## **4.0 ASSOCIATED MATERIALS**

4.1 Inprocess Inspection Form QPF 1.1

4.2 Nonconforming Material Procedure QP7

## **5.0 PROCEDURE**

### **FIRST PIECE AND INPROCESS INSPECTION**

5.1 Each manufactured item shall be subjected to inspection at each process sequence.

5.2 Written first piece inspection using QPF 1.1 shall be performed by the operator on all CNC operations. First piece inspection shall include all characteristics generated at that operation including manufacturing dimensions from the job traveler or set-up instructions.

5.3 All manual machine operations shall require a first piece audit by QA. Sawcut will require operator inspection with periodic QA auditing.

5.4 It is the operators responsibility to notify QA when quality audits are required.

5.5 The operator is expected to have the appropriate inspection equipment and standards readily available throughout the operation.

# *Quality Assurance Procedure*

SUBJECT: BASELINE QUALITY PLAN  
PROCEDURE #: QP1 REVISION: A  
APPROVED BY: SCOTT F. FRENCH

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DATE ISSUED: 1/25/00

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- 5.6 QA shall audit the findings of the operators first piece inspection report. Frequency of inprocess inspection and recording of measured characteristics shall be determined at this time and recorded on QPF 1.1.
  - 5.7 No production run shall be made until the first piece inspection is complete, acceptable and audited by QA.
  - 5.8 When an operation is finished, the operator shall note the quantity completed, any rework or scrap, initial and date the job traveler next to the operation performed. This indicates all process and quality assurance requirements are complete.
  - 5.9 Documentation generated at each work center shall travel with the lot follower and be collected at completion by QA.
  - 5.10 Nonconforming material shall be dispositioned in accordance with QP7.
  - 5.11 All assembly and test operations shall require first piece auditing by QA to insure required specifications have been met. The auditor shall initial and date the job traveler sequence audited.

## **FINAL INSPECTION**

- 5.12 All products shall be given a final inspection by QA prior to shipment.
- 5.13 As a minimum, final inspection shall consist of the following:
  - 5.13.1 QA shall check the job traveler to insure that each operation has been signed off by the operator and, if applicable, each inprocess inspection sheet is available and complete. If an operation has not been signed off, and the inprocess inspection sheet is not available the final inspector shall insure that the operation and quality requirements have been fulfilled.
  - 5.13.2 If it is necessary to re-inspect the final inspector shall initial and date the particular operation(s) on the job traveler indicating that the omission has been covered.
  - 5.13.3 The final inspector shall check for nicks and burrs to insure that the part has a quality appearance and all operations have been completed.

## *Quality Assurance Procedure*

SUBJECT: BASELINE QUALITY PLAN  
PROCEDURE #: QP1            REVISION: A  
APPROVED BY: SCOTT F. FRENCH

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- 5.14 Final inspection may also include re-inspection and documentation of specific dimensions as might be required by a specific customer. Information including applicable standards, sampling plans and customer specific requirements shall be documented or referenced on the job traveler. Copies of referenced materials shall be maintained in customer files in the QA room. Material certification and other required quality documents shall be referenced on the final inspection report to maintain material traceability as required by the customer.
  - 5.15 The final inspector shall initial and date the job traveler and forward this and, if applicable, final inspection reports to shipping. Final inspection reports shall be maintained in a file for a minimum of four (4) years unless otherwise specified by a customer.
  - 5.16 Nonconforming material found in final inspection shall be dispositioned per QP7.
  - 5.17 All incoming/inprocess inspection data shall be maintained for a minimum of 6 months unless otherwise specified by the customer. All final inspection, test and material certification data shall be maintained for a minimum of 5 years unless otherwise specified by the customer.

# *Quality Assurance Procedure*

SUBJECT: FUNCTIONAL DESIGN PROCEDURE  
PROCEDURE #: QP2 REVISION: C  
APPROVED BY: EDWARD H. GERVAIS III

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DATE ISSUED: 4/24/07

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## **1.0 PURPOSE**

This procedure provides instructions for completion of the functional design process.

## **2.0 APPLICATION**

This procedure applies to the Engineering Department personnel.

## **3.0 DEFINITIONS**

- 3.1 The Functional Design Procedure is used to support a proposal to a customer for a new pump or other Cascon product. It is intended to insure that the customer's functional requirements such as performance and envelope are met by the design.

