Standard Name: Quality Management Common Specifications - (Automotive) / General Quality Agreement

	Date	Reason for Change	ISSUE	CHK	APP
B	August 26, 2022	* 2.1 (9) remove VDA6.3 * 2.5.1 change audit method as VDA6.3 * 2.5.2 add VDA6.3 for audit method * 2.5.5 clarification of CQI type * 2.8 add VDA6.3 as recommended audit method * 3.5 clarify relationship between special characteristics and severity / occurrence of FMEA * 3.12 clarify packaging verification method * 4.2 clarify exit criteria and format for sale launch control	M. Hongo	Ishiyama H. Hongo Sonoda Mochizuki	Saito
A	Established on June 15, 2021.	Defined as automotive-specific documents in order to add and manage the Automotive requirements of the Quality Management Common Specifications (102-5004).	Makoto Hongo	Takafumi Saito	Tatsuo Honda

Table of Contents

1. General Rules

1.1 Purpose

This specification specifies the requirements on the quality management capability for the supplier as a supplier (hereinafter referred to as the "Supplier"), and further provides the necessary requirements to meet the quality management requirements. Also, this specifies that Tyco Electronics Japan G.K. (hereinafter referred to as the "TE") bears responsibility to check the enforcement status of the requirements provided in this specification in order to aim to ensure that the items ordered by the TE are manufactured and delivered in stable quality through compliance by each other. In addition, this is also used as a manual for instructing and educating sub- suppliers.

1.2 Scope

This applies to the processes related to the application of automotive products and services (including trading company functions) of the Automotive Business Unit and their support processes. The target is processing that includes manufacturing and secondary processing of raw materials, parts, semi-finished products, and finished products, which are generally called direct materials.

Apply to products made of indirect materials (secondary materials, e.g. packaging material) if necessary. For details, contact the TE's department in charge of purchase.

1.3 Responsibility

Supplier shall manufacture products ordered from TE at the factory managed by supplier and, in principle, shall not manufacture them at a sub-supplier. If it is unavoidable to manufacture at a sub-supplier, the Sub-Supplier Registration Application (TE J-1001) must be submitted for approval by TE in advance. However, the approval by this procurement department must be given in consideration of the judgment (information for making a judgment: the data of the process/quality checked by supplier about sub-supplier) of the quality assurance department.

2. General Requirements

2.1 Quality management system (IATF 4.1/4.2/4.3f/4.4f/5.1f/5.2)

TE establishes the following requirements for the supplier's quality management system.

(1) Supplier needs to establish and maintain an effective, appropriate, and economical quality management system to ensure that delivered contract products satisfy the purchase specifications of TE.

(2) Quality requirements needs to be established and maintained based on the requirements of ISO 9001. Automotive suppliers shall have received certification of the latest version of ISO 9001 from an external certification body as a minimum requirement.

(3) An agreement on participating in the supplier development program that is intended to comply with the latest version of IATF 16949 needs to be reached. The following items are the additional items, and the underlined items are required to be applied.

- Items within the IATF 16949 standard: 4.3.2, 4.4.1.2, 5.3.2, 6.1.2.3, 7.1.4, 7.1.5.3, 7.2.1, 7.2.2, 7.5.3.2.2, 8.2.1.1, 8.2.3.1.2, 8.3.3.3, 8.4.1.3, 8.5.1.1, 8.5.1.2, 8.6.2, 8.7.1.6, 8.7.1.7, 9.1.2.1, 9.2.2.2, 9.2.2.3, 9.2.2.4, 10.2.3, 10.2.6
- Five core tools issued by AIAG (APQP, FMEA, PPAP, MSA, SPC)

(4) Supplier shall be subjected to examinations of this quality management system by TE and, if any deficiencies are found as a result of the examinations and requested to be improved, follow the request.

(5) Receipt of or any change made to ISO 9001 or IATF 16949 certification shall be reported. In addition, any suspension or revocation of the certification shall be reported to the Procurement Department of TE within five working days.

(6) Provide quality management product assurance of products. In addition, a quality assurance management representative is to be appointed and the Quality Assurance and Inspection Management Representative Notification (TE J-286) is to be completed and submitted to the TE.

(7) Setting and deployment of quality objective

Supplier shall establish the quality policy and quality objective of the fiscal year based on the requirements of TE, the degree of achievement of the quality objective of the previous fiscal year, and the analysis results, and make them known to all related departments, including the sub-suppliers. In addition, the management shall set evaluation indicators to ensure thorough policy development and achievement of the objectives, and follow their progress.

(8) Development of the requirements in this document to the supply chain

Supplier is obligated to develop and comply with the requirements in this document throughout the supply chain.

(9) Quality policy (Zero defect)

Supplier promotes quality improvement with the goal of "Zero defects" in order to meet IATF 16949, VDA6.3, and the customer's quality requirements. Mainly PPM is used as the monitoring standard, and quality goals

to improve internal and external defects and losses are set and achieved.

"Zero defect" aims to eliminate defects not only in products but also in processes so that they become zero.

(10) Implementation of management review

Supplier shall review the effectiveness of the quality management system on a regular basis (once a year or more) by holding a meeting. The input for the management review shall include the following:

i) Results of internal and external audits
ii) Product conformity, cost of quality defects, process effectiveness, and process efficiency
iii) Status of preventive and corrective actions
iv) Follow-up to the results of the past management reviews
v) Changes that may affect the quality management system
vi) Proposed improvements
vii) Analysis of obvious and potential problems in the market and their effect on the quality, safety, or environment

2.2 Customer-specific requirements (CSR) (IATF 4.3.2)

If there is an impact on the supply chain, including Supplier, TE deploys the customer-specific requirements (CSR) from its customers to Supplier in such a way as to use product drawings and specifications. Supplier shall review the CSR within 10 working days and then reflect it in its quality management system. If there are any questions, supplier contacts TE and makes a decision.

* The drawings, specifications, and supplier quality manuals issued by the TE's customers can also be referred to in the Supplier Portal.

2.3 Supplier portal

Supplier can refer to documents including drawings, issue labels, use customer claim management (SNMS), and use Supplier ePPAP using Supplier Portal: https://supplier.te.com/web/supplier-portal/home.

2.4 Supplier Registration/Assessment

2.4.1 Cooperation in investigation

At the start of production of contracted products by supplier, TE investigates / audits the business conditions and quality management capability of the Supplier's factories to confirm the degree of possession of the ability to satisfy contractual requirements, such as matters stipulated in this specification, and to confirm on a regular basis or as needed that the ability is still maintained after the start of production. Supplier shall cooperate with this. The suppliers of direct components delivered to the Automotive Business Unit shall be in accordance with Section 2.5 of this document.

2.4.2 Matters for investigation

The investigation of the business conditions and quality management capability is conducted using the Quality Management Capability Investigation Report (TE J-180-7). This investigation item complies with the

requirements of ISO 9001.

2.4.3 Documents for submission

For the investigation specified in 2.4.2, supplier submits the following documents:

(1) Biography
(2) Organization Chart
(3) Quality Assurance System Diagram
(4) Quality Management Procedure Catalog (Quality Assurance System Diagram)
(5) Inspection Equipment List
(6) Production Equipment List
(7) Quality Management Process Chart
(8) Other documents required by the TE and agreed by the Supplier

2.5 Audit (IATF 9.2f)

TE has the authority to audit supplier. Audits are system, process, or product audits. An audit plan is given by TE in advance. In addition, from the perspective of confidentiality of supplier, it is possible to exclude some from audits through prior consultation. For matters pointed out in audits, proposed improvements must be considered and implemented, and an improvement plan must be prepared and submitted to the TE within one week. In addition, the improvement results are to be reported to the TE with evidential materials within one month.

[Audits conducted by TE]

2.5.1 Audit for new certification

TE has the authority to audit supplier for new registration. New registration is to audit and make pass/fail judgments on new events (new factories, new technologies, etc.) from the perspective of 5M1E also in a case other than new transactions. For the audit method, VDA6.3 method is used and, if necessary, the Supplier Audit Worksheet (AUTGF 5176) or the IATF 16949/VDA 6.3 equivalent audit form are used for the audit. In addition, if the audit fails, conducting the audit for registration is not allowed for one year.

2.5.2 Periodic audit

TE judges the risk and makes an audit plan based on the quality records (customer complaints, DLPM, and faulty supplied parts), delivery records, past audit results, and voluntary audit items and, in principle, conducts audits once every three years using the Supplier Audit Worksheet (AUTGF 5176) or VDA6.3 or IATF 16949/VDA6.3 equivalent audit form. If supplier is subjected to an audit, the audit plan is to be sent in advance.

2.5.3 Extra audit

TE may conduct an extra audit on supplier besides periodic audits. For example, in the following cases, an audit is conducted using an arbitrary audit sheet. Supplier shall cooperate with the implementation of this extra audit.

