

**TW Metals Inc.**

**QUALITY MANUAL**

ISO 9001:2008  
AS 9100 Rev. B

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Controlled Copy No. \_\_\_\_

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This Quality Manual (QM) contains only the pages issued by this facility. The Director of Quality and Compliance is responsible for processing all authorized changes, and for inserting revision pages into official copies. The Director of Quality and Compliance has authority to remove and dispose of obsolete pages to prevent their unintentional usage. This QM is a controlled copy document and shall be used as the final authority regarding the latest revision level and amendment status for the QM. The Director of Quality and Compliance maintains the Master Copy (MC) of this QM.

SECTION	DATE	PAGE(S)	DESCRIPTION	APPROVAL
All	10/15/03	All	Initial Release	Director of QA
5.0	11/21/03	3 of 5	Added Organizational Chart	Director of QA
0.5	12/08/03	2 of 2	Added Locations Chart	Director of QA
4.0		2 of 4	Inserted "Interaction of Key Processes" Chart	
4.0, 5.0, 6.0, 7.0, 8.0		Multiple	Added References to Corporate Procedures Under "Related and Support Documentation"	
7.0, 8.0	05/27/04	Multiple	Added References to New Corporate Procedures Under "Related and Support Documentation"	Director of QA
7.0	06/08/04	8 of 9	Added 7.4 "Validation of Processes for Production and Service Provision Exclusion"	Director of QA
0.3, 0.5	06/16/04	Multiple	Added specific Quality Objectives to Section 0.3 and 2 Exclusions to Section 0.5	Director of QA
4	08/15/05	2 of 4	Added specific reference as to how we pursue continuous improvement	Director of QA
CP49-	08/29/05	1, 2, 3	Revised requirements for data	Director of

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SECTION	DATE REVISED	PAGE(S)	DESCRIPTION	APPROVAL
7.4.3-010			input during the receiving process	QA
CP49-7.4.3-012 Rev. Initial	10-10-05	2	Verification Testing, Third Party Establishes the requirements for verification testing of materials	Director of QA
Tier 1 7 Issue 4	01-06-06	3 of 9	Removed language of the standard relevant to design to reflect exceptions taken to the subject section.	Director of QA
CP49-4.2.4-001 Rev 6	01-06-06	1 & 2	Changed retention length to 7 years minimum, added title to clause V "Storage & Protection	Director of QA
Tier 1	01-06-06	1	Revised to include change of ownership	Director of QA
CP49-7.5.4-001 Rev 3	01-16-06	1 V.B.1	Revised to reflect physical inventory frequency IAW customer's schedule	Director of QA
Tier 1	01/31/06	All	Completely revised to insert relevant clauses of AS 9100 Rev B	Director of QA
Tier 1	01/31/06	4.3	Added Configuration Management	Director of QA
Forms	01/16/06	CF49-7.4.3-003	Change form title, added addition contact information required	Director of QA
CP49-7.4.3-002 Rev 4	09/29/06	V.B.8	Added requirement to place nonconforming metal in Metalware status 3 reject code	Director of QA
Quality Manual Tier 1	07/10/07	Page 1 of 2	Removed exclusion of 7.5.2 from Section 0.5 Introduction	Director of QA

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SECTION	DATE REVISED	PAGE(S)	DESCRIPTION	APPROVAL
Tier 2	07/10/07	CP49-7.5.2.001	“Validation of Special Processes” Added	Director of QA
Tier 1	5/30/08	All	Various Revisions & Corrections	Director of Q&C
Tier 1	11/07/08	Various	Various Revisions & Corrections to publish Issue 6	Director of Q&C
Tier 1	9/12/09	Various	Added all changes to 9001:2008 to publish Issue 7	Director of Q&C
Tier 1	5/28/10	9 & 10	Changed Scope of Registration to include Finished Aircraft Parts at specific location(s) - Wichita	Director of Q&C
Tier 1	5/28/10	Various	Various editorial changes	Director of Q&C

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**I. TW Metals Executive Vision**

“TW Metals is leveraging the knowledge base of our employees, our focus on our core competencies and our strong balance sheet to position itself to prosper and evolve into the premier global distributor of specialty metals.

We are streamlining our processes to provide customers with quicker, more robust service, while continuing to refine our distribution system. These operational enhancements will lead to improved service, significant cost reductions, improved on-time performance, and customer satisfaction.”

