

Advanced Companies

# Quality Manual

**Certified to ISO 9001:2008 & EN/JISQ/AS9100:2004**

Revision: C  
10 May 2010





## 1.0 SCOPE

Advanced Companies (Advanced) has established a Quality Management System (QMS) and manages processes in accordance with AS9100. Advanced Companies includes three different companies, co-located at 11212 E 112<sup>th</sup> St. N, Owasso OK 74055. These companies are:

### **Advanced Plastics, Inc.**

Advanced Plastics, Inc. (API) is a distributor of engineered plastics, and fabricator of plastics and metal components.

### **Advanced Machining and Fabrication, Inc.**

Advanced Machining & Fabrication, Inc. (AMF) is a CNC machine shop and provider of precision components / parts (metal and plastic) and light assemblies.

### **Advanced Plastics Composite Marketing Group, Inc.**

Advanced Plastics Composite Marketing Group (CMG) is a distributor of composite materials, and manufacturer's representative organization.

Clause 7.3, Design and Development is excluded from the scope of Advanced Companies' quality management system, because none of the three companies perform design work.

## 2.0 REFERENCES

SAE AS9100:2004, *Quality Systems - Aerospace - Model for Quality Assurance in Design, Development, Production, Installation and Servicing*. Where this manual says "AS9100," it means SAE AS9100:2004 (revision B) and includes the contents of ISO 9001:2008.

## 3.0 TERMS AND DEFINITIONS

Key Characteristics - the features of a material, process, or part whose variation has a significant influence on product fit, performance, service life, or manufacturability.

E2 – Advanced Companies' manufacturing software system Shoptech Industrial Software Corp.

