DENSO TEN

DENSO TEN AMERICA Limited

EXTERNAL PROVIDER QUALITY ASSURANCE MANUAL

T-QA029 Rev. I

April 2018

EPQAM Approval,

Created	*Checked*	*Approved – QA*	*Approved - Purchasing*
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FOREWORD

The Specific Requirements outlined in this manual are in addition to requirements communicated by documented information, such as drawings, specifications, contracts, and TNAM's Customer Pass Through requirements – as detailed by TNAM QA

This revision of TNAM's External Provider Specific Requirements Manual, T-QA029, is based on the standard IATF 16949. The purpose of the new structure is to provide a clear presentation of the requirements. This revision "I" of the manual cancels and replaces revision "H."

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In order to facilitate the review of the manual, we have implemented the use of the following highlights,

Highlights for key information

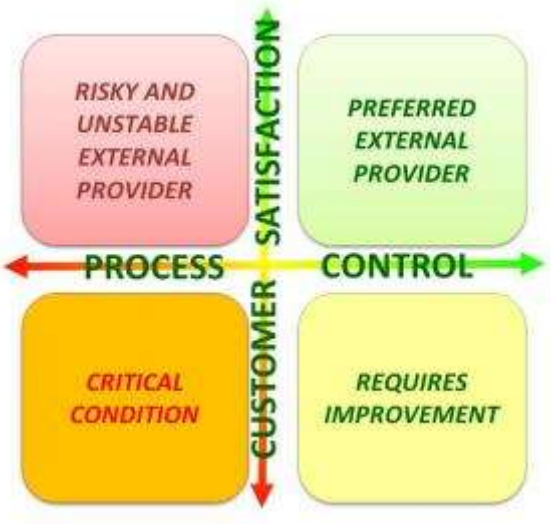
1 INTRODUCTION

At TNAM we understand the importance and value of having open and clear communication with our External Providers

1.1 PURPOSE

TNAM recognizes the importance of our External Providers, and treats them as an extension of our business in our efforts to achieve total customer satisfaction. External Providers must strive to achieve a "Zero Defects" goal and perform Value Analysis/Value Engineering (VA/VE) activities on products and processes. Continuous improvement efforts and compliance to requirements will assure an External Provider's preferred status.

This manual represents a compilation of quality assurance (QA) activities and specific requirements from TNAM. External Providers must adhere to these requirements.



The purpose of this manual includes but it is not limited to the following,

- To provide guidance to compliance requirements,
- To communicate TNAM's minimum Quality Assurance requirements and expectations,
- To assure, maintain, and raise the quality level of the delivered goods or services,
- To provide for continual improvement, defect prevention and risk mitigation,
- To facilitate waste reduction.

1.2 SCOPE

This manual should be applied for both the Production Preparation and Mass Production stages.

This External Provider Quality Assurance Manual is applicable for North American procured External Providers of products, processes, and services that affect customer requirements.

1.3 TNAM QUALITY POLICY

Our Quality Policy:

- **Total Customer satisfaction**

  We will provide products and services that meet or exceed quality, performance, and delivery requirements by demonstrating leadership necessary to achieve total customer satisfaction.

- **Continual Improvement**

  We will continually improve the quality of our products and the effectiveness of our quality management system and processes based on objective measurements and risk management.

- **World Class Quality System**

  We will comply with IATF 16949 and Customer Specific Requirements, including applicable statutory and regulatory requirements.

1.4 CERTIFICATION REQUIREMENTS

Compliance to IATF 16949 standard is required as per IATF scheme timing

TNAM requires External Providers to develop fundamental quality systems that cover for the expectations listed on this manual and provide for continuous improvement and emphasizes defect prevention while reducing variation and waste.

TNAM External Providers shall be IATF 16949 certified per the standard, or have a plan in place to achieve certification. At a minimum, External Providers shall be ISO 9001 certified by an accredited third-party certification body in addition to meeting the Minimum Automotive Quality Management System Requirements (MAQMSR). Waiver to these requirements has to be in writing and approved by TNAM Purchasing and Quality Management.

Per IATF 16949, External Providers can follow the QMS development sequence depicted in the following image,

However, External Providers that are distributors, trading, forwarding company, or sales offices, shall obtain ISO 9001 + MAQMSR or IATF 16949 certification from the manufacturer as per TNAM requirements. TNAM may request to verify the manufacturer's QMS certificate.

TNAM's Tier 1 External Providers are responsible to assure tier 2 and after providers have Quality Management systems that meet the requirements of this quality manual.

In the given case the External Provider is ISO 9001 certified only, it must also comply with the Sub-Tier Requirements listed below,

1. Control Plans
2. Process Approach
3. Performance Evaluation- Customer Satisfaction, Sub-tier providers, and Problem Solving
4. Internal Auditing
5. Control of non-conforming Product
6. Core Tools (SPC, FMEA, MSA, APQP, PPAP) Implemented per TNAM expectations
7. Management Responsibility
8. Determination and documentation of Special Characteristics and Pass Through Characteristics
9. AIAG Special Process Assessment – as applicable (discuss with TNAM SQE in a case-by-case basis)
   a) AIAG CQI-8: Layered Process Audit Guideline
   b) AIAG CQI-9 Special Process: Heat Treat System Assessment
   c) AIAG CQI-11 Special Process: Plating System Assessment
   d) AIAG CQI-12 Special Process: Coating System Assessment
   e) AIAG CQI-14: Consumer-Centric Warranty Management
   f) AIAG CQI-15 Special Process: Welding System Assessment
   g) AIAG CQI-16: Guidance Manual
   h) AIAG CQI-17 Special Process: Soldering System Assessment
   i) AIAG CQI-18: Effective Error Proofing
   j) AIAG CQI-19: Sub-Tier Supplier Management Guideline
   k) AIAG CQI-20: Effective Problem Solving Practitioner Guide
   l) AIAG CQI-21: Effective Problem Solving Leader Guide
   m) AIAG CQI-22: The Cost of Poor Quality Guide
   n) AIAG CQI-23 Special Process: Molding System Assessment

NOTE: consult with TNAM SQE and AIAG site for the latest version and applicable documents

1.5 DISTRIBUTION

The official controlled copy of this manual is the digitally signed PDF document and visible to all authorized users. All printed copies are considered uncontrolled copies used for reference only. The manual will be distributed/posted by TNAM when there is a revision, or whenever an External Provider requests a copy. The External Provider is responsible as follows,

- Obsolete revisions are disposed,
- Establish an area to have it readily available for further consultation within your company,
- A permanent management level position must be designated to be responsible for comprehension, deployment and ongoing internal training of TNAM's requirements.