Jack Elrod  
President and CEO

**II. TW Metals Quality Policy**

TW Metals is committed to establish, communicate, implement, review, monitor, measure and continually improve the effectiveness of the quality management system that assures material and services, procured and supplied by TW Metals conform to customer, regulatory and statutory requirements of the products provided.

**III. TW Metals Quality Objectives**

1. Promote customer satisfaction by the reduction of customer complaints through the reduction of credits by .5% (1/2) per year
2. Improve on time delivery to 97%
3. Improve supplier performance to 98% through measurement of product quality and supplier on time delivery

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TW Metals, Inc., a wholly owned subsidiary of O’Neal Steel, Inc. was formed in December of 1998, as a result of the merger of Tubesales, Inc. (“Tubesales”) and Williams and Company (“Williams”). TW Metals was subsequently acquired by O’Neal Steel, Inc. in 2005 from Superior Group, Inc.

In 1955, Superior purchased a majority interest in Tubesales, a Los Angeles based tube distribution company. Over the years, Superior became the sole owner of Tubesales.

Tubesales had since gained a considerable share in the long products distribution market in industries such as aerospace, general transportation, medical, energy generation, and other industries that rely on long metal mill products for their production.

In 1959, Superior began to buy shares of Williams from its founder and made a public tender offer in 1976 for the remaining shares of the company. Founded in 1907, Williams was a major distributor of metals in plate, sheet, and coil and bar forms with service centers and refrigeration stores generally located in the Midwest and Northeast United States.

In 2002 TW Metals decided to concentrate its efforts on its core business which is the distribution of long metallic mill products in the form of tubing, pipe, bar and extrusions.

In 2005 TW Metals was acquired by O’Neal Steel, Inc. of Birmingham Alabama a privately owned metals distributor with a philosophy of customer and employee satisfaction. TW Metals continues its concentration on its core business.

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## Introduction

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This Quality Manual describes the policies and company wide control system of the **TW Metals Corp.** quality management system. The quality management system described in this manual meets the requirements of the ISO 9001:2008 and where applicable AS9100 Rev. B of the international standards. Procedures have been created and implemented that also meet the requirements of this international standard.

TW Metals locations under this Quality Assurance system are shown on page 2 of this section.

### Scope of Registration:

The scope of TW Metals supply is the stockholding, inventory management, and processing of Metal Mill Products and Finished Aircraft Parts as listed in the table on the following page of this Section 0.5 (Introduction).

### Interaction of Processes:

In order to ensure product supplied by TW Metals meets or exceeds the customers' expectations, the processes required are identification of customer requirements, procurement of product to requirements, verification of the product, preservation and traceability of the product, processing of the product to customer requirements, ensuring the products have been determined to meet customer requirements prior to delivery, and delivery of the product to the customer.

### Permissible Exclusions:

- TW Metals does no designing or fabrication of product, therefore Section 7.3 is excluded in its entirety.
- TW Metals does no servicing or repair to the product it supplies, therefore clause 7.5.1.5 is excluded.

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**TW Metals Locations:**

	<b>District</b>	<b>Location</b>	<b>Scope</b>
			Metal Mill Products
AS	03	Cincinnati, OH	Metal Mill Products
ISO	05	Toledo, OH	Metal Mill Products
ISO	07	Charleston, WV	Metal Mill Products
AS	12	Le Roy, NY (Rochester)	Metal Mill Products
ISO	20	Charlotte, NC	Metal Mill Products
AS	50	Los Angeles, CA	Metal Mill Products
ISO	52	Woodinville, WA (Seattle – Boeing)	Metal Mill Products
ISO	53	Woodinville, WA (Seattle – Commercial)	Metal Mill Products
ISO	54	Phoenix, AZ	Metal Mill Products
ISO	55	“Denver” – Paper District	Metal Mill Products
AS	60	Monroe Township, NJ (Cranbury)	Metal Mill Products
AS	62	Agawam, MA (Hartford)	Metal Mill Products
AS	70	Forest Park, GA (Atlanta)	Metal Mill Products
ISO	71	Garden City, GA (Savannah)	Metal Mill Products
AS	72	Orlando, FL	Metal Mill Products
ISO	75	Houston, TX	Metal Mill Products
AS	76	Arlington, TX (Dallas)	Metal Mill Products
AS	77	Wichita, KS	Metal Mill Products & Finished Aircraft Parts
AS	80	Carol Stream, IL (Chicago)	Metal Mill Products
ISO	81	Mequon, WI (Milwaukee)	Metal Mill Products
ISO	83	Rogers, MN (Minneapolis)	Metal Mill Products
ISO	98	QRT, Carol Stream, IL	Metal Mill Products