## 4.0 QUALITY MANAGEMENT SYSTEM

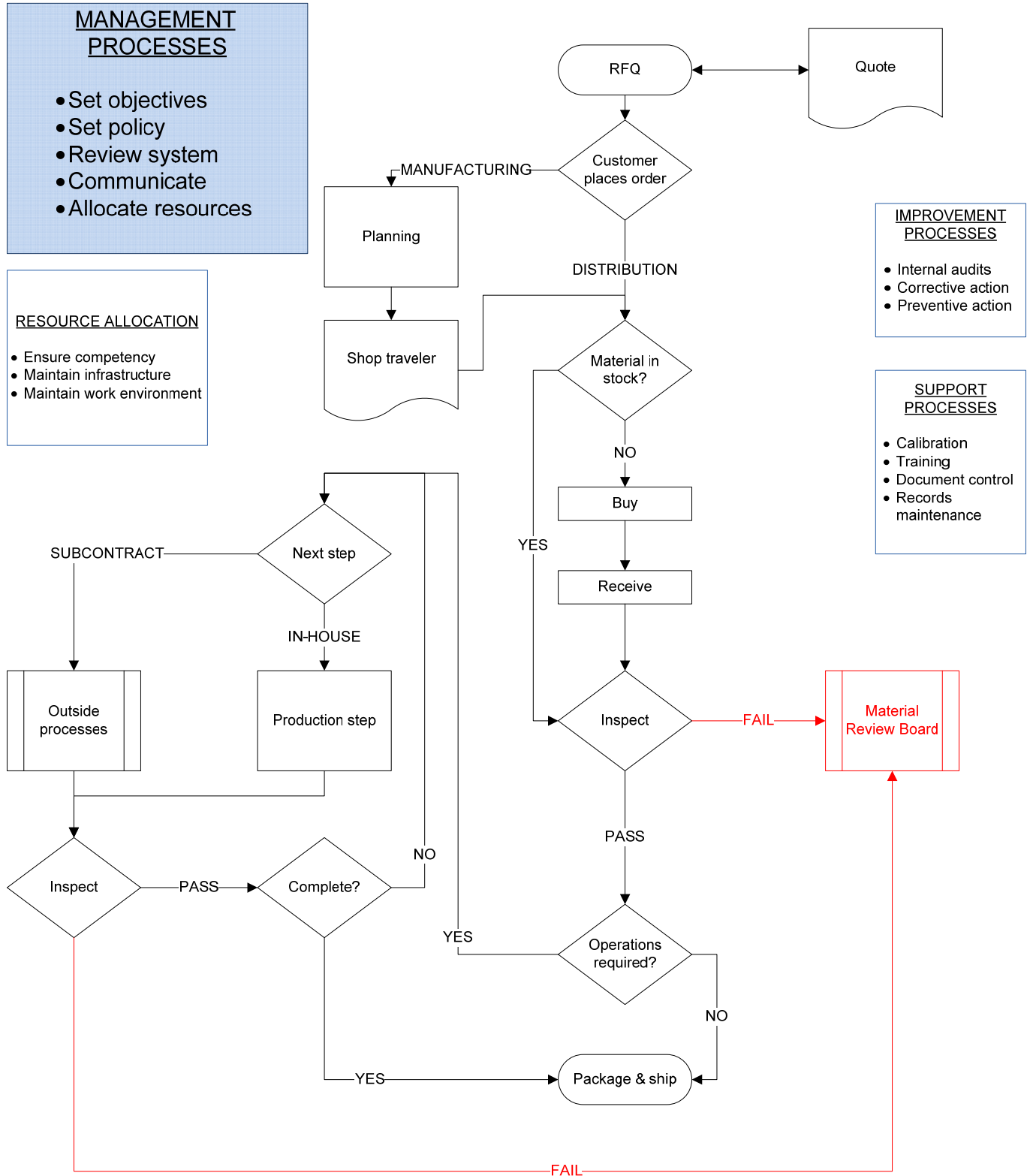
### 4.1 GENERAL REQUIREMENTS

Advanced Companies has established, documented, implemented and maintains a quality management system and continually improves its effectiveness in accordance with the requirements of AS9100.

Advanced Companies has

- a. identified the processes needed for the quality management system and their application throughout the organization (see Figure 1),
- b. determined the sequence and interaction of these processes (see Figure 1),
- c. determine criteria and methods needed to ensure that both the operation and control of these processes are effective,
- d. ensure the availability of resources and information necessary to support the operation and monitoring of these processes,
- e. monitor, measure and analyze these processes, and
- f. Implement actions necessary to achieve planned results and continual improvement of these processes.

These processes, their sequence and interaction (including any outsourced processes) are shown in Figure 1. These processes are managed in accordance with AS9100, quality management system documentation, customer requirements, and applicable regulatory requirements.



**FIGURE 1. ADVANCED COMPANIES' QUALITY MANAGEMENT SYSTEM**



## 4.2 DOCUMENTATION REQUIREMENTS

### 4.2.1 GENERAL

Advanced Companies' quality management system documentation includes a quality policy (see para. 5.3), quality objectives (see para. 5.4.1), this manual, procedures referenced in this manual, related records, and all requirements imposed by applicable regulatory authorities.

Advanced Companies' personnel have access to quality management system documentation and are aware of relevant procedures. Customer and/or regulatory authorities' representatives shall have access to quality management system documentation.

### 4.2.2 MANUAL

This manual describes the scope of Advanced Companies' quality management system (see para 1.0), references related procedures in the clause to which they are applicable, and describes the interaction between the processes of the quality management system (see Figure 1).

### 4.2.3 DOCUMENT CONTROL

Documents are controlled in accordance with Procedure 1201, *Document Control*.

### 4.2.4 RECORDS CONTROL

Records are controlled in accordance with Procedure 1202, *Records Control*.

## 4.3 CONFIGURATION MANAGEMENT

Configuration management is maintained in accordance with Procedure 1203, *Configuration Management*.

## 5.0 MANAGEMENT RESPONSIBILITY

### 5.1 MANAGEMENT COMMITMENT

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

- a. communicating to the organization the importance of meeting customer as well as statutory and regulatory requirements,
- b. establishing a quality policy (see para 5.3),
- c. establishing objectives (see para 5.4.1),
- d. conducting management reviews, and
- e. ensuring the availability of resources.

### 5.2 CUSTOMER FOCUS

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

### 5.3 QUALITY POLICY

Through a culture based on teamwork and continuous improvement, ADVANCED provides manufactured and distributed goods while bringing measured value to our customers and meeting requirements.