Should you have any questions about the Manual, please contact TNAM's Quality group.

2 NORMATIVE REFERENCE

The latest edition of IATF 16949, *Automotive Quality Management System Standard,*

AIAG related Standards and Supporting booklets,

3 TNAM SPECIFIC TERMS, DEFINITIONS AND ACRONYMS

See IATF 16949 requirements for industry definitions

4M
Refers to process inputs; Man, Machine, Method, Materials

6S
It consists of the following steps, Sorting, Straighten/Shifting (set in order), Shine / Sweeping, Standardize, Sustain, and Safety

AMC
"Affiliated Manufacturing Company", refers to DTEN manufacturing locations throughout the world, such as TNMX, TNTH, TNPH, etc.

CNF
"Cause Not Found", refers to situations where the phenomenon can be confirmed but the cause cannot be identified

CPAR - SCAPAR
"Corrective and Preventive Action Request." "Supplier Corrective and Preventive Action Request."

Customer Pass Through Requirements
Requirements specified by TNAM's customers that are applicable to lower tier providers. Such as AIAG CQI requirements. Consult TNAM Quality contacts for details on applicability.

Direct Provide Parts
When specified by DTEN, the External Provider shall purchase products, materials, or services from DTEN-directed sources.

e^3
"Educate, Enforce, Escalate", is a structured system developed by TNAM Quality to support our External Providers in effectively complying to the requirements on this manual

EPRC
"External Provider Report Card"

TNMX
DENSO TEN MEXICO, S.A. DE C.V.

IPO
"International Procurement Office", refers to DTEN Purchasing locations throughout the world, such as TNSG, TNTT, TNJP, etc.

IPQM
"Initial Production Quality Management", DTEN's equivalent to Advanced Product Quality Planning

IPR
"Initial Production Part Report", it is a format used by Incoming Inspection section to document initial details on an anomaly identified on production parts.

MAQMSR
"Minimum Automotive Quality Management System Requirements", refers to requirements that complement an ISO 9001 certification for Automotive intended products or services

NONC
"Notification of Nonconformance Shipment", it is used by the External Provider to notify TNAM in the event that nonconforming product has been shipped.

NTF
"No Trouble Found", refers to a phenomenon that was reported seen but cannot be duplicated by the analysis/confirmation entity

PTC
"Pass Through Characteristics" are functional components characteristics that are not used by TNAM "tear1" during the process but they are used by TNAM customers "OEM", so if there are quality issues from the External Provider "tear2", they will only be detected on the OEM. The External Provider owns the final check on these characteristics

"Poka Yoke" <from the Japanese Poka = mistake, Yoke = prevention>
Mistake proofing device or method to mitigate the risk of causing or letting escape potential defects. There are various levels of Poka Yokes, depending on the level of assurance

QCD
"Quality, Cost, Delivery"

Special Controls Part
This classification is assigned by DTEN to parts that can lead to important or large-volume of defects, and therefore require special management

4 CONTEXT OF THE ORGANIZATION

4.1 SWOT ANALYSIS.- STRENGTHS WEAKNESSES OPPORTUNITIES THREATS

TNAM recommends External Providers to be aware of their Strengths, Weaknesses, Opportunities, Threats, and emerging technologies in their fields. The purpose is twofold,

1. To anticipate possible scenarios and prevent negative consequences that could have a ripple effect, and
2. To look for favorable conditions that can offer benefits i.e. Improved QCD

TNAM Purchasing do the follow up on External Provider risk level and mitigation.

5 LEADERSHIP

5.1 CUSTOMER FOCUS

Top management needs to be participative, actively engaged, involved and committed. Top management delegates authority within the organization and ensures resources to achieve customer satisfaction.

In order to ensure that TNAM requirements are met, top management shall communicate the escalation contact list, including roles and responsibilities, of those in charge of leading key activities, including but not limited to the following,

a) problem solving,
b) preventive action implementation,
c) capacity analysis,
d) technical support,
e) improvement activities, audits follow up, and
f) TNAM report card follow up

To designate the contact personnel use the “Designation of External Provider Representative form - FM529.” Please identify a representative for all shifts. Notify TNAM of any changes within 5 working days.

The External Provider shall secure the appropriate resources -personnel and equipment, to comply with communication language and format as required by TNAM.

5.2 QUALITY POLICY AND GOALS

The External Provider top management plays a key role in the development of the Quality Management System to ensure that the quality policy and quality goals are supportive of TNAM requirements.

5.3 COST RECOVERY – COST OF COMPLIANCE VS. COST OF NON-COMPLIANCE

5.3.1 Purpose

It is wiser to invest into compliance and defect prevention than having to deal with the cost of non-conformances. As non-conformances trickle down the pipeline, the cost of dealing with them grows exponentially. TNAM encourages the External Providers to implement a QMS that has the right investment into compliance.

5.3.2 Policy

External Providers can be held responsible for all costs associated with TNAM or TNAM's customers receipts of defective material. Any defect situation requiring cost recovery will be communicated to you by TNAM Purchasing or Quality. Costs may include, but are not limited to:

