

Approvals

The Vice President & General Manager, Director of Operations and Quality Manager have electronically approved this manual within the document control database. Changes to this manual must be approved by these same functions.

Revisions

Rev	Name	Change	Date
1	S. Winpigler	Initial Issue of Document. Originally QPM, rev Original	06/30/05
2	S. Winpigler	Add the QPM to document, needs to be updated to current practice. Updated to current practice, reformatted layout	12/04/07
3	S. Winpigler	Deleted picture on cover page	12/05/07
4	S. Winpigler	Replaced old QP with new QP. Updated Procedure Index with current Procedures, added notation about procedure changes; updated org chart.	06/16/08
5	S. Winpigler	Complete rewrite to address ISO 9001 requirements	10/31/08
6	S. Winpigler	Added the Director of Operations for sign-off of this document.	05/29/09
7	S. Winpigler	Changed approval title and name; updated references to ISO 9001, from ISO9001:2000; updated general text in 6.2.2. for clarity.	08/17/09
8	S. Winpigler	Added cover page, changed format in QSi to .pdf	09/15/09
9	S. Winpigler	Updated Senior Management Organization Structure	11/18/09
10	S. Winpigler	Updated Core Processes in section 1.2.2; replace TT-SOP-0006 with SQ02-0014; removed ref. to TT-F0256 SOP Matrix; other minor text corrections	12/29/09
11	S. Winpigler	Change associated document TT-SOP-0032 to SQ02-0004. Updated reference in 4.2 accordingly. Updated the reference doc in section 8.5 from TT-SOP-0006 to SQ02-0014.	02/08/10
12	S. Winpigler	Split "Foundry" to "Forming" & "Firing"; reworded & clarified Scope 1.2.2; added External ref's ISO9000 & 9004; added procedure ref's to 4.2.4, 7.5.5, 8.5.2 & 8.5.3; changed 8.5.1 from Manufacturing process improvement, to Continual Improvement; clarified 5.5.2 to include "customer requirements"; changed from SQ02-0016 to TT-SOP-0031 Statistical Process Control.	3/3/10
13	S. Winpigler	Added reference to TT-SOP-0035 under section 7.1.	5/17/10

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1 Scope and purpose

1.1 Purpose

This manual defines the Trans-Tech approach to and assignment of responsibilities for, the company quality system. This quality system manual is the foundation of the Trans-Tech quality system.

This manual is based on ISO 9001 and follows the same section numbering format. The Trans-Tech quality system strives for continual improvement beyond these requirements.

Changes to this manual must be approved by the President & General Manager, Director of Operations and Quality Manager.

1.2 Scope

This manual applies to the entire Trans-Tech site. Trans-Tech does not have any design and development activities and as a result, this manual excludes those elements.

1.2.1 Location descriptions

Adamstown, MD Trans-Tech is a whole owned subsidiary of Skyworks Inc. that manufactures ceramic filters, coaxial and dielectric resonators, magnetic material, and advanced materials used in RF/Microwave applications. Skyworks and Trans-Tech may be used interchangeably in this document, and other TTI QMS documentation, and is applicable only to this site.

1.2.2 ISO 9001 management system

The Scope of the ISO 9001 management system is: **Manufacture and Testing of Advanced Technical Ceramics: Dielectric, Ferrite & Magnetic Materials and RF Components that use those materials.**

The table below indicates the core processes applicable to the TTI sites that are managed under ISO 9001 management system.

	Supplier Quality	Powder	Forming	Firing	Post Foundry	Human Resources	Supply Chain	Sales/Marketing	Customer Quality	Management	Business Planning	Audit & Continuous Improvement
Adamstown, MD												

The organizational scheme indicated above supports the manufacturing activities in Adamstown and Frederick, MD.

2 Associated documents

The following documents contain provisions which, through reference in this document, constitute provisions of this manual. The latest edition of the documents referred to apply.

