SUPPLIER QUALITY MANUAL

ISSUE 3: REVISION A

Effective: (8/1/2025)

Hayashi Telempu North America (HTNA)

The purpose of the Hayashi Supplier Quality Manual (SQM) is to communicate HTNA requirements to our suppliers. This manual has been created using HTNA Customer Specific Requirements, ISO 9001:2015 and IATF 16949:2016 standards. The HTNA SQM requirements apply to all suppliers of HTNA as designated in the RFQ (Request for Quote).

HTNA uses supplier assessment activities as the risk-based model to define the minimum acceptable level of development and a target QMS development level for each supplier.

IATF 16949:2016 Section 8.4.2.3 requires HTNA suppliers of automotive products and services to develop, implement, and improve a QMS with the ultimate objective of eligible organizations becoming certified to the IATF 16949:2016 QMS Standard. Unless otherwise authorized by HTNA Purchasing in writing; a QMS certified to ISO 9001:2015 is the initial minimum acceptable level of development. Based on current risks to the customer, the objective is to move suppliers through the following QMS development progression:

1) Certification to ISO 9001:2015 through third-party audits; unless otherwise specified by the HTNA, suppliers to the organization shall demonstrate conformity to ISO 9001:2015 by maintaining a third-party certification issued by a certification body bearing the accreditation mark of a recognized IAF MLA (International Accreditation Forum Multilateral Recognition Arrangement) member and where the accreditation body's main scope includes management system certification to ISO/IEC 17021.

2) Certification to ISO 9001:2015 with compliance to other customer specific QMS requirements (such as Minimum Automotive Systems Requirements for Sub-Tier Suppliers [MAQMSR] or equivalent) through second party audits.

3) Certification to ISO 9001:2015 with compliance to IATF 16949:2016 through second party audits.

4) Certification to IATF 16949:2016 through third-party audits (valid third-party certification of the supplier to IATF 16949:2016 by an IATF-recognized certification body).

The goal of this manual is not strictly for communication and documentation between HTNA and the supplier but rather to help the supplier better understand their own internal systems. This better understanding of quality is to be used to drive continuous improvement activities and cost reductions efforts.

In the spirit of ongoing continuous improvement, HTNA encourages our suppliers to suggest how this manual and its implementation could be better improved. All suggestions should be directed towards your Quality and/or Purchasing contact.

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INTRODUCTION: HAYASHI SUPPLIER QUALITY MANUAL (SQM)

PURPOSE

The purpose of this section is to introduce the Hayashi Supplier Quality Manual (SQM), define the requirements and expectations of the supplier, and explain the methods by which to control this document.

SCOPE

This manual applies to all suppliers that provide production level or service parts for Hayashi Telempu North America (HTNA). It includes all Quality Management Systems (QMS) and APQP requirements for the suppliers.

EXPLANATION

HTNA has identified the need to provide our suppliers with the tools required to meet or exceed the requirements of HTNA and/or our customers. HTNA has chosen to develop the SQM to reflect *IATF 16949:2016* and AIAG standards; our goal at HTNA is to establish a set of standard procedures that allow our supply base to perform to the best of their abilities while maintaining the requirements of our global customers.

We strive to:

Communicate the importance of HTNA's expectations, requirements, and goals to the supplier to maintain the highest quality products available at a competitive price.

Encourage suppliers to become team participants through maintaining open lines of communication which help create new and better ideas to improve quality and reduce costs.

Work with suppliers to develop plans to help ensure smooth and timely launches based upon effective planning and communication.

Provide our suppliers with the tools required for continuous improvement, cost reduction, quality development, and increased efficiency.

Assure that the completed assembly of all parts supplied to HTNA will meet the requirements and satisfaction of HTNA and HTNA's customers.

DEFINITIONS

Commodity: Any component that is not specialized for HTNA (i.e., staples, labels, etc.).

Raw Material: Any material or component with specifications designated by HTNA.

Trade Sale: Finished good product manufactured and shipped from the supplier directly to HTNA's customer on behalf of HTNA.

Cross Dock (XDK): Finished good product manufactured and shipped from the supplier directly to HTNA as a pass through, then shipped by HTNA to the customer.

DOCUMENT ADMINISTRATION RESPONSIBILITIES

HTNA Responsibilities:

HTNA will be responsible for updating the SQM and ensuring the distribution of its revisions to the supplier, through the designated method (managed by Purchasing, supported by QA).

One manual will be released to each supplier via award letter instruction and/or designated method.

HTNA has the right to update or change the SQM quality requirements at any time.

HTNA encourages suggestions for future updates to the manual.

HTNA will maintain a master record of all manuals and the current revision level.

Supplier Responsibilities:

The supplier will be responsible for using the latest SQM revisions as well as maintaining the distribution of these revisions.

The supplier will be responsible for training other departments and their suppliers to meet the requirements of the SQM.

The updated revision level becomes effective from the date of submission to the suppliers. Forms affected by a new revision are to be used starting from the date of issuance.

Suppliers are encouraged to use the formats provided in this manual; however, suppliers may use other formats if:

HTNA approves the substitute format, and

The proposed format meets all requirements and represents all pertinent information.

NOTE: HTNA reserves the right to refuse any forms other than what has been provided and may require suppliers to resubmit forms if not in an approved format

NOTE: HTNA Supplier forms include a document control number, revision, start with the prefix HSF (Hayashi Supplier Form) and are referenced throughout this manual. The latest revisions are to be used for all document submissions. Previously accepted documents will not need to be updated.

OVERVIEW: QUALITY SYSTEM REQUIREMENTS

PURPOSE

To define the expectations of the supplier's quality management system.

EXPLANATION

The supplier shall establish, document, and maintain a quality system that defines and documents the requirements of the system to ensure that the product conforms to the specified customer requirements. A quality manual shall exist that outlines the quality systems and the appropriate procedures to ensure consistency throughout the organization and the manufacturing process. The quality system is to be defined (at a minimum) by the following key points: Quality Policy, Quality Assurance Manual, Process Maps and Interaction Flow, Quality Management System Procedures, Work Instructions, Process and Product Audits.

SUPPLIER RESPONSIBILITIES

Quality System Procedures:

HTNA Supplier Quality System Requirements reflect *ISO 9001:2015, IATF 16949:2016 Sec. 4 Context of the organization.*

HTNA Clarification

The supplier shall have systems and a Quality Policy in place that are consistent with the requirements of HTNA, ISO 9001:2015 and IATF 16949:2016 (as applicable) as outlined in this manual. This system must be understood, documented, and implemented throughout all levels of the supplier organization with top management leadership and commitment.