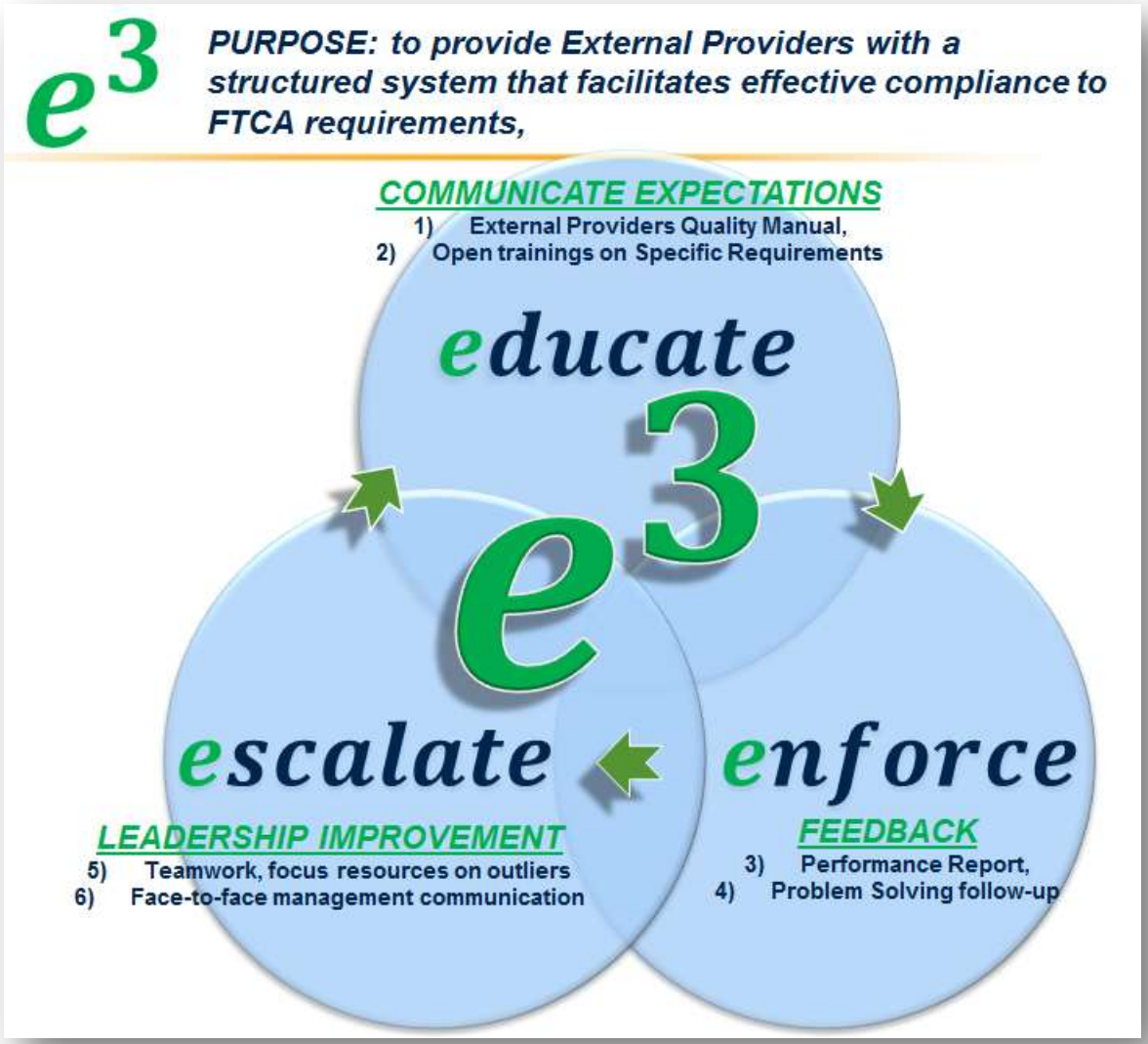
- Administrative
- Sorting of suspect material
- Rework
- Customer Charges
- Premium Freight
- Production Downtime
- Third party containment
- Scrap
- PPAP Delays
- Overtime
- Laboratory Testing
- Travel

5.4 e^3

e^3 is part of TNAM's External Provider Management/Development activities. At TNAM we believe in

- good communication of expectations → **educate**
- objective feedback/evaluation → **enforce**
- working as a team focusing resources when the situations merits → **escalate**

The goal is to have an effective External Provider Chain Management that results in a consistent supply delivered on time with the required level of Quality



5.4.1 Educate

1) By ensuring the External Provider has a thorough understanding of TNAM's specific requirements. This is achieved by documenting and communicating

2) TNAM SQE's provide ongoing training. External Providers are encouraged to request training as they see it necessary. Trainings are available as needed.

5.4.2 Enforce

3) Enforcing refers to monitoring the results vs. targets. In 2nd quarter FY 2016, TNAM's Performance Report is comprehensive and visual. The intent is to provide guidance for Continuous Improvement. For details, look at the Performance Evaluation section on this manual.

5.4.3 Escalate

4) TNAM has an escalation process that is applicable when the basic expectations are not met- Quality and Responsiveness. Escalation normally involves, 1) a development of an improvement plan, 2) Face to face leadership review, 3) 2nd party audits to the External Provider facilities

e^3 —What does it mean to you our External Provider, what is the expected behavior?

1. **Trust and open communication sharing pertinent information,**
2. **Cooperate in developing relationship, and**
3. **Leadership to your quality, ensure resources needed to support QMS are available**

5.5 TNAM AUDITS

The External Provider is expected to periodically perform self-assessment internal audits using the TNAM Audit Survey or equivalent

The goal of the audits is to understand capabilities and identify continuous improvement opportunities. With prior notification TNAM will conduct 2nd Party audits at External Providers and sub-tier facilities - manufacturing, design, and support,

Generally the audits take place as follows,

1. Potential External Providers will be audited as part of TNAM sourcing process,
2. Current External Providers may be audited for the following reasons,
    a) If there are ongoing quality problems,
    b) Launch of new parts – in such case, you may be required to provide a Master Planning Sheet and schedule of new project milestones
    c) Tool moves/relocation, or facilities layout changes. Tool moves to a different manufacturing facility may require a Quality System audit of the new facility. It is prohibited to move tools without prior notification and approval from TNAM.
    d) QCD related initiatives
    e) And others as required by TNAM QA

TNAM will send a Pre-assessment survey before any type of audit. The External Provider is to return the pre-assessment form prior to TNAM conducting the audit. Following the audit TNAM will forward our findings and any needed corrective actions. Results of the audit will be used in the sourcing decision.

6 PLANNING

6.1 PROJECT MANAGEMENT – 4M GANTT CHART

Closed loop communication, and PDCA Project Management are key to effectively preventing and resolving challenges.

Top management involvement nominating and empowering/supporting a Leader for project management is fundamental for success.

4M need to be part of the input for a PDCA project management, including but not limited to new parts launches, problem solving process, and change management.