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## 0.6 GLOSSARY

IA – Internal Audit

IM&TE - Inspection, Measuring and Test Equipment

MC - Master Copy

MR - Management Representative

MRM – Management Review Meeting

NCMR – Non-conforming Material Action Record

QM – Quality Manual

QPs – Quality Procedures

R&A - Responsibility and Authority

RFI – Request For Information

RFQ – Request For Quote

Standard(s) - industry, national and international quality standards and ISO 9001:2008

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## Quality Management System

### 4.0 Scope and Purpose

A. The quality system described in this section of the QM conforms to the requirements of the standard: Section 4—Quality Management System. This policy defines the corporate commitment to quality.

#### B. Responsibility and Authority (R&A)

The R&A for overall administration of quality management system activities is shared by Upper Management. Employees have the responsibility to complete quality activities in support of the quality policy, quality system documentation and customer requirements. Employees have been granted authority in order to meet specified requirements.

### General Requirements:

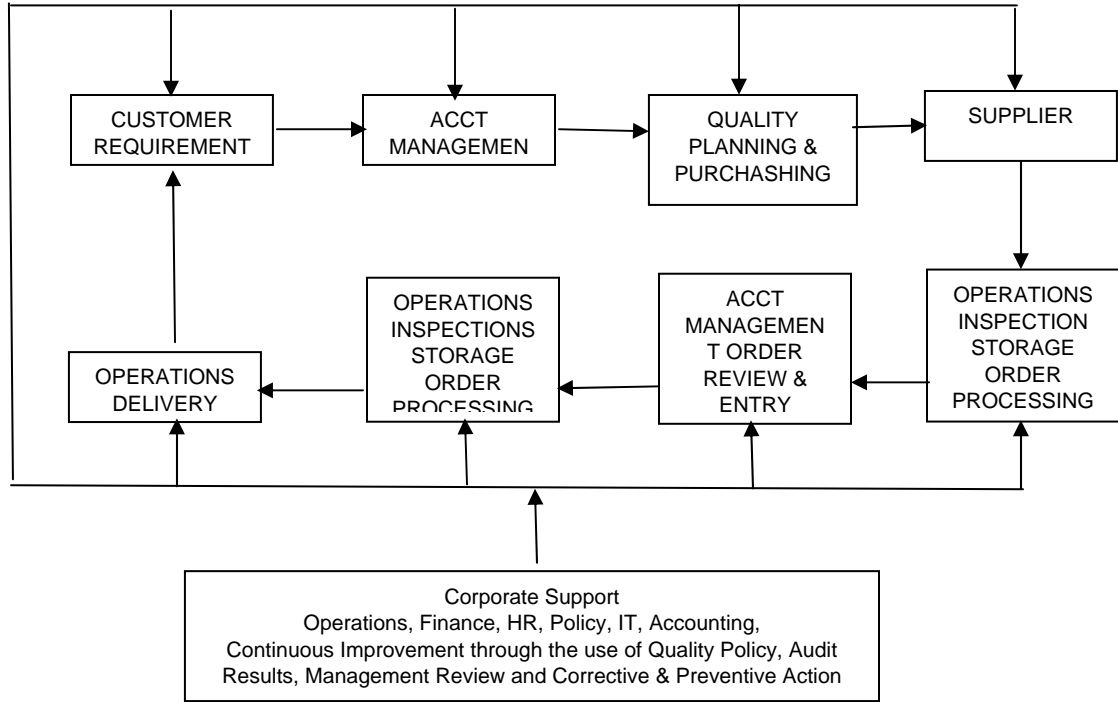
- 4.1 A quality management system has been established, documented, implemented, maintained and is continually improved in accordance with the requirements of ISO 9001:2008 and / or AS9100 as applicable.

To implement the system, the organization has:

- a. will determine the processes needed for the quality management system and their application throughout the organization;
- b. determined the sequence and interaction of these processes (see chart below);
- c. determined the 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. monitored, measured, (where applicable) and analyzed these processes, and
- f. implemented actions necessary to achieve planned results and continual improvement of these processes.

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### Interaction of Key Processes



Control is ensured over any outsourced processes that affect product conformity with requirements. Control of such applicable processes are identified and defined within the quality management system.