External Documents

ISO 9001:2008	International Organization or Standardization	Quality management systems – Requirements
ISO9000:2005	International Organization or Standardization	Quality management systems – Fundamentals & Vocabulary
ISO 9004	International Organization or Standardization	Managing for the sustained success of an organization- A quality management approach

Internal Documents

SQ02-0002	Management Procedure
SQ02-0004	Document and Data Control
SQ02-0010	Competency and Training
SQ02-0011	Calibration
SQ02-0012	Internal Audits
SQ02-0014	Continuous Improvement / Corrective and Preventive Action
SQ02-0018	Customer Satisfaction
SQ03-0135	Customer Property Handling Procedure
TT-SOP-0031	Statistical Process Control
TT-SOP-0035	Inspection and Test Procedure
TT-SOP-0037	Trans-Tech Supplier Quality Manual
TT-SOP-0038	Product Control Procedure
TT-SOP-0039	Sourcing
TT-SOP-0040	Supply Chain Management
TT-SOP-0041	Product Realization Process – PRP
TT-SOP-0042	Production Flow
TT-SOP-0043	Trans-Tech World Wide Facilities
TT-WI-0155	Handling, Packaging, Preservation, Storage and Delivery of Product
TT-F0256	Trans-Tech QMS Functions- Standard Operating Procedures Matrix
TT-F0184	Trans-Tech Quality Management System Processes - Sequence and Interactions of Processes

3 Acronyms, terminology, description and definition

For the purposes of this manual, the terms and definitions given in ISO 9000 apply.

4 Quality management system

4.1 General requirements

Trans-Tech has established documented, implemented and maintains a quality management system and continually improves its effectiveness in accordance with the requirements of ISO 9001.

4.2 Documentation requirements

4.2.1 General

Reference: TT-F0184 Trans-Tech Quality Management System Processes - Sequence and Interactions of Processes

This manual outlines the quality system designed to ensure continual improvement through the dedicated efforts of all employees in the ongoing pursuit of achieving customer satisfaction.

This manual is a part of a hierarchy of documentation that is established to ensure uninterrupted quality from all levels of Trans-Tech. The sequence and interaction of the quality management system processes is outlined in **TT-F0184 Quality Management System Processes - Sequence and Interactions of Processes**.

Level II - Standard Operating Procedures

Trans-Tech policies and procedures that define the different tasks that make up the processes needed to meet the requirements of the Quality Systems Manual and the ISO 9001 standard. The scope of Standard Operating Procedures impacts the entire site.

Level III - Work Instructions

Site procedures that define how the tasks referenced in the Level II documents are performed.

Level IV - Forms

Site documents that provide a means to record results achieved or evidence of activities performed.

Note: A form becomes a record after information has been recorded onto it.

4.2.2 Quality Manual

This Level I quality manual defines the scope of the Trans-Tech Quality Management System (QMS), establishes the documented procedures that are part of the QMS, and describes the interaction between the processes of the QMS. There is only one Level I document in the QMS, and applicable Level II quality system documents are referenced in this manual.

4.2.3 Document control

Reference: SQ02-0004 Document and Data Control

Documents are reviewed and approved for adequacy by authorized personnel prior to issue. A system of document control and release, together with a readily available master list is used to ensure that:

- Pertinent current issues of documents are available at all locations where operations essential to the effective functioning of the quality system are performed
- Changes and the current revision status of documents are identified
- Invalid and/or obsolete documents are promptly removed from all points of issue or use, or otherwise assured against unintended use

- Documents are legible and are readily identifiable
- Documents of external origin (i.e. customer specifications, drawings, industry standards) are controlled and distributed
- Any obsolete documents retained for legal or knowledge/preservation purposes are suitably identified

4.2.4 Record control

Reference: SQ02-0004 Document and Data Control

Trans-Tech establishes and maintains a documented procedure for identification, collection, storage, retention, maintenance and disposition (disposal) of quality records to ensure that:

- conformance to specified requirements and the effective operation of the quality management system are demonstrated
- quality records are legible, readily retrievable, and stored in a suitable environment to prevent damage or deterioration and prevent loss
- quality records are retained for retention times in compliance with government and/or customer requirements. All specified retention times are considered “minimums”, but records are eventually disposed.
- when contractually agreed, the customer or the customer’s representative makes quality records available for evaluation.