## **4.0 ASSOCIATED MATERIALS**

- 4.1 QPF 2.1 Design Planning and Review Form

## **5.0 PROCEDURE**

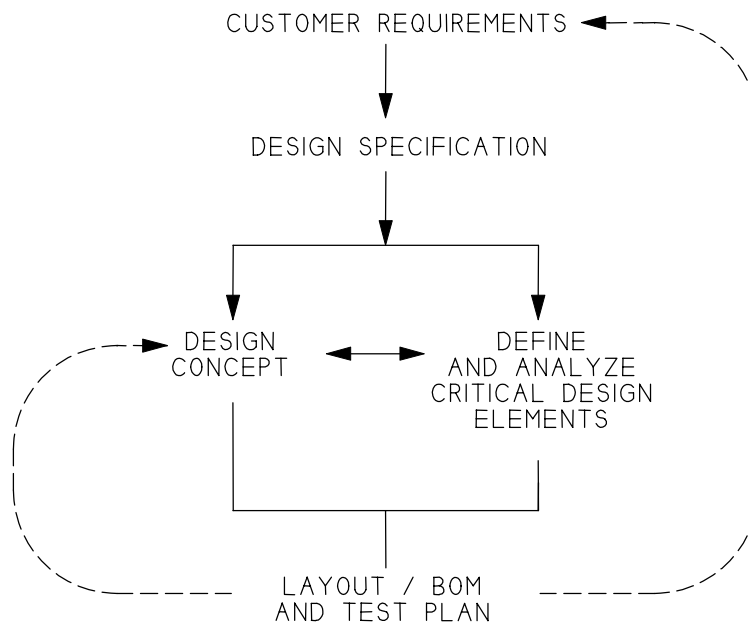
- 5.1 A Lead Engineer, who is responsible for establishing organizational and technical interfaces between different groups that provide design input, will be assigned to each project and is responsible for planning and completion of Functional Design output.
- 5.2 The Functional Design Procedure shall have as its output five components: 1) Compilation of Design Specifications, 2) Assembly or Layout Drawing with Bill of Materials, 3) any additional drawings required to describe the design or estimate its cost accurately, 4) description of any qualification and acceptance test requirements, and 5) documentation verifying that the various elements of the design are appropriate to support the Design Requirements. The development of these components relate as shown in the figure designated Functional Design Development in this procedure.
- 5.3 The Design Planning and Review Form will be used to assess the completeness of the Functional Design. Engineering will compile a check list for each product developed that will include as a minimum, those items contained on the Functional Design Review Form. Design elements not covered on the Review Form may be added by the Engineering Manager or assigned Lead Engineer as necessary.
- 5.4 All items on the Design Planning and Review Form must be checked and initialed by the Engineering Manager or the assigned Lead Engineer.

# Quality Assurance Procedure

SUBJECT: FUNCTIONAL DESIGN PROCEDURE  
PROCEDURE #: QP2      REVISION: C  
APPROVED BY: EDWARD H. GERVAIS III

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DATE ISSUED: 4/24/07

## Functional Design Development



# *Quality Assurance Procedure*

SUBJECT: DESIGN FOR MANUFACTURE PROCEDURE  
PROCEDURE #: QP3 REVISION: B  
APPROVED BY: EDWARD H. GERVAIS III

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DATE ISSUED: 4/24/07

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## **1.0 PURPOSE**

This procedure provides instructions to ensure that the product conforms to defined user needs and/or requirements.

## **2.0 APPLICATION**

This procedure applies to the Engineering Department personnel.

## **3.0 DEFINITIONS**

3.1 The Design for Manufacture Procedure is used to translate the customers requirements, as it is defined by the Functional Design, into detailed drawings and instructions for the manufacture, test, and validation of a pump or other product.

## **4.0 ASSOCIATED MATERIALS**

4.1 QPF 2.1 Design Planning and Review Form

## **5.0 PROCEDURE**

5.1 A Lead Engineer, who is responsible for establishing organizational and technical interfaces between different groups that provide, design input, will be assigned to each project.

5.2 The Design for Manufacture Procedure shall have as its output three components: 1) a top-level assembly drawing with complete bill of materials, 2) detailed drawings of all non-hardware parts (drawings of standard bolts, washers, etc. are not required but must be called out in the BOM), and 3) Acceptance Test Procedures and, where applicable, Assembly Procedures. This documentation will be issued with the order to manufacture the product.

5.3 The Design Planning and Review Form will be used to assess the completeness and accuracy of the manufacturing documentation. All items on the Design Planning and Review Form must be checked and initialed by the Engineering Manager or the assigned Lead Engineer.

# *Quality Assurance Procedure*

SUBJECT: ENGINEERING CHANGE ORDER PROCEDURE  
PROCEDURE #: QP4 REVISION: D  
APPROVED BY: Edward H. Gervais III

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DATE ISSUED: 09/17/07

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## **1.0 PURPOSE**

This procedure provides instructions for the revision of engineering documents used for the manufacture, maintenance, and operation of pumps and related products.

## **2.0 APPLICATION**

This procedure applies to all engineering documents that have previously been released from engineering.

## **3.0 DEFINITIONS**

- 3.1 Engineering documents used for manufacture include CAD drawings (drafts) and models, specifications and datasheets.
- 3.2 Released to manufacturing means that the document has had its preliminary marking removed and has been made available outside the engineering group pre-release storage area on the engineering server.

## **4.0 ASSOCIATED MATERIALS**

- 4.1 QPF 4.1 Engineering Change Order (ECO) Form

## **5.0 PROCEDURE**

### **5.1 Change Requests**

Requests to change engineering documents released from engineering may come from customers, manufacturing or within the engineering group and may be in the form of written requests or marked up drawings. All such requests shall be directed to the Engineering Manager or the assigned Project Engineer.