Quality Planning:

HTNA Supplier Quality System Requirements reflect *ISO 9001:2015, IATF 16949:2016 Sec. 6 Planning*

HTNA Clarification

HTNA expects suppliers to follow the requirements set forth by the IATF 16949:2016 Quality Planning section which includes the following elements:

- Advanced Product Quality Planning (HTNA Supplier Advanced Quality Planning Schedule)
- Special Characteristics
- Feasibility / Design Reviews
- Product Safety
- Process Failure Mode and Effects Analysis (PFMEA)
- Mistake Proofing (Poka-Yoke)
- Control Plan
- Contingency / Escalation Plan

Product Approval Process:

Suppliers are expected to have the following systems in place to monitor the part evaluation process:

AIAG Production Part Approval Process (PPAP) manual requires sub-suppliers to meet the same requirements as the customer SQM.

System to record and track Engineering and Process Changes to ensure they have been implemented.

Continuous Improvement:

The supplier is responsible for implementing a continuous improvement system that is known and understood throughout the entire organization. The system shall continuously improve the quality, delivery, service performance and reduce costs.

The following is a list of examples of different techniques that can be used for continuous improvement:

Control Charts

Design of Experiments (DOE)

Parts Per Million (PPM) analysis

Benchmarking (Yokoten) – Lessons Learned

Analysis of motion/ergonomics

Mistake Proofing (Poka-Yoke)

Employee continuous improvement program (Kaizen)

Separation of man and machine (Judoka)

Facilities and Tooling Management:

The supplier shall be aware of the facilities, the process, and equipment that is used or is planned to be used and how those items relate to the overall advanced quality planning process. Plant layouts shall be designed to reduce material handling and travel, waiting, wasted floor space, and poor ergonomics.

Tooling management shall include the following:

Location and personnel capable of repairing tooling and subsequent alternatives.

Storage and retrieval process

Master list of tooling by location

Tooling repair and Engineering Change Order History Sheet

Maintenance Log

SECTION 1: PLANNING - QMS REQUIREMENTS

1-1 QUALITY POLICY

PURPOSE

The purpose of this section is to inform the supplier of the HTNA Quality Policy.

EXPLANATION

HTNA has identified the need to establish a Quality Policy. Our policy is founded on the premise that all suppliers and their employees are committed to providing products and services that satisfy our and our customers' needs.

QUALITY POLICY AND SUPPLIER RESPONSIBILITIES

Suppliers are also required to define a Quality Policy that reflects the following objectives:

Provide HTNA with only quality products and services.

Provide those products and services on time, utilizing efficient methods.

Provide HTNA with the best value for our products/services.

Provide open, effective communications with HTNA.

Provide systematic validation and control of manufacturing design, manufacturing, operational, and quality processes.

Provide a system of continuous improvement across all disciplines.

Provide a system of employee involvement, motivation, and training.

Provide a system for reducing costs without compromising the quality of the products.

1-2 MANAGEMENT RESPONSIBILITY

PURPOSE

To define the expectations of suppliers' commitment to the implementation and maintenance of the Quality Management System (QMS).

EXPLANATION

The supplier is responsible for maintaining a quality system which defines and documents their policy, is known and understood throughout the organization, is reviewed on a set basis, is one which collects and analyzes the data, and meets the satisfaction of HTNA. The system incorporates a policy that promotes continuous improvement in quality and strives to be competitive in costs.

QUALITY POLICY AND SUPPLIER RESPONSIBILITIES

Quality Management System: HTNA Supplier Quality System Requirements reflect *IATF 16949:2016 Sec. 8.4.2.3 Supplier quality management system development.*

HTNA Clarification

HTNA will define and communicate the acceptable QMS / Certification level for each supplier based on risk assessment.

Quality Policy:

HTNA Supplier Quality System Requirements reflect *IATF 16949:2016, Sec. 5.2 Policy*

HTNA Clarification

Supplier management is responsible for defining and documenting its policy for quality and its overall commitment to quality. The quality policy is to be relevant to the supplier's organizational goals as well as the expectations and needs of HTNA and its customers. The Quality Policy shall include continuous improvement. It is the responsibility of the supplier to make sure the quality policy is understood, implemented, and maintained throughout all levels of the organization.

Responsibility and Authority:

HTNA Supplier Quality System Requirements reflect *ISO 9001:2015 Sec. 5.3 IATF 16949:2016 Section 5.3 Organizational roles, responsibilities and authorities.*

HTNA Clarification

The supplier at a minimum shall have the following documents available for review by HTNA:

Organization Chart

Supplier Quality Representative for all shifts *(see SQM Form HSF 1-3), Supplier Quality Representative Contact)*

Quality Manual, Quality Policy and Standardized Work

Resources:

HTNA Supplier Quality System Requirements reflect *ISO 9001:2015, IATF 16949:2016 Sec. 7.1 Resources*

HTNA Clarification

The supplier's top management shall make sure appropriate resources are available to monitor and maintain the QMS.

Management Representatives:

HTNA Supplier Quality System Requirements reflect *ISO 9001:2015, IATF 16949:2016 Sec. 5.1 Leadership and commitment.*

HTNA Clarification

The supplier shall have quality person/personnel with the authority and responsibility to develop and maintain quality systems, verify the processes that affect quality, communicate all issues affecting quality to HTNA, and be able to resolve all issues regarding nonconforming material or warranty issues. The supplier shall be committed to continuously improving quality while always striving to reduce costs. It is the belief of HTNA that all suppliers need to realize the value of the global economy and the international standards that have been established. HTNA will inform suppliers of the QMS level requirements based on the supplier assessment and risks identified.

Organization Interfaces:

HTNA Supplier Quality System Requirements reflect *ISO 9001:2015, IATF 16949:2016 Sec. 4.4 Quality Management System and its processes.*

HTNA Clarification

The supplier shall define the processes (process maps/turtle diagram) needed for the QMS and determine inputs, outputs, infrastructure, risk, performance indicators and defined responsibilities. The supplier shall determine and apply the criteria and methods needed to ensure effectiveness of the process. The supplier shall also show the sequence and interactions between these processes.

Information to Management:

HTNA Supplier Quality System Requirements reflect *ISO 9001:2015, IATF 16949:2016 Sec. 5.3 Organizational roles, responsibilities, and authorities.*

HTNA Clarification

The supplier's top management shall ensure the responsibilities and authorities are defined, communicated, and monitored for each role required to support the QMS processes.