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This quality policy is

- a. appropriate to the purpose of the organization,
- 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. is communicated and understood within the organization, and
- e. is reviewed for continuing suitability.

## 5.4 PLANNING

### 5.4.1 QUALITY OBJECTIVES

Increase sales.  
Increase on-time deliveries.  
Reduce scrap.  
Reduce customer returns.

Top management has established the quality objectives listed above for the entire organization of Advanced Companies; these objectives apply within each of the three companies.

### 5.4.2 QUALITY MANAGEMENT SYSTEM PLANNING

Top management shall 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.

## 5.5 RESPONSIBILITY, AUTHORITY AND COMMUNICATION

### 5.5.1 RESPONSIBILITY AND AUTHORITY

Top management shall ensure that the responsibilities and authorities are defined and communicated within the organization. Job descriptions are maintained for each position. The top tier organizational chart is depicted in Figure 2. Shaded positions represent members who share top management responsibilities.

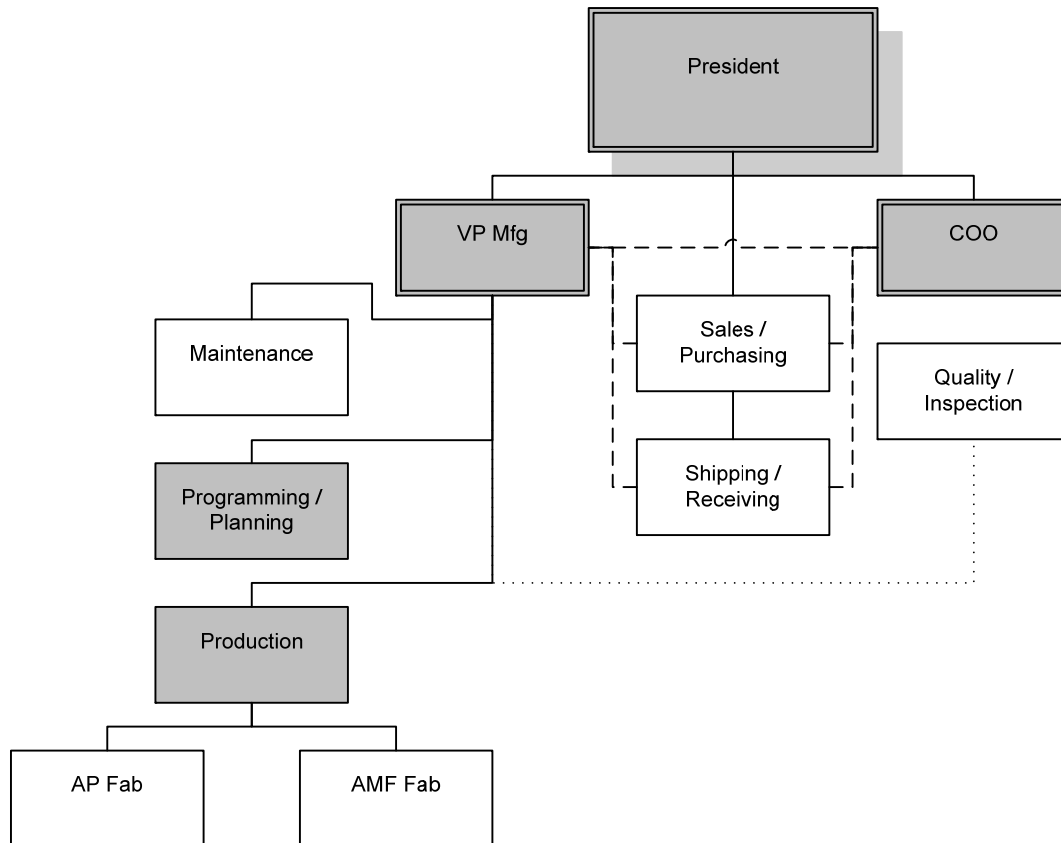
### 5.5.2 MANAGEMENT REPRESENTATIVE

Top management has appointed the COO who, irrespective of other responsibilities, shall have the 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,
- c. ensuring the promotion of awareness of customer requirements throughout the organization, and
- d. the organizational freedom to resolve matters pertaining to quality.