### **5.2 Responsibility**

Changes to drawings and models that have been released require an engineering change order and the completion of the Engineering Change Order Form QPF 4.1. Test procedures and internal specifications may be revised without use of QPF 4.1 so long as such changes do not affect product form, fit or function. It is the responsibility of the Engineering Manager or assigned Project Engineer to research the change, compile the necessary backup materials, generate revised documents, complete the ECO form, and obtain the necessary approvals.

# *Quality Assurance Procedure*

SUBJECT: ENGINEERING CHANGE ORDER PROCEDURE  
PROCEDURE #: QP4 REVISION: D  
APPROVED BY: Edward H. Gervais III

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## 5.3 Engineering

Changes to engineering documents can impact the manufacturability, fit, form, and function of a product. Changes must be carefully considered. Backup materials such as engineering analyses, datasheets, etc. necessary to support the change shall be attached to the ECO Form.

## 5.4 Revised Documents

Once the appropriate analysis has been completed and the specific changes documented on the ECO Form, the Engineering Manager, Project Engineer, or Designer/Drafter is responsible for generating the revised documents for approval. All documents under revision shall be so marked in the field of view and reside in the “pre-released” area of the engineering server.

## 5.5 Approval

Engineering Change Orders require the approval of the Engineering Manager, Manufacturing Manager, and Quality Manager. In the event that a new product has not yet ever been ordered from manufacturing, or in cases that do not impact manufacturing or quality assurance (such as correction of a typographical error), the Engineering Manager may waive the requirement for approval from the Manufacturing Manager and Quality Assurance Manager by initialing and dating those approval zones on the ECO Form.

Changes that affect the form, fit or function of the product delivered to the customer require customer approval.

## 5.6 Redline Changes

In the event that a change is needed while a part is being manufactured, redline changes may be made to hardcopies of the document by engineering or manufacturing personnel with verbal approval of the Engineering Manager or assigned Project Engineer. Approving personnel and approval date shall be noted on the document next to the redline change. It is the responsibility of the Engineering Manager or assigned Project Engineer to compile such redline changes into an engineering change order using QPF 4.1.

## 5.7 Release of Changed Documents

Once all approvals have been obtained, it is the responsibility of the Engineering Manager, Project Engineer, or Designer/Drafter to remove the indication that the document is under revision, move the revised document to the appropriate “released” location on the engineering server, and move the previous revision document to the “obsolete” location on the engineering server.

# *Quality Assurance Procedure*

SUBJECT: DOCUMENT AND DATA CONTROL  
PROCEDURE #: QP5 REVISION: B  
APPROVED BY: Edward H. Gervais III

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DATE ISSUED: 9/17/07

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## **1.0 PURPOSE**

This procedure provides instructions for the control of documents and data relevant to Cascon products.

## **2.0 APPLICATION**

This procedure applies to all personnel.

## **3.0 DEFINITIONS**

None applicable

## **4.0 ASSOCIATED MATERIALS**

4.1 QPF 5.1 Cascon Document Numbering Convention

## **5.0 PROCEDURE**

- 5.1 All documents necessary for the manufacture and testing of Cascon pumps and other products shall have a unique number that follows the Cascon Document Numbering Convention. The revision level of each document shall be stored on the Cascon computer system. Paper copies should be considered reference only.
- 5.2 The Cascon Purchase Order is the master document for the manufacturing of Cascon pumps and equipment. For the purposes of drawing and specification control, the purchase order shall specify the part number (Assembly Drawing number), all component part drawing numbers, and all associated assembly and test specifications. The Purchase Order shall also specify the revision level for each of the above.
- 5.3 If a revision is made to any of the drawings or specifications after a purchase order is issued, a revision must be made to the Purchase Order indicating the drawing or specification change. A Purchase Order revision will be designated by a revision letter on the purchase order. Revised drawings and specifications as well as all applicable ECO's must accompany the revised Purchase Order.

# *Quality Assurance Procedure*

SUBJECT: CALIBRATION PROCEDURE  
PROCEDURE #: QP6                      REVISION: D  
APPROVED BY: SCOTT F. FRENCH

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DATE ISSUED: 9/18/07

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## **1.0 PURPOSE**

To define a system for control, maintenance and calibration of measuring equipment and calibration standards. The system shall meet the requirements of ANSI Z-540-1, 1994.

## **2.0 SCOPE**

The calibration system applies to all monitoring and measurement equipment used at CMI or CASCON for verification or development of pumps and products including those furnished by the government or customers.

## **3.0 RESPONSIBILITY**

- 3.1 The Quality Assurance Manager is responsible for implementation and maintenance of the gage control system.
- 3.2 The Production Manager is responsible to insure that all personnel use only calibrated equipment for the inspection and test of material processed at CMI.
- 3.3 The Engineering Manager is responsible for ensuring that all equipment used in the Cascon engineering lab is properly calibrated.

## **4.0 GAGE INVENTORY AND IDENTIFICATION**

- 4.1 Quality Assurance shall maintain and control a gage control inventory list which will include all tooling, test and measuring equipment owned by CMI or its employees.
  - 4.1.1 Newly acquired items will be added as they are put into service.
  - 4.1.2 Obsolete or out of service equipment will be segregated and the status so noted on the inventory list.
- 4.2 All equipment shall be marked with a specific identification number by means of scribing, etching, or metal stamping. Where size is prohibitive, such as gage pins, the box or case shall be marked.
- 4.3 Equipment damaged beyond normal calibration repair techniques will be segregated from active equipment and its status so noted on the inventory list until such time as it can be repaired and returned to service.