(1) If a serious customer complaint is received

(2) If it is necessary to determine whether or not the contracted products/processes of supplier meets the requirements of TE and the TE's customers (release of new products/customer audits, etc.)

[Audits conducted by the Supplier]

2.5.4 Self-audit

Supplier conducts a self-audit once a year using the Supplier Audit Worksheet (AUTGF 5176) and takes corrective action against the risks detected during the audit. The audit results shall be submitted to TE with a corrective action plan attached.

2.5.5 Process audit

For the production process of products of TE, a process audit must be conducted at least once every three years. The recommended method for process audits is the audit method based on VDA 6.3. It must be considered that the audit frequency is reduced based on the number of customer complaints and the number of in-house nonconformities. When it is specified as a special process (CQI) designated by AIAG, the audit must be conducted including the details on CQI. Type of CQI is shown as below but should be confirmed lates status at AIAG web site.

- CQI-9 Heat Treat Assessment
- CQI-11 Plating System Assessment
- CQI-12 Coating System Assessment
- CQI-15 Welding System Assessment
- CQI-17 Electronic Assembly Manufacturing-Soldering System Assessment (EAM SSA)
- CQI-23 Molding System Assessment
- CQI-27 Casting System Assessment
- CQI-29 Brazing System Assessment

Reference: https://www.aiag.org/

2.6 Supplier performance monitoring (IATF 8.4.2f)

2.6.1 Key performance indicator (KPI)

The automotive of TE exchanges target values of the important quality indicators (the number of complaints from TE's customers, DLPM (Received defective parts: Defective parts per million), faulty supplied parts) with each supplier as needed.

2.6.2 Supplier scorecard (hereinafter referred to as a score card)

2.6.2.1 Purpose and implementation of scorecard

A scorecard is designed to provide information for judgment of delivery quality from TE to supplier and to help quality improvement after that. The Procurement Department is in charge.

2.6.2.2 Description of scorecard

A scorecard is calculated from the three elements of *quality, cost, and delivery*. The key performance indicators for each element are as follows:

(1) Quality: DLPM (defective parts per million), number of defective lots, number of customer complaints due to partner companies.

(2) Cost: Fabrication productivity (quarterly), project in TEBIT

(3) Delivery: On time supplier committed (STC), on time TE request (STR)

In addition, a scorecard is calculated once every quarter of the year. The reference minimum achievements of a scorecard are set separately by the Procurement Department of TE.

2.6.3 Monitoring of key performance indicators of supplier

The Procurement Department and the Quality Assurance Department of TE monitor quality and delivery issues of supplier. In addition to scorecards, TE monitors the key performance indicators based on the number of defects obtained by adding up the results of received defective parts, domestic and overseas complaints, and defective supply parts notifications on a monthly basis in order to judge the delivery quality of supplier. Depending on the achievement status of these key performance indicators, TE requests that supplier make improvements as needed to help supplier improve its quality.

2.7 Escalation/Activities when the reference minimum achievements are not met

If a supplier's scorecard does not meet reference minimum achievements, the Procurement Department conducts improvement activities with the centrally led commodity team. For delivery and cost issues, the Procurement Department takes the lead in conducting improvement activities. For quality issues, the Quality Assurance Department takes the lead in conducting them. If the improvement activities are not effective, suspension of new business opportunities and termination of business are discussed through consultation.

2.8 Management of sub-suppliers (IATF 8.4.2f)

(1) It is to be ensured that the sub-supplier's quality management system meets the requirements of TE. Supplier audits sub-suppliers on a regular basis and judges corrective actions for the issues pointed out. The results must be submitted on the request of TE.

(2) Deployment of requirements to sub-suppliers
Supplier must deploy the necessary requirements of TE, legal requirements, and special characteristics of products or processes to sub-suppliers.

(3) TE has the authority to visit or participate in quality management system audits/process audits by notifying the Supplier's sub-suppliers in advance. The same applies to customers of TE and third party organizations certified by TE.

2.9 Resource operations management

2.9.1 Human resources (IATF 7.1.2)

Supplier must clarify and secure personnel and skills necessary for effective implementation of the quality management system and operation and management of its process.

2.9.2 Education and training (IATF 7.1.2)

It is to be documented that personnel engaged in work that affects the product quality receive necessary education and training, and qualified as necessary.

(1) During education and training, the required competence is clarified, the degree of understanding is checked, and they are recorded.

(2) The skill effectiveness shall be judged regularly and the capability levels shall be clarified, including educators.

(3) The effect and importance of the quality characteristics of production parts on product functions in finished products shall be investigated and educated.

*If product functions, their effect, or their importance is unknown, be sure to contact the department in charge of TE.

2.9.3 Infrastructure (IATF 7.1.3f)

The infrastructure required to achieve compliance with product requirements (see below) must be clarified and maintained.

・Buildings, work areas, and related utilities (electricity, water, air, steam, etc.)
・Equipment (including software)
・Items related to transportation and communication support services

2.9.4 Contingency plan (IATF 6.1.2.3)

For all supply chains, supplier extracts all risks that may affect delivery to TE and considers and implements the following actions in normal times and in emergencies in reference to the nine items in the figure below.

(1) [Normal time] Supply Chain Information Disclosure: Component Supply Chain Chart (CSCC: TE J-1010)

(2) [Normal time] Planning and promotion of disaster mitigation actions against production risks from the perspective of the characteristics of parts/materials

(3) [Emergency] Check of own status by each supplier (human life first)

(4) [Emergency] Check of supplier status

(5) [Emergency] Determination of affected product numbers, stocktaking, and setting recovery priorities.
In addition, in order to ensure the response in the event of an emergency, the effectiveness of the contingency plan shall be checked through training, simulation or by other means on a regular basis, including the management.

[Contingency action items]

No.	Emergency	General description of response plan/implementation
1	Large-scale disaster strike (such as many equipment failures and outages)	The priority recovery line is decided in consideration of basic information and customer information.
2	Safety, environmental issues	Response in the event of occupational accidents, environmental pollution
3	Noncompliance	Response to a breach of labor laws, economic laws (subcontract acts, antitrust laws, etc.)
4	Poor quality	Emergency response in the event of poor quality
5	Utility failure/outage	Emergency response in the event of a utility failure/outage Spare parts management/Clarification of arrangement procedure
6	Equipment failure/outage	Determination of bottleneck equipment and daily management Cyberattack on IT systems
7	Trouble in transportation	Emergency response in the event of delayed delivery
8	Labor shortage	Adjustment and securing of asset factors due to the change of production volume, personnel
9	Others (second/third business closing etc.)	Response to legal procedures, production adjustment/securing

2.10 Quality Management Procedure

2.10.1

Supplier must codify the procedure necessary to implement the items specified in the Quality Management Common Specifications, review it once a year, and keep it up to date.

2.10.2

Supplier shall prepare a list of quality management procedures and submit a copy to TE upon request.

2.10.3

TE shall request corrections if any problems with the content of this procedure or its management are found.

2.11 Continuous improvement (IATF 10f)

In order to improve the quality of products, the Supplier shall continuously improve the quality and delivery by making and implementing continuous quality and delivery improvement plans.

2.12 Confidentiality (IATF 8.1.2)

Supplier is required to sign a nondisclosure agreement (NDA) as supplier understands and agrees to strictly maintain the confidentiality of all confidential information provided by TE.

Upon request from TE, supplier shall return all documents provided by TE.

2.13 Environment-related standards

Supplier shall agree to receive ISO 14001 certification or those for ISO 14001-compliant environment-related standards or comply with them, and maintain them. It is recommended to receive third-party certifications.

2.14 Environment-related substances management

Supplier manages all materials, parts, products, and packing materials delivered to TE in accordance with TEC-138-702 of the TE-Global regulations. In addition, stationery (including oil-based markers, ballpoint pens, clips, and files) used in products, packing, and attached documents that are delivered to TE at the TE's request shall be managed in the same manner. Upon request from TE, supplier shall promptly submit the hazardous substances analysis data without delay.

3. Requirements at product design, process design, and development stages

3.1 Feasibility Commitment/Supplier Component Review (SCR) (IATF 8.2.3f)

Supplier must analyze whether it has the capability to achieve the requirements given by TE. The result is submitted as a Feasibility Commitment with a quotation at the request of TE. The analysis includes requirements, such as suitability for the project plan, production volume, quality goal, technical views, safety/environmental requirements, and legal regulations. The analysis includes potential risks, how to eliminate risks, and past problems learned from past projects/products. The content of the Feasibility Commitment is to be described in the Supplier Feasibility Study Form (TE J-1014) and mutually agreed with TE on request. If necessary, use a method such as DFM (Design for Manufacturability).

3.2 APQP support (IATF 8.3.2.1 / 8.3.4.1 / 8.3.5f)

Supplier conducts this following the latest APQP manual issued by AIAG regarding project management methods. The plan is to include the project planning schedule of TE and the schedule of the sub-suppliers. In addition, the Supplier's project plan must be submitted on the request of TE.