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**Documentation Requirements:**

4.2 Quality management system documentation includes:

4.2.1 General: The quality management system documentation includes:

- a. documented statements of a quality policy and quality objectives;
- b. Quality Manual;
- c. documented procedures and records required by ISO 9001:2008 and AS9100 Rev. B
- d. documents, including records, determined by the organization to be necessary to ensure the effective planning, operation and control of its processes.
- e. records required by ISO 9001:2008 and AS9100 Rev. B,
- f. quality system requirements imposed by the applicable statutory and regulatory authorities.

4.2.2 A Quality Manual has been established and maintained that includes:

- a. the scope of the quality management system, including details of and justification for any permissible exclusions;
- b. the documented procedures established for the quality management system, or reference to them. Reference to these standards are clearly shown in procedures; and,
- c. a description of the interaction between the processes of the quality management system.

**Control of Documents:**

4.2.3 Documents and records required by the quality management system are controlled. A documented procedure has been established to define the controls needed to:

- a. approve documents for adequacy prior to issue;
- b. review and update as necessary and re-approve documents;
- c. ensure that changes coordinated with customers or statutory and regulatory authorities and the current revision status of documents are identified;
- d. ensure that relevant versions of applicable documents are available at points

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of use;

- e. ensure that documents remain legible and readily identifiable;
- f. ensure that 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; and,
- g. prevent the unintended use of obsolete documents, and to apply suitable identification to them if they are retained for any purpose.

**Control of Records:**

- 4.2.4 Records are established and maintained to provide evidence of conformity to requirements and of the effective operation of the quality management system. A documented procedure has been established to define the controls needed for the identification, storage, protection, retrieval, retention time and disposition of records including those created and / or retained by suppliers. The procedure allows for the review by customers and / or statutory and regulatory authorities in accordance with contract or the statutory and regulatory requirements.

**Configuration Management**

- 4.3 As a stockist the organization performs no manufacturing that changes fit, form or function of the metallic mill products supplied to customers. Configuration is maintained by heat number and / or lot number traceability and protection of the as received condition of the product while in possession of the organization. Changes in length, width or height are in accordance with stated customer requirements, specifications and / or drawings.

Related and Support Documentation

- CP49-4.0-002 Notification of Changes Affecting Quality
- CP49-4.2.3-001 Control of Documents and Document Changes
- CP49-4.2.4-001 Control of Records
- CP49-7.5.3-001 Identification and Traceability
- CP49-7.5.1-002 Customer order Processing

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5.0 **Management Responsibility**

A. Scope and Purpose

The quality system described in this section of the QM conforms to the requirements of the standard: Section 5—Management Responsibility. This policy defines the corporate commitment to quality.

B. Responsibility and Authority (R&A)

The R&A for overall administration of quality management system activities is shared by top management. Employees have the responsibility to complete quality activities in support of the quality policy, quality system documentation and customer requirements. Employees have been granted authority in order to meet specified requirements.

5.1 **Management Commitment**

Top management has provided evidence of its commitment to the development and 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 the quality policy;
- C. ensuring that quality objectives are established;
- D. conducting management reviews; and,
- E. ensuring the availability of resources.

5.2 **Customer Focus:**

Top management has ensured that customer requirements are determined and fulfilled with the aim of enhancing customer satisfaction.

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5.3 **Quality Policy:**

Top management has ensured the 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. communicated and understood within the organization; and,
- E. reviewed for continuing suitability.

5.4 **Planning**

5.4.1 **Quality Objectives:**

Top management has ensured that quality objectives, including those needed to meet requirements for product, are established at relevant functions and levels within the organization. The quality objectives are measurable and consistent with the quality policy.

5.4.2 **Quality Management System Planning:**

Top management has ensured that:

- A. the planning of the quality management system is carried out in order to meet the requirements of the general requirements of this international standard (section 4.1); 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 and Authority and Communication:**

Top management has ensured the responsibilities and authorities are defined and communicated within the organization.

5.5.2 **Management Representative:**

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Top management has appointed a member of the organization's management who, irrespective of other responsibilities, has responsibility and authority that includes:

- A. ensuring 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. acting as liaison with external parties on matters relating to the quality system as appropriate and,
- E. the organizational freedom to resolve matters pertaining to quality.

The appointed Management Representative is the Quality Manager.  
An organizational chart is available upon request.

5.5.3 **Internal Communication:**

Top management has ensured appropriate communication processes are established within the organization and that communication takes place regarding the effectiveness of the quality management system.

5.6 **Management Review:**

5.6.1 General: Top management reviews the quality management system at planned intervals to ensure its continuing suitability, adequacy and effectiveness. This review includes assessing opportunities for improvement and the need for changes to the quality management system, including the quality policy and quality objectives. Records of management reviews are maintained.