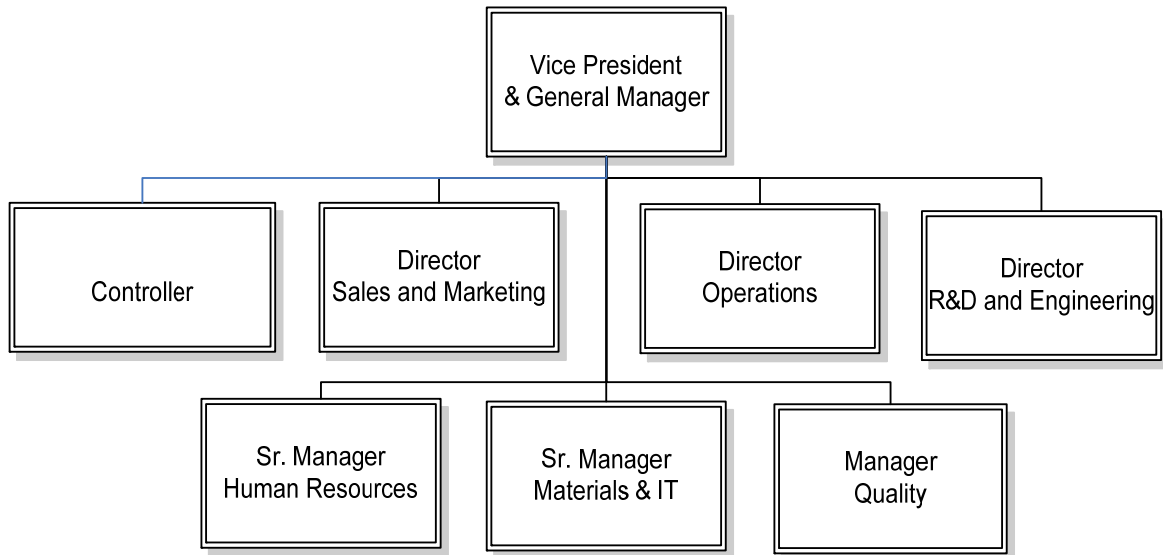
5 Management responsibility

5.1 Management commitment

The President and General Manager of Trans-Tech has overall responsibility to customers for the quality of Trans-Tech’ products. This commitment transcends all levels of senior management, who develop and implement the quality management system and ensure its effectiveness by:

- communicating to the organization the importance of meeting customer as well as statutory and regulatory requirements
- establishing the quality policy
- ensuring that quality and business objectives are established
- conducting management reviews
- ensuring the availability of resources
- reviewing the product realization process and support processes to assure their effectiveness and efficiency.

Senior Management Organizational Structure



5.2 Customer focus

Reference: SQ02-0018 Customer Satisfaction

Trans-Tech senior management ensures that customer requirements are determined and are met with the aim of enhancing customer satisfaction. This requirement is supported further in sections 7.2.1 and 8.2.1.

5.3 Quality policy

Trans-Tech Quality Policy

At SKYWORKS, we are committed to the never ending quest for perfect quality:

- No field failures
- No customer returns
- No reliability failures
- No yield loss

Trans-Tech Quality Management has the responsibility for reviewing the quality policy to ensure that it is reviewed for suitability and remains consistent with the purpose of the organization.

All levels of management and other support departments ensure that this policy is communicated, understood, implemented, and maintained throughout the organization.

The Skyworks Quality Policy may be translated to facilitate communication to those individuals whose primary language is not English.