### 5.5.3 INTERNAL COMMUNICATION

Top management shall ensure that appropriate communication processes (such as Communication Boards and company meetings) are established within the organization and that communication takes place regarding the effectiveness of the quality management system.



**FIGURE 2. ADVANCED COMPANIES' ORGANIZATIONAL CHART**

## 5.6 MANAGEMENT REVIEW

### 5.6.1 GENERAL

Top management shall review the organization'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 objectives. Records (management review meeting minutes) shall be maintained.

### 5.6.2 INPUTS

Items that will appear on the agenda include:

- a. results of internal, customer and regulatory 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 OUTPUTS

The following items will appear in the meeting minutes:

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



## 6.0 RESOURCE MANAGEMENT

### 6.1 PROVISION OF RESOURCES

Advanced Companies has determined and provides the resources needed to:

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

## 6.2 HUMAN RESOURCES

### 6.2.1 GENERAL

All Advanced Companies' employees shall be competent on the basis of appropriate education, training skills, and experience.

### 6.2.2 COMPETENCE, AWARENESS AND TRAINING

For full-time, part-time, and temporary employees, Advanced Companies

- a. has determined the necessary competence for personnel performing work affecting product quality,
- b. provides training or takes other actions to satisfy these needs,
- c. evaluates the effectiveness of this training,
- d. ensures personnel are aware of the relevance and importance of their activities and how they contribute to the achievement of the quality objectives, and
- e. maintains appropriate records of education, training, skills and experience.

Advanced Companies' Management Team regularly reviews the knowledge, capability and skill needs of the organization against those available. In any instance where there is a gap between needs and capability, the functional manager will take the necessary steps to acquire needed knowledge, capabilities and/or skills. This may include training and skills development for existing employees, or the use of consultants or other outside expertise.

Necessary competencies are spelled out within job descriptions which are maintained for all positions. New hires are selected based upon their ability to meet the needs described in these job descriptions. New and existing personnel are provided with orientation and any necessary training in order to meet the requirements of their given responsibilities. Personnel with responsibilities that include the use of E2 software are provided the necessary training to execute those functions.

## 6.3 INFRASTRUCTURE

Advanced Companies has determined and provides and maintains the infrastructure necessary to achieve conformity to product requirements, including:

- a. buildings, workspace and associated utilities,
- b. process equipment (both hardware and software), and
- c. supporting services (such as transport and communication).

Specifically, Advanced has established a warehouse and production facility with the necessary environmental controls for factors including temperature, humidity, lighting, and cleanliness. Facilities undergo routine preventive maintenance.

## 6.4 WORK ENVIRONMENT

Advanced Companies has determined and manages the work environment needed to achieve conformity to product requirements.



## 7.0 PRODUCT REALIZATION

### 7.1 PLANNING OF PRODUCT REALIZATION

Advanced Companies plans and develops the processes needed to produce parts in accordance with customer specifications. Planning is consistent with other QMS processes as shown in Figure 1.

During the planning process, Advanced determines (as appropriate):

- a. quality objectives and requirements for the product;
- b. the need to establish processes, documents, and provide resources specific to the product;
- c. the required verification, validation, monitoring, 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; and
- e. the identification of resources to support operation and maintenance of product.

The output of the planning is the shop traveler and related drawings or specifications that show dimensions, characteristics, tolerances, and any key characteristics are clearly defined.

### 7.2 CUSTOMER-RELATED PROCESSES

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

Advanced Companies determines

- a. requirements specified by the customer, including 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 related to the product, and
- d. any additional requirements determined by the organization.

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

Advanced Companies reviews the requirements related to the product. This review shall be conducted prior to Advanced's commitment to supply a product to the customer and shall ensure that

- a. product requirements are defined,
- b. contract or order requirements differing from those previously expressed are resolved,
- c. Advanced Companies has the ability to meet the defined requirements, and
- d. risks (e.g., new technology, short delivery time scale) have been evaluated.