# *Quality Assurance Procedure*

SUBJECT: CALIBRATION PROCEDURE  
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APPROVED BY: SCOTT F. FRENCH

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## **5.0 STANDARDS**

- 5.1 All standards used for calibration of measuring and test equipment shall have the accuracy, stability and range required for their intended use and will have an accuracy greater than the item being calibrated.
- 5.2 Calibration standards shall be identified with a calibration label and will be used only by designated personnel within the inspection/gage calibration area. Calibration standards are used primarily for the calibration of shop standards and other inspection equipment.
- 5.2.1 Calibration standards shall be directly traceable to the National Institute of Standards and Technology and will be calibrated in accordance with an established frequency.
- A) In the case of new equipment, the manufacturers certification will be used to establish traceability.
  - B) Recalibration shall be done by the original manufacturer or by a recognized calibration laboratory qualified to ANSI Z-540-1, 1994.
  - C) Certificates and reports pertaining to calibration standards will be maintained on file by Quality Assurance.

## **6.0 CALIBRATION SOURCES**

- 6.1 Outside sources used for the calibration of measuring or test equipment shall meet the requirements of ANSI Z-540-1, 1994.
- 6.2 Certifications and reports received from calibration sources shall document the following;
- A) Date of Calibration
  - B) Accuracy
  - C) Temperature
  - D) Standard Used
  - E) Certification number of standard used
  - F) Standard certification date
- 6.3 A file of certifications and reports confirming calibration of measuring or test equipment shall be maintained by Quality Assurance.

# *Quality Assurance Procedure*

SUBJECT: CALIBRATION PROCEDURE  
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6.4 Standards and instruments calibrated by an outside source will have a label showing calibration date, due date and inspectors signature or stamp.

## **7.0 CALIBRATION FREQUENCY**

7.1 Calibration intervals shall be established for all standards and all measuring and test equipment under control of the gage control program. The frequency of calibration shall be determined and adjusted based on usage, stability, and purpose of measurement and historical record. Intervals may be lengthened when the historical results of previous calibrations demonstrate no significant changes.

7.2 Calibration intervals for each standard and each item of measuring and test equipment, used in the inspection or test of controlled products, will be stored in the computer calibration control program.

7.2.1 In general, calibration intervals for the various types of inspection and test equipment are listed in the gage calibration frequencies section. Calibration intervals will not exceed these intervals unless justified by documented historical experience.

## **8.0 CALIBRATION RECALL**

8.1 A calibration recall report will be generated each Monday on the computer calibration control program. Quality Assurance is responsible to insure that equipment on this list is recovered and calibrated.

8.2 Any calibrated equipment that is suspected of inaccuracies or shows signs of damage shall be immediately returned to Quality Assurance.

8.2.1 Should it not be practical to move an "out of calibration" piece of equipment because of size, mounting, etc.; the equipment shall be plainly marked so as to prevent its use until recalibrated.

## **9.0 CALIBRATION PROCEDURES**

9.1 Calibration procedures shall be written for each type of equipment calibrated at CMI.

9.1.1 All procedures shall be approved by the Quality Assurance Manager.

9.1.2 In addition to mechanical instructions, procedures will include tolerance or acceptance limits.

# *Quality Assurance Procedure*

SUBJECT: CALIBRATION PROCEDURE  
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APPROVED BY: SCOTT F. FRENCH

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- 9.2 Calibrations may be performed in accordance with the manufacturers specification, or recognized published documents until an appropriate procedure can be written.
- 9.3 Equipment to be calibrated by an outside source will be so indicated on the computer calibration control program.
- 9.4 Measuring and test equipment shall be tested in an environment controlled to the extent required to insure repeatability of measurement.

## **10.0 OUT OF TOLERANCE CONDITIONS**

- 10.1 All out of tolerance conditions shall be reported to the Quality Assurance Manager.
- 10.2 An out of tolerance condition is considered significant if it would result in the acceptance of nonconforming material.
- 10.3 Should an out of tolerance condition be found during calibration previous inspections and tests shall be assessed for validity. Documentation of such assessment shall be maintained in the QA records as well as any necessary action on the equipment or product affected.
- 10.4 All calibrated instruments shall be adjusted by trained personnel responsible for calibration to insure that inspections are safeguarded from inadvertent adjustments made by the operators.

## **11.0 CALIBRATION RECORDS**

- 11.1 A calibration record and history for each item requiring calibration will be maintained in the calibration history notebook or computer.
- 11.2 At a minimum, the computer calibration control program will contain the following information:
- A) Identification of the item including serial number
  - B) Calibration interval
  - C) Date of last calibration
  - D) Date of next calibration
  - E) Disposition
- 11.3 Prior to adjustment of a gage, the actual measurement (or the amount of adjustment required) will be recorded as a part of the history utilized for calibration frequency evaluation. The record will also note the fact if no adjustment was required.