5.4 Planning

5.4.1 Quality and business objectives

Senior management establishes quality, business and operational performance objectives that are measurable and consistent with requirements of products, customers and the quality policy. These objectives are established at relevant functions within the organization (i.e. operations and support functions). These objectives are compared with actual performance and lead to decision-making activities, long-term planning and continual improvement.

5.4.2 Quality management system planning

Refer to section 7.1 of this manual.

5.5 Responsibility, authority and communication

5.5.1 Responsibility and authority

The senior management of each Manufacturing and Support Organization defines and documents the responsibility, authority, and interrelation of personnel who manage, perform, and verify work that affects quality. The achievement of "Customer Satisfaction" is the primary responsibility of every employee. All employees are empowered to represent the needs of the customer in internal functions in addressing ISO 9001 requirements (e.g., setting quality objectives, training, corrective & preventive actions and process development).

Personnel responsible for quality have the authority to stop production, if necessary to correct quality problems.

5.5.2 Management representative

The Quality Manager is designated as the management representative for this site and is responsible for ensuring that the processes needed for the quality management system are established, implemented, and maintained in accordance with this manual. The Quality Manager and designated representative's report on the performance and effectiveness of the quality management system for review and as a basis for improvement.

The Quality Manager and Sales Manager are designated as the customer representatives and are responsible for ensuring that customer requirements are being addressed and to promote the awareness of the customer requirements throughout the organization.

5.5.3 Internal communication

Each department manager ensures that systems are in place to facilitate communication, manage organizational interfaces and other appropriate activities during product and process design, development, manufacturing, delivery and the execution of an effective quality management system. A multi-disciplinary approach for decision-making is used.

All employees promptly inform management with responsibility and authority for corrective action when products or processes become noncompliant with specified requirements.

5.6 Management review

Reference: SQ02-0002 Management Procedure

5.6.1 General

The quality management system is reviewed at planned intervals to ensure it continuing suitability and effectiveness in satisfying the requirements of this manual, its customers and the quality policy. These reviews assess improvement opportunities; identify required changes to the management system, quality objectives or the quality policy.

Records of management reviews are maintained and retained.

5.6.2 Management review input

The input to management review includes but not limited to information on:

- results of audits
- customer feedback
- process performance and product conformity
- status of preventive and corrective actions
- follow-up actions from previous management reviews
- changes that could affect the quality management system
- recommendations for improvement

5.6.3 Review output

The output of management reviews includes any decisions and actions related to:

- improvement of the effectiveness of the quality management system and its processes
- improvement of the product related to customer requirements
- resource needs

6 Resource management

Reference: SQ02-0010 Competency and Training

6.1 Provision of resources

The management of each Manufacturing and Support Organization identifies and provides adequate resources, including the assignment of trained personnel (see 6.2) for the management, the performance and the verification of work affecting quality and implementation of the quality management system.

6.2 Human resources

6.2.1 General

It is the policy of Trans-Tech to assure that personnel performing work affecting product quality will be competent on the basis of appropriate education, training, skills and experience.

6.2.2 Competency, awareness and training

Each Manufacturing and Support organization establishes competency needs for personnel performing activities affecting quality. Training or other actions are taken as required to satisfy these needs. The effectiveness of these actions is evaluated. Appropriate records of training, education, skills and experience are maintained and retained.

6.3 Infrastructure

Reference: TT-SOP-0043 Trans-Tech World Wide Facilities

It is the policy of Trans-Tech to determine, provide and maintain the infrastructure needed to achieve conformity to product or customer requirements including all:

- buildings, workspaces and utilities
- process equipment (both hardware and software)
- supporting services such as transportation and communication

6.4 Work environment

Reference: TT-SOP-0043 Trans-Tech World Wide Facilities

Trans-Tech senior management manages all work environments, laboratories and workstations needed to achieve conformity to product requirements.