5.6.2 **Management Review Input:**

Input to management review includes information relative to:

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- 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 earlier management reviews;
- F. changes that could affect the quality management system; and,
- G. recommendations for improvement.

5.6.3 **Management Review Output:**

Output from management review includes any decisions and actions related to:

- A. improvement of the effectiveness of quality management system and its processes;
- B. improvement of product related to customer requirements; and,
- C. resource needs.

Related and Support Documentation: CP49-5.0-001 Management Responsibility

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6.0 **Resource Management**

Scope and Purpose:

The quality system described in this section of the QM conforms to the requirements of the standard: Section 6—Resource Management. This policy defines the corporate commitment to quality.

6.1 **Provision of Resources:**

Resources have been determined and provided 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: Personnel performing work affecting conformity to product requirements shall be competent on the basis of appropriate education, training, skills and experience.

6.2.2 **Competence, Training, and Awareness:**

The organization has:

- A. determined 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. ensured 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. maintained appropriate records of education, training, skills and experience.

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6.3 **Infrastructure:**

The infrastructure needed to achieve conformity to product requirements has been determined, provided and maintained. Infrastructure examples may include, but not be limited to:

- A. buildings, workspace and associated utilities;
- B. process equipment, (both hardware and software); and,
- C. supporting services (such as transport, or communication, or information systems).

6.4 **Work Environment:**

The work environment needed to achieve conformity to product requirements has been determined and managed.

6.4.1 Related and Support Documentation  
 CP49-6.2-001 Resource Management

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7.0 **Product Realization**

Scope and Purpose

The quality system described in this section of the QM conforms to the requirements of the standard: Section 7—Product Realization. This policy defines the corporate commitment to quality.

A. Responsibility and Authority (R&A)

The R&A for overall administration of quality management system activities is shared by top management. Employees have the responsibility to complete quality activities in support of the quality policy, quality system documentation and customer requirements. Employees have been granted authority in order to meet specified requirements.

7.1 Planning of Product Realization:

The processes needed for product realization are planned and developed, and are consistent with the requirements of the other processes of the quality management system. In planning product realization, the following has been determined, 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, measurement, 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 the operation and maintenance of the product.

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7.2 **Customer-Related Processes**

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

Requirements related to the product have been determined, including:

- A. requirements specified by the customer, including the requirements for delivery and post-delivery activity;
- 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.

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

Requirements related to the product are reviewed. Records of the review are maintained. This review is conducted prior to committing to supply a product to customers, and ensures 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; and,
- D. records of the results of review and actions arising from this review are maintained, and
- E. risks have been evaluated

Where the customer provides no documented statement of requirements, customer requirements are confirmed before acceptance.

Where product requirements are changed, it is ensured that relevant documents are amended and that relevant personnel are made aware of the changed requirements.

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7.2.3 **Customer Communication:**

Effective arrangements for communication with customers relating to the following are determined and implemented:

- A. product information;
- B. inquiries, contracts or order handling, including amendments; and,
- C. customer feedback, including customer complaints.

7.3.1 **Design and Development Planning: Not Applicable to TW Metals Inc.**

7.3.2 **Design and Development Inputs: Not Applicable to TW Metals Inc.**

7.3.3 **Design and Development Outputs: Not Applicable to TW Metals Inc.**

7.3.4 **Design and Development Review: Not Applicable to TW Metals Inc.**

7.3.5 **Design and Development Verification: Not Applicable to TW Metals Inc.**

7.3.6 **Design and Development Validation: Not Applicable to TW Metals Inc.**

7.3.7 **Control of Design and Development Changes: Not Applicable to TW Metals Inc.**

7.4 **Purchasing Process:**

7.4.1 Purchasing processes are controlled to ensure purchased product conforms to specified purchase requirements. The type and extent of control is applied to suppliers and purchased product is dependent upon the effect of the purchased product on subsequent product realization or the final product. The organization is responsible for the quality of all products purchased from suppliers, including customer designated sources. The controls applied are;

- A. an electronic register of approved suppliers and scope of the approval;
- B. periodic review of supplier performance,

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- C. the necessary actions to take for suppliers that do not meet requirements,
- D. identification of customer approved sources, and
- E. the authority to disapprove the use of suppliers by responsible functions.

7.4.2 **Purchasing Information:**

Purchasing information describes the product to be purchased, including where appropriate. The organization ensures the adequacy of specified purchasing requirements prior to their communication to suppliers is ensured.