Management Review:

HTNA Supplier Quality System Requirements reflect ISO 9001:2015, *IATF 16949:2016 Sec. 9.3 Management Review*

HTNA Clarification

The supplier's quality management shall be responsible for reviewing the quality system at defined intervals (minimum annually) to ensure its effectiveness. Frequency of reviews to be determined based on risk assessment. Records of these reviews and their results shall be maintained and relinquished upon the request of HTNA.

Business Plan:

HTNA Supplier Quality System Requirements reflect *ISO 9001:2015, IATF 16949:2016 Sec. 6.2 Quality objectives and planning to achieve them.*

HTNA Clarification

The supplier shall establish, monitor, and communicate appropriate quality objectives (Key Performance Indicators-KPI) for each process in their QMS that satisfy the requirements in this supplier manual.

Analysis and Use of Company Level Data:

HTNA Supplier Quality System Requirements reflect ISO 9001:2015, IATF 16949:2016 Sec.9.1.3 Analysis and evaluation.

HTNA Clarification

The supplier shall have a system and the personnel for maintaining the processes that affect quality. An internal audit system that audits the initial quality and the standardization of the process is required. Product quality is to be established on an ongoing basis complete with inspection, testing, and failure analysis. Trends should be evaluated and compared with past performance to help determine process direction. HTNA and their customers' initial quality performance are to be used as indicators in helping improve the overall process and quality systems.

Customer Satisfaction:

HTNA Supplier Quality System Requirements reflect *ISO 9001:2015, IATF 16949:2016 Sec. 9.1.2 Customer Satisfaction.*

HTNA Clarification

The supplier shall monitor customer satisfaction through continual evaluation of internal and external performance indicators to ensure compliance.

Performance indicators shall be based on objective evidence and include but are not limited to:

Scorecard VALU score, Trade sale: OEM scorecard.

Field returns, recalls and warranty (when data is available).

Delivery performance (including incidents of premium freight).

Customer notifications related to quality or delivery issues, including special status.

Monitor performance of manufacturing processes.

1-3 SUPPLIER QUALITY CONTACTS

PURPOSE

To define the roles and responsibilities of the Supplier Quality Representative and the expectations and procedures for helping them properly communicate with HTNA.

EXPLANATION

The Supplier Quality Representative is responsible for maintaining quality relations between the suppliers' company and all applicable HTNA facilities. All quality related information should be exchanged and communicated through Supplier Quality Representatives.

QUALITY POLICY AND SUPPLIER RESPONSIBILITIES

Supplier Quality Representative Contact form:

This form is to be completed and returned to HTNA upon request and any of the following changes:

- Initial Submission (New Supplier)
- Initial Submission (New Facility Added)
- Supplier Name Change
- Contact Information Change
- Contact name, title, email, phone, etc.

Supplier Quality Representative / SQM Contact:

This person is responsible for being the primary contact between the supplier and HTNA on all quality related issues. The following are a few examples of the responsibilities that are expected of the Supplier Quality Representative:

Act as a representative of the supplier and HTNA during all quality-related meetings.

Develop and uphold the supplier quality system to meet the requirements of the SQM.

Review and reply to all HTNA or customer corrective actions/concerns.

Organize and provide failure analysis on all returned components.

The authority to control supplier production/process to prevent or contain nonconforming products from being produced or shipped to HTNA and/or its customers.

Monitor and respond to the monthly Supplier Quality Scorecard if applicable *(see SQM Section 5-2, Supplier Quality Performance)*

Responsible for all SQM documentation to HTNA

This person is responsible for maintaining the SQM and all related documents/forms and revisions.

Quality Manager:

This person is responsible for managing the quality matters at the manufacturing facility.

Quality Tech / Engineer:

This person shall have the responsibility of coordinating the functions of a new project. The following are a few examples of the responsibilities that are expected:

- Supplier Advanced Quality Planning Schedule (see SQM Section 1-5, Supplier Advanced Quality Planning Schedule)
- Special Characteristics
- Feasibility Reviews
- Product Safety
- PPAP Submission as per HTNA provided due dates
- Design/Process Failure Mode and Effects Analysis
- Mistake Proofing (Poka-Yoke)
- Control Plans
- Submission of Trial Parts Inspection Data

1st, 2nd, and 3rd Shift Contacts:

These personnel are responsible for maintaining quality in the absence of the Supplier Quality Representative, the Quality Manager, and/or the Quality Engineers. These contacts are to have the ability to control the production/process to prevent or contain nonconforming products from being produced or shipped as directed by HTNA. If a supplier does not run additional shifts, then the supplier should name contact personnel that may be contacted during emergency situations.

Return Material Contact:

This person shall have the responsibility for the return of nonconforming material, issuing of return material authorization numbers, and providing courier account numbers. If the address for nonconforming material differs from the production address, please provide a shipping address.

Customer Service:

This individual shall have the responsibility of maintaining quality at the HTNA facility. Based upon the request of HTNA this position will need to be activated during such quality activities as severe nonconformance and production validation builds. A few responsibilities of the Customer Service Representative: Inspecting, sorting, reworking, working with HTNA to determine containment and preventative countermeasures in the case of nonconformance, measuring, checking, evaluating new parts and processes during production validation builds, assuring open lines of communication between the supplier and HTNA, help provide the best overall quality product to HTNA and its customers.

Multiple Representative Positions:

It is acceptable for one individual to be responsible for more than one area and thus have their name appear in more than one location on the Supplier Quality Representative Contact form. At least 2-3 company representatives should be included.

1-4 OVERVIEW OF PREPRODUCTION RESPONSIBILITIES

PURPOSE

The purpose of this section is to provide an overview of the events required to be supported by supplier. These are the minimum requirements that are required; however, the supplier shall comply with all the requirements and intent of this Hayashi Supplier Quality Manual (SQM), ISO 9001:2015, IATF 16949:2016 (as applicable), and the OEM SQM (as communicated by HTNA).

EXPLANATION

The intent of this section is to define the relationship between HTNA and the supplier on how to properly achieve a successful production launch. The supplier is to understand the importance of documentation submittals, part evaluations, testing, production trials, PPAP submission, and actual part interaction. Documentation will be required on an ongoing basis to ensure that the supplier has a full understanding of their processes and to help reduce risk and/or any unexpected issues prior to production.