7 Product realization

7.1 Planning of product realization

Reference: TT-SOP-0041 Product Realization Process – PRP; TT-SOP-0035 Inspection and Test Procedure

Trans-Tech plans and develops the processes needed for product realization. Planning of these realization processes is consistent with the other requirements of the Trans-Tech Quality Management System. In planning the processes for realization of product, Trans-Tech has determined the following, as appropriate:

- quality objectives and requirements for the product;
- the need to establish processes and documentation, and provide resources specific to the product;
- verification, validation, monitoring, inspection and test activities, specific to the product and the criteria for product acceptance;
- the records necessary to provide that the realization of the processes and resulting product meets requirements.

7.2 Customer related processes

7.2.1 Determination of Requirements Related to the Product

Each Manufacturing and Support Organization, together with engineering and other technical support groups, determines the performance and manufacturing requirements (including availability, delivery and support) related to the product or customer. These may include unstated requirements by the customer but are necessary for the specified or intended use of the product by the customer. Examples of these unstated requirements are:

- codes and standards from industry and/or government regulatory bodies
- applicable government, environmental regulations applied to the acquisition, storage, handling, recycling elimination or disposal of product.

To assure customer satisfaction it is necessary that these requirements be ascertained with the customer (on custom designs), internally understood, internalized into process, material or procedural documentation, agreed to and confirmed as achievable by Trans-Tech Manufacturing Organizations.

7.2.2 Review of Requirements Related to the Product

Trans-Tech reviews customer requirements. A contract review is conducted prior to the commitment to supply a product to the customer (e.g. submission of a quotation, acceptance of a contract or order) and ensures that:

- product requirements are defined;
- contract or order requirements differing from those previously expressed (e.g. in a tender or quotation) are resolved;
- Trans-Tech has the ability to meet defined requirements.

The results of the review and subsequent follow-up actions are recorded (section 4.2.4). Where product requirements are changed, Trans-Tech ensures that relevant documentation is amended. Trans-Tech communicates any changes to relevant personnel to ensure they are made aware of the changed requirements.

7.2.3 Customer communication

Trans-Tech determines and implements effective arrangements for communicating with customers in relation to:

- Product information
- Inquiries, contracts or order handling, including amendments
- Customer feedback, including customer complaints

7.3 Design and development (Excluded)

Not Applicable

7.4 Purchasing

Reference: TT-SOP-0039 Sourcing

Together, the Quality and requesting department ensures that purchased material, process equipment and services directly affecting product quality conform to specified requirements. Documented procedures are established and maintained to ensure implementation and compliance to product and manufacturing requirements.

7.4.1 Purchasing process

Trans-Tech has established purchasing processes to ensure purchased product conforms to requirements. Trans-Tech:

- Evaluates and selects its suppliers based on their ability to supply product in accordance with our requirements;
- Defines the type and extent of control to be exercised depending upon the type of product, the impact of purchased product on the quality of final product, and previously demonstrated capability and performance of vendors.

The results of evaluations and necessary actions are maintained.

7.4.2 Purchasing information

Reference: TT-SOP-0037 Trans-Tech Supplier Quality Manual

Purchasing documents contain information describing the product to be purchased, including where appropriate:

- requirements for approval / qualification of
 - product,
 - procedures,
 - processes,
 - equipment, and
 - personnel;
- Quality management system requirements.

Purchasing ensures the adequacy of specified requirements contained in the purchasing documents prior to their release.

7.4.3 Verification of purchased product

Reference: TT-SOP-0035 Inspection and Test Procedure

Purchased materials, process equipment or services requiring inspection or qualification prior to release to production are inspected and qualified by trained and responsible Trans-Tech personnel to ensure that they meet specified purchase requirements.

Where purchased material, process equipment or service is verified by Trans-Tech personnel at the supplier's or subcontractor's premises, verification arrangements are specified in the purchasing documents.

7.5 Production and service provision

Reference: TT-SOP-0042 Production Flow ; TT-SOP-0040 Supply Chain Management

7.5.1 Control of production and service provision

Departments or groups directly responsible for manufacturing plan and ensure that production processes that directly affect product quality are carried out under controlled conditions that include:

- the availability and compliance to information that describes the characteristics of the product
- the availability and use of work instructions, as necessary
- the use of suitable equipment and working environment
- the availability and use of monitoring and measurement devices;
- the implementation of monitoring and measurement;
- the implementation of defined processes for release, delivery and applicable post-delivery activities.

