

# Harmony Castings LLC

Aluminum V-Process Castings

Quality Manual Section:

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Issue Date: 10/10/12

Revision Date: 6/04/13

Revision 01

Approval Signature:

Andy Renkey, President

Mark Fallen, Plant Manager

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Approval Date: 6/4/13

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**1.0. Scope. Harmony Castings LLC's** quality system is manufacture and supply of aluminum V-Process castings. **Harmony Castings LLC's** quality system is based on AS9100 Rev C.

**1.2a Harmony Castings LLC** excludes AS9100 Rev C section 7.3 Design and development from its quality management system. **Harmony Castings LLC** is a job shop, which produces castings to order per customer-supplied designs, drawings and specifications. **Harmony Castings LLC** does not perform any design and development activities. **Harmony Castings LLC** assumes no responsibility for the design of parts produced for customers.

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## Quality Policy Statement

### **QUALITY POLICY**

It is the policy of Harmony Castings LLC to provide products conforming in all respects to the functional quality requirements specified by our customers, to include all applicable specifications, procedures, standards, and codes. Conformance to this standard of quality must be built into each casting in order to achieve optimum cost and insure scheduling integrity.

Aiding in the achievement of company objectives, **Harmony Castings LLC**, established and maintains a comprehensive Quality Management System based on AS9100 Rev. C while acknowledging customers' specific requirements. Harmony Castings LLC realizes and emphasizes the importance of continual process improvement of our Quality Management System.

The Quality Management System shall;

Establish procedures that standardize processes and minimize variation;

Engineer solutions that eliminate the potential for defects

Drive employee accountability for process and product produced.

The established program for the assurance of quality at Harmony Castings LLC has been recorded in the company Quality Assurance Manual. No deviation from the scope of this manual is permitted.

Quality will be the cornerstone of our reputation, our productivity, and our continued growth in a highly competitive marketplace.

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Andy Renkey  
General Manager

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## 4.1 General Requirements

**Harmony Castings LLC** has established documented, implemented and maintained a quality management system and continually improves its effectiveness in accordance with the requirements of AS9100 Rev C.

**Harmony Casting LLC's** quality management system shall also address customer and applicable statutory and regulatory quality management system requirements.

**Harmony Castings LLC** has:

- a) Determined the processes needed for the quality management system and their application throughout the organization,
- b) Determined the sequence and interaction of these processes,
- c) Determined criteria and methods needed to ensure that both the operation and control of these processes are effective,
- d) Ensured the availability of resources and information necessary to support the operation and monitoring of these processes,
- e) Monitor, measure where applicable, and analyzed these processes, and
- f) Implemented actions necessary to achieve planned results and continual improvement of these processes.

**Harmony Castings LLC** will manage these processes in accordance with the requirements of this International Standard. Where **Harmony Castings LLC** chooses to outsource any process that affects product conformity to requirements, **Harmony Castings LLC** will ensure control over such processes. The type and extent of control to be applied to these outsourced processes shall be defined within the quality management system. Control of such outsourced processes is identified within the quality management system.

An "outsourced process" is a process that the organization needs for its quality management system and which the organization chooses to have performed by an external party.

Ensuring control over outsourced processes does not absolve the organization of the responsibility of conformity to all customers, statutory and regulatory requirements. The type and extent of control to be applied to the outsourced process can be influenced by factors such as

- a> The potential impact of the outsourced process on the organizations capability to provide products that conforms to requirements
- b> The degree to which the control for the process is shared.
- c> The capability of achieving the necessary control through the application of 7.4

References
HCP – 32 Flow Chart
H-8 - Audit Schedule for Key Processes
HCP- 4 Vendor Qualification

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## H-18 Supplier Evaluation Survey

### 4.2 Documentation Requirements

#### 4.2.1 General

The quality management system documentation includes:

- a) Documented statements of a quality policy and quality objectives,
- b) A quality manual,
- c) Documented procedures and records required by AS9100 Rev C,
- d) Documents, including records, determined by **Harmony Castings LLC** to be necessary to ensure the effective planning, operation and control of its processes

The documentation may be in any form or type of medium.

**Harmony Castings LLC** shall ensure that personnel have access to, and are aware of, relevant quality management system documentation and changes.

#### 4.2.2 Quality Manual

**Harmony Castings LLC** has established and maintained a quality manual that includes

- a) The scope of the quality management system. Including details of and justification for any exclusion.
- b) The documented procedures established for the quality management system. Or reference to them, and
- c) A description of the interaction between the processes of the quality management system.