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11.4 For those items calibrated by an outside source, the calibration report, including date of calibration, and certification # of the equipment used, will be used for the calibration history record.

## **12.0 CALIBRATION STATUS LABELS**

12.1 All measuring and test equipment shall have a calibration status label indicating the following:

- A) Date of calibration
- B) Inspectors initial or stamp
- C) Due date for next calibration

12.1.1 Under certain circumstances or environments, it may be inappropriate to use calibration labels, (test stand oil). Under these conditions, the history record may be used to indicate the information in 12.1 above.

12.2 Certain measurement or test items may be designated "For Reference Only". These items will not be used to accept or reject material.

12.3 Equipment that is not used to its full capacities may have a "Limited Use" designation. Such equipment shall have a "Limited Use" label indicating the allowable tolerance, range or scale for which it is authorized as well as the calibration information noted in 12.1 above. Calibration records will reflect these designations and limitations.

## **13.0 PERSONAL EQUIPMENT**

13.1 All personal equipment shall be included on the gage control program or it will be removed from the shop floor. If a gage is marked "For Reference Only" it may remain on the shop floor but will not be used to accept or reject manufactured goods.

13.1.1 Such equipment will be calibrated according to the same procedures and frequencies, as shop owned inspection equipment.

## **14.0 JIGS AND FIXTURES**

14.1 Items such as jigs, fixtures and templates shall not be used as a means of inspection unless they are so designated. If they are so designated they shall be included in the calibration recall program and calibrated to the original blueprint.

# *Quality Assurance Procedure*

SUBJECT: CALIBRATION PROCEDURE  
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## **15.0 HANDLING AND STORAGE**

- 15.1 Gages, standards and inspection equipment under the gage control system shall be kept in a storage area or cabinet, where possible. Gages in use on the shop floor shall be protected in a suitable manner to retain their accuracy.
- 15.2 Gages waiting for calibration shall be segregated and held in the Quality Assurance area until they can be recalibrated.

# Quality Assurance Procedure

SUBJECT: CALIBRATION PROCEDURE  
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## Calibration Procedure Revision Control Record

Date	Procedure Number	Revision	Description
11/3/99	CP 6.1	A	Calibration Gage Blocks
11/3/99	CP 6.2	A	Gage Blocks
11/3/99	CP 6.3	A	Gage Pins
11/3/99	CP 6.4	A	Micrometer Standards
11/3/99	CP 6.5	A	Micrometers
11/3/99	CP 6.6	A	Bore Gages
11/3/99	CP 6.7	A	Dial Calipers
11/3/99	CP 6.8	A	Sine Bar
11/3/99	CP 6.9	A	Bevel Protractor
11/3/99	CP 6.10	A	Cylindrical Pin and Plug Gages
11/3/99	CP 6.11	A	Thread Plug Gages
11/3/99	CP 6.12	A	Thread Ring Gages
11/3/99	CP 6.13	A	Rockwell Hardness Tester
11/3/99	CP 6.14	A	Coordinate Measuring Machines
11/3/99	CP 6.15	A	O.D. Dial Snap Gages
11/3/99	CP 6.16	A	Surface Plates
11/3/99	CP 6.17	A	Dial & Test Indicators
11/3/99	CP 6.18	A	Dial Groove Gages
11/3/99	CP 6.19	A	Height Stand
11/3/99	CP 6.20	A	Surface Profilometer
11/3/99	CP 6.21	A	Depth Micrometers
11/3/99	CP 6.22	A	Indicating Micrometers
11/3/99	CP 6.23	A	Pressure Gages
11/3/99	CP 6.24	A	Thermometers
11/3/99	CP 6.25	A	Vacuum Gages
11/3/99	CP 6.26	A	Gerotor Type Flowmeters
11/3/99	CP 6.27	A	Digital Readouts
11/3/99	CP 6.28	A	Pitch Micrometers
11/3/99	CP 6.29	A	Sunnen Bore Gages
11/3/99	CP 6.30	A	Sunnen .800 dia. Setting Ring
11/3/99	CP 6.31	A	Vernier Groove Width Micrometers
2/13/01	CP 6.32	A	Torque Wrench's
2/13/01	CP 6.33	A	Pressure Transducer

# Quality Assurance Procedure

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## Gage Calibration Frequencies

PROC. #	EQUIPMENT/ITEM	MONTHS
CP6.1	Calibration Gage Blocks	24
CP6.2	Gage Blocks	12
CP6.3	Gage Pins	60
CP6.4	Micrometer Standards	60
CP6.5	Micrometers	12
CP6.6	Bore Gages	12
CP6.7	Dial Calipers	12
CP6.8	Sine Bar	12
CP6.9	Bevel Protractors	240
CP6.10	Cylindrical Pin and Plug Gages	12
CP6.11	Thread Plug Gages up to 1"	12
	Thread Plug Gages over 1"	24
CP6.12	Thread Ring Gages	12
	Thread Ring Gages over 1"	24
CP6.13	Rockwell Hardness Tester	12
CP6.14	Coordinate Measuring Machine	12
CP6.15	O.D. Dial Snap Gages	12
CP6.16	Surface Plates	12
CP6.17	Dial & Test Indicators	12
CP6.18	Dial Groove Gages	12
CP6.19	Height Stand	60
CP6.20	Surface Profilometer	12
CP6.21	Depth Micrometers	12
CP6.22	Indicating Micrometers	12
CP6.23	Pressure Gages	12
CP6.24	Thermometers	60
CP6.25	Vacuum Gages	12
CP6.26	Gerotor Type Flowmeters	60
CP6.27	Digital Readouts	60
CP6.28	Pitch Micrometers	12
CP6.29	Sunden Bore Gages	12
CP6.30	Sunden .800 dia. Setting Ring	60
CP6.31	Vernier Groove Width Micrometers	12
CP6.32	Torque Wrench's	24
CP6.33	Pressure transducers	60