Order entry into E2 is a record that (a) through (d) above have been realized. Records of actions arising from the review shall become a part of the work package.

Where the customer provides no documented statement of requirement, the customer requirements shall be confirmed by requesting customer approval of a quote or by read-back on the phone (non-aerospace parts only).

Where product requirements are changed after work has begun, Advanced shall ensure that relevant documents are amended and that relevant personnel are made aware of the changes.

#### 7.2.3 Customer Communication

Advanced Companies shall 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.



### 7.3 DESIGN AND DEVELOPMENT

Advanced Companies excluded design and development from the scope of its QMS per paragraph 1.0.

### 7.4 PURCHASING

#### 7.4.1 Supplier Selection and Evaluation

Suppliers are controlled in accordance with Procedure 1211, *Supplier Selection & Evaluation*

#### 7.4.2 Purchase Orders

Purchase orders shall include, where appropriate

- a. requirements for approval of product, procedures, processes and equipment,
- b. requirements for qualification of personnel,
- c. quality management system requirements,
- d. the drawing or specification (or other technical data) and applicable revision,
- e. requirements for design, test, examination, inspection and related instructions for acceptance,
- f. requirements for test specimens for design approval, inspection, investigation or auditing,
- g. requirements for supplier notification to Advanced of nonconforming product,
- h. requirements for the supplier to notify Advanced of changes in product and/or process definition and, where required, obtain organizational approval,
- i. right of access by the organization, their customer, and regulatory authorities to all facilities involved in the order and to all applicable records, and
- j. requirements for the supplier to flow down requirements to sub-tier suppliers.

Advanced shall ensure adequacy of specified purchase requirements before communicating them to supplier.

#### 7.4.3 Receiving Inspection

Advanced Companies has established receiving inspection and other activities necessary to ensure purchased product meets specified purchase requirements.

Receiving Inspection uses certificates of conformity and test reports coupled with visual and dimensional inspection to verify product.

Without exception, purchased product shall not be used or processed until it has passed receiving inspection.

Test reports for raw material shall periodically be validated by an independent lab.

Advanced Companies does not delegate inspection to suppliers.

Advanced Companies does not perform source inspection.

Where specified by contract, Advanced Companies' customer shall be afforded the right to verify at the supplier's premises or at Advanced's premises that subcontracted product conforms to specified requirements. Verification by the customer shall not be used by Advanced as evidence of effective control of quality by the supplier and shall not absolve Advanced of the responsibility to supply acceptable product, nor shall it preclude subsequent rejection by the customer.



## 7.5 PRODUCTION AND SERVICE PROVISION

### 7.5.1 Control of Production and Service Provision

Planning considers, as applicable,

- a. the establishment of process controls and development of control plans where key characteristics have been identified,
- b. the identification of in-process verification points when adequate verification of conformance cannot be performed at a later stage of realization,
- c. the design, manufacture, and use of tooling so that variable measurements can be taken, particularly for key characteristics, and
- d. special processes (see 7.5.2).

Advanced Companies plans and carries out production and service provision under controlled conditions. Controlled conditions 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 devices,
- e. the implementation of monitoring and measurement,
- f. the implementation of release, delivery and post-delivery activities,
- g. accountability for all products during manufacture (e.g., parts quantities, split orders, nonconforming product)
- h. evidence that all manufacturing and inspection operation have been completed as planned, or as otherwise documented and authorized,
- i. provision for the prevention, detection, and removal of foreign objects,
- j. monitoring and control of utilities and supplies such as water, compressed air, electricity and chemical products to the extent they affect product quality, and
- k. criteria for workmanship (e.g., deburr or blending – smoothing out steps), which shall be stipulated in the clearest practical manner (e.g., written standards, representative samples or illustrations).

#### 7.5.1.1 Production Documentation

Production operations shall be carried out in accordance with approved data. This data shall contain as necessary:

- a. drawings, parts lists, process flow charts including inspection operations, production documents (process sheet); and inspection documents (see 8.2.4.1), and
- b. a list of specific or non-specific tools and numerical control (NC) machine programs required and any specific instructions associated with their use.