6.2 PREVENTIVE ACTIONS AND RISK ANALYSIS

By definition Preventive Action is an action to eliminate the cause of a potential nonconformity or other undesirable potential situation.

Implementation of Preventive Actions is an essential element of an effective QMS. A systemic Risk Analysis Process will result in implementation of Preventive Actions and consequently increased levels of Customer Satisfaction.

The External Provider shall use FMEA process as a basic tool for prioritizing risk mitigation and implementation of Preventive Actions.

The External Provider is required to have evidence of risk analysis activity from a 4M point of view.

The figure is an aide in deciding how to go about prioritizing Preventive Actions, use this along with cost vs. benefit trade-offs.

7 SUPPORT

7.1 6S, RESOURCES – 4M

7.1.1 6S is the base of an efficient, safe, and error free organization. It mainly supports standardization and provides a highly visual work place making problems obvious. It consists of the following steps, Sorting, Straighten/Shifting (set in order), Shine / Sweeping, Standardize, Sustain, and Safety. The External Provider shall have a 6S or similar program in place that achieves a professional work environment.

7.1.2 4M resources shall be adequate to support all activities outlined in this manual. The manufacturing facility is to be organized in a way that it optimizes the flow and use of floor space. Adhering to handling and visualization principles such as, 1) correct parts and identification, 2) correct location, 3) correct quantity

7.2 COMPETENCE

The External Provider shall evaluate the training system in terms of its effectiveness supporting compliance to TNAM requirements

The External Provider shall have a training process applicable for all personnel performing activities affecting conformity to requirements. This process, as a minimum needs to contain the following evaluation,

a) Evaluation of Results –
   - ✓ Evaluate the tangible benefits by analyzing internal and external performance indicators
   - ✓ To measure, consider TNAM's performance report and the achievement of organizational objectives. The evaluations are used as input to improve the training process, especially when the internal indicators show opportunity for improvement.

8 OPERATION

8.1 CHANGE CONTROL ECR PCR

Engineering and process changes, including sub-tier providers, must be properly notified to TNAM

Changes affecting parts and/or process must be properly validated and approved prior to implementation. On its own responsibility the External Provider shall make arrangements for all necessary validations.

8.1.1 Submission for Engineering Change Requests,

a) An "Engineering Change Request (ECR), form FM519," must be approved by TNAM prior to making changes. ECRs must be discussed/submitted to TNAM SQE and copy Purchasing at least 70 working days before the planned implementation date. Any deviations are to be discussed with TNAM SQE
b) Example but not limited to the following conditions
   - Changes to materials (or sub-materials)
   - Changes from manufacturing facility or materials producers.
   - Changes to delivery specifications, such as packaging, quantity, etc.
   - Change to part numbers
   - Changes to the structure

8.1.2 Submission for a Process Change Requests,

a) A "Process Change Request (PCR), form FM270," must be approved by TNAM prior to making changes. PCRs must be discussed/submitted to TNAM SQE and copy Purchasing at least 70 working days before the planned implementation date. Any deviations are to be discussed with the related TNAM contact.
b) Example but not limited to the following conditions
   - Change in the manufacturing process and or tooling. Installation of additional equipment
   - Additional tooling or added cavities to tooling currently approved for mass production or any new process
   - Manufacturing location changes or relocation
   - Changes to the methods or conditions for processing or assembly
   - Restoration of non-operating process
   - Changes to Control Limits specified on the Control Plan.
   - Sub-supplier process changes

8.2 TRACEABILITY

Traceability relates to the origin of materials/components, the processing history, and the location of product/service

The External Provider shall use suitable means to control the unique identification of the outputs, and shall retain the documented information necessary to enable traceability. All unique aspects of production shall be traceable, production timing (date shift) and location, line, equipment, cavity, mold/tool, teammate, subcomponents of the goods, etc.

8.3 PPAP – CAPACITY, CAPABILITY

Without approval, External Providers shall not ship 1G production parts or beyond
TNAM Purchasing informs the project schedule including 1G production

8.3.1 PPAP

The External Provider is required to obtain approval for 1G production parts or beyond prior to shipment. As a reference, use the latest revision of the Production Part Approval Process (PPAP) developed by the Automotive Industry Action Group (AIAG). As stated by AIAG "The purpose of PPAP is to determine if all TNAM engineering design record and specification requirements are properly understood by the External Provider and that the process has the potential to produce product consistently meeting these requirements during an actual production run at the quoted production rate"

1. To obtain full approval suppliers must fulfill all AIAG PPAP requirements and TNAM specific requirements
    a) TNAM's customers Pass Through Requirements are part of PPAP
2. The External Provider is responsible for the completion of inspection and testing to engineering standards to verify conformance to product requirements
3. PPAP due dates will be determined and communicated to suppliers as part of the APQP process
4. Unless otherwise instructed PPAP packages shall be sent to the TNAM SQE

8.3.1.1 Capacity studies

The External Provider is required to conduct production capacity studies for all TNAM components

Based on the quoted capacity communicated by TNAM Purchasing, the External Provider is required to conduct production capacity studies for all parts. The analysis shall consider Lean and Maximum capacity with a safety margin for requirement fluctuations. TNAM reserves the right to request capacity studies at any given time. Refer to DTENs "Capacity Analysis Format, form – FM1126." With previous approval by TNAM QA, the External Providers may use an equivalent format of their preference.

8.3.1.2 When to submit

The External Provider shall submit PPAP for new parts or changes to existing parts, processes, drawings, manufacturing locations, sub-contractors, or materials (See also notification of changes). The default level for PPAP submission is Level 3. All External Providers are required to submit level 3 PPAP unless otherwise authorized by TNAM.

8.3.1.3 Catalog or service parts External Providers

The External Provider of standard catalogue production or service parts shall submit Level 1 PPAP (Part Submission Warrants only), unless otherwise approved by TNAM. Family approvals may be acceptable in some cases. Please contact TNAM SQE or Buyer with questions. Tooling shall be maintained for standard catalogue items for as long as the items are offered for sale.