# *Quality Assurance Procedure*

SUBJECT: NONCONFORMING MATERIAL  
PROCEDURE #: QP7 REVISION: C  
APPROVED BY: SCOTT F. FRENCH

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DATE ISSUED: 9/25/07

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## **1.0 PURPOSE**

This procedure provides instructions for identification and disposition of nonconforming material at all stages of manufacturing, assembly and test.

## **2.0 APPLICATION**

This procedure applies to all employees involved in the identification and disposition of nonconforming material.

## **3.0 DEFINITIONS**

Nonconforming material is any item which deviates from the specified requirements.

## **4.0 ASSOCIATED MATERIALS**

QPF 7.1 Nonconformance Report Form

QPF 7.2 Nonconformance Report Form Log

QPF 7.3 Waiver/Deviation Request Form

QPF 7.4 Waiver/Deviation Request Form Log

## **5.0 PROCEDURE**

All non-conforming material shall be immediately tagged with a REPAIRABLE OR REWORK or REJECTED tag to differentiate it from conforming material until a disposition can be made by QA. If multiple parts are affected the parts shall be segregated and tagged.

At a minimum the operator shall record the following information on the tag: customer, job number, part number, quantity affected, reason/discrepancy and date.

If nonconforming material is found at incoming inspection which cannot be made to meet the applicable specifications QA shall tag the discrepant material and record the nonconformance on the Nonconformance Report Form QPF 7.1. Disposition of such material shall be coordinated between QA, manufacturing, the vendor and the customer as applicable.

REPAIRABLE OR REWORK and REJECTED tags shall be removed by Quality Assurance only.

# Quality Assurance Procedure

SUBJECT: NONCONFORMING MATERIAL  
PROCEDURE #: QP7 REVISION: C  
APPROVED BY: SCOTT F. FRENCH

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## 5.1 REJECTED / SCRAP NONCONFORMING MATERIAL

A part determined to be scrap by QA may be carried with conforming material to be used as a set-up piece on subsequent operations. Such pieces will have been dispositioned by QA as scrap and marked as such on the REJECTED tag and job traveler on the sequence where the discrepancy occurred.

Material will be isolated in the scrap area as soon as QA has determined that it is no longer useful. Once in the designated scrap area, the tag will be removed by QA for recording and corrective action purposes.

If the material scrapped was customer supplied material QA shall record the nonconformance on the Nonconformance Report Form QPF 7.1. Disposition of such material shall be coordinated between QA and the customer as applicable.

### REJECTED / SCRAP TAG

Category: \_\_\_\_\_  
Part # \_\_\_\_\_

JOB NO. **REJECTED** P.O. NO. \_\_\_\_\_

PART NO. \_\_\_\_\_ SERIAL NO. \_\_\_\_\_

PART NAME \_\_\_\_\_

NUMBER OF PIECES REJECTED \_\_\_\_\_

REASON \_\_\_\_\_

DISPOSITION \_\_\_\_\_

INSPECTOR \_\_\_\_\_ DATE \_\_\_\_\_

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FAX (781) 346-5539  
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# Quality Assurance Procedure

SUBJECT: NONCONFORMING MATERIAL  
PROCEDURE #: QP7 REVISION: C  
APPROVED BY: SCOTT F. FRENCH

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## 5.2 REPAIRABLE OR REWORK NONCONFORMING MATERIAL

### 5.2.1 Rework

Non-conforming material that can be made to meet all customer requirements by normal machining/processing methods is defined as rework. If it is determined that the material can be reworked to print QA will note the operation/s on the rework tag and the job traveler and forward the material to manufacturing for processing. Manufacturing personnel performing rework operations shall add an "R" to the job number on their time cards to designate the operation as rework.. Upon completion, the operator will notify QA to inspect the reworked dimension. If acceptable, QA shall remove the rework tag and the lot will continue normal processing according to the job traveler.

### 5.2.2 Repair

Nonconforming material which requires welding, chrome plating or other processes not common to the normal processing of the particular part, or if the rework procedure doesn't result in complete conformance to customer specifications, the process is defined as repair. QA shall coordinate any repair procedure/s with the customer via the Waiver/Deviation Request Form QPF 7.3.

- a) The rejected material shall be tagged to separate it from conforming material until a repair procedure is coordinated with the customer. If customer approval is not obtained, the parts shall be scrapped per section 5.1.
- b) When the repair has been completed the operator will notify QA to inspect the repaired dimension/s. If acceptable, QA shall remove the repair tag and the lot will continue normal processing according to the job traveler.