- A. requirements for approval of product, procedures, processes, and equipment;
- B. requirements for qualification of personnel; and,
- C. quality management system requirements;
- D. positive identification and applicable issues of specifications, drawings, process requirements, inspection instructions and other relevant technical data,
- E. requirements for design, test, examination, inspection, and related instructions for acceptance by the organization
- F. requirements for test specimens, design approval, inspection, investigation or auditing,
- G. requirements relative to supplier notification of nonconforming product and arrangements for organizational approval of supplier nonconforming material,
- H. requirements for the supplier to notify the organization of changes in product and / or process definition and, where required, obtain organizational approval,
- I. the 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 to sub-tier suppliers the applicable requirements in the purchasing documents, including key characteristics when identified and required by the customer

7.4.3 **Verification of Purchased Product:**

Inspection or other activities necessary for ensuring that purchased product meets specified purchase requirements are established and implemented. Where

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verification of purchased product is intended at suppliers' premises, including customer verification of such product, the verification activity and the method of product release are stated in the purchasing information. Verification includes;

- A. objective evidence of product quality from suppliers,
- B. inspection and audit at supplier's premises when required,
- C. review of the required documentation,
- D. inspection of product upon receipt, and
- E. delegation of verification to the supplier, or supplier certification.

**7.5 Production and Service Provision**

**7.5.1 Control of Production and Service Provision:**

Production and service operations are planned and carried out under controlled conditions, including planning that considers establishment of process controls, development of control plans, identification of key characteristics, in-process verification points, and tooling. Controlled conditions are 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; and,
- F. the implementation of product release, delivery, and post-delivery activities,
- G. the accountability of all product during processing,
- H. evidence that all processes and inspections have been completed and documented,
- I. provision for prevention, detection and removal of foreign objects,
- J. monitoring and control of utilities and supplies, and
- K. criteria for workmanship, which is documented and clearly defined.

**7.5.1.1 Production Documentation**

Production operations are carried out in accordance with approved data. This data

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contains as necessary;

- A. drawings, parts lists, process flow charts, inspection operations, production documents, and inspection documents, and
- B. as applicable, list of specific or nonspecific tools and instructions for their use.

**7.5.1.2 Control of Production Process Changes**

Persons authorized to approve changes to production processes are identified, acceptance by the customer or regulatory authority is obtained in accordance to contract requirements. Changes affecting processes, production equipment, tools and programs are documented and procedures established. Results of the changes are assessed to determine the desired effect. Established procedures are referenced in elsewhere this section.

**7.5.1.3 Control of Production Equipment and Tools**

Production equipment, tools, and programs are validated prior to use and are maintained and periodically inspected. When required by contract first article inspection is performed.

When applicable, stored tooling and production equipment is periodically inspected. Established procedures are referenced in elsewhere this section.

**7.5.1.4 Control of Work Transferred on a Temporary Basis**

Processes and procedures have been established to control and validate the quality of work transferred outside the organization on a temporary basis. Established procedures are referenced in elsewhere this section.

**7.5.1.5 Control of Service Operations**

The organization performs no servicing, therefore the organization takes exception to this clause.

**7.5.2 Validation of Processes for Production and Service Provision:**

All materials supplied by TW Metals can be verified against material manufacturing

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specifications and customer requirements.

The methods and controls for the validation of processes for production and service is addressed in Corporate Procedure CP49-7.5.2-001.

**7.5.3 Identification and Traceability:**

Product is identified, where appropriate, by suitable means throughout product realization. The status of the product is identified with respect to measurement and monitoring requirements. Where traceability is a requirement, the unique identification of product is controlled, recorded and records maintained. Established procedures are referenced elsewhere in this section.

**7.5.4 Customer Property:**

Care is exercised with customer property including intellectual property and personal data while it is under control or being used. Customer property provided for use or incorporation into product is identified, verified, protected and safeguarded. Any customer property that is lost, damaged or otherwise found to be unsuitable for use is recorded and reported to customers, and records maintained. Established procedures are referenced elsewhere in this section.

**7.5.5 Preservation of Product:**

Conformity to the requirements of product during internal processing and delivery to the intended destination is preserved. As applicable, preservation shall include, identification, handling, packaging, storage and protection. Preservation also applies to the constituent parts of a product. When required by specification and / or applicable regulations or contract, provisions are made for;

- A. cleaning;
- B. prevention, detection, and removal of foreign objects;
- C. special handling when applicable for sensitive products;
- D. marking and labeling including safety warnings;
- E. shelf life control when applicable;
- F. special handling for hazardous materials, and
- G. documents required are present at delivery.