7.5.2 Process validation

Trans-Tech validates any production and service processes where the resulting output cannot be verified by subsequent measurement or monitoring. This includes any processes where deficiencies may become apparent only after the product is in use or the service has been delivered. Validation demonstrates the ability of these processes to achieve planned results.

Trans-Tech has defined arrangements for these processes that include the following, as applicable:

- defined criteria for review and approval of the processes;
- approval of equipment and qualification of personnel;
- use of specific methods and procedures;
- requirements for records;
- re-validation.

7.5.3 Identification and traceability

Reference: TT-SOP-0038 Product Control Procedure

Each department or group directly responsible for product manufacturing:

- Identifies product by suitable means from receipt and during all stages of production and delivery including identification with regards to monitoring and measurement requirements and traceability information, where required.

7.5.4 Customer property

Reference: SQ03-0135 Customer Property Handling Procedure

If applicable the quality department establishes and maintains documented procedures for the control of storage, verification and maintenance of customer property provided to Trans-Tech for use in meeting contractual requirements whether used into the product or not.

Any customer property that is lost, damaged or is otherwise unsuitable for use is recorded, reported to the customer, and records of reporting retained.

7.5.5 Preservation of product

Reference: TT-WI-0155 Handling, Packaging, Preservation, Storage and Delivery of Product

Departments or groups responsible for product or material handling establish and maintain documented procedures for handling, storage, packaging, protection and preservation of product or material.

7.6 Control of monitoring and measurement devices

Reference: SQ02-0011 Calibration

In order to provide evidence of conformity to requirements, Trans-Tech identifies the monitoring and measurements to be taken and acquires the devices needed to perform these measurements. In order to ensure valid results, these devices are, where necessary:

- calibrated or verified at specified intervals, or prior to use, against measurement standards traceable to national measurement standards (where no such standards exist, the basis used for calibration is recorded).
- adjusted or re-adjusted as necessary
- identified to enable the calibration status to be determined
- safeguarded from adjustments that would invalidate the measurement results
- protected from damage and deterioration during handling, maintenance and storage

When the equipment is found not to conform to requirements, Trans-Tech assesses and records the validity of previous measurement results and takes appropriate action on the device and any product affected.

Test software used in the monitoring and measurement of specified requirements is validated before use and revalidated when updated. Records of test software validation are maintained.

8 Measurement, analysis and improvement

8.1 General

Each Manufacturing and Support Organization plans and implements the measurement, monitoring, analysis and improvement activities used to assure conformance to product and customer requirements and continual improvement of the quality management system. This includes the determination of the need for, and use of, applicable methodologies including statistical techniques.

8.2 Monitoring and measurement

8.2.1 Customer satisfaction

Reference: SQ02-0018 Customer Satisfaction

Each Manufacturing and Support Organization monitors and documents key indicators of customer satisfaction and dissatisfaction. These indicators are based on customer related information, such as meeting needs and expectations, requirements, pricing and delivery performance. Additional information on survey results and direct customer complaints, etc. are used as applicable

Trans-Tech monitors customer satisfaction using the following performance indicators:

- delivered part quality based on returns

- external customer complaints
- on-time delivery

8.2.2 Internal audit

Reference: SQ02-0012 Internal Audits

Trans-Tech maintains a dynamic audit program to provide feedback to management on the effectiveness of the quality management system. Records are maintained and prompt corrective action is taken to eliminate nonconformities detected during the audits. Follow up activities take place to verify the effectiveness of these corrective actions.

Trans-Tech conducts quality system audits to ensure conformity to the requirements of ISO 9001. The audit process compares actual practice to these standards and internal system documentation. Trans-Tech conducts internal audits to determine whether the quality management system conforms to the requirements of ISO 9001 and has been effectively implemented and maintained.