#### 4.2.3 Control of Documents

Documents required by the quality management system are controlled. Records are a special type of document and shall be controlled according to the requirements given in 4.2.4.

A documented procedure is established to define the controls needed:

- a) To approve documents for adequacy prior to issue,
- b) To review and update as necessary and re-approve documents,
- c) To ensure that changes and the current revision status of documents are identified,
- d) To ensure that relevant versions of applicable documents are available at points of use,
- e) To ensure that documents remain legible and readily identifiable,
- f) To ensure those documents of external origin determined by the organization to be necessary for the planning and operation of the quality management system are identified and their distribution controlled.
- g) To prevent the unintended use of obsolete documents, and to apply suitable identification to them if they are retained for any purpose.

#### 4.2.4 Control of Records

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Records established to provide evidence of conformity to requirements and of the effective operation of the quality management system shall be controlled. A documented procedure to define the controls needed for the identification, storage, protection, retrieval, retention and disposition of records. Records shall remain legible, readily identifiable and retrievable.

References
HCP-11 Document control

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## 5.0 Management Responsibility

### 5.1 Management Commitment

Top management will evidence of its commitment to the development and implementation of the quality management system and continually improving its effectiveness by:

- a) Communicating to **Harmony Castings LLC** the importance of meeting customer as well as statutory and regulatory requirements,
- b) Establishing the quality policy,
- c) Ensuring that quality objectives are established.
- d) Conducting management reviews, and
- e) Ensuring the availability of resources.
- f) To be included are: President, Plant Manager, Quality Manager, and V.P Sales.

### 5.2 Customer Focus

Top management will ensure that customer requirements are determined and are met with the aim of enhancing customer satisfaction.

Top management shall ensure that product conformity and on-time delivery performance are measured and that appropriate action is taken if planned results are not, or will not, be achieved.

### 5.3 Quality Policy

Top management will ensure that the quality policy:

- a) Is appropriate to the purpose of **Harmony Castings LLC**,
- b) Includes a commitment to comply with requirements and continually improve the effectiveness of the quality management system,
- c) Provides a framework for establishing and reviewing quality objectives,
- d) Communicated and understood within **Harmony Castings LLC**, and
- e) Reviewed for continuing suitability.

## 5.4 Planning

### 5.4.1. Quality Objectives

Top management will ensure that quality objectives, including those needed to meet requirements for product, are established at relevant functions and levels within **Harmony Castings LLC**. The quality objectives shall be measurable and consistent with the quality policy.

### 5.4.2 Quality Management System Planning

Top management will ensure that:

- a) The planning of the quality management system is carried out in order to meet the requirements given in 4.1, as well as the quality objectives, and
- b) The integrity of the quality management system is maintained when changes to the quality management system are planned and implemented.



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(8.2.3) Monitoring and Measurement of Processes	X	0	0				0		
(8.2.4) Monitoring and Measurement of Product	0	X	0	0			0		
(8.3) Control of Nonconforming Product	0	X	0	0					
(8.4) Analysis of Data	0	X	0	0					
(8.5.1) Continual Improvement	0	0	X	0					
(8.5.2) Corrective Action	0	X	0	0					
(8.5.3) Preventive Action	0	X	0	0					

Main Responsibility X

Associated Responsibility 0



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## **5.5.2 Management Representative**

**Harmony Castings LLC's** management representative is the Quality Manager who, irrespective of other responsibilities, has responsibility and authority that includes:

- a) Ensuring that processes needed for the quality management system are established, implemented and maintained,
- b) Reporting to top management on the performance of the quality management system and any need for improvement, and
- c) Ensuring the promotion of awareness of customer requirements throughout the organization
- d) The organizational freedom and unrestricted access to top management to resolve quality management issues.

## **5.5.3 Internal Communication**

Top management has ensured that appropriate communication processes have been established within **Harmony Castings LLC** and that communication takes place regarding the effectiveness of the quality management system.

Communication processes at Harmony Castings LLC include but are not limited to the following:

- Posting of customer returns, causes, and trends monthly on bulletin board,
- Monthly meetings of management to review customer returns, causes and trends,
- Monthly meetings of management to review corrective actions,
- Weekly reports and meetings of management to review on time delivery status and dock audit results,
- Monthly Safety Meetings to review Safety Audits, Injuries/Follow-ups, safety suggestions and any environmental issues with minutes being posted for all to read.
- Monthly "all-in-one" reports distributed to management covering all aspects of business conditions including sales, backlog, profits, scrap, efficiencies etc.,
- Management Review twice per year,
- Weekly meeting of management to go over status of all new and revised jobs, and
- Monthly meetings with employees from top management on various business related topics.