#### 7.5.1.2 Control of Production Process Changes

Programming/Planning are authorized to approve changes to production processes; these changes and their approval shall be documented.

Advanced Companies identifies and obtains acceptance of changes that require customer and/or regulatory authority approval in accordance with contract or regulatory requirements. Changes affecting processes, production equipment, tools and programs are documented. Procedure 1208, *Manufacturing Process Changes*, is available to control change implementation. The results of changes to production processes are assessed to confirm that the desired effect has been achieved without adverse effects to product quality.



7.5.1.3 Control of Production Equipment, Tools and Numerical Control (NC) Machine Programs  
Production equipment, tools and programs are validated prior to use and maintained and inspected periodically in accordance with Procedure 1209, *Equipment, Tooling and Program Control*. Validation prior to production use includes verification of the first article produced to the design data/specification.

Storage requirements, including periodic preservation/condition checks, are established for production equipment or tooling in storage.

7.5.1.4 Control of Work Transferred, on a Temporary Basis, Outside the Organization's Facilities  
As of this revision, Advanced Companies does not transfer work outside its facility. If and when work is transferred outside the facility on a temporary basis, the process to control and validate the quality of work shall be defined prior to the transfer.

7.5.1.5 Control of Service Operations

As of this revision, Advanced Companies has no contractual requirements relating to service operations.

7.5.2 Validation of Processes for Production and Service Provision (Special Processes)

Validation demonstrates the ability of these processes to achieve planned results.

Advanced Companies shall specify arrangements for these processes including, as applicable

- a. defined criteria for review and approval of the processes,
- b. qualification and approval of special processes prior to use,
- c. approval of equipment and qualification of personnel,
- d. use of specific methods and procedures,
- e. control of the significant operations and parameters of special processes in accordance with documented process specifications and changes thereto,
- f. requirements for records (see 4.2.4), and
- g. revalidation

7.5.3 Identification and Traceability

Product is identified by suitable means throughout product realization.

Advanced Companies shall maintain the identification of the configuration of the product in order to identify any differences between the actual configuration and the agreed configuration. Product status with respect to monitoring and measuring requirements is identified; nonconforming parts are identified (and segregated) in accordance with Procedure 1204, *Control of Non-Conforming Product*.

As of this revision, inspection stamps are not used. If Advanced Companies implements acceptance authority media, a procedure for control shall be established and documented.

Where traceability is a requirement, Advanced Companies controls and records the unique identification of the product.

According to the level of traceability required by contract, regulatory, or other established requirements,



Advanced Companies' system provides for:

- a. identification to be maintained throughout the product life;
- b. all the products manufactured from the same batch of raw material or from the same manufacturing batch to be traced, as well as the destination (delivery, scrap) of all products of the same batch;
- c. for an assembly, the identity of its components and those of the next higher assembly to be traced;
- d. for a given product, a sequential record of its production (manufacture, assembly, inspection) to be retrieved.

#### 7.5.4 Customer Property

Advanced Companies exercises care with customer property while it is in Advanced's control or use. Advanced shall identify, 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, it will be reported to the customer and records maintained in accordance with Procedure 1202, *Records Control*.

#### 7.5.5 Preservation of Product

Advanced Companies preserves the conformity of product during internal processing and delivery to the intended destination. This preservation includes identification, handling, packaging, storage and protection. Preservation also applies to the constituent parts of a product.

Preservation of product also includes, where applicable in accordance with product specifications and/or applicable regulations; 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.

Advanced Companies ensures that documents required by the contract/order to accompany the product are present at delivery and are protected against loss and deterioration.

### 7.6 CALIBRATION

Advanced Companies determines the monitoring and measurement to be undertaken and the monitoring and measuring devices needed to provide evidence of conformity of product in accordance with Procedure 1210, *Control of Monitoring and Measuring Devices*.

## 8.0 MEASUREMENT, ANALYSIS, AND IMPROVEMENT

### 8.1 GENERAL

Advanced Companies plans and implements the monitoring, measurement, analysis and improvement processes needed:

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

This includes 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, Advanced Companies shall monitor information relating to customer perception as to whether the organization has met customer requirements. The methods for obtaining and using this information are determined.