8.3.1.4 Samples from production parts

The External Provider is required to submit one sample part (and when applicable one sample part per cavity/mold) as part of the PPAP package. Full layout for that sample part is required, along with data for special characteristics on an additional 4 sample parts. The additional 4 sample parts are not required to be submitted. The costs associated with PPAP samples are solely responsibility of the External Provider.

8.3.1.5 Annual layouts and functional testing

In order to verify continuing conformance, Annual Layouts and Functional Tests shall be performed annually to applicable customer engineering material and performance standards. Results shall be available for review upon TNAM's request.

8.3.1.6 Dimensional results

For each unique manufacturing process, e.g., production line, cavities, molds, patterns, or dies the External Provider shall submit full layout dimensional data on 1 piece and critical or special characteristic data on 4 pieces, use "TNAM Dimensional Results Report, form – FM1128," or equivalent with contents as noted on our form.

All dimensions, characteristics, specifications, and the requirements marked on the drawing or specification (documented information) shall be reported under the dimensional report. Relative documented information needs to be marked with ballooned numbers and those numbers shall match with the dimensional report results.

8.3.1.7 Special and critical characteristics

In order to monitor capability, Special and critical characteristics must be evaluated and monitored with ongoing process capability studies. Normal distribution of the data and stable process are some of the considerations for the study. Please use AIAG core tool booklets for requirements on computing these indexes.

8.3.1.8 High level Production Geographic location Flow

The External Provider is required to maintain a high level flow diagram for materials and parts flow, including sub-processes and geographic locations. Particularly but not limited to integrated circuits, where wafer→ probing→ encapsulation→ testing→ taping→ packaging→ distribution may take place on different continents.

TNAM reserves the right to obtain a copy of such flows, which may be requested to be submitted as part of your PPAP. The purpose is to understand possible risks associated with geographic locations.

8.4 SPECIAL CHARACTERISTICS

Special characteristics must be evaluated and monitored with ongoing process capability studies

8.4.1 Special characteristics - description

These are characteristics with an important impact to the customer, and shall meet the requirements below,

8.4.1.1 Safety Characteristic (S)

Safety

- Can be a direct contributor to a defect causing an accident involving an injury or vehicle fire.

8.4.1.2 Regulatory Characteristic (R)

Regulatory

- Can be a direct contributor to a defect causing non-compliance with laws and regulations.

8.4.1.3 Functional Characteristic (F)

Functional

- Can be a direct contributor to a defect in function, appearance and critically affect customer satisfaction.

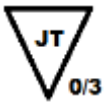
The inverse delta symbols are used on the written documentation that establishes the requirement for special characteristics. It can be located near by the special characteristic feature, or it can be indicated with leader lines.

8.4.2 Special characteristics Master Symbol

For parts with special characteristics, the drawing will use the following notations,

- For one page drawings, it will indicate the quantity of special characteristics. 3 shown on the example

- For drawings with multiple pages, the special characteristics symbol will indicate how mane on that page, and how many total for the part. For example 3/6, indicates 3 on that specific page, and 6 total



- If the 1st page of the drawing or document does not contain a special characteristic, it will be noted as 0/3 if the total document or specification has 3 special characteristics
- To denote SCs in e-mails and text based communication use the following respectively: (JTS), (JTR), (JTF)

8.4.3 Additional requirements for special characteristics (in addition to indications on drawings and other documented information)

1. Control Plan and PFMEA
   a. The External Provider shall identify the control methods, inspection methods, and failures modes related to special characteristics. Use defined symbols
2. Capability studies (as a reference, use AIAG booklet)
   b. Compute capability indexes and submit with the initial delivery,
   c. If required capability cannot be achieved, External Provider shall inform TNAM and provide a plan for improvement. While capability is not acceptable, use 100% inspection to assure quality and provide work instructions or other documents as evidence.
3. X-bar-R control charts need to be submitted to TNAM for all applicable special characteristics.
4. Record retention policy for Control Plan, Work Instructions, Control Charts and inspection criteria, shall be defined as the length of time that the product is active for production and service requirements, plus 10 calendar years, unless otherwise specified by the OEM Customer Specific Requirements (CSR), or regulatory agency.
   d. TNAM may request periodic submission of capability studies for special characteristics. The data can be obtained from the control charts being used in production. Capability acceptance criteria shall be met.

8.4.4 Product with embedded software – See IATF 16949 8.4.2.3.1

External Providers of product-related software or products with embedded software shall implement and maintain a process for software quality assurance, and are required to retain documented information of a software development capability self-assessment that is based on risk and potential impact to the customer

DTEN conducts methodical assessments of software development processes.

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8.5 PARTS THAT REQUIRE SPECIAL CONTROLS

Poka Yokes and escape prevention systems are mandatory for processes that can affect Pass Through Characteristics (PTC). External Provider is required to comply with unique checklists for special processes. TNAM QA will communicate as needed

DENSO TEN classifies as Special Controls Parts the type of parts that can lead to important or large-volume of defects, and therefore require special management

8.5.1 Critical characteristics are marked on drawings by symbols such as - ***, **, #, ¥ , ¥¥,** and others

In addition to indications provided on drawings and other documented information, the following requirements apply to Critical Characteristics,

1. **Control Plan and PFMEA**
   a) The External Provider shall identify the control methods, inspection methods, and failures modes related to the critical characteristics that are defined on the drawings or specifications. Use defined symbols
2. **Process Capability** shall be monitor and controlled
   b) If required capability cannot be achieved, External Provider shall provide a plan for improvement. If capability is still not acceptable after improvements, use 100% inspection to assure quality and provide work instructions or other document as evidence.
3. **Record retention policy** for Control Plan, Work Instructions, Control Charts and inspection criteria, shall be defined as the length of time that the product is active for production and service requirements, plus one calendar year, unless otherwise specified by the OEM CSR, or regulatory agency.
   c) TNAM may request periodic submission of capability studies for significant characteristics. The data can be obtained from the control charts being used in production. Capability acceptance criteria shall be met.

8.5.2 Special Processes,

Consult with TNAM SQE for other possible special processes and necessary controls, such as the case with Pass Through Requirements

DENSO TEN has defined the following special processes: Tapping, Shaft riveting, welding and terminal crimping. Consult with TNAM SQE for other possible special processes and necessary controls, such as the case with Pass Through Requirements

a) Special process shall be identified as such on the Control Plan, and PFMEA
b) As determined by TNAM, the External Provider is required to comply with unique checklists for some special processes. Drawings and other forms of documented information indicate the need of such checklists. Such checklists are required to be submitted as part of the PPAP package. Consult with TNAM SQE for the required checklists.