3.3 Supply chain analysis (IATF 8.4.1.2 / 8.4.1.3)

Supplier analyzes and determines risks within the supply chain and implements actions against the risks in advance. The risk analysis includes the QMS certification level (such as ISO 9001 and IATF 16949), supplier novelty, process novelty, site novelty, effects on special characteristics, and the presence or absence of special processes. The scope of the supply chain covers not only sub-suppliers but also tertiary and subsequent suppliers, going back to raw material suppliers. Upon TE's request, fill out the Component Supply Chain Chart (CSCC: TE J-1010) and submit it to the Procurement Department of TE.

3.4 Prototype support (IATF 8.3.4.3)

At the request of TE, supplier must submit prototypes to TE with the results of verification of the requirements. All samples are submitted with the dimensional verification results, material test results, and performance verification results attached in accordance with the requirements of the *AIAG PPAP Manual*.

3.5 Special characteristics (IATF 4.4.1.2 / 8.3.3.3)

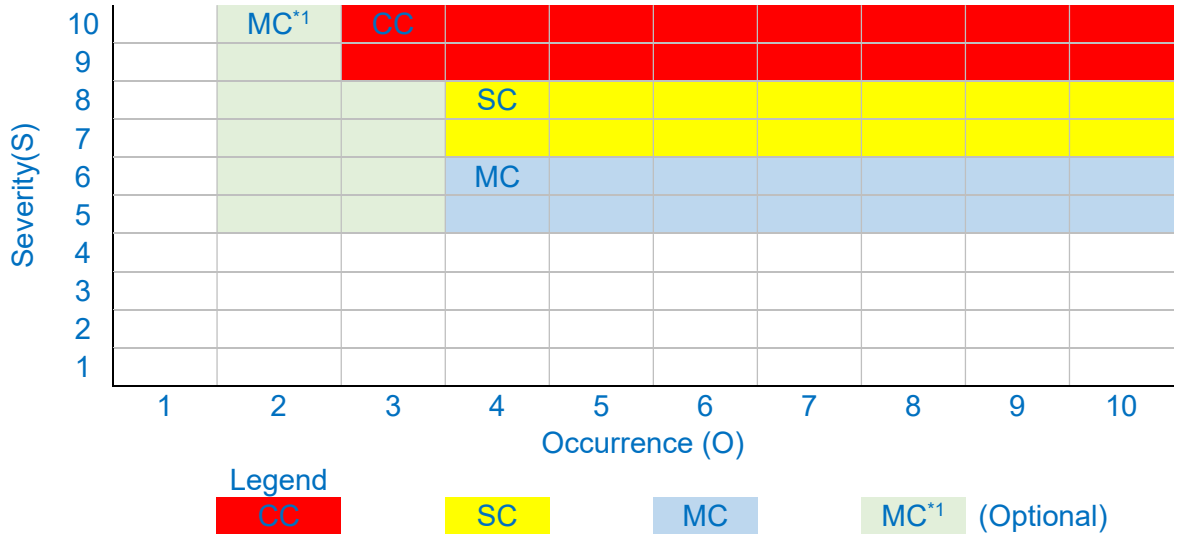
Special characteristics are those that are high risk and require special considerations by supplier. Special characteristics are to be considered in all steps from the initial stage of development to the design with consideration, examination of error proofing, special management method, verification method, and expression in documents. What is to be documented shall be drawings, process flows, FMEA, control plans, work procedures, inspection standards, and related documents. If special characteristics affect a sub-supplier, supplier is responsible for ensuring accountability, understanding, and implementation of the process management. TE deploys special characteristics to supplier using a SC/CTP list or drawings for distribution. In addition, special characteristics are classified below. additionally, relationship between special characteristics severity/occurrence of PFMEA is shown as below.

In case customer of TE requires special identification, below classification is out of scope. TE requires special control method to supplier separately.

For the fifth edition of the *AIAG FMEA Manual*, contact the Quality Assurance Department of TE for the implementation level.

	Symbol	Reference for actions on D/P-FMEA	Process management method (at least one)
Critical characteristics (CC)		Implement actions (required) so that O (degree of occurrence) is 2 or less using S (severity) = 9, 10.	・Elimination by error proofing ・100% inspection ・Management diagram ・Process capability
Significant characteristics (SC)	■	Implement actions (required) so that O is 3 or less using S = 7, 8.	
Major characteristics (MC)	☒	Implement actions (selective) so that O is 3 or less using S = 2 to 6.	・Sampling inspection ・Setup inspection, etc.
Customer Touch Point (CTP)	CTP	Set (selective) how much O (degree of occurrence) is lowered according to S (severity).	Follow CC/SC for S (severity) = 7 to 10 or MC for S (severity) = 2 to 6.
Pass-through characteristics (PTC)	PTC		

Figure. Relationship between special characteristics and severity/occurrence of PFMEA



3.6 FMEA (Failure Mode and Effect Analysis) (IATF 6.1.2.2 / 8.3.5.1 / 8.3.5.2)

Supplier must prepare and review FMEA at an appropriate stage in accordance with the FMEA manual issued by AIAG. Consequently, risks are determined in advance, and actions against the results are considered and reflected in design documents and process documents to reduce the risks before the start of mass production (e.g. process flows, control plans, standards, and work procedures). Supplier prepares an FMEA in consideration of all life cycle stages of a product (design, production, assembly, packing, transportation, customer use, etc.). In addition, recognize the FMEA as a tool for risk analysis, accumulation of past problems, and improvement, and review regularly based on new technologies/experiences. This includes events at sub-suppliers.

3.7 Consideration/Verification of introduction of error proofing (IATF 8.3.5.2)

Introduction of error proofing shall be considered for design guidelines, special characteristics of customers, FMEA items with high severity (S), and other items that may cause sudden abnormalities. At the time of introduction, appropriate judgments shall be made, and daily/periodic inspection methods and the setting of inspection samples shall be considered. Upon TE's request, the verification results must be reported. In addition, for an inspection sample, the inspection method, expiration date, and management method must be specified and implemented.

3.8 Preparation and approval of QC process chart (QC flowchart/Control plan) (IATF 8.3.5.2 / 8.5.1.1)

Supplier shall prepare a QC process chart for each product or obtain it from TE and manage manufacturing based on the QC process schedule. QC process charts prepared by supplier shall be approved by the Quality Assurance Department of TE. A QC process chart shall show all manufacturing sites (including those of sub-suppliers and work at home).

Note that an automotive industry control plan refers to a comprehensive document that organizes the management procedure for product characteristics and process characteristics over the entire process. It includes acceptance, in-process, shipping, and periodic requirements to ensure that all process outputs are in control. In regular mass production, a control plan specifies the monitoring and control methods of processes used for control of characteristics. The same control plan can be used for product groups or product families produced through the same process in the same factory. In that case, clarify the correspondence between the PFMEA process numbers and the target product numbers.

For preparation, consistency is to be ensured with PFMEA, process flows, and special characteristics as important inputs. In addition, each stage is to be agreed through consultation between TE and supplier as necessary. For the Automotive Department, the following three types are defined as a control plan.

Control Plan Name	Description	Remarks
Prototype	Describes the dimensional measurement, and material and development tests at the prototype stage.	Upon request
Production Prototype (Prelaunch)	Describes the dimensional measurement and material and functional tests after trial production and before mass production. Management of additional products/processes that are to be implemented until the mass production process is valid is to be included.	Required
Mass Production	Describes the system that manages parts and processes for mass production. Mass production control plans are live documents. Update them by adding or deleting management methods depending on changes.	Required

A control plan form is specified to be TE J-247-2 but, if similar content is included, it can be prepared using a different form. In addition, the timing of preparation shall be not only when a new product is launched but also during change management (such as design change and process change) or in the event of a customer complaint.

3.9 Verification of floor plan layout

Verify the layout, including the inspection site, control chart indication site, inspection samples storage, nonconforming products storage, workflow circulation, and product transportation method. From the perspective of ergonomics, consider and verify the ease of work and safety.

3.10 Work instructions (IATF 8.5.1.2)

(1) It is important to maintain work instructions for each process as the basis for providing quality in the processes. Supplier is responsible for preparing work instructions for each process and providing guidance and education to related departments so that work standards/inspections can be thoroughly conducted when

workers or inspectors are changed.

(2) For work instructions, clearly state the form of the recording and data checklist in order to keep a record of work/inspection/check items.

(3) Work instructions are the most important tool for process management and the points are as follows:

(a) Work instructions clarify the main points as it is intended to fulfill the purpose of work.

(b) Work instructions are easy to understand and use photographs, figures, or other means effectively.

(c)The content is to fulfill the purpose of work and to contrive error proofing. In particular, the processes/work handled by humans always incorporate error proofing, for example, manual work, 100% inspection, packing, labeling, and shipping.