### 8.2.2 Internal Audit

Advanced Companies conducts internal audits at planned intervals to determine whether the quality management system:

- a. conforms to the planned arrangements, to the requirements of AS9100 and to the quality management system requirements established by Advanced and
- b. is effectively implemented and maintained.

Internal audits are performed in accordance with Procedure 1205, *Internal Audits*.

### 8.2.3 Monitoring and Measurement of Processes

Advanced Companies shall apply suitable methods for monitoring and, where applicable, measurement of the quality management system processes.

These methods demonstrate the ability of the processes to achieve planned results. When planned results are not achieved, correction and corrective action is taken, as appropriate, to ensure conformity of the product.

In the event of process nonconformity, Advanced Companies

- a. takes appropriate action to correct the nonconforming process,
- b. evaluates whether the process nonconformity has resulted in product nonconformity, and
- c. identifies and controls the nonconforming product.

### 8.2.4 Monitoring and Measurement of Product

Advanced Companies monitors and measures the characteristics of the product to verify that product requirements are met. This is carried out at appropriate stages of the product realization process in accordance with the planned arrangements.

When key characteristics have been identified, they are monitored and controlled.

When Advanced uses sampling inspection as a means of product acceptance, the plan is statistically valid and appropriate for use. The plan will preclude the acceptance of lots whose samples have known nonconformities. When required, the plan will be submitted for customer approval.

Product is not be used until it has been inspected or otherwise verified as conforming to specified requirements.

Evidence of conformity with the acceptance criteria is maintained. Records indicate the person(s) authorizing release of product.

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



#### 8.2.4.1 Inspection documentation

Measurement requirements for product or service acceptance will be documented. This documentation may be part of the production documentation, but will include

- a. criteria for acceptance and/or rejection,
- b. where in the sequence measurement and testing operation are performed,
- c. a record of the measurement results, and
- d. type of measurement instruments required and any specific instructions associated with their use.

Test records will show actual test results data when required by specification or acceptance test plan.

Where required to demonstrate product qualification Advanced Companies ensures that records provide evidence that the product meets the defined requirements.

#### 8.2.4.2 First Article Inspection

Advanced Companies provides a process for the inspection, verification and documentation of representative item from the first production run of a new part, or following any subsequent change that invalidates the previous first article inspection result.

### 8.3 CONTROL OF NONCONFORMING PRODUCT

Advanced Companies ensures that product which does not conform to product requirements is identified and controlled to prevent its unintended use or delivery. The responsibilities and authorities for controlling nonconforming product are defined in Procedure 1204, *Nonconforming Product*.

### 8.4 ANALYSIS OF DATA

Advanced Companies determines, collects and analyzes appropriate data to demonstrate the suitability and effectiveness of the quality management system and to evaluate where continual improvement of the effectiveness of quality management system can be made. This includes data generated as a result of monitoring and measurement and from other relevant sources.

The analysis of data provides information relating to:

- a. customer satisfaction,
- b. conformance to product requirements,
- c. characteristics and trends of processes and products including opportunities for preventive action, and
- d. suppliers.

### 8.5 IMPROVEMENT

#### 8.5.1 Continual Improvement

Advanced Companies continually improves 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.

#### 8.5.2 Corrective Action

Advanced Companies takes action to eliminate the cause of nonconformities in order to prevent recurrence in accordance with Procedure 1206, *Corrective Action*.

#### 8.5.3 Preventive Action

Advanced Companies determines action to eliminate the causes of potential nonconformities in order to prevent their occurrence in accordance with Procedure 1207, *Preventive Action*.



**REVISIONS**

<b>Rev</b>	<b>Date</b>	<b>Changes</b>
<b>A</b>	08/14/09	Revised "AS9100" to "SAE AS9100:2004 (Revision B)". Corrected grammar issues. Revised org chart to highlight top management members. Added communication examples.
<b>B</b>	09/16/09	Removed text from par. 7.4.1 and made reference to procedure 1211 <i>Supplier Selection and Evaluation</i>
<b>C</b>	05/10/10	Changed "In Compliance" to "Certified to" on cover page