## **5.6 Management Review**

### **5.6.1 General**

Top management will review **Harmony Castings LLC's** quality management system, at planned intervals, to ensure its continuing suitability, adequacy and effectiveness. This review shall include assessing opportunities for improvement and the need for changes to the quality management system, including the quality policy and quality objectives.

Records from management reviews will be maintained.

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## **5.6.2 Review Input**

The input to management review will include information on:

- a) Results of audits,
- b) Customer feedback,
- c) Process performance and product conformity,
- d) Status of preventive and corrective actions,
- e) Follow-up actions from previous management reviews,
- f) Changes that could affect the quality management system, and
- g) Recommendations for improvement.

## **5.6.3 Review Output**

The output from the management review will include any decisions and actions related to:

- a) Improvement of the effectiveness of the quality management system and its processes,
- b) Improvement of product related to customer requirements, and
- c) Resource needs.

References
HCP-33 – Employee Meetings
HCP-21 Management Review

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## **6.0 Resource Management**

### **6.1 Provision of Resources**

**Harmony Castings LLC** will determine and provide the resources needed

- a) To implement and maintain the quality management system and continually improve its effectiveness, and
- b) To enhance customer satisfaction by meeting customer requirements.

## **6.2 Human Resources**

### **6.2.1 General**

Personnel performing work affecting conformity to product requirements will be competent on the basis of appropriate education, training, skills and experience.

Conformity to production requirements can be affected directly or indirectly by personnel performing any task within the quality management system.

### **6.2.2 Competence, Awareness and Training.**

**Harmony Castings LLC** will:

- a) Determine the necessary competence for personnel performing work affecting conformity to product requirements,
- b) Where applicable, provide training or take other actions to achieve the necessary competence,
- c) Evaluate the effectiveness of the actions taken,
- d) Ensure that its personnel are aware of the relevance and importance of their activities and how they contribute to the achievement of the quality objectives, and
- e) Maintain appropriate records of education, training, skills and experience.

## **6.3 Infrastructure**

**Harmony Castings LLC** will determine, provide and maintain the infrastructure needed to achieve conformity to product requirements. Infrastructure includes, as applicable:

- a) Buildings, workspace and associated utilities,
- b) Process equipment (both hardware and software), and
- c) Supporting services (such as transport, communication, or information systems).
- d) IT systems (Rev 08)

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## **6.4 Work Environment**

**Harmony Castings LLC** shall determine and manage the work environment needed to achieve conformity to product requirements.

- a) All employees initially have a hearing test and chest x-ray. This is used as a bench mark for annual screening.

The term "work environment" relates to those conditions under which work is performed including physical, environmental and other factors (such as noise, temperature, humidity, lighting or weather).

References
HCP-7 General processes
HCP-13 New employee
HCP-33 Employee Meetings
HCP-14 Document Control

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## 7.0 Product Realization

### 7.1 Planning of Product Realization.

**Harmony Castings LLC** will plan and develop the processes needed for product realization. Planning of product realization will be consistent with the requirements of the other processes of the quality management system.

In planning product realization, **Harmony Castings LLC** shall determine the following, as appropriate:

- a) Quality objectives and requirements for the product;
- b) The need to establish processes and documents, and to provide resources specific to the product.
- c) Required verification, validation, monitoring, measurements, inspection and test activities specific to the product and the criteria for product acceptance.
- d) Records needed to provide evidence that the realization processes and resulting product meet requirements.
- e) Company Goals and Objectives will be kept on file in the President's Office.

The output of this planning will be in a form suitable for **Harmony Castings LLC's** method of operations.

#### 7.1.1 Project Management

**Harmony Castings LLC** shall plan and manage product realization in a structured and controlled manner to meet requirements at acceptable risk, within resource and schedule constraints.

#### 7.1.2 Risk Management

**Harmony Castings LLC** shall establish, implement and maintain a process for managing risk to the achievement of acceptable requirements that includes as appropriate to **Harmony Castings LLC** and the product:

- a) assignment of responsibilities of risk management,
- b) definition of risk criteria. (eg. likelihood, consequences, risk acceptance),
- c) identification, assessment and communication of risks throughout product realization,
- d) identification, implementation, and management of actions to mitigate risks that exceed the defined risk acceptance criteria, and
- e) acceptance of risks remaining after implementation of mitigating actions.