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7.6 **Control of Measuring and Monitoring Equipment:**

The monitoring and measurements to be undertaken, and the monitoring and measuring equipment needed to assure conformity of product to determine requirements are determined. Processes are established to ensure that monitoring and measurement can be carried out and are carried out in a manner consistent with the monitoring and measurement requirements. Where necessary to ensure valid results, measuring equipment is:

- A. 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 is recorded;
- B. adjusted or re-adjusted as necessary;
- C. identified to enable the calibration status to be determined;
- D. safeguarded from adjustments that would invalidate the measurement result; and,
- E. protected from damage and deterioration during handling, maintenance and storage;
- F. can be recalled to a defined method when requiring calibration.

The validity of the previous measuring results are assessed and recorded when the equipment is found not to conform to requirements. Appropriate action is taken on the equipment and any product affected. Records of the results of calibration and verification are maintained.

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

7.6.1 Related and Support Documentation

CP49-7.1-001 Verification Of Processes

CP49-7.2.1-001 Determination of Requirements Related to The Product

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- CP49-7.2.2-001 Review of Requirements Related to the Product
- CP49-7.2.3-001 Customer Communications
- CP49-7.4.2-005 Supplier Requirements
- CP49-7.4.3-001 Test Report Verification
- CP49-7.4.3-002 Receiving Inspection
- CP49-7.4.3-003 Aluminum Aerospace Extrusion Inspection
- CP49-7.4.3-010 Receiving Routing and Data Input
- CP49-7.4.3-011 Inspection of Direct Ship Product
- CP49-7.4-001 Corporate Purchasing
- CP40-7.4-002 District Purchasing
- CP49-7.4-003 Vendor Acknowledgement Review
- CP49-7.4-006 Identification of Unacceptable Vendors
- CP49-7.4-007 P & W End Use Requirements
- CP49-7.5.1-001 Control of Production
- CP49-7.5.1-002 Customer Order Processing
- CP49-7.5.1-003 Production Documentation
- CP49-7.5.1-004 P & W Tube Marking
- CP49-7.5.1.2-001 Control of Production & Process Changes
- CP49-7.5.1.3-001 Control of Production Equipment
- CP49-7.5.1.4-001 Control of Work Transferred
- CP49-7.5.2-001 Validation of Special Processes
- CP49-7.5.3-001 Identification and Traceability
- CP49-7.5.3-002 Inspection of Incoming Test Reports
- CP49-7.5.4-001 Customer Property
- CP49-7.5.4-002 Control of Tooling
- CP49-7.5.5-001 Cycle Count
- CP49-7.5.5-002 Labeling and Packaging
- CP49-7.5.5-003 DVD Packaging
- CP49-7.5.5-004 P & W Handling, Storage, and Packaging
- CP49-7.5.5-005 Shape Memory Fittings Handling
- CP49-7.5.5-006 Packaging For Ocean Freight
- CP49-7.5.5-007 Storage
- CP49-7.6-002 Calibration Procedures and Records

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## **8. Measurement, analysis and improvement**

### A. Scope and Purpose

The quality system described in this section of the QM conforms to the requirements of the standard: Section 8—Measurement, Analysis and Improvement. This policy defines the corporate commitment to quality.

### B. Responsibility and Authority (R&A)

The R&A for overall administration of quality management system activities is shared by Upper Management. Employees have the responsibility to complete quality activities in support of the quality policy, quality system documentation and customer requirements. Employees have been granted authority in order to meet specified requirements.

## **8. Measurement, Analysis and Improvement**

### **8.1 General Requirements:**

The organization has planned and implemented the monitoring, measurement, analysis and improvement processes needed to:

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

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

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## 8.2 **Monitoring and Measurement**

### 8.2.1 **Customer Satisfaction:**

As one of the measurements of the performance of the quality system, the organization monitors information relating to customer perception as to whether customer requirements have been met. The methods for obtaining and using this information are determined in CP49-8.2.1-001

### 8.2.2 **Internal Audit:**

Periodic internal audits are conducted 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,
- b. is effectively implemented and maintained

An audit program is planned that takes 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 are defined. Selection of auditors and conduct of audits ensures objectivity and impartiality of the audit process. Auditors do not audit their own work.

The responsibilities and requirements for planning and conducting audits, and for reporting results and maintaining records, are defined in a documented procedure.