The supplier should formulate a team of qualified personnel to ensure that all the requirements of the SQM can be met. Quality starts at the top but needs to have the involvement of all employees to provide world-class products. The cross-functional team should be made up of the following departments to help ensure a successful launch:

- R&D
- Engineering
- Manufacturing
- Material Control
- Purchasing
- Production
- Quality
- Sales
- Program Management (including sub-supplier)

SUPPLIER RESPONSIBILITIES

Schedule:

The supplier is to develop a Supplier Advanced Quality Planning Schedule based on the schedule of HTNA and its customers. Trade sale suppliers will follow the OEM schedule. The schedule is to include the timing of all the events that are required to meet both their internal requirements as well as those of HTNA. This initial schedule shall be developed and submitted immediately after the supplier has been awarded HTNA business and received the HTNA schedule. This schedule is to include the following:

- HTNA provided Schedule.
- Tooling Build Schedule
- Facility/Equipment Preparation Schedule
- Part Submittal/Trial Schedule
- APQP Documentation Schedule
- PPAP Submission
- Production Build Schedule
- Quality Documentation (i.e., sample data sheets, gage R&R, PFMEA, control plan, process flow, etc.)
- Material Testing and Certification

Pre-Production Responsibilities:

There are three main stages within AIAG's APQP that are directly related to the development of the tooling, the trial production runs, and the launch or Start of Production (SOP). These three stages consist of Design and Development (Prototype Stage), Process Design (Pilot Stage), and Product Approval Process (Launch/SOP Stage). Each one of these stages has a set of required inputs and outputs that are designated by IATF 16949 and expected by HTNA.

Stage 1 - Design and Development Stage - Prototype-:

Main Objectives:

Manufacture tooling that can produce parts that meet the specifications of the drawing can be controlled by the inspection standard and meet the intent for the use of the part.

Develop and manufacture check fixtures (where applicable) that can be used to check and validate parts to both the drawing and the inspection standards on an ongoing basis. (These gages will require the same care, treatment, certification, and GR&R testing that is required with all dimensional gages)

Required Inputs:

- Functional and performance requirements
- Information derived from previous similar design and development activities
- Statutory and regulatory requirements
- Standards or codes of practice that the organization has committed to implement
- Potential consequences of failure due to the nature of the products and services.
- Product specifications including but not limited to special characteristics (see Sec 8.3.3.3).
- Boundary and interface requirements
- Identification, traceability, and packaging
- Consideration of design alternatives
- Assessment of risks with the input requirements and the organization's ability to mitigate/manage the risk, including from the feasibility analysis
- Targets for conformity to product requirements including preservation, reliability, durability, serviceability, health, safety, environmental, development timing, and cost
- Applicable statutory and regulatory requirements of the customer-identified country of destination, if provided.
- Embedded software requirements.

Required Outputs:

- Design risk analysis (FMEA)
- Reliability study results
- Product special characteristics
- Results of product design error-proofing, such as DFSS, DFMA, and FTA
- Product definition including 3D models, technical data packages, product manufacturing information, and geometric dimensioning & tolerancing (GD&T)
- 2D drawings, product manufacturing information, and geometric dimensioning & tolerancing (GD&T)
- Product design review results
- Service diagnostic guidelines are repair and serviceability instructions
- Service parts requirements
- Packaging and labeling requirements for shipping

HTNA Additional Requirements:

Submit Check Fixture drawing for approval (if applicable).

Tooling shall conform to the drawing or the inspection standards, whichever is the more stringent of the two. The supplier is responsible for ensuring the initial part quality conforms to the drawing(s) and inspection standard(s). The dimensions that do not conform are to be identified and HTNA is to be informed prior to submission of the PPAP.

Develop an Evaluation Plan that identifies all steps and timing involved to validate the part at each level of submission.

Stage 2 - Process Design - Pilot Stage:

Main Objectives:

Verify design improvement effectiveness.

Identify and resolve issues surrounding manufacturing.

Evaluate process capability using the Run @ Rate method.

Finalize process steps and methods.

Confirm part quality, reliability, and product intent.

Required Inputs:

- Product design output data including special characteristics
- Targets for productivity, process capability, timing, and cost
- Manufacturing technology alternatives
- Customer requirements, if any
- Experience from previous developments
- New materials requirements
- Product handling and ergonomic requirements, and
- Design for manufacturing and design for assembly

Required Outputs:

- Specifications and drawings
- Special characteristics for product and manufacturing process
- Identification of process input variables that impact characteristics
- Tooling and equipment for production and control, including capability studies of equipment and process(es)
- Manufacturing process flow charts/layout, including linkage of product, process, and tooling
- Capacity analysis
- Manufacturing process FMEA
- Maintenance plans and instructions
- Control plan
- Standardized work and work instructions
- Process approval acceptance criteria
- Data for quality, reliability, maintainability, and measurability
- Results of error-proofing identification and verification as appropriate
- Methods of rapid detection, feedback, and correction of product/manufacturing process nonconformities

HTNA Additional Requirements:

Production tooling, equipment, and facilities must be used during this stage

Production process and methods must be established and used

Production operators must be trained and used

When a Check Fixture is required, it must be validated and approved by HTNA using the Gage Repeatability and Reproducibility (GRR) process prior to any confirmation of production tooling.

The supplier is responsible for ensuring the initial part quality conforms to the drawing and inspection standard(s). Dimensions that do not conform are to be identified on the Part Evaluation Plan *(see SQM Section 4-2, Part Evaluation Plan)* with corrective actions included.

Evaluate how the part mates to the surrounding parts and use this information to help develop internal controls for critical part characteristics. Identify these critical areas on the control plan.

Develop work standards sheets for each process and inspection required.

Develop rework standards for each rework process and re-inspection required. Rework methods shall be defined in the control plan.

If specific cosmetic surfaces are required, evaluation and approval will be negotiated between HTNA, OEM, and the supplier.

The supplier is to maintain an Open Issues matrix Plan *(see SQM Form HSF 5-1, Open Issue Sheet)* that maintains the status of all issues. This sheet is to be submitted to HTNA as requested.

Be able to quickly solve quality and mass production capability issues in both the tooling and the process.

All tooling dimensions should be made to the nominal.

Develop preventative maintenance schedule for all tooling and equipment. Records of maintenance are to be provided to HTNA upon request.

Develop contingency plans for emergencies. Plans should incorporate methods to assure quality, productivity, and delivery during equipment failure.

Sub-supplier production should be monitored in a method like this SQM to ensure on time part delivery and quality. HTNA and its customers reserve the right to visit sub-suppliers upon proper notification.

The supplier is responsible for the implementation of all Engineering Change Orders (ECO) at their facility as well as their sub-suppliers by the ECO specified date. An ECO history list is to accompany all PPAP/PA submissions.