#### 7.1.3 Configuration Management

**Harmony Castings LLC** shall establish, implement and maintain a configuration management process that includes as appropriate to the product

- a) configuration management planning,
- b) configuration identification,
- c) change control,
- d) configuration status accounting, and
- e) configuration audit.

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## **7.1.4 Control of Work Transfers**

**Harmony Castings LLC** shall establish, implement and maintain a process to plan and control the temporary or permanent transfer of work from one organization facility to another or from one supplier to another, and to verify the conformity of work to requirements.

## **7.2.1 Determination of Requirements Related to the Product**

**Harmony Castings LLC** will determine:

- a) Requirements specified by the customer, including the requirements for delivery and post-delivery activities.
- b) Requirements not stated by the customer but necessary for specified or intended use, where known.
- c) Statutory and regulatory requirements applicable to the product, and
- d) Any additional requirements considered necessary by the organization.

Post-delivery activities include, for example, actions under warranty provisions, contractual obligations such as maintenance services, and supplementary services such as recycling or final disposal.

## **7.2.2 Review of Requirements Related to the Product**

**Harmony Castings LLC** will review the requirements related to the product. This review shall be conducted prior to **Harmony Castings LLC's** commitment to supply a product to the customer (e.g. submission of tenders, acceptance of contracts or orders. acceptance of changes to contracts or orders) and will ensure that:

- a) Product requirements are defined,
- b) Contract or order requirements differing from those previously expressed are resolved.
- c) The organization has the ability to meet the defined requirements.

Records of the results of the review and actions arising from the review shall be maintained. See 4.2.4.

Where the customer provides no documented statement of requirements, Harmony Castings LLC will confirm the customer requirements before acceptance.

Where product requirements are changed, **Harmony Castings LLC** will ensure that relevant documents are amended and that relevant personnel are made aware of the changed requirements.

**Harmony Castings LLC** performs a preliminary review at the quote phase and will perform a more detail analysis when a purchase order is received.

## **7.2.3 Customer Communication**

**Harmony Castings LLC** will determine and implement effective arrangements for communicating with customers in relation to:

- a) Product information
- b) Inquiries. Contracts or order handling, including amendments, and
- c) Customer feedback, including customer complaints.

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Note: when requested by the customer, **Harmony Castings LLC** will process Confidentiality or Non-Disclosure agreement to ensure that all customer related documents, product identification, and product knowledge is protected from 3<sup>rd</sup> party knowledge.

## 7.3 Design and development

**Harmony Castings LLC** takes exception to AS9100 Rev C section 7.3. See Section 1.2 of this manual.

## 7.4 Purchasing

### 7.4.1 Purchasing Process

**Harmony Castings LLC** will ensure that purchased product conforms to specified purchase requirements. The type and extent of control applied to the supplier and the purchased product will be dependent upon the effect of the purchased product on subsequent product realization or the final product.

**Harmony Castings LLC** shall be responsible for the conformity of all products purchased from suppliers, including product from sources defined by the customer.

**Harmony Castings LLC** will evaluate and select suppliers based on their ability to supply product in accordance with **Harmony Castings LLC's** requirements. Criteria for selection, evaluation and re-evaluation will be established. Records of the results of evaluations and any necessary actions arising from the evaluation will be maintained.

**Harmony Castings LLC** shall

- a) maintain a register of its suppliers that includes approval status and scope of the approval,
- b) periodically review supplier performance; the results of those reviews shall be used as a basis for establishing the level of controls to be implemented,
- c) define the necessary actions to take when dealing with suppliers that do not meet requirements,
- d) ensure when required that both **Harmony Castings LLC** and all suppliers use customer-approved special process sources,
- e) define the process, responsibilities, and authority for the approval status decision, changes of the approval status and conditions for a controlled use of suppliers depending on the supplier's approval status, and
- f) determine and manage the risk when selecting and using suppliers (See 7.1.2)

Processes which may be subcontracted by Harmony Castings LLC are as follows:

- design and construction of casting tooling including patterns, core boxes, gages and checking fixtures,
- core making,
- machining and machining fixtures and programming,

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- assembly,
- finishing operations such as plating, painting, powder coat, impregnation etc. and others as required by customers,
- testing such as x-ray, LP, tensile testing, leak testing, cleanliness and others as required by customers
- calibration
- other operations as required by customers.