The management responsible for the audited area ensures that any necessary corrections and corrective actions are taken without undue delay to eliminate detected

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nonconformities and their causes. Follow-up activities include the verification of the actions taken and the reporting of verification results. Detailed tools have been developed and implemented in support of the quality management system.

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

Suitable methods of monitoring and, where applicable, measurement of the quality management system processes have been established. These methods demonstrate the ability of the processes to achieve the planned results. When planned results are not achieved, correction and corrective action is taken to ensure conformity of the product.

In the event of process nonconformity, the organization;

- 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 in accordance with clause 8.3.

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

The characteristics of the product are monitored and measured to verify that product requirements are fulfilled. This is completed at appropriate stages of the product realization process in accordance with planned arrangements.

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

Sampling plans are statistically valid and appropriate for use. Plans preclude the acceptance of lots having known nonconformities. When required, the plans are submitted for customer approval.

Products are not used until it has been inspected or otherwise verified as conforming to

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the specified requirements.

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

Product release and delivery of service to the customer do 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 for product acceptance is documented and forms part of the production documentation. Test records show actual results when required by specification, or acceptance test plan. Records of evidence of acceptance meet the defined requirements.

- A. criteria for acceptance or rejection,
- B. where and when testing and measurement operations are performed,
- C. a record of measurement results, and
- D. the type of measurement instruments and specific instructions associated with their use.

**8.2.4.2 First Article Inspection**

When required a process is established for the inspection, verification, and documentation of a representative item from a production run of a new part or following any subsequent change that invalidates the previous first article. (AS 9102)

**8.3 Control of Nonconforming Product:**

The controls and related responsibilities and authorities for dealing with nonconforming product are defined in a documented procedure.

Product that does not conform to product requirements is identified and controlled to prevent its unintended use or delivery.

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Where applicable, nonconforming product is addressed by one or more of the following manners:

- 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; and,
- 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.

When nonconforming product is corrected, it is subject to re-verification to demonstrate conformity to the requirements.

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

When nonconforming product is detected after delivery or use has started, actions are taken appropriate to the effects, or potential effects, of the nonconformity.

Procedures defining this process are located elsewhere within this section.

#### 8.4 **Analysis of Data:**

The determination of, collection, and analysis of appropriate data is completed 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 includes data generated as a result of monitoring and measurement and from other relevant sources.

The analysis of data provides information relating to:

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- a. customer satisfaction; (see 8.2.1)
- b. conformance 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) and,
- d. suppliers (see 7.4).

## 8.5 **Improvement**

### 8.5.1 **Continual Improvement:**

The effectiveness of the quality management system is continually improved through implementation of the following:

- A. quality policy;
- B. quality objectives;
- C. audit results;
- D. analysis of data;
- E. corrective and preventive actions; and,
- F. management review.

### 8.5.2 **Corrective Action:**

Corrective action is taken to eliminate the causes of nonconformities in order to prevent recurrence. Corrective actions are appropriate to the impact of the problems encountered. A documented procedure for corrective action is established defining 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 actions taken; and,
- F. reviewing the effectiveness of the corrective action taken,

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- G. flow down of the corrective action requirement to a supplier, when it is determined that the supplier is responsible for the root cause, and
- H. specific actions where timely and / or effective corrective actions are not achieved.

### 8.5.3 Preventive Action

Preventive action is determined to eliminate the causes of potential nonconformities in order to prevent occurrence. Preventive actions are appropriate to the effects of the potential problems.

A documented procedure for preventive action is established defining requirements for:

- A. determining potential nonconformities and their causes;
- 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.

#### Related and Support Documentation

- CP49-8.2.1-001 Customer Satisfaction
- CP49-8.2.2-001 Internal Audits
- CP49-8.2.2-002 Internal Auditor Training
- CP49-8.2.4-005 Inspection Stamp Control
- CP49-8.2.4-006 Customer Government Source Inspection and Access to Records
- CP49-8.2.4-008 Monitoring and Measurement of Products
- CP49-8.2.4-010 P & W Sampling Plan
- CP49-8.3-001 Control of Nonconforming Product
- CP49-8.3-002 Notification of Nonconforming Product
- CP49-8.3-003 Nuclear regulatory Commission Defect and Noncompliance Reporting
- CP49-8.4-002 Demand Analysis of Data

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CP49-8.4.2.1-001 Inspection Documentation Measurement Requirements  
 CP49-8.5.2-001 Corrective Action  
 CP49-8.5.3-001 Preventive Action

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