Stage 3 – Product Approval - Start of Production (SOP) Stage:

Main Objectives:

Confirm that parts manufactured off production tooling conform to HTNA/OEM specifications.

Confirm mass production capability.

Submit PPAP/PA documentation.

Begin and maintain delivery of quality conforming components to HTNA in accordance with the production schedule.

Establish, implement and maintain a product and manufacturing approval process conforming to requirements defined by the customer(s).

Approval of suppliers externally provided products and services prior to submission of their approval PPAP to HTNA.

Obtain documented product approval prior to shipment.

NOTE: Product approval should be after the verification of the manufacturing process.

Required Inputs:

Production Trial Run – Run @ Rate

Measurement Systems Evaluation (calipers, CMM, etc.)

Preliminary Process Capability Study

Production Part Approval Process (PPAP)

Production Validation Testing

Packaging Evaluation

Production Control Plan

Quality Planning Sign-off and Management Support

Certificate of Compliance (C of C) for each shipment, as required. C of C's are required if an RMIS is not required. The C of C will confirm that the material meets specifications, and other requirements stipulated in the request for quote and the purchase order. The material specifications must not deviate from the first C of C submitted at the beginning of the program. Any deviations will require a PCR.

Required Outputs:

Reduced Variation

Customer Satisfaction

Delivery Service

HTNA Additional Requirements:

Ensure nonconforming material is not shipped to HTNA.

The supplier will be responsible for the cost of all nonconforming material and the subsequent costs that are inherent for the received and processed material.

The supplier is responsible for the sorting or supplying of personnel required to sort. Material that is sorted based on immediate necessity or at the request of the supplier will be ultimately charged back to the supplier.

The supplier is to notify HTNA immediately if they have identified that nonconforming material has been potentially shipped or if internal issues affect production or delivery. Trade sale suppliers are to notify both HTNA and the OEM.

Data for regulation items shall be submitted according to the inspection standards.

Final approval will be issued, thus final tooling/equipment payment, once HTNA customer has issued approval. Typically, after 90 days of Safe Launch with no defect outflows.

HTNA and Internal Assessment

All suppliers shall have a functional Internal Assessment for their Quality Management System (QMS). The supplier shall keep evidence of assessments and closure of identified issues. One tool that can be utilized is the HTNA Supplier Assessment Form (Form HSF 5-7). Frequency of assessments shall be determined based on identified risks. All suppliers shall be available for an audit of their facilities, or sub-suppliers' facilities, given proper notice (typically 1 month).

1-5 SUPPLIER ADVANCED QUALITY PLANNING SCHEDULE

PURPOSE

To define the expectations of the supplier for identifying the major components and defining the submission process for the Supplier Advanced Quality Planning Schedule.

EXPLANATION

The Supplier Quality Assurance Schedule is to provide a detailed plan relating to quality and manufacturing that outlines all the necessary requirements to ensure quality production parts. The SAQPS should reflect the HTNA/OEM master schedule and should include all activities up to and including Start of Production (SOP) and the four months following.

SUPPLIER RESPONSIBILITIES

Supplier Advanced Quality Planning Schedule (SAQPS):

The supplier is to maintain and submit SAQPS per HTNA request *(Form HSF 1-5 Supplier Advanced Quality Planning can be used for sub-supplier tracking).* The following documentation is to be included on the schedule and is described below:

Master Schedule – The HTNA Master Schedule is to be incorporated into the top portion of the SAQPS and should include part submission dates. Trade sale suppliers shall use the OEM Master schedule.

Supplier Schedule – The Supplier Master Schedule is to be incorporated into the top portion of the SAQPS and just below the HTNA Master Schedule. This schedule is to reflect and support the requirements of HTNA and its customers.

Supplier Validation Trials – All trials are to be incorporated and supported by the supplier and scheduled to meet the requirements of HTNA/OEM. *(HTNA may require more production trials for testing than the required Design and Production Validation tests to help ensure quality and repeatability.* Off process production level parts are to be made using the following to validate process and quality:

Production team members

Certified and validated production level material

HTNA/OEM approved process flow, layout, control plan, and procedures

Production level tools, dies, equipment, jigs, etc.

Safe Launch check sheets developed from RMIS information.

Start Of Production – The schedule should reflect the start-up plan for current and future components. This plan should include the SOP date, inventory requirements, and tracking methods.

Sub-Supplier Control – The schedule should reflect all major components and indicate their status. The information should include such items as:

- Prototype Tooling Build Status (if applicable)
- Production Tooling Build Status
- PPAP Approval
- APQP Kick-Off
- Source Date

Supplier Quality Assurance Schedule Requirements – At a minimum, the supplier shall list all the requirements that the HTNA Supplier Quality Manual (SQM) require. The following is a list of HTNA requirements:

- Supplier Quality Representative Contacts (Section 1-3)
- Supplier Advanced Quality Planning Schedule (Section 1-5)
- Design Validation: Review Drawings & Specifications (Section 2-1)
- Tooling Progress Report (Section 2-4)
- Engineering Change Number History Sheet (Section 2-5)
- Process Flow Layout (Section 3-1, 3-2)
- AIAG-VDA PFMEA (Section 3-3)
- Process Control Plan (Section 3-6) Packaging Review & Trials (Section 3-7)
- Part Identification and Traceability Section 3-8)
- Raw Material Inspection Standard (RMIS) (Section 3-9)
- Operator Work Instruction Sheets (Section 3-10)
- PV Production Trial (Section 3-11)
- Evaluation Plan (Section 4-2)
- Material Certifications and Test Data (Section 4-3)
- MSA Plan: Gage R&R (if Applicable) (Section 4-6)
- Process Capability (Section 4-7)
- Boundary Samples (Section 4-8)
- PPAP Submission (Section 4-9)
- Maintenance Plan (Preventative, Predictive and Periodic Overhaul) (Section 4-10)
- Product and Process Quality Audits (Section 5-8)
- Training Personnel (Section 5-9)

Management Review – The supplier shall identify key review dates in which the Team validates the status of the program vs. the requirements.