## 7.4.2 Purchasing Information

Purchasing information will describe the product to be purchased, including where appropriate:

- a) Requirements for approval of product. Procedures, processes and equipment,
- b) Requirements for qualification of personnel, and
- c) Quality management system requirements.
- d) the identification and revision status of specifications, drawings, process requirements, inspection/verification instructions and other relevant technical data,
- e) requirements for test, inspection, verification (including production process verification), use of statistical techniques for product acceptance, and related instructions for acceptance by **Harmony Castings LLC**, and as applicable critical items including key characteristics,
- f) requirements for test specimens (e.g. production method, number, storage conditions) for inspection/verification, investigation or auditing,
- g) requirements regarding the need for the supplier to
  - notify **Harmony Castings LLC** of nonconforming product
  - obtain **Harmony Castings LLC** approval for nonconforming product disposition
  - notify **Harmony Castings LLC** of changes in product and/or process, changes of suppliers, changes of manufacturing facility location and, where required, obtain Harmony Castings LLC approval, and
  - flow down to the supply chain the applicable requirements including customer requirements,
- h) records retention requirements, and
- i) right of access by **Harmony Castings LLC**, their customer and regulatory authorities to the applicable areas of all facilities, at any level of the supply chain, involved in the order and to all applicable records.

**Harmony Castings LLC** will ensure the adequacy of specified purchase requirements prior to their communication to the supplier.

## 7.4.3 Verification of Purchased Product

**Harmony Castings LLC** will establish and implement the inspection or other activities necessary for ensuring that purchased product meets specified purchase requirements.

Where **Harmony Castings LLC** or its customer intends to perform verification at the supplier's premises, **Harmony Castings LLC** will state the intended verification arrangements and method of product release in the purchasing information.



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Where purchased product is released for production use pending completion of all required verification activities, it shall be identified and recorded to allow recall and replacement if it is subsequently found that the product does not meet requirements.

Where Harmony Castings LLC delegates verification activities to the supplier, the requirements for delegation shall be defined and a register of delegations maintained.

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## **7.5 Production**

### **7.5.1 Control of Production**

**Harmony Castings LLC** will plan and carry out production under controlled conditions. Controlled conditions shall include, as applicable

- a) The availability of information that describes the characteristics of the product.
- b) The availability of work instructions, as necessary.
- c) The use of suitable equipment.
- d) The availability and use of monitoring and measuring equipment.
- e) The implementation of monitoring and measurement.
- f) The implementation of product release, delivery and post-delivery activities.
  - a) accountability for all product during production (e.g. parts quantities, split orders, nonconforming product),
  - b) evidence that all production and inspection/verification operations have been completed as planned, or as otherwise documented and authorized,
  - c) provision for the prevention, detection, and removal of foreign objects (as required),
  - d) monitoring and control of utilities and supplies (e.g. water, compressed air, electricity, chemical products) to the extent that they affect conformity to product requirements,
  - e) criteria for workmanship, specified in the clearest practical way (e.g. written standards, representative samples, illustrations).

#### **7.5.1.1 Production Process Verification**

**Harmony Castings LLC** shall use a representative item from the first production run of a new part or assembly to verify that the production processes, production documentation and tooling are capable of producing parts and assemblies that meet requirements. This process shall be repeated when changes occur that invalidate the original results (e.g. engineering changes, manufacturing process changes, tooling changes).

NOTE This activity is often referred to as first article inspection.

#### **7.5.1.2 Control of Production Process Changes**

Personnel authorized to approve changes to production processes shall be identified.

**Harmony Castings LLC** shall control and document changes affecting processes, production equipment, tools or software programs.

The results of changes to production processes shall be assessed to confirm that the desired effect has been achieved without adverse effects to product conformity.

#### **7.5.1.3 Control of Production Equipment, Tools and Software Programs**

Production equipment, tools and software programs used to automate and control/monitor product realization processes shall be validated prior to release for production and shall be maintained.

Storage requirements, including periodic preservation/condition checks, shall be defined for production equipment or tooling in storage.

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## **7.5.1.4 Post Delivery Support**

Post-delivery support shall provide as applicable for the

- a) collection and analysis of in-service data
- b) actions to be taken, including investigation and reporting, when problems are detected after delivery,
- c) control and updating of technical documentation,
- d) approval, control, and use of repair schemes, and
- e) controls required for off-site work (e.g. **Harmony Casting LLC's** work undertaken at the customer's facilities).

## **7.5.2 Validation of Processes for Production**

**Harmony Castings LLC** will validate any processes for production where the resulting output cannot be verified by subsequent monitoring or measurement and, as a consequence, deficiencies become apparent only after the product is in use or the service has been delivered. Validation will demonstrate the ability of these processes to achieve planned results.