### **REPAIRABLE OR REWORK TAG**

**REPAIRABLE or REWORK**

CUSTOMER \_\_\_\_\_

JOB NO. \_\_\_\_\_ DATE \_\_\_\_\_

PART NO. \_\_\_\_\_ PART NAME \_\_\_\_\_

RO. NO. \_\_\_\_\_ SERIAL NO. \_\_\_\_\_

NO. of PIECES \_\_\_\_\_

DISPOSITION \_\_\_\_\_

INSPECTOR \_\_\_\_\_ STAMP \_\_\_\_\_

REASON FOR REWORK (Over)

# *Quality Assurance Procedure*

SUBJECT: NONCONFORMING MATERIAL  
PROCEDURE #: QP7 REVISION: C  
APPROVED BY: SCOTT F. FRENCH

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## 5.3 DEVIATION REQUESTS

Should non-conforming material be practically non-repairable, yet is believed to be functional, A Waiver/Deviation Request Form QPF 7.3 shall be completed and forwarded to the customer.

5.3.1 Material will be tagged with a REPAIRABLE OR REWORK tag indicating the discrepancy and the disposition shall be identified as “hold for customer approval”.

5.3.2 Upon customer approval a copy of the approved Waiver/Deviation Request Form QPF 7.3 will be shipped with the identified material.

5.3.3 If customer approval is not obtained, the material will be scrapped per section 5.1.

## 5.4 WAIVER REQUESTS

Prior to production, nonconformity including alternate material recommendations or alternate construction recommendations shall be coordinated with the customer using the Waiver/Deviation Request Form QPF 7.3.

## 5.5 RESPONSIBILITY

The QA manager or his assigns shall be responsible for the distribution, maintenance and completion of all Nonconformance Reports and Waiver/Deviation Request's. A status log of all Nonconformance Report's and Waiver/Deviation Requests shall be maintained in the QA department.

## 5.6 NONCONFORMANCE CONTAINMENT

Appropriate action shall be documented and recorded on the Nonconformance Report Form QPF 7.1 when nonconforming material is detected after delivery or use has started. This action shall include prompt notification of all customers affected and segregating affected material in inventory.

# *Quality Assurance Procedure*

SUBJECT: RETURNED AND CUSTOMER OWNED  
MATERIALS  
PROCEDURE #: QP8                      REVISION: C  
APPROVED BY: Edward H. Gervais III

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DATE ISSUED: 9/17/07

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## **1.0 PURPOSE**

This procedure provides instructions for reviewing and controlling customer-owned pumps and related products.

## **2.0 APPLICATION**

This procedure applies to the Marketing Manager, Engineering Manager, Project Engineer or Customer Service personnel.

All materials related to Cascon pumps or other products that are not the property of Cascon or Chamberlain will be handled using this procedure.

## **3.0 DEFINITIONS**

3.1 Returned goods are those Cascon supplied materials returned from a customer for any reason.

## **4.0 ASSOCIATED MATERIALS**

4.1 Returned Materials Database (RM Database)

## **5.0 PROCEDURE**

### **5.1 Returned Material Authorization Number and Required Information**

In most cases the customer will contact Cascon prior to the return of pumps or other assemblies. During this contact a Returned Material Authorization (RMA) number is issued to the customer using the Returned Material (RM) Database. When the number is issued, the following information must be entered into the database; these are the minimum requirements: company name, customer contact with phone number and/or email address, part number, serial nos. if applicable, date of notification, originating (Cascon) employee, and a description of why the product is being returned. The customer is instructed to reference the returned material (RM) number (e.g. RM1234) on shipping papers and the outside surface of the packaging. The customer is responsible for the cost of shipping returned material to Cascon.

### **5.2 Receipt of Material**

Upon receipt of returned material, the Engineering Manager or Project Engineer shall be notified. Returned materials must remain in the receiving area until checked into the RM Database and tagged

# *Quality Assurance Procedure*

SUBJECT: RETURNED AND CUSTOMER OWNED  
MATERIALS  
PROCEDURE #: QP8                      REVISION: C  
APPROVED BY: Edward H. Gervais III

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DATE ISSUED: 9/17/07

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with the RM number. All material shall remain tagged with the RM or other identifying number while in process.

The material will be designated as received by entering the date of receipt in the RM Database.

There will be times when material is received without prior authorization or without complete information. Material shall not be further processed until a returned authorization number is issued to the customer and the information described in Section 5.1 of this procedure is entered into the RM Database. It is the responsibility of the Engineering Manager or designated engineer, with assistance from the Sales/Customer service department, to collect the required information prior to processing the material

## 5.3 Processing of Material

### 5.3.1 Initial Review of Returned Product

Once received, the designated engineer will complete an initial review of the material. He or she will first determine whether the hardware condition matches that in the description provided by the customer. Any discrepancies shall be resolved.

### 5.3.2 Material Delivered to Cascon for Program Support

Customer owned equipment (motors, valves, special instruments, etc.) delivered to Cascon or Chamberlain in support of a program shall be inspected to assess and shipping damage, etc. Items shall be tagged with the RM or other identifying number and remain so while in Cascon or Chamberlain possession. Any observations concerning this material shall be noted in the log section of the RM database.