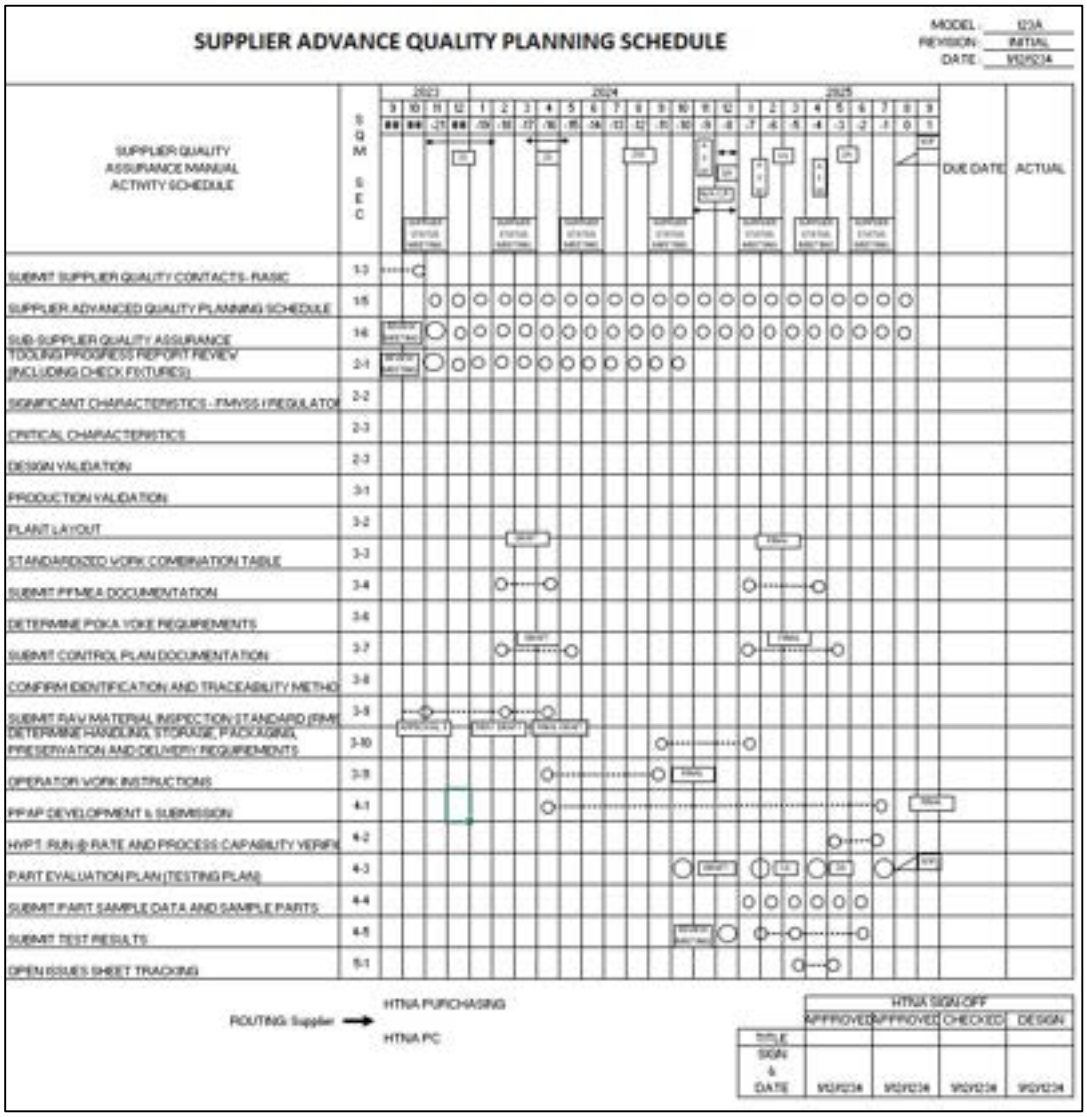
Submission Requirements:

The supplier is expected to make documentation available upon request by HTNA.

The submission format may be by electronic media or hard copy.

If the supplier is unable to meet the requirements of the Master Schedule, they must negotiate with HTNA PC and Purchasing.

The supplier is expected to notify the relevant HTNA department immediately if any changes are expected to affect the schedule, cost, delivery, and/or quality.



1-6 SUB-SUPPLIER QUALITY ASSURANCE

PURPOSE

To define the supplier's responsibility for controlling the quality of their suppliers.

EXPLANATION

The Tier 2 supplier is responsible for controlling, coordinating, and evaluating the performance of their supplier(s). All activities should be in accordance with the requirements of this manual, the timing plan, and the quality requirements that are required of ISO 9001:2015 or IATF 16949:2016 suppliers. The overall responsibility of the Tier 3 supplier(s) is that of the Tier 2 supplier per the supplier sourcing table below.

Suppliers Defined by Tier Level

Tier 1 = HTNA, Tier 2 = Supplier, Tier 3 = Sub-Supplier, Tier 4+ = Sub-Sub-suppliers

QUALITY POLICY AND SUPPLIER RESPONSIBILITIES

The supplier shall have a system in place to evaluate and select all sub-suppliers. Process and/or quality audits of the Tier 3 and subsequent suppliers are to be submitted to HTNA upon request. Tier 2 suppliers are to notify the Tier 3 supplier that HTNA and their customers have the right to request a visit and/or take part in any quality audit. All Tier 3+ activity is to be arranged through the Tier 2 supplier.

The supplier shall have a method of providing performance feedback to the Tier 3 supplier. This data shall be maintained and shall be made available to HTNA upon request.

The Tier 3 supplier PPAP documentation shall be made available to HTNA upon request.

Tier 3 suppliers are expected to take part in all activities that directly affect part quality and/or delivery.

The Tier 2 supplier must work accordingly with the Tier 3 supplier's PFMEA and Process Control Plan to assure that all critical characteristics and potential problems can be identified and prevented from being shipped to HTNA.

The supplier cannot add or change a Tier 3 supplier without first submitting a Process Change Request (PCR) to HTNA. Trade sale suppliers will issue the change request using the OEM format with HTNA approval. Types of changes that require a PCR include:

- Location of Manufacturing Change
- Location of Ship Point Change
- New Ownership
- Name Change
- Sourcing Change

The supplier shall make the request to HTNA as soon as possible to help expedite the change. HTNA Purchasing and Quality approval is required for the supplier to proceed with the change. Refer to *(Section 5-3, Process Change Request)*. The change must be formal. The PSW/PPAP submission requirements will be communicated by HTNA.

A change to a Tier 3+ supplier manufacturing location must follow the same Process Change Request rules and thus must be qualified prior to any shipments to HTNA. The Tier 2 supplier must provide all

the correct timing, quality, delivery, and evaluation results prior to shipping. In most cases a PPAP submission must be submitted unless otherwise directed by HTNA.