Trans-Tech establishes and maintains a written procedure identifying responsibilities and requirements for conducting audits, recording results and reporting to management. Trans-Tech develops the audit plan annually, taking into consideration the status and importance of the activities and processes to be audited as well as the results of previous audits. The audit plan is reviewed after each audit cycle and updated if needed. The audit criteria, scope, frequency and methods are defined. Personnel do not audit activities that they are responsible for. Management responsible for the audited area take timely corrective action on deficiencies found during the audit. Follow-up actions include the verification of the implementation of corrective action, and the reporting of verification results.

8.2.3 Monitoring and measurement of quality management system processes

Reference: TT-SOP-0031 Statistical Process Control

Each Manufacturing and Support Organization identifies and uses process metrics in the review and continual improvement of manufacturing processes and the quality management system. These methods demonstrate the ability of the processes to achieve planned results. Corrective actions are taken when planned results are not achieved to ensure continuing product conformity.

Manufacturing process capability specified by customer part approval requirements is maintained. When a process becomes statistically unstable or incapable, corrective action is taken.

8.2.4 Monitoring and measurement of product

Reference: TT-SOP-0035 Inspection and Test Procedure

Departments or groups directly responsible for manufacturing perform inspection and testing according to documented procedures to ensure conformance to product requirements. Records of product inspection and testing are appropriately maintained.

Product release does not proceed without the completion of planned processes and requirements unless otherwise approved by the relevant authority or by the customer.

8.3 Control of nonconforming product

Reference: TT-SOP-0038 Product Control Procedure

Trans-Tech ensures that product which does not conform to requirements is identified and controlled to prevent unintended use or delivery. These activities and responsibilities are defined in documented procedure.

The system provides for identification, documentation (record keeping), evaluation, segregation (when practical), disposition of nonconforming product or material, and for notification of the functions

concerned. Nonconforming product or material is segregated (where practical) and immediately placed in a status that prevents reintroduction into the production flow.

Visual identification of nonconforming or suspect material or product, and any quarantine areas are provided.

8.4 Analysis of data

Trans-Tech determines, collects and analyzes appropriate data to determine the suitability and effectiveness of the quality management system and to identify improvements that can be made. This includes data generated by monitoring and measurement activities and other relevant sources.

Trans-Tech analyzes this data to provide information on:

- customer satisfaction and/or dissatisfaction (section 8.2.1);
- conformity to product requirements (section 7.2.1);
- characteristics of trends of processes and products including opportunities for preventive action, and
- suppliers.

8.5 Improvement

8.5.1 Continual improvement

Trans-Tech improves the effectiveness of the quality management system through the use of the quality policy, objectives, audit results, analysis of data, corrective and preventive action and management review.

8.5.2 Corrective action

Reference: SQ02-0014 Continuous Improvement / Corrective and Preventive Action

Trans-Tech establishes and maintains a documented procedure for implementing corrective and preventive action. Corrective or preventive action taken is commensurate with the magnitude of the problem and/or associated risk. Changes to documented procedures resulting from corrective and preventive action are implemented and recorded. The procedure for corrective action includes:

- the effective handling of customer complaints and reports of product nonconformities
- investigation of the cause of nonconformities relating to the product, the process, and/or the quality system
- determination of the corrective action needed to eliminate the cause of nonconformities
- application of controls to ensure that corrective action is taken and that it is effective.

The system tracks problem analysis completion time and uses this data for continuous improvement

8.5.3 Preventive action

Reference: SQ02-0014 Continuous Improvement / Corrective and Preventive Action

Trans-Tech has procedures for preventive action which include:

- the use of appropriate sources of information such as processes reviews audit results, quality records, and customer complaints to detect, analyze, and eliminate potential causes of nonconformities
- determination of steps needed to effectively resolve problems requiring preventive action
- initiation of preventive action and application of controls to ensure that it is effective