8.5.3 Parts with Pass Through Characteristics such as Vehicle Mounting Features-

The External Provider shall implement suitable Poka yokes and escape/outflow prevention systems for PTCs such as features mating with vehicle. Bear in mind that TNAM process does not use nor check these characteristics, the External Provider owns the final check.

a) The External Provider shall use the “Poka Yoke verification format, form - FM 1127,” and include it as part of the PPAP package
b) Control Plan, PFMEA and applicable documents must have identified the Poka yokes related to PTCs.

8.5.4 Other as designated by TNAM and/or TNAM’s customers

There may be other parts requiring special controls, possibly New Technologies, New processes, Customer requests, etc. TNAM SQE will communicate as deemed necessary. See 1.4 for a list of AIAG CQI checklists.

8.6 SPECIAL LABELING FOR STRATIFICATION / IDENTIFICATION

8.6.1 Special Shipment Identification

For all shipments prior to Mass Production, the External Provider must identify special shipments with the "Special Shipment Tag, form – FM1129," including but not limited to the following cases:

- Parts Submission Warrant
- Samples requested by TNAM
- Packaging Trials
- Sample evaluation by provider
- Reworked parts
- 100% supplier inspected parts, short term and long term CM shipments
- Parts approved on temporary deviation
- Other samples which intend is other than regular production

8.7 NONC, CONTROL OF NC, REWORK, DEVIATION

8.7.1 NONC

Notification of Nonconformance Shipment, the External Provider shall immediately notify TNAM in the event that nonconforming product has been shipped. Initial communication shall be followed with,

1. detailed documentation of the event
2. a plan to establish a reaction plan for immediate containment of non-conforming material.
3. the requirements outlined on 10.3 External Provider Corrective Action Request of this manual apply to NONC.

8.7.2 Control of nonconforming product

It is the responsibility of the External Provider to identify nonconforming product and effectively control it in order to prevent unintended use or delivery.

8.7.3 Rework

The rework must be traceable, and in some occasions, special tagging is required

If material can be reworked, by a method or condition not included in the approved control plan, the External Provider needs to request authorization to TNAM. In the request needs to include the flow, work instructions, visual aid or any other documentation necessary to prove that the product meets specifications and that the method for rework does not cause any reliability issues or other negative side effects. If the rework is temporary, the approval will be granted through the "Temporary Deviation" procedure. If the rework activity is to occur periodically during the life of the product, a "Process Change Request" needs to be submitted to TNAM for approval of the addition of the rework- as a permanent but infrequent process. The rework procedure must be identified as a critical process and properly documented on the Flow Chart, PFMEA and Control Plan during PPAP submission. The rework must be traceable. In some occasions, tagging is required.

8.7.4 Temporary Deviation

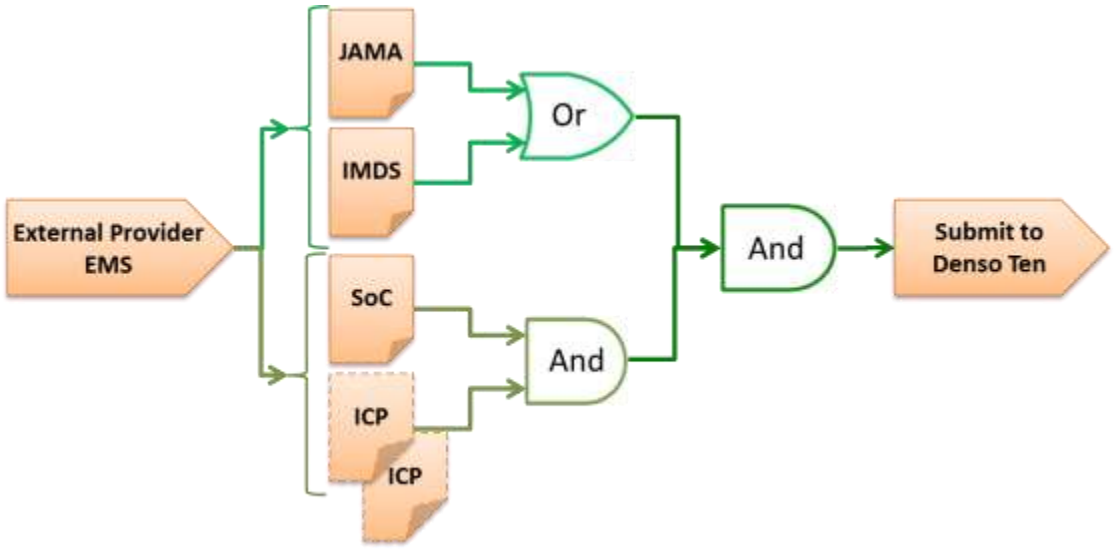
In the event that the manufacturing process (from the 4M standpoint), specifications, conformance to print or requirements differ from that which is currently approved, the External Provider shall obtain TNAM's concession /approval or deviation prior to further processing. In the event a Temporary Deviation may be required, a request must be submitted to TNAM and approved prior to shipping the related material. TNAM approval will be based on how deviations might impact the form, fit and function of the parts. Deviation requests must include details of the non-conformance and the number of parts affected. TNAM's "Temporary Deviation Request, form - FM518," may be used. Requirements listed on this manual on 8.6 Special Labeling / Identification apply to material covered under temporary deviations.

8.8 JAMA SOC IMDS

Control of SOCs is a Regulation item and shall be treated as a critical requirement

The External Provider shall control Environmental Requirements in accordance with the latest version of "Green Procurement Guidelines" issued by DENSO TEN. For new parts and parts undergoing a design change, the design department will request information on the materials at the time when the "Request for Design and development of parts", and when part drawings are issued. The External Provider shall report on the JAMA or IMDS sheets in response to the request.