Supplier Sourcing Types and Responsibilities

EXPLANATION

The following table will help to further explain the relationship and differences between consignment parts and controlled self-procurement Tier 3 parts.

HTNA Supplier Sourcing Types (Roles and Responsibilities)

	A. Self Procured	B. Consignment (Tier 2)	
	Tier 2 Supplier Procures	Tier 2 Supplier Procures	HTNA Procures
Designation Code	**A1**	**B1**	**B2**
Tier 3 Sourcing	Tier 2 Supplier	HTNA Purchasing	HTNA Purchasing
Pricing	Tier 2 Supplier	HTNA Purchasing	HTNA Purchasing
Quality/Delivery Control/PPAP	Tier 2 Supplier	Tier 2 Supplier	HTNA/Tier 2 Supplier
Issues Tier 3 PO	Tier 2 Supplier	Tier 2 Supplier (per HTNA Pur.)	HTNA Purchasing
Payment to Tier 3	Tier 2 Supplier	Tier 2 Supplier	HTNA Purchasing

SUPPLIER RESPONSIBILITIES

General:

HTNA Supplier Quality System Requirements reflect *ISO 9001:2015 Sec. 8.5.3 Property belonging to customers or external providers.*

HTNA Clarification

The supplier needs to have systems in place to ensure that the consignment material is verified, safely stored, and maintained throughout all levels of the plant.

Any material that is lost, damaged, or nonconforming is to be reported immediately to HTNA so that containment and preventative countermeasures can be implemented.

Consignment material should follow the same systems that the supplier has in place for identifying, handling, and the disposition of nonconforming products.

Consignment material that is shipped directly to the supplier does not absolve the supplier from the responsibility of providing an acceptable product to HTNA.

Quality Responsibilities

In the event of a quality problem the following will be in effect.

Tier 2 suppliers will have primary responsibility for controlling the consignment part supplier's quality problems and countermeasure activities.

Problems that cannot be resolved by the Tier 2 supplier can be escalated to HTNA.

HTNA will support for Quality resolutions as needed.

Customer Owned Tooling:

HTNA Supplier Quality System Requirements reflect *IATF 16949:2016 Sec. 8.5.1.6 Management of production tooling and manufacturing, test, inspection tooling and equipment.*

HTNA Clarification

HTNA tooling or equipment is to be permanently identified so that HTNA ownership is visually apparent.

Storage location shall be identified, and storage methods shall be appropriate to prevent damage to or deterioration of the tooling. A report on the storage location shall be submitted to HTNA Purchasing annually.

A preventive maintenance schedule and history log must be in place to maintain and document the history of the tool/equipment. A report on the tool condition shall be submitted to HTNA Purchasing upon request.

If the tool is damaged requiring repair, HTNA Purchasing is to be notified immediately.

SECTION 2: PRODUCT DESIGN AND DEVELOPMENT

2-1 REQUEST FOR QUOTE (RFQ) AND DESIGN VALIDATION

PURPOSE

The supplier shall have documented procedures identifying, controlling, and verifying the design of the product to ensure that the specified requirements are understood and can be achieved prior to the acceptance of an RFQ.

EXPLANATION

The supplier is to have methods established to review, verify, and validate the specifications of the design.

QUALITY POLICY AND SUPPLIER RESPONSIBILITIES

Design Control:

HTNA Supplier Quality System Requirements reflect *ISO 9001:2015, IATF 16949:2016 Sec. 8.3 Design and development of products and services.*

HTNA Clarification

The supplier shall establish and maintain a design verification process that is appropriate for the product and focuses on prevention rather than detection.

Design and Development Planning:

HTNA Supplier Quality System Requirements reflect *ISO 9001:2015, IATF 16949:2016 Sec, 8.3.2 Design and development planning.*

HTNA Clarification

The supplier is to have qualified personnel assigned and equipped with the adequate resources required to review and validate product design and share information as requested with HTNA.

The supplier shall understand and be qualified where appropriate in the following skills:

Computer Aided Design (CAD)/Computer Aided Engineering (CAE) as applicable

Geometric Dimensioning and Tolerancing (GD&T)

Failure Mode and Effects Analysis (DFMEA as applicable, PFMEA, etc.)

Measurement System Analysis (MSA)

Simulation Techniques (if applicable)

Organization and Technical Interfaces:

HTNA Supplier Quality System Requirements reflect *ISO 9001:2015, IATF 16949:2016 Sec 8.3.4 Design and development controls.*

HTNA Clarification

HTNA prefers the use of 2D / 3D (in various software) data as a method of design and our SharePoint portal site for sharing of design information.

Design Input:

HTNA Supplier Quality System Requirements reflect *IATF 16949:2016 8.3.3.1 Product design input.*

HTNA Clarification

The supplier shall be able to identify and document the requirements relating to designated control characteristics and governmental regulations for adequacy. Incomplete, ambiguous, or conflicting requirements are to be resolved through discussion with HTNA R&D.

Amongst many other requirements and similar product knowledge the supplier shall assist with incorporating the following into the validation of the product design.

The "Voice of the Customer"

Things Gone Right (TGR)

Things Gone Wrong (TGW)

Field Returns

Internal Quality Issues and Scrap

HTNA and other Customer-related Quality Issues

Methods of Inspection and Rework

Design input will consider the results of any contract review activities and apply the necessary changes.

Design Output:

HTNA Supplier Quality System Requirements reflect *ISO 9001:2015, IATF 16949:2016 8.3.5 Design and development outputs.*

HTNA Clarification

The supplier shall perform and document design reviews with HTNA to verify and validate against the design input requirements to determine if the design meets the desired intent.

The requirements of the design output must:

Meet the design input requirements

Contain or refer to the acceptance criteria

Must identify the designated control characteristics and governmental *regulations (See SQM Section 2-2, 2-3 Significant and Critical/Special Characteristics)* that are critical to the safe and proper function of the part (i.e. – operating, storage, handling, maintenance, and disposal requirements).

The design required outputs are as follows:

Design Failure Mode and Effects Analysis (DFMEA) - Provided by HTNA when applicable.

Design for Manufacturability and Assembly

Engineering Drawings (Including Math Data)

Design Verification

Engineering Specifications

Design Reviews

Design Review:

HTNA Supplier Quality System Requirements reflect *ISO 9001:2015 Sec. 8.3 Design and development of products and services.*

HTNA Clarification

The supplier shall have documented reviews of the design at appropriate intervals throughout the design process with the results of the findings planned and carried out as instructed.