### 5.3.3 Returned Material Inspection Report

The Returned Material Inspection Report is completed by the designated engineer to provide a detailed description and analysis of hardware condition. In the case where the product is discrepant, the RM inspection report provides a root-cause analysis that may be used in support of a Non-Conformance Report

### 5.3.4 Non-Conformance/Corrective Action Report

In cases where returned material is found to be discrepant due to a defect in manufacturing, assembly, or design, a Non-Conformance/Corrective Action Report may be initiated at the discretion of the Quality Assurance Manager or Engineering Manager.

# *Quality Assurance Procedure*

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## 5.3.5 Activity Log

An activity log is provided in the RM Database to track all actions taken on returned material. Should the returned material be moved (shipped to a manufacturing or to an outside lab for analysis), re-tested, repaired, etc., an entry shall be made the log. The log should reflect the present status and location of the returned material.

## 5.4 Final Disposition

Since material covered by this procedure is owned by the customer, decisions regarding final disposition shall be made with their concurrence. Final disposition shall be noted in the RM Database. The record in the RM Database shall remain open until final disposition is complete.

## 5.5 Review

Data collected from this procedure shall be reviewed on annual basis (at a minimum) for trends regarding quality, misapplication of the product, etc.

# *Quality Assurance Procedure*

SUBJECT: INTERNAL QUALITY AUDIT PROCEDURE  
PROCEDURE #: QP9 REVISION: D  
APPROVED BY: SCOTT F. FRENCH

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DATE ISSUED: 5/9/03

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## **1.0 PURPOSE**

This procedure provides instructions for reviewing the continued effectiveness of the Quality System and compliance with the ISO 9001 Standard. The Internal Quality Audit shall encompass all elements of the Quality System to insure continued compliance to the stated policies in the Quality Assurance Manual.

## **2.0 APPLICATION**

This procedure applies to the CMI/Cascon member trained in internal audit techniques.

## **3.0 DEFINITIONS**

- 3.1 Internal Audit – A review performed by an organizations management on it's own systems, procedures and facilities. The auditors may be from the organizations own staff or hired to act in their behalf.

## **4.0 ASSOCIATED MATERIALS**

- 4.1 QPF 7.1 Nonconformance Report Form  
4.2 QPF 15.4 Internal Audit Schedule  
4.3 QPF 15.10 ISO 9001:2000 Checklist

## **5.0 PROCEDURE**

- 5.1 Internal quality audits shall include various elements of the quality system at the discretion of the auditor. At the end of the calendar year all elements of the quality system shall be audited.
- 5.2 The auditor from Cascon shall audit the direct quality assurance elements at Chamberlain Machine to eliminate bias and influences, which could affect objectivity. The Quality Assurance Manager shall be responsible for assessing all other elements of the quality system and for auditing the Cascon quality system.
- 5.3 The auditor shall present any audit results to the CMI/Cascon management and appropriate company representatives for required corrective action using the Nonconformance Report Form QPF 7.1.
- 5.4 The corrective action shall be assessed and a follow up date shall be presented to the auditor.

# *Quality Assurance Procedure*

SUBJECT: INTERNAL QUALITY AUDIT PROCEDURE  
PROCEDURE #: QP9            REVISION: D  
APPROVED BY: SCOTT F. FRENCH

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- 5.5    A follow up audit shall be performed at the scheduled date. If the corrective action was deemed acceptable the auditor shall close-out the nonconformance generated during the first audit. If the corrective action was not deemed suitable another nonconformance report shall be generated and follow up scheduled. This cycle shall be continued until the corrective action is deemed suitable.

# *Quality Assurance Procedure*

SUBJECT: EMPLOYEE TRAINING PROCEDURE  
PROCEDURE #: QP10 REVISION: B  
APPROVED BY: SCOTT F. FRENCH

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DATE ISSUED: 5/8/03

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## **1.0 PURPOSE**

This procedure provides instructions for employee training in quality related functions associated with their respective positions.

## **2.0 APPLICATION**

This procedure applies to all employees' at Cascon and Chamberlain Machine.

## **3.0 DEFINITIONS**

3.1 Employee training consists of providing all employees with the intrinsic knowledge needed to perform the tasks associated with their respective positions.

## **4.0 ASSOCIATED MATERIALS**

- 4.1 Employee Training Matrix QPF 10.1
- 4.2 Employee Education and Experience Requirements QPF 10.2A
- 4.3 Employee Education and Experience QPF 10.2B

## **5.0 PROCEDURE**

- 5.1 The QA Manager shall be responsible for all training oversight and record keeping.
- 5.2 The employees shall be trained in all of the elements of the quality system that relate to their respective job positions. The employee shall verify the completion of the training in conjunction with the QA Manager.
- 5.3 The following table applies to the Employee Training Matrix QPF 10.1:

**Table 1**

	DOES NOT APPLY
1	ON THE JOB TRAINING
2	OUTSIDE TRAINING/EDUCATION
3	PREVIOUS EDUCATION / EXPERIENCE