Before PPAP submission the External Provider must verify SOC contents are lower than the specified limits and complete the report on the SOC evidence list. In order to grant approval, the PSW is to indicate that environmental information has been submitted, i.e. JAMA or IMDS, SOC and Analysis Evidence



The latest version of the Green Procurement Guidelines, and the Environmental Report Format are available at the public website of Denso Ten:

http://www.denso-ten.com/society/ecology/guideline/

Send Environmental documentation to: mailto:jamasoc@rio.ten.fujitsu.com

JAMA = JAPANESE AUTOMOTIVE MANUFACTURING ASSOCIATION

IMDS = INTERNATIONAL MATERIAL DATA SYSTEM

SOC = SUBSTANCE OF CONCERN

ICP = INDUCTIVELY COUPLED PLASMA

8.9 APPEARANCE ITEMS, LIMIT SAMPLES, AND MATING PARTS

8.9.1 Appearance items

When the part is designated by TNAM as an "Appearance item ", the External Provider shall prepare the following:

- Appropriate environment for evaluation, including lighting
- Masters and limit samples for color, piano black, grain, gloss, metallic brilliance, texture, etc. as applicable
- Maintenance and control of masters, limit samples, and evaluation equipment
- Applicable "attribute GR&R" studies for personnel performing the appearance evaluations
- Drawings and other documented information indicating the approval process for Appearance items

8.9.2 Limit samples (LS)

When there are one or more characteristics that are difficult to measure in quantitative terms, or as indicated by drawings or other form of documented information, the External Provider shall prepare limit samples for judging acceptability.

a) Preparation steps,

1. **Advanced Schedule**: LS shall be prepared before the first 1G delivery, and using the equipment and method intended for mass production.
2. **Quantity:** three samples is the standard to prepare, one for the supplier and the remaining two for DENSO TEN Incoming inspection.
3. **Method:** The LS shall be traceable and submitted with an identification tag. The tag will contain information such as, date of preparation, External Provider name, part number, etc .

b) Control for limit samples

4. The External Provider must maintain the LS conditions as to preserve the characteristics as approved. Protective boxes or displays are recommended for these purposes.

c) Expiration of limit samples

5. Generally LS are valid for one year. If the specific criteria have changed or the sample has been damaged, or for any other reason the sample is no longer valid, then the External Provider must properly dispose of it and submit a request for renewal.

8.9.3 Mating Parts

When mating parts/components are needed to be used for fitting, appearance matching, and/or testing, the External Provider must submit a request to TNAM Purchasing to obtain the part. A description of the intended use and control method may be needed.

The External Provider is responsible to maintain and dispose of mating parts through confidentiality agreement with TNAM.

8.10 APQP

The External Provider shall have a clearly defined “APQP Chart”

Every activity relevant to quality, including outsourced work- from order receipt→ production→delivery of the product, shall be determined. Responsibilities shall be clearly defined for each area:

Expectations for the organizational chart

1. Define QA activities performed by each department at each stage from planning and design through sales and after sales service, and include the relations between them.
2. If QC system differs for each division of the company, a separated organizational chart will be required
3. Define the responsibility for each department relating to internal and customer complaints and include the flow

Charts shall be a controlled document and submitted per TNAM’s request.

8.11 OUTSOURCED PROCESS

The External Provider is responsible for outsourced products and services

The External Provider is required to ensure conformance of all outsourced products and processes and maintain a system that mitigates the risk throughout the supply chain, including cascading TNAM requirements down the chain to manufacturing.

8.12 DIRECT PROVIDE PARTS

In case of Direct Provide Parts, DTEN has the responsibility to select the sub-tier provider. See 3 TERMS, DEFINITIONS AND ACRONYMS

The External Provider is responsible to manage daily quality related items, Incoming inspection, evaluation and monitoring, feedback, etc. In the event a quality trends is identified, an audit or escalation will be required. TNAM SQE and/or Purchasing will coordinate a plan that generally involves both providers.

9. - PERFORMANCE EVALUATION

9.1 EXTERNAL PROVIDERS REPORT CARD - EPRC

Refer to TNAM's communication on "External Provider Report Card"

As part of e^3 activities, TNAM utilizes an External Provider rating process to evaluate performance. Issuing ratings allows TNAM to identify improvement opportunities in the area of quality. The ratings will be used in making sourcing decisions. Feedback on ratings will be provided on an ongoing basis

External Provider Ratings are based upon the following :

AREA	WEIGHT	DESCRIPTION AND PURPOSE
Quality	30%	External Providers must have a strong system to prevent occurrence, and escapes. Quick reaction when issues are reported to permanently eliminate defects
Compliance & Regulatory	30%	To assure production process is in compliance and capable for new or changed parts Global compliance requirement to assure parts are free of prohibited substances Assure world class quality system for supplier processes
Communication	20%	Require to improve on quality defects, with an increased sense of urgency To minimize impact of potential problems
Commitment & Project Management	5%	To have control of projects and assure successful execution of launches
Cooperation & Flexibility	5%	To motivate External Providers to take adequate care of DTEN as needed
Change Management ECR/PCR	5%	To have control of changes and mitigate potential implications
Quality of Support Activities	5%	To motivate External Providers to take adequate care of DTEN as needed

9.2 CUSTOMER SATISFACTION

The External Provider is required to have a way to measure and improve TNAM's level of satisfaction, and shall document and implement an improvement plan when required by the EPRC or when there is a negative trend on the performance indicators. Reviews will take place at TNAM's discretion and request.

10 IMPROVEMENT

10.1 PROBLEM SOLVING FLOW

The External Provider is required to document a flow that details how to react when a non-conformance product is being reported. The flow shall detail contact escalation (at least 3 contacts: Name, e-mail, phone number), standard or typical timing, responsibilities and interactions to respond to the situation. Report any changes to the flow to TNAM SQE within 5 days.

10.2 CONTAINMENT AND NEW BUSINESS HOLD PROCESS

The External Provider is responsible for developing a process to protect TNAM from receiving material that does not meet the quality requirements and specifications set by TNAM. Failure to achieve these requirements can lead to the External Provider being placed into one of three levels of Containment.

10.2.1 Level I Containment (L1):

L1 is for Start-Up Production. As part of APQP Pre Launch Control Plans will be developed that consist of process controls to identify defects that typically occur during early production. TNAM will determine the length of time in L1.