**Harmony Castings LLC** will establish arrangements for these processes including, as applicable:

- a) Defined criteria for review and approval of the processes,
- b) Approval of equipment and qualification of personnel,
- c) Use of specific methods and procedures,
- d) Requirements for records (see 4.2.4), and
- e) Revalidation.

## **7.5.3 Identification and Traceability**

Where appropriate, **Harmony Castings LLC** will identify the product by suitable means throughout product realization. **Harmony Castings LLC** will identify the product status with respect to monitoring and measurement requirements throughout production realization.

**Harmony Castings LLC** shall maintain the identification of the configuration of the product in order to identify any differences between the actual configuration and the agreed configuration. Where traceability is a requirement, **Harmony Castings LLC** shall control the unique identification of the product and maintain records (see 4.2.4).

When acceptance authority media are used (e.g. stamps, electronic signatures, passwords), **Harmony Castings LLC** shall establish appropriate controls for the media.

## **7.5.4 Customer Property**

**Harmony Castings LLC** will exercise care with customer property while it is under **Harmony Castings LLC's** control or being used by **Harmony Castings LLC**. **Harmony Castings LLC** will identify by Harmony Castings own 4 digit code number, verify, protect and safeguard customer property provided for use or incorporation into the product. If any customer property is lost, damaged or otherwise found to be unsuitable for use, the organization shall report this to the customer and maintain records (see 4.2.4).

Customer property can include intellectual property and personal data.

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## 7.5.5 Preservation of Product

**Harmony Castings LLC** will preserve the product during internal processing and delivery to the intended destination in order to maintain conformity to requirements. As applicable, preservation will include identification, handling, packaging, storage and protection. Preservation will also apply to the constituent parts of a product.

Preservation of product shall also include, where applicable in accordance with product specifications and applicable statutory and regulatory requirements, provisions for

- a) cleaning,
- b) prevention, detection and removal of foreign objects,
- c) special handling for sensitive products,
- d) marking and labeling including safety warnings,
- e) shelf life control and stock rotation,
- f) special handling for hazardous materials.

## 7.6 Control of Monitoring and Measuring Devices

**Harmony Castings LLC** will determine the monitoring and measurement to be undertaken and the monitoring and measuring equipment needed to provide evidence of conformity of product to determined requirements.

**Harmony Castings LLC** shall maintain a register of the monitoring and measuring equipment and define the process employed for their calibration/verification including details of equipment type, unique identification, location, frequency of checks, check method and acceptance criteria.

**Harmony Castings LLC** will establish processes to ensure that monitoring and measurement can be carried out and are carried out in a manner that is consistent with the monitoring and measurement requirements.

**Harmony Castings LLC** shall ensure that environmental conditions are suitable for the calibration, inspection, measurement and testing being carried out.

Where necessary to ensure valid results, measuring equipment will

- a) Be calibrated or verified or both at specified intervals, or prior to use, against measurement standards traceable to international or national measurement standards; where no such standards exist, the basis used for calibration or verification will be recorded; (see 4.2.4).
- b) Be adjusted or re-adjusted as necessary;
- c) Have identification in order to determine its calibration status;
- d) Be safeguarded from adjustments that would invalidate the measurement result;
- e) Be protected from damage and deterioration during handling, maintenance and storage.

**Harmony Castings LLC** shall establish, implement and maintain a process for the recall of monitoring and measuring equipment requiring calibration or verification.

In addition, **Harmony Castings LLC** will assess and record the validity of the previous measuring results when the equipment is found not to conform to requirements. **Harmony Castings LLC** will

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take appropriate action on the equipment and any product affected. Records of the results of calibration and verification will be maintained.

When used in the monitoring and measurement of specified requirements, the ability of computer software to satisfy the intended application will be confirmed. This will be undertaken prior to initial use and reconfirmed as necessary.

Records of the results of calibration and verification shall be maintained (see 4.2.4).

Confirmation of the ability of computer software to satisfy the intended application would typically include its verification and configuration management to maintain its suitability for use.

References
HCP-3 Sample casting
HCP-5 Non conforming material
HCP-6 Calibration
HCP-7 General processes
HCP-9 Pattern shop work order (red tag)
HCP-10 Melt deck
HCP-15 Brinell
HCP-24 Sieve and sand test
HCP-29 Straightening tables
HCP-30 Pattern shop guide lines
H-59 Ingot acceptance specifications
ALL PROCESS SHEETS.
HCP-14 Document Control

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## **8.0 Measurement, Analysis and Improvement**

### **8.1 General**

**Harmony Castings LLC** will plan and implement the monitoring, measurement, analysis and improvement processes needed

- a) To demonstrate conformity to product requirements.
- b) To ensure conformity of the quality management system, and
- c) To continually improve the effectiveness of the quality management system.