(4) Higher-level documents are always control plans, and it is necessary to ensure the consistency with the control plans prepared.

3.11 Preparation and approval of inspection criteria (IATF 8.5.1.2)

Supplier is required to prepare inspection criteria as part of the inspection plan in consultation with TE. In consideration of special characteristics, reflect the inspection frequency, count, management with management diagrams, and management based on process capability. Inspection criteria prepared by supplier must be approved by the Quality Assurance Department of TE.

3.12 Packaging condition verification (IATF 8.5.5.1)

Supplier must specify packaging style instructions for not only final products but also work-in-process and semi-finished products to minimize the risk of damage, impact and contamination of foreign matter during normal transportation, and to judge the protection from harmful environmental factors. Draft packing styles, formulate verification plans, and make judgments in advance to ensure the packing style at the mass production stage. Generally, drop test and transportation should be conducted. The packing style instructions for final products must be approved by the responsible department of TE. In addition, the verification plan and results must be submitted upon TE's request.

3.13 MSA (Measurement System Analysis) (IATF 7.1.5.1.1)

The Supplier must conduct measurement system analyses in accordance with the *MSA Manual* issued by AIAG. For all measurement systems, ensure bias, stability, linearity, and gauge R&R measurement systems. The implementation level and submission level are to be decided in consideration of special characteristics and the novelty of the measurement system to be introduced. Gauge R&R is basically subjected to submission but, if necessary, it is required to analyze bias and linearity.

3.14 Run@Rate/Advanced production/Long-running production (IATF 8.3.4.3)

Supplier must provide advanced production before mass production using mass production jigs, mass

production equipment, mass production environment (including manufacturing workers), mass production sites, and mass production inspection equipment. TE calls this Run@Rate or long-running production. Make sure of the following:

(1) Advanced production is to be provided under the same conditions and with the same production efficiency as mass production.
(2) Process documents, such as work procedures and work instructions, must be available.
(3) The total production volume specified in the operating hours of one to eight hours shall be continued for pieces of 300 or more. This does not apply if instructions are separately given from the responsible department of TE.

3.15 Process verification (IATF 8.3.4.2 / 8.3.4.4)

Supplier must conduct process verification during or based on the results of Run@Rate. For the check items for process verification, examples are shown below, but they are not limited to this.

(1) Quality objective (percent defective) achievement
(2) Achievement of production efficiency targets (availability, cycle time, production volume per hour, etc.)
(3) Process audit (if necessary)

・Standard compliance status confirmation results and workability verification results (the presence/absence of any points that are difficult to do or should be improved?)

3.16 Validation of mass production (IATF 8.3.4.4)

The validation test for mass production is a technical test for checking the validity of satisfying drawings and normative references, including requirements for appearance, for products produced in Run@Rate. The Supplier is required to verify the validity of mass production. Consider the following items during verification. These also apply to the initial process capability investigation.

① When the production process is wide-ranging as in multiple assembly lines, sample parts from each production line
② For multi-cavity molds, casting molds, jigs and tools, and patterns, sample parts from each point

3.17 Initial process capability investigation/verification (IATF 9.1.1.3)

For special characteristics specified in a control plan, make a plan for initial process capability investigation to verify the stability of the mass production process and verify it at the advanced production stage. Use Ppk (short-term process capability) as the criteria and satisfy the condition of Ppk ≥ 1.67 or more. Sampling is based on at least 25 subgroups, including the values measured during Run@Rate for at least 100 continued parts. When TE requests criteria separately for a project, the criteria prevails. In some cases, use Cpk (long-term process capability). If Ppk ≥ 1.67 cannot be satisfied, report it promptly and improve the quality after prior consultation. For details on process capability, refer to the *SPC Manual* issued by AIAG.

3.18 Inspection of initial product (PPAP: Production Process and Approval Process) (IATF 8.3.4.4)

3.18.1 Items subject to inspection of initial product (PPAP items)

Item	Requested to:	Approved by:
a. Production with new equipment (new product)	Procurement or manufacturing technology	QA of Industry Headquarters
b. Modification of equipment or molds due to EC	Ditto	Ditto
c. Additional installation of equipment, molds	Ditto	Ditto
d. Material change	Ditto	Ditto
e. Relocation of equipment and molds between factories	Ditto	Ditto
f. Modification for improvement in productivity	Ditto	Ditto

3.18.2 Method

For new products or installation of new manufacturing equipment, supplier inspects all dimensions on drawings and product characteristics based on the applicable product drawings. In addition, if existing equipment is modified/relocated or raw materials are changed, inspect the applicable inspection criteria and related inspection items. The procedures for inspection of the initial product are promoted through consultation between TE and supplier. Supplier must report the inspection data for the initial product to TE and it must be approved by the Quality Assurance Department of TE. After that, when it is determined that the product can be mass-produced as a result of process verification, process validity verification, and initial process capability verification, make an application to TE for PPAP. The application level shall be Level 3 based on the *PPAP Manual* issued by AIAG. However, at the time of design change and process change, the level can be set through consultation between TE and supplier according to the extent of the effect due to the change. For details on submission documents, refer to the *PPAP Manual* issued by AIAG.

3.18.3 Supplier ePPAP

In order to prove to TE that products and processes conform to the requirements, supplier must submit the products and related documents to TE before starting mass production and must start production after receiving approval from TE. All relevant documents for approval are to be submitted via supplier ePPAP on Supplier Portal.

3.18.3.1 PPAP submission documents

TE has the authority to use the PPAP-related documents submitted by supplier when it is necessary to submit them to a customer of TE. The only exclusion is process FMEA. When it is confidential and cannot be submitted to customers of TE, supplier shall clearly indicate "Confidential."

3.18.3.2 Parts submission warranty (PSW)

Supplier submits PSW as one of the PPAP related documents. PSW is to be submitted with a signature of the Quality Assurance Manager. TE verifies the validity of the PPAP-related documents and, when there is no

problem with the judgment results of the submitted samples, the manager of the Quality Department signs the PSW and sends it to supplier.

4. Initial Stage of Mass Production

4.1 Start conditions of mass production

Supplier starts production after receiving approval for mass production from TE. The approval for mass production is given to supplier using PSW. In addition, the initial product of mass production must be clearly identified. The identification method is decided in consultation with the responsible department of supplier.

4.2 Initial Production Control plan (Safe Launch Plan)

Supplier prepares and implements the Safe Launch Plan for new products and products under change control (design changes, process changes). Clearly define the period, management items, and removal criteria in the Safe Launch Plan. During the initial flow period, the following conditions are to be observed at a minimum.

a) At the request of TE, follow the period requested by the customer.
b) If not requested, set for a period that includes at least three setups with production of 40 hours or more.
c) The same applies to the child parts. Set the production period with three setups or more according to the plan of basic final products.
d) Exit criteria should include defectiveness ratio, Overall Equipment Effectiveness, process capability cycle time at least. Exit criteria should be agreed with TE in advance.
(in case material is provided from TE, material utilization during set up should be considered)

For the management plan, it is necessary to fill out the Safe Launch Plan and the Initial Production Control Plan (TE J-1023) or equivalent forms and receive approval from the responsible quality assurance department of TE. In case TE requires special Safe Launch format (Safe Launch Control Sheet(TEAP_FOR_PR2.3_01_01), supplier needs to follow TE's instruction. Implementation of design changes and process changes must be decided in consultation with the quality department of the Supplier. The target of the Safe Launch includes all supply chains. Supplier must report monthly on the progress with respect to the Safe Launch Plan and removal criteria. At that time, if any of the targets are not achieved, a report must be made that includes the improvement plans. In addition, in the event of a fatal defect or an event that requires immediate actions, it is necessary to immediately report it to the responsible department of TE. For removal, it is necessary to receive approval from the responsible Quality Assurance Department of TE.

4.3 Feedback Lesson Learnt/Best Practices to the origin

Supplier is required to feed back the lessons learnt and best practices obtained before the start of mass production to the origin in order to use them for future product launch activities. Review the feedback content using the following as an example.

(1) Review of success/failure case
(2) Results of implementation of corrective action plan

(3) DFMEA and PFMEA

5. Mass production stage

5.1 Special Concession (Request for deviation) (IATF 8.7.1f)

Supplier is responsible for meeting all requirements of the purchase order, drawings, and TE specifications or, if specified or applied, industry standards and industry specifications (e.g. EIA, ASTM). Products that do not meet these requirements must not be shipped to TE, its customers, or other suppliers without prior written approval given in the form of a request for deviation of approved known nonconformity.

5.1.1 Application

A request for deviation shall be sent to the Procurement Department of TE. Approval or disapproval of supplier's request for deviation are documented and communicated to supplier.

5.1.2 Corrective Action

Each request for deviation shall include a statement of corrective action, a responsible person for corrective action, and a scheduled date for corrective action to prevent recurrence of nonconformity.