10.2.2 Level II Containment (L2):

The External Provider will be placed into L2 as a result of a spill or recurrence, at the discretion of TNAM. The External Provider will be required to take immediate actions to cease shipping defective material. These actions may include but not limited to:

1. Describe containment, and if applicable method of certification and validation, the inspection must be an addition to the current process
2. Sending certified replacement parts to replace suspect parts in-transit and in TNAM inventory (issue an RMA as needed). All stock location to be purged of suspect stock.
3. Marking certified parts as agreed to by TNAM – Relevant traceability information,
    a. When required, DENSO TEN reference number (“GEMS” number) must be used – format A#########, or other number such as CAR, IPR, etc.
    b. Serial number / lot number / date code
    c. Manufacturing location / line / date / shift / etc.
    d. Utilize the TNAM Certified Part identification label to identify certified shipments
4. Collecting daily sort data. Reporting daily findings to TNAM
5. Teammates conducting the inspection must be certified. All inputs must be controlled, such as equipment (MSA), WI’s, resources

The duration of L2 will be 3 consecutive lots free of defects, or as agreed with the SQE.

10.2.3 Level III Containment (L3):

The External Provider will be placed into L3 for failing to contain defective material at their facility.

L3 requires the External Provider to have a mutually agreed third party containment company inspect parts prior to shipment to TNAM for a minimum period of 30 days or as agreed with the SQE. L3 inspection must be performed outside the External Provider's facilities unless authorized by TNAM. The External Provider will still be required to complete the actions for L2.

10.2.4 Exit criteria:

Containment levels will be terminated once the following criteria is met:

- Corrective Action report has been approved by TNAM SQE
- An exit criteria period of time without additional defects has been met. The details on this will be discussed case by case

The External Provider is responsible for the costs associated with the containments, see 5.3 Cost Recovery – Cost of Compliance vs. Cost of Non-Compliance

10.2.5 New Business Hold

As a general guideline, NBH will be considered if any or multiple of the following occur,

1. 6 months of underperformance as reflected on the EPRC. See 9.1 External Providers Report Card - EPRC
2. Failure to comply with any of the levels of special containment
3. Critical nonconformance cases at the discretion of TNAM

The External Provider will be notified of this status by a letter signed by SQE and Purchasing management.

External Providers placed on new business hold will not be eligible to bid on new parts or projects until an acceptable corrective action plan is approved and/or implemented. TNAM supports the External Provider in meeting the exit criteria.

10.3 EXTERNAL PROVIDER CORRECTIVE ACTION REQUEST - CAR

Upon identification of nonconforming material TNAM will issue a "Corrective Action Request, form FM1125." Nonconforming material can be found during incoming inspection (IPR), audit, assembly, customer line and warranty returns, other. The initial CAR includes details of the non-conformance symptom; the External Provider representative must acknowledge and communicate receiving the CAR.

If required, a Return Material Authorization (RMA) must be issued and communicated in return. If a RMA is not received the suspect material will be returned or scraped at the External Provider's expense.

TNAM reserves the right to sort suspect material to avoid shutdown of its production lines, the External Provider is responsible to support such sorts and take ownership of 4M – providing the required equipment, personnel and method. TNAM is not responsible for the fallout associated with the sort; External Provider is encouraged to react and takeover as soon as possible.

The External Provider is responsible for the costs associated to problems that are their responsibility, see 5.3 Cost Recovery – Cost of Compliance vs. Cost of Non-Compliance.

The following highlights outline high level expectations related to CAR.

Within 24 hours of notification, the External Provider communicates the following,
1. Implementation of L2 containment requirements see **10.2 Containment and New Business Hold Process**
2. Initiate definition of Problem Statement
3. Establish Investigation Team Members
4. **Interim Containment Action (ICA)**
Within 10 business days of notification
5. Root causes of defect occurrence and escape
6. Permanent Corrective Actions
7. Prevent Recurrence and Extrapolate

Approval and closure of the response will be at the discretion of TNAM

Throughout the CAR process, TNAM and the External Provider will maintain open communication for clarification of additional requirements. TNAM will analyze the final response and provide the decision, Accepted, Conditionally Accepted or Rejected. If rejected, TNAM will provide an analysis report detailing the reasons for Conditional Acceptance or Rejection, and resubmission expectations. The actions shall effectively eliminate escapes and the cause of nonconformity, and prevent recurrence.

10.4 FIELD QUALITY

The External Provider's warranty management process shall integrate all applicable TNAM specific requirements listed on this manual. Depending on the component in case, specific procedures are required for the evaluation of No Trouble Found (NTF).

Depending on the impact of the quality issue, the External Provider may be responsible for field actions – as per section 5.3 Cost Recovery – Cost of Compliance vs. Cost of Non-Compliance , up to including

- Dealer campaigns
- Customer distribution Points
- OEM plants
- DTEN AMCs
- Products recalls
- Etc.

10.5 CONTINUAL IMPROVEMENT

The External Provider is required to have a formal continual improvement process to determine if there are needs or opportunities- applicable to the suitability, adequacy and effectiveness of the quality management system- that shall be addressed as part of continual improvement.

Per definition, continual improvement applies to common causes of variation and not to assignable causes, therefore the process has to be statistically capable and stable, or when characteristics meet requirements.

With advance notice and agreement, TNAM reserves the right to confirm the Continual Improvement process at any given time.

LIST OF FORMS

THE FOLLOWING FORMS ARE AVAILABLE FROM YOUR TNAM QUALITY CONTACT.

FM529	Designation of External Provider Representative	FM518	Temporary Deviation Request
FM270	Process Change Request (PCR)	FM519	Engineering Change Request (ECR)
FM1121	Riveting Process Verification	FM1126	Capacity Analysis Format
FM1122	Tapping Process Verification	FM1127	Poka Yoke Verification
FM1123	Terminal Crimping Process Verification	FM1128	Dimensional Results Report
FM1124	Welding Process Verification	FM1129	Special Shipment Tag
FM1125	Corrective Action Request		

REVISIONS

CONTROL OF CHANGES

April 4, 2018	Rev. I	24 / 32 Various	#1) Updated link for “Green Procurement Guidelines”, and the “Environmental Report Format” #2) Updated company name and acronyms to “Denso Ten”