This will include determination of applicable methods, including statistical techniques, and the extent of their use.

### **8.2 Monitoring and Measurement**

#### **8.2.1 Customer Satisfaction**

As one of the measurements of the performance of the quality management system, **Harmony Castings LLC** will monitor information relating to customer perception as to whether **Harmony Castings LLC** has met customer requirements. The methods for obtaining and using this information will be determined.

Harmony Castings LLC will routinely track customer returns and delivery performance. These will be reported at the monthly employee meetings and discussed at the semiannual Management review meeting.

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Monitoring customer perception can include obtaining input from sources such as customers satisfaction surveys, customer data on delivered product quality, user opinion surveys, lost business analysis, compliments, warranty claims and dealer reports.

Information to be monitored and used for the evaluation of customer satisfaction shall include, but is not limited to, product conformity, on-time delivery performance, customer complaints and corrective action requests. **Harmony Castings LLC** shall develop and implement plans for customer satisfaction improvement that address deficiencies identified by these evaluations, and assess the effectiveness of the results.

## **8.2.2 Internal Audit**

**Harmony Castings LLC** will conduct internal audits at planned intervals to determine whether the quality management system

a) Conforms to the planned arrangements, to the requirements of this International Standard and to the quality management system requirements established by the organization, and

NOTE Planned arrangements include customer contractual requirements.

b) Is effectively implemented and maintained.

An audit program will be planned, taking into consideration the status and importance of the processes and areas to be audited, as well as the results of previous audits. The audit criteria, scope, frequency and methods will be defined. The selection of auditors and conduct of audits will ensure objectivity and impartiality of the audit process.

A documented procedure shall be established to define the responsibilities and requirements for planning and conducting audits, establishing records and reporting results.

Auditors will not audit their own work.

Records of the audits and their results shall be maintained (see 4.2.4).

The management responsible for the area being audited will ensure that any necessary corrections and corrective actions are taken without undue delay to eliminate detected nonconformities and their causes. Follow-up activities will include the verification of the actions taken and the reporting of verification results.

## **8.2.3 Monitoring and Measurement of Processes**

**Harmony Castings LLC** will apply suitable methods for monitoring and, where applicable, measurement of the quality management system processes. These methods will demonstrate the ability of the processes to achieve planned results. When planned results are not achieved, correction and corrective action will be taken, as appropriate.

When determining suitable methods, it is advisable that the organization consider the type and extent of monitoring or measurement appropriate to each of its processes in relation to their impact on the conformity to production requirements and on the effectiveness of the quality management system.

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In the event of process nonconformity, **Harmony Castings LLC** shall

- a) take appropriate action to correct the nonconforming process,
- b) evaluate whether the process nonconformity has resulted in product nonconformity,
- c) determine if the process nonconformity is limited to a specific case or whether it could have affected other processes or products, and
- d) identify and control any nonconforming product (see 8.3).

## **8.2.4 Monitoring and Measurement of Product**

**Harmony Castings LLC** shall monitor and measure the characteristics of the product to verify that product requirements have been met. This shall be carried out at appropriate stages of the product realization process in accordance with the planned arrangements. Evidence of conformity with the acceptance criteria shall be maintained.

Records shall indicate the person(s) authorizing release of product for delivery to the customer (see 4.2.4).

Measurement requirements for product acceptance shall be documented and include

- a) criteria for acceptance and/or rejection,
- b) where in the sequence measurement and testing operations are to be performed,
- c) required records of the measurement results (at a minimum, indication of acceptance or rejection), and
- d) any specific measurement instruments required and any specific instructions associated with their use.

When critical items, including key characteristics, have been identified **Harmony Castings LLC** shall ensure they are controlled and monitored in accordance with the established processes.

When **Harmony Castings LLC** uses sampling inspection as a means of product acceptance, the sampling plan shall be justified on the basis of recognized statistical principles and appropriate for use (i.e. matching the sampling plan to the criticality of the product and to the process capability).

Where product is released for production use pending completion of all required measurement and monitoring activities, it shall be identified and recorded to allow recall and replacement if it is subsequently found that the product does not meet requirements.

Records will indicate the person(s) authorizing release of product for delivery to the customer.