5.1.3 Shipment Management

Supplier shall identify, store, and ship nonconforming products approved for deviation in a manner that they are isolated from conforming products. If it is applied, the deviation number is indicated on the packing slip and, if necessary, on all shipping packages.

5.2 Statistical process control / process capability (SPC) (IATF 9.1.1.3)

Supplier uses a trend management diagram that allows you to manage the stability or change points of the special characteristics described in the control plan in the mass production process. In addition, make judgments using Cpk to manage the process capability. In mass production management, satisfy the special characteristic item of Cpk ≥ 1.33. Although judgments with Ppk are allowed, however, the judgment criteria are Ppk ≥ 1.67. In addition, if Cpk ≥ 1.33 cannot be satisfied, report it promptly and continuously improve the quality after prior consultation. Until the product quality improves, 100% inspection shall be made under the responsibility of supplier. For trend management, the basic Xbar-R management diagram shall be used. Refer to the *SPC Manual* issued by AIAG. Upon request, the management diagram must be submitted to TE.

5.3 Layout inspection (Re-qualification) and Functional testing (IATF 8.6.2)

Layout inspection (also called re-qualification) is a method of judging drawings and related specifications and standards at fixed intervals (usually once a year) according to control plan while verifying the wear condition of equipment and molds and verifying conformity to the requirements. In order to meet IATF 16949, VDA 6.3, and TE's customer specific requirements, supplier makes rules for layout inspections of products on a regular basis. In addition, it is also possible to agree on the details of the implementation of individual parts in consultation with TE.

(1) Layout inspection is the complete measurement of all product dimensions and other product characteristics shown in the product drawings.
* For raw materials, the material properties described in the delivery specifications are subject to layout inspection.
* In the case of consignment production, QIP items may be subject to layout inspection.

(2) Upon request from TE for the layout inspection, promptly submit the record of layout inspection.

(3) If the result of layout inspection showed problems, promptly report it to TE.

5.5 Problem solution (IATF 10.2.3)

Use the 8D method as a problem solution. The abbreviation 8D stands for Eight Discipline, which is a form of procedure divided into problem solution steps. To help with that, seven QC tools (such as a Pareto chart, cause and effect diagram, and scatter chart), FTA (Fault Tree Analysis), or other means shall be used for implementation.

5.6 Nonconforming products management (IATF 8.7.1.2 / 8.7.1.3)

5.6.1 How to identify nonconforming products

Supplier shall identify nonconforming products, separate and isolate them from mass-produced products into a red box, and manage to prevent them from scattering so that they are not used or handed over by mistake.

5.6.2 Rework, repair, sorting (IATF 8.7.1.4 / 8.7.1.5)

Supplier must receive the approval of TE before rework, repair, and sorting of products.

In addition, if there may be an immediate effect on the production of TE or TE's customers, TE reserves the right to urgently use outside contractors for reworking and repairs. The cost is charged to supplier through consultation.

5.6.3 Notification of poor quality and outflow of defective products (IATF 8.7.1.6 /8.7.1.7)

If a defective product is found through the detection of production lots and it is difficult to judge whether it is good or bad or if an unusual abnormality is found, supplier promptly contacts the Quality Assurance Department of TE. In addition, if the relevant lots have already been delivered to TE, immediately issue the Quality News (for Partner Factories) (TE-J 192-1), contact the Quality Assurance Department of TE, and receive instructions and a response. If damage occurs from an outflow of defective products, a compensation claim may be made in consultation with the Procurement Department.

5.7 Corrective action (IATF 5.7.2)

Supplier must specify and manage the procedures for handling abnormalities and abnormal products. For reference, the procedures and the abnormality report of TE are attached. (Appendix (1))

5.7.1 Responsibility

If a nonconformity or nonconforming products occur or are likely to occur, supplier must implement immediate

actions to correct the condition and confirm its effectiveness.

5.7.2 Corrective actions

If a defect is found in a contract product after it is delivered to TE and corrective action is required to prevent a recurrence, supplier must make information from TE known to the relevant departments, immediately implement the appropriate actions to eliminate the causes, and report the progress and results to TE. What require corrective actions are complaints, receipt of defective products, abnormal supply parts, and defective processes. For actions against defectives (details on corrective action), use the Supplied Parts Abnormality Report/Actions against Defects (TE-J 534), Actions against Defects (TE-J 183), and Report on Prevention Actions (TE-J 234).

5.7.3 Timing line of corrective action

If supplier receives a report on a customer complaint, receipt of defective products, abnormal supply parts, and defective processes, supplier must report the details of the outflow prevention actions (narrowed-down information on target lot and securing of non-defective products) to TE within 24 hours. Furthermore, supplier must strictly adhere to the reply deadline (within 10 business days in principle), investigate the cause, implement corrective actions to prevent a recurrence, and confirm the effectiveness. If the reply deadline will be passed, inform the person in charge about the circumstances and the possible date of reply.

5.8 Response to recurrence of defects (IATF 10.2f)

TE reserves the right to conduct additional inspections (CSL1, CSL2) in the event of a recurrence of a defect in a contracted product.

CSL1 (Control Shipment Level 1): At the direction of TE, supplier must conduct 100% inspections of products before shipping.
Mark all packing materials as inspected.

CSL2 (Control Shipment Level 2): Supplier must receive the second 100% inspection by a third party approved by TE. CSL2 is implemented when a defect recurs during implementation of CSL1. TE reserves the right to choose where to implement CSL2.

TE determines the cost of additional inspections in consultation with the Supplier. For both CSL1/2, TE declares the end after the written corrective action is accepted, and the effect is confirmed.

5.9 Charge back

If supplier's contracted products do not satisfy the specifications and drawings, TE charges supplier for the additional costs incurred by TE in accordance with the Basic Purchasing Contract.

5.10 Suspension of new business opportunities

In the event of a quality problem with supplier, TE has the authority to suspend supplier from new business opportunities after consultation with supplier. The following are examples that lead to the exclusion of new business opportunities, but not limited to the list shown below:

(1) If supplier fails the audit of TE
(2) If a contracted product does not meet the requirements of TE
(3) If a contracted product cannot comply with the agreement with TE
(4) If a defect occurs in a contracted product without effective containment actions

5.11 Change management (Design change/Process change) (IATF 8.5.6)

5.11.1 Changes and changing points

"Changes (change of plan)" in the change management means that 4M (Man, Material, Machine, Method) is intentionally changed. "Changing point (unplanned change/sudden change)" means that 4M (Man, Material, Machine, Method), product quality, and workmanship change unintentionally. As for "changing points," it is often difficult to notice them. Therefore, set the control values, and establish and manage a system that can verify the changing points. Even for intentional changing points, unintentional changing points may occur from variations or harmful effects with changes. Changes and changing points shall be defined in advance, including planned and sudden ones.

5.11.2 Application for Process Change

When changing the factors (4M) that have an effect on the quality of delivered products, including specifications and the processing methods of raw materials and auxiliary materials of delivered products approved by TE in advance, the Supplier fully follows the management, notifies the Procurement of TE in advance (six months ahead for automotive suppliers) using the Process Change Notification, and presents the product verification/results before and after the changes. In addition, through prior consultation with the Engineering Department, Manufacturing Department, and Quality Department of TE, an agreement needs to be obtained from them. Automotive suppliers submit an advanced application and, after receiving the notification of decision of approval/disapproval about changes, verify the changes. After that, samples that have been verified against the changes and the verification results are submitted for approval. For details, follow Section 3.18 of this document. In addition, process changes within 12 months after the start of mass production are not permitted.

(1) When changing process conditions, equipment, or molds, be sure to report it to the relevant manager and obtain its consent.
(2) Clarify the purpose and reasons for the change.
(3) With reference to the definition of process change (Appendix B), consider submitting the process change notification to TE.
(4) Submit the process change notification list to Procurement, Manufacturing Engineering, and Quality

Assurance Departments of TE and obtain their consent.

(5) Evaluate the quality verification after the change in continuous lots.

(6) When the content of the QC flowchart is revised because of process changes, submit the manufacturing process, QC flowchart application, and approval form.

(7) If it is unavoidable to produce at a sub- supplier, examine the quality control capability of the sub-supplier and report it with the results. Supplier is fully responsible for operating the quality management process of the sub-supplier. For the supply chain analysis, follow Section 3.3 of this document.

(8) Supplier extracts the changing points before and after the change using the 5M1E changing point check sheet (TE J-440) and presents the verification results.

(9) At TE's request, supplier uses the Changing Point Review Sheet (TE J-1020) to verify the conflict due to the changing point, its containment method, evaluation method, mass production management method, and submits the results to TE.

(10) The initial product approval procedure is conducted on Supplier ePPAP.

If there are any questions after confirming the definition of process change (Appendix B), it is necessary to contact the responsible Procurement and Quality Assurance departments.