Design reviews shall include representatives from all functions that are affected by part design (i.e. – design, quality, manufacturing, engineering, purchasing, etc.)

Records of these reviews are to be maintained in accordance with the Documentation and Data Control Section of this manual *(See SQM Section 6-3, Quality Records and Documentation).*

Design Verification:

HTNA Supplier Quality System Requirements reflect *ISO 9001:2015 Sec. 8.3 Design and development of products and services.*

HTNA Clarification

The supplier shall identify and verify that the design outputs meet the requirements of the design inputs.

Records of these reviews are to be maintained in accordance with the Documentation and Data Control Section of this manual *(See SQM Section 6-3, Quality Records and Documentation).*

The supplier shall facilitate a series of tests to ensure the performance of the product conforms to the requirements of HTNA. These tests are to be defined in the Part Evaluation Plan *(See SQM Section 4-2 Part Evaluation Plan).*

The Part Evaluation Plan shall be included in the Supplier Advanced Quality Planning Schedule for the proper timing of submissions *(See SQM Section 1-5 Supplier Advanced Quality Planning Schedule).*

The supplier shall document and respond to all corrective and preventative actions using the Open Issue/Problem Follow-up Sheet *(See SQM Section 5-1 Open Issue).*

The supplier shall submit design validation parts to HTNA for review and following the requirements for part submission per the APQP schedule *(See SQM Section 4-3 Part Sample Data Sheets & Part Submission Requirements).*

The Design Validation Process is intended to meet the following requirements:

The Design Validation process follows a successful design verification

Validation is normally performed under defined operating conditions

Design Validation is to be performed on the final product design unless otherwise specified by HTNA

Multiple validations may be required if there are different intended uses.

NOTE: The check fixture gauge is to be designed after the release of the 3D data and aid in the development of the Part Inspection Standard to ensure compatibility with both the standard and the drawing as applicable.

The supplier shall submit the following prior to any development of the check fixture gauge at quote timing:

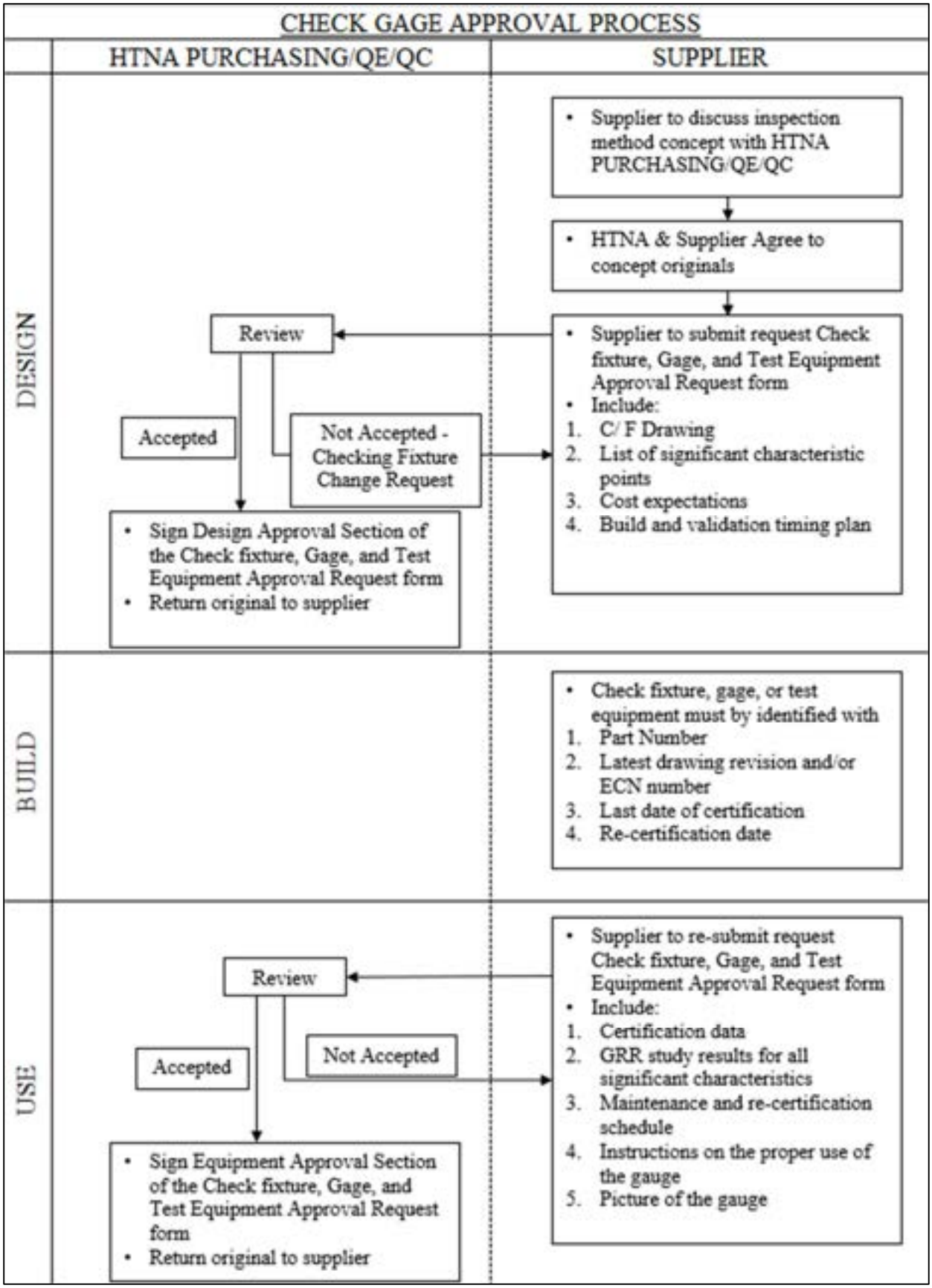
Drawing of proposed C/F complete with datum locations and tolerances.

List of proposed inspection points, critical characteristics, and [Pc] to be controlled by the fixture.

Cost expectations.

Build and validate timing plan.

All check fixtures, gages, and other test equipment shall meet the requirements of Gage Repeatability and Reproducibility (GRR) per MSA. The gage accuracy shall be verified. If the supplier is unable to meet the GRR requirements, they must negotiate with HTNA QE/QC to determine alternative options.


CHECK GAGE APPROVAL PROCESS
HTNA PURCHASING/QE/QC
SUPPLIER
DESIGN
Supplier to discuss inspection method concept with HTNA PURCHASING/QE/QC
HTNA & Supplier Agree to concept originals