When required to demonstrate product qualification, **Harmony Castings LLC** shall ensure that records provide evidence that the product meets the defined requirements.

Product release and delivery to the customer will not proceed until the planned arrangements have been satisfactorily completed, unless otherwise approved by a relevant authority and, where applicable, by the customer.

**Harmony Castings LLC** shall ensure that all documents required to accompany the product are present at delivery.

## **8.3 Control of Nonconforming Product**



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**Harmony Castings LLC** will ensure that product which does not conform to product requirements is identified and controlled to prevent its unintended use or delivery.

**Harmony Castings LLC's** documented procedure shall define the responsibility and authority for the review and disposition of nonconforming product, and the process for approving personnel making these decisions.

Where applicable, **Harmony Castings LLC** will deal with nonconforming product by one or more of the following ways:

- a) By taking action to eliminate the detected nonconformity;
- b) By authorizing its use, release or acceptance under concession by a relevant authority and, where applicable, by the customer;
- c) By taking action to preclude its original intended use or application.
- d) By taking action appropriate to the effects, or potential effects, of the nonconformity when nonconforming product is detected after delivery or use has started.
- e) **Harmony Castings LLC'S** nonconforming product control process shall provide for timely reporting of delivered nonconforming product.
- f) By taking actions necessary to contain the effect of the nonconformity on other processes or products.
- g) Dispositions of use-as-is or repair shall only be used after approval by an authorized representative of the organization responsible for design.
- h) **Harmony Castings LLC** shall not use dispositions of use-as-is or repair, unless specifically authorized by the customer, if the nonconformity results in a departure from the contract requirements.
- i) Product that is dispositioned for scrap shall be conspicuously and permanently marked, or positively controlled, until physically rendered unusable.

When nonconforming product is corrected it shall be subject to re-verification to demonstrate conformity to the requirements. Records of the nature of nonconformities and any subsequent actions taken, including concessions obtained, shall be maintained (see 4.2.4).

Records of the nature of nonconformities and any subsequent actions taken, including concessions obtained, will be maintained.

## **8.4 Analysis of Data**

**Harmony Castings LLC** will determine, collect and analyze appropriate data to demonstrate the suitability and effectiveness of the quality management system and to evaluate where continual improvement of the effectiveness of the quality management system can be made. This shall include data generated as a result of monitoring and measurement and from other relevant sources.

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The analysis of data will provide information relating to

- a) Customer satisfaction
- b) Conformity to product requirements, (see 8.2.4).
- c) Characteristics and trends of processes and products including opportunities for preventive action, (see 8.2.3 and 8.2.4)
- d) suppliers, (see 7.4)

## **8.5 Improvement**

### **8.5.1 Continual Improvement**

**Harmony Castings LLC** will continually improve the effectiveness of the quality management system through the use of the quality policy, quality objectives, audit results, analysis of data, corrective and preventive actions and management review.

**Harmony Castings LLC** shall monitor the implementation of improvement activities and evaluate the effectiveness of the results.

### **8.5.2 Corrective action**

**Harmony Castings LLC** will take action to eliminate the causes of nonconformities in order to prevent recurrence. Corrective actions will be appropriate to the effects of the nonconformities encountered.

A documented procedure is established to define requirements for

- a) Reviewing nonconformities (including customer complaints),
- b) Determining the causes of nonconformities,
- c) Evaluating the need for action to ensure that nonconformities do not recur,
- d) Determining and implementing action needed,
- e) Records of the results of action taken, and
- f) Reviewing the effectiveness of corrective action taken.
- g) flowing down corrective action requirements to a supplier when it is determined that the supplier is responsible for the nonconformity,
- h) specific actions where timely and/or effective corrective actions are not achieved, and
- i) determining if additional nonconforming product exists based on the causes of the nonconformities and taking further action when required.

### **8.5.3 Preventive Action**

**Harmony Castings LLC** will determine action to eliminate the causes of potential nonconformities in order to prevent their occurrence. Preventive actions will be appropriate to the effects of the potential problems.

A documented procedure has been established to define requirements for

- a) Determining potential nonconformities and their causes,

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- b) Evaluating the need for action to prevent occurrence of nonconformities,
- c) Determining and implementing action needed,
- d) Records of results of action taken, and
- e) Reviewing the effectiveness of the preventive action taken.

References:
HCP-5 Non conforming material
HCHP-8 Internal audit
HCP-20 Preventive and corrective actions.
HCP-9 Pattern Shop Work Order (red tag)
HCP-33 Employee meetings