4M Category	**4M Changes**
Person change (Man)	●Change of qualified persons, certified persons, and soldering workers ●Change of quality manager and contact person
Change of machines, and jigs and tools (Machine)	●Repair, expansion, update of molds ●Introduction of new machines, molds ●Change of processing conditions (related to quality) (Example) ・Plating process: Change of line speed and current value ・Molding process: temperature (cylinder, mold), injection pressure, cooling time ●Change of process and work environment (expansion, relocation, etc.)
Change of method (Method)	●Significant process additions, reductions, and change of procedure ●Change of management criteria (standards, number of inspections, judgment standards, etc.) ●Major change of work method (manual work -> introduction of automated machines, etc.)

Change of raw materials, parts, and products (Material)	●Design change related to specifications (drawings), including material manufacturers, parts shapes, dimensions, materials, etc. ●Change of ancillary materials attached to parts and products ●Change of packing specifications

5.11.3 Verification of change

Follow Section 3.14-17 of this document.

5.11.4 Approval procedure for changed products

Follow Section 3.18 of this document.

5.12 Changing point management (IATF 8.5.6.1.1)

5.12.1 Definition of changing points

What is a changing point: The conditions of 4M (Man, Material, Machine, Method) for making good products change. Even if a changing point occurs, implement the appropriate actions before and when the changing point occurs to prevent defectives in advance so that non-defective products can be manufactured stably. This activity is called changing point management. Changing points can be predictable or suddenly occur.

5.12.2 Development of rules for changing point management

In consideration of the following points, develop and implement the rules for changing point management.

(1) Decide the items for the changing points to manage.
(2) Decide what kind of form to use for management.
(3) Decide who implements management when and how. (Implementor/Time/Content)
(4) Decide who confirms that it has been done correctly. (Person in charge of confirmation)

Also consider the following steps.

(a) Decision to implement changing point management
- Notification of changing points: Clarify the contact route and the responsible person.
- Decision to implement changing point management

(b) Advanced preparation
- Checking whether changes do not disturb the conditions for making good products, checking of outflow prevention function, notification to downstream processes

(c) What to check in the event of a changing point
- Whether or not the conditions for making good products are satisfied
- Whether or not the quality is equal to or higher than before the changing point

(d) Storage of records
- Make it possible to check whether downstream defects attribute to the changing point.

An example of a changing point is shown below.

Predictable changes		Sudden changes	
Cause	Changing item	Cause	Changing item
Man	Takt change, process change, rotation, staff organization change, annual leave, temporary leave, temporary shift, out-of-line worker change, lunch break, at the end of work	Man	Temporary leave (toilet etc.), sudden annual leave, follow-up during work interruption, stop and restart of line
Machine	Modification work, repair work, modification of mold/repair work, installation of new mold/renewal work of mold, relocation of equipment, newly increased productivity, change of mold, renewal of mold, change/replacement of tools/jigs/cutting tools, inspection jig, new installation and renewal of gauge, changeover, periodic inspection, maintenance, cleaning, change and relocation of error proofing equipment	Machine	Equipment failure, equipment abnormality, mold abnormality, deterioration/damage of tools, jigs and cutting tools, mold failure (including damage), failure of 100% inspection jig and tester, damage, failure of sampling inspection jig and tester, production instruction down
Material	Design change, construction change, raw material change, material change, unprocessed material change, change of oil and fat, accuracy correction, tuning, ancillary material change, operation before and after long holidays, stockpile	Material	Troubleshooting, retroactive inspection, no choice but to flow due to defective products attributed to production or wrong/missing parts
Method	Process change, emergency process change, condition change, cycle time change, line construction work, line change (relocation), attempt, trial	Method	Follow-up during work interruption, follow-up of mistake in work, and resumption of production in emergency

5.13 Inspection and test procedure・Requirements (IATF 8.5.1.2 / 8.6.1f)

5.13.1 Inspection criteria

The Supplier shall specify and implement the inspection and test procedures necessary to check the quality characteristics of products manufactured based on the specifications presented by the TE. Note that this procedure is subject to the approval of the TE.

5.13.2 Requirements for sampling inspection

For sampling inspection, supplier consults with TE on the details of the implementation. In addition, when applied, the inspection criteria (QIP) of the TE for the functions based on the appearance, dimensions, and usage conditions shall be followed unless otherwise specified.

5.13.3 Incoming inspection (IATF 8.4.2f)

Supplier must conduct an acceptance inspection as necessary to check the quality of the contracted products manufactured by the sub- suppliers of supplier. As a result, if a defective product is found, corrective actions must be implemented according to the nature and frequency of the product to prevent recurrence. Supplier is

fully responsible for the quality assurance of its sub-suppliers. (For assembly, press, mold, and plating factories, quality audits shall be conducted and recorded.)

5.13.4 In-process inspection

In order to keep the quality of contracted products constant, supplier must make inspections at appropriate points during the manufacturing process as necessary. However, although this inspection is proof of quality, it does not exempt the inspection of finished products. In addition, for inspection of special characteristics, the processes must be statistically managed using management diagrams. In-process inspections are the setup inspection, intermediate inspection, and lot inspection, which are recorded in the inspection criteria and stored.

5.13.5 Setup inspection (verification of setup)

For mass production, the quality manager must set up dies, molds, machines, or other means and inspect the equipment and products produced for the first time after adjustment, and determine whether or not to start production by conducting inspections of all items based on the relevant drawings and inspection criteria.

5.13.6 Intermediate inspection (In-process inspection)

For products that are put into production after passing the setup inspection and are in production, the quality condition (good or bad) during production must be inspected at regular intervals to determine whether or not to continue work.

5.13.7 Lot inspection

Whether or not production lots can be received (including transfer to the next process) must be judged by a third party (other than the manufacturer).

5.13.8 Final inspection

Specimens must be randomly sampled from the specified quantity of lots, the characteristics of the products must be inspected, and a pass/fail judgment of lots must be made from the results.

5.13.9 100% inspection

A 100% inspection may be conducted to prevent outflow to products or customers with unstable process capability.

5.13.10 Inspection of finished products (Outgoing inspection)

Supplier must inspect finished products to ensure the contracted products. The inspection data (performance report) of finished products are to be submitted to TE for each delivery lot.

5.13.11 Indication of products that have passed the inspection

Supplier must indicate the inspection mark showing that the contracted products have passed the inspection on the reel tag, the box label.

5.14 Identification and Traceability (IATF 8.5.2)

5.14.1 Lot management

Supplier must clarify the production history during the manufacturing process or of the available products. In the event of an abnormality, non-defective product lots must be easily distinguished, whereas prompt and appropriate actions must be implemented against defective product lots for effective quality assurance.

5.14.1.1 Method

Lot management shall be conducted for each process from acceptance of materials to shipment of finished products, and traceability for the entire process shall be established using forms and records. In addition, upon request, it must be promptly presented.

5.14.1.2 Lot No., Date code

The dates that make up the date code are as follows for each item.

(1) Terminal: Date of Press Manufacturing (including surface treatment)

(2) Mold: Date of Molding

(3) Connector: Date of Assembly

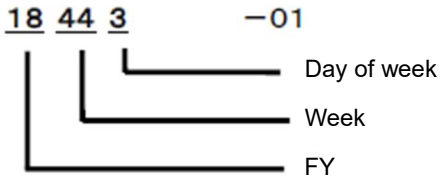
(4) Cutting in general: Date of Cut

(5) For those other than the above four items, the lot numbers and date code are defined separately through consultation between the TE and Supplier.

5.14.1.3 Lot indication

For the production lot of each product, stamp (indicate) a date code at the specified position according to the applicable packing/packaging standards. In special cases, if the lot indication needs to be further subdivided, add "-" after the date code (or lot number) and indicate its reference number.

Exam Date code Ref. No. 2018



3rd day in 44 weeks
(October 30, Tuesday)

Note that "Manufacturing Calendar" shall be used for the weekly code.

5.14.2 Inventory management (IATF 8.5.4)

Supplier must specify storage environment conditions, including temperature and humidity, to prevent

deterioration in quality during storage of materials, parts, semi-finished products, and products that are related to contracted products, regardless of whether they are purchased or manufactured in-house, and implement appropriate inventory management through strict enforcement of first-in, first-out.

5.14.3 Packing labeling

Packing shall meet all consent items and labeling requirements as stated on the purchase order, product drawings, or material specifications. Unless otherwise stated, supplier shall be responsible for packing and labeling, and such packing and labeling shall be appropriate to prevent damage or degradation in quality during shipping.

At a minimum, the following items shall be indicated on the label for all shipments.

A. Purchase Order No.
B. Part No. of Tyco Electronics
C. Product/Material correspondence label
D. Quantity
E. Country of origin
F. D/C

5.14.4 Quality Management Record

Supplier shall maintain and store the records of inspections, tests, and other quality-related matters of contracted products. These records shall be available to censor at any time at the request of TE.

Unless otherwise specified by the customer, the record retention period shall be the period of the attached record list.

5.14.5 Items to be stated in inspection reports of delivered products

Supplier must attach the items specified by TE for the contracted products for each delivery lot. If no relevant report is attached, TE suspends the inspection or rejects the lot as nonconforming products.

Note that the report shall include at least the following items.

(1) Supplier Name
(2) Part No., Drawing REV., and Product Name
(3) Order No. and Quantity (or Weight)
(4) Lot No.
(5) Inspection date and inspector's name
(6) Judgment records of inspections and tests required for the applicable drawings and standards (Entering measured values as much as possible)
(7) Material Lot No.

5.15 Management of standard process conditions for manufacturing (IATF 8.5.1.2)

(1) Set standard process conditions.

a. Set standard process conditions for each equipment, mold, and line.

b. Standard process conditions shall be specified as the "Reference Value ± Tolerance."

c. For standard process conditions, set the optimum conditions based on the relationship between process parameters and quality performance.
(Design of experiments, short shot method, past conditions/results, etc.)

d. Subject to standard process conditions

・Standard molding conditions

・Plating line conditions

・Painting line conditions

・Press conditions

・Assembly machines

(2) Maintain the standard process conditions.

a. Standard process conditions shall be continuously (daily) monitored, and their stability and fluctuation status shall be checked and recorded (trend management).

b. Standard process conditions shall not be changed by the operator without permission.

5.16 Maintenance management of equipment/mold (preventive maintenance) (IATF 8.5.1.5 / 8.5.1.6)

(1) Specify maintenance and inspection items and management methods.

a. Set management items and methods for each equipment and mold.

b. Specify management items for periodic maintenance management (weekly, monthly, every three months, every six months, every year, etc.) and daily maintenance management (at every shift, daily). In addition, keep records using a record book or forms as a management means to ensure a system for managing history and confirmation.

c. Equipment subject to maintenance management

・Press and ancillary equipment

・Molding and ancillary equipment

・Plating device

・Mold (die, ,mold)

・Assembly devices

・Inspection device (checker) or inspection jig

(2) Set the life cycle (lifetime) of the parts.

a. Specify the life cycle for important parts that are repeatedly operated and used for cutting.

b. The life cycle is to be specified based on the production volume and uptime.

c. Life cycle parts

・Cutting blades of a press and bending parts

・Cutting blades and bending parts of the assembly machine

・Contact parts (contacts), such as inspection (checker) and continuity probe pin

5.17 Inspection and measurement tools and test equipment (IATF 8.5.1.6)

Supplier shall prepare measuring tools and gauges for the inspection of contracted products; set appropriate usable periods and procedures according to their type, purpose of use, and frequency of use; and maintain the accuracy of the inspection equipment at all times. In principle, the accuracy of these calibrations must comply with national or international standards. As a general rule, measuring instruments, test equipment, and gauges must be calibrated every year and records of the results must be clearly maintained.

5.18 Shelf life (IATF 8.5.1.7/8.6.2)

Supplier must store all products to be delivered to TE so that they meet the standards and requirements. Supplier must determine and implement the rules for managing shelf life even if there is no request from TE. If necessary, TE may require that supplier inspect the layout of products that have been stored for more than one year. In that case, supplier must respond according to the request.

5.19 Management of drawings and technical data (IATF 7.5.3)

5.19.1

Supplier must prepare the latest applicable drawings, standards, and technical requirements so that they can be used at any time for joint inspections held by TE.

5.19.2

Supplier is responsible for ensuring that all documents referenced in the technical drawings and specifications described in the purchase order use the latest revision level.

5.19.3

Supplier manages the drawings and technical materials borrowed from TE so that they are not used by third parties and promptly returns them to TE after use.

5.19.4

Supplier shall collect the changed or abolished drawings and standards from where they are used every time they are changed or abolished to prevent them from being misused.

5.19.5

Changed/Abolished drawings and standards are to be returned to TE immediately or discarded at supplier's own risk.

5.19.6 Web Site with drawings available

Supplier can obtain TE's drawings and standards at the following address.

https://supplierportal.tycoelectronics.com/portal/server.pt?sLocale=ja-jp

5.20 Management of rental tools (IATF 8.5.3)

5.20.1

When renting or returning the jigs and tools of TE, supplier shall confirm that there are no problems, such as rust, missing parts, or damage, or, if there are any problems, notify TE for instructions.

5.20.2

Supplier shall not repair the rental tools without permission. If repairs are required, notify TE about it with documents and follow its instructions. In addition, when it is repaired according to the instructions, it shall be recorded.

5.20.3

For the rental procedure, repair, and management of dies and molds, follow the guidance of TE based on the rental contract.

5.21 Management of supplies (IATF 8.4.1.3/8.5.3)

Supplier conducts acceptance inspections for products supplied from TE and, if any defects are found in inspections of processes or finished products, supplier immediately notifies TE by means of Supplied Parts Abnormality Report/Actions against Defects for actions to be implemented. Supplier must also monitor the supplies with the care of a good manager.

6. Incoming inspection by the TE

6.1 Type of incoming inspection

Contracted products must pass the incoming inspection by TE. The incoming inspection by TE consists of a normal inspection and a skip inspection as follows:

6.2 Normal inspection

This inspection is conducted for each delivery lot after passing the initial inspection. As a general rule, a sampling inspection is conducted according to the inspection and test procedures in Section 2.16.

6.3 Skip inspection

When the TE finds that the quality is stable based on the quality conditions of normal products, the inspection or test reports submitted by supplier shall be enough, and the normal inspection by TE may be skipped.

7. Exception

TE and supplier have a relationship as a party. Therefore, for the requirements in this document that are deemed inappropriate or need to be provided with separate provisions, it is allowed to raise them to the other party and define them as exceptions through mutual consultation.

8. Relevant materials

Explanatory versions of Quality Management Common Specifications

Make effective use of the explanatory versions of the Quality Management Common Specifications described below in order to advance the activities for quality management and quality improvement to obtain results.

(1) Quality Management Common Specifications for 100% Inspection: Manual version (102-5004-1)
(2) Quality Management Common Specifications: Explanatory Version for Workpieces (102-5004-2)
(3) Quality Management Common Specifications: Explanatory Version for nonferrous metals (102-5004-3)
(4) Guidelines for Labeling and Packing (102-5004-5)
(5) Quality Management Common Specifications: Explanatory Version for Ancillary Materials (102-5004-6)
(6) All Requirements of Quality Management for Suppliers (TEC-1005)
(7) IATF 16949 Quality System Requirements
(8) ISO 14001 Environmental Management Systems
(9) VDA – German Association of the Automotive Industry Standard and Rules: www.vda-qmc.de
(10) AIAG (Automotive Industry Action Group) Standards and Rules (Including CQI guidelines) https://www.aiag.org/

9. Appendix

(1) Defect handling procedure
(2) Codes for inspection equipment and gauges
(3) Quality record list

10. Related Forms

(1) Supplied Parts Abnormality Report/Actions against Defects (TE J-534)
(2) Actions against Defects (TE J-183)
(3) Report on Prevention Actions (TE J-234)
(4) Definition of Process Change (TE J-296)
(5) Process Change Notification (TE J-277)
(6) Manufacturing Process/QC Flowchart Application/Approval (TE J-278)
(7) Quality Management Capability Investigation Report (TE J-180-7)
(8) Quality News (for Partner Factories) (TE J-192-1)
(9) Quality Assurance Manager Notification (TE J-286)
(10) 5M1E Changing Point Check Sheet (TE J-440)
(11) Secondary Partner Factories Registration (TE J-1001)
(12) Supplier Audit Worksheet and Report (AUTGF 5176)
(13) Basic Purchasing Contract (TE J-901)
(14) Quality Assurance Agreement (TE J-446)
(15) Safe Launch Plan/Initial Flow Management Plan (TE J-1023)
(16) Supplier Feasibility Study Form (TE J-1014)
(17) Components Supply Chain Chart (CSCC: TE J-1010)
(18) Changing Points Review Sheet (TE J-1020)

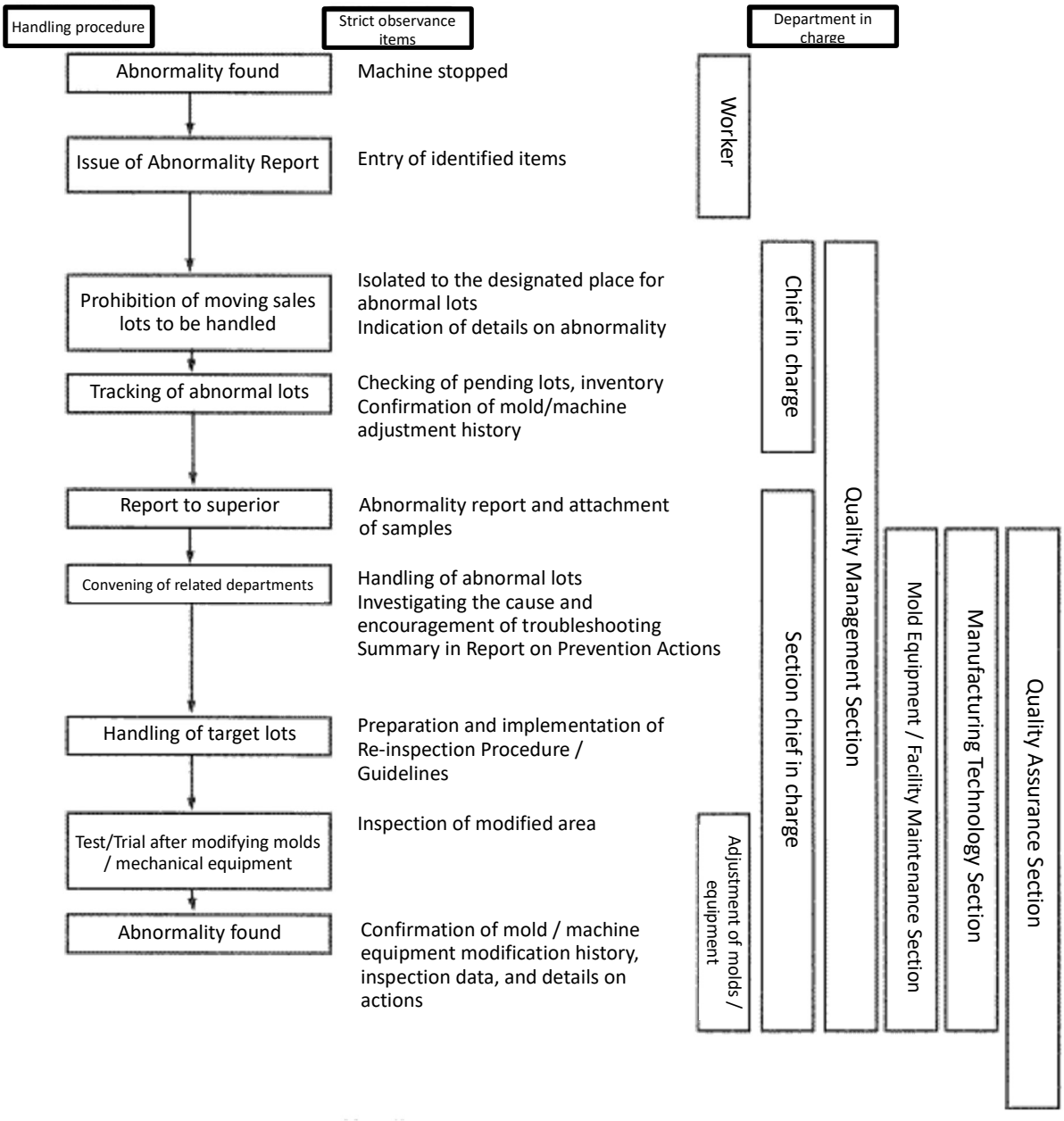
The above forms are subject to change without notice. For the latest version, please contact each business office.

Appendix (1)

(2) Defect handling procedure

1. What is a defect?
   (A) In the event of defective products (dimensions, appearance, characteristics, etc.)
   (B) If there is a risk of mixing of defective or different products in the checkout lot
   (C) If a failure is found in raw materials and semi-finished products
   (D) If a defect is found in metal and mechanical equipment
   (E) If a management diagram shows an abnormality

2. Handling method



3. Check items after repair
   (A) Management conditions of Abnormality Report
   (B) Management conditions of Mold/Mechanical Equipment Repair Records
   (C) Management condition of Implementation Details on Actions
   (D) Actual product processing condition

Appendix (2)

According to 102-5101 Specifications (Codes for Measuring Instruments and Gauges)

Codes for inspection equipment and gauges

1.1 Measuring instruments				1.2 Gauges	
Code:	Name	Code:	Name	Code:	Name
V:	Visually	TSQ:	Precision square ruler	SP:	Standard bin gauge
R:	Magnifying glass	SPL:	Surface plate	SG:	Special gauge
C:	Vernier calipers	MAG:	Magnetic crack detector	DL:	Drill rod
S:	Scale	DES:	Pressure tester	RG:	R gauge
P:	Protractor	CHT:	Chloroform tester	PG:	Plug gauge
VP:	Protractor with width scale	TMS:	Tool microscope	TG:	Tab gap gauge
RS:	Finish comparison piece	MSP:	Stereomicroscope	BG:	Barrel gauge
TR:	Torque wrench	RHT:	Rockwell hardness tester	EG:	Expansion gauge
FG:	Force gauge (spring type)	TSG:	Tension gauge	THG:	Thickness gauge
DI:	Dial gauge	TOM:	Digital tensile tester	TAG:	Taper gauge
HG:	Height gauge	15T:	15-kg tensile tester	THD:	Screw gauge
HM:	Height master	30T:	300-kg tensile tester	RIG:	Ring gauge
CO:	Projector	10tT:	10-tons tensile tester	BLG:	Block gauge
MS:	Microscope	DTM:	Digital tool microscope		
BS:	Beta scope	3DS:	3D coordinates measuring instrument		
MC:	Flat micrometer	MM:	Aquameter (Moisture mater)		
VMC:	Flat micrometer with vernier**	ST:	Small tester		
DMC:	Depth micrometer*	PST:	Pressure tester		
IMC:	Inside micrometer	SBT:	Soldering tester		
BMC:	Ball micrometer*	IRM:	Insulation-resistance meter		
CMC:	Cone micrometer*	mΩM:	Contact resistance meter		
CHM:	Crimp Height Micrometer**	DFG:	Digital force gauge		
SMC:	Spline micrometer*	UTS:	Transverse universal test stand		
MMC:	Multi anvil micrometer*	DHM:	Digital height meter		
CYG:	Cylinder gauge	HCC:	Harness checker		
LDI:	Lever-type dial test gauge				

Note: * General accuracy: 0.01 mm

** General accuracy: 0.001 mm

Appendix (3)

[Quality record list]

Record		Storage term	
① Product realization processes and, as a result, and resulting records necessary to prove that the product meets the requirements (including product inspection/test results)		Other than AUT	AUT BU
Press products	Setup Preparation Check/Work Completion Check Sheet	3 years	25 years
	Intermediate Inspection Check Sheet	10 years	25 years
	Daily Checklist for Machine	3 years	25 years
	Die repair record	*	25 years
Plated product	Setup check sheet	3 years	25 years
	Intermediate Inspection Check Sheet	10 years	25 years
	X chart of plating liquid	3 years	25 years
	Liquid Control Check Sheet		25 years
	Line Control Check Sheet		25 years
Molded product	Setup Check Sheet	3 years	25 years
	Intermediate Inspection Check Sheet	10 years	25 years
	Production Record	3 years	25 years
	Daily Control Sheet for Molding Conditions		25 years
	Daily Check Sheet for Equipment/Ancillary Equipment		25 years
	Mold Management Record	*	25 years
Assembly	Setup Check Sheet	3 years	25 years
	Intermediate Inspection Check Sheet	10 years	25 years
	Daily Checklist for Machine	3 years	25 years
	Assy Machine Adjustment/Repair Record	*	25 years
	Management Diagram		25 years
QC	Setup Inspection Record	10 years	25 years
	Warehousing Inspection Check Sheet		25 years
	Inspection Result of Initial Product		25 years
	SPC Data (if applicable)		25 years
	PPAP (if applicable)		25 years*
General	Work Procedure, Work Instructions		25 years*
② Unique identification records for products if traceability is included in the requirements			
	Acceptance Inspection Report	10 years	25 years
	Raw Material Report of Each Manufacturer	3 years	25 years
	Production Record	10 years	25 years
	Product Warehousing Record	3 years	25 years
	Production Instructions		25 years
	Material Feed Lot No. Record		25 years
	Calibration Report	15 years	25 years
	Weighing Instruments Accuracy Failure Notification	10 years	25 years
	Order Sheet		25 years
	Shipping Record		25 years
③ Nonconforming Product Characteristics Record and Actions (including deviations)			
	Application for Deviation (Approved)	10 years	25 years
	Application for Process Change	*	25 years
	Actions against Defects	10 years	25 years*
	Abnormality Report		25 years*
	Re-Inspection Request/Report	3 years	25 years
	Nonconforming Material Record	10 years	25 years
④ Action Record of Preventive Actions			
	Change Record of Equipment Drawings	*	25 years*
	Change Record of QC Flow Chart/Control Plan	3 years	25 years*
	Action Record of FMEA	*	25 years*
	Confirmation Record of Action Result of Actions against Defects	12 years	25 years*
⑤ Environment-Related Record			
	SDS	10 years	25 years
	IMDS Registration No. (if applicable)		25 years
	Certificate of Analysis		25 years

* The storage term of the items with the "*" mark shall be "1 year after the customer approval for the end of production."
Note that the record names follow the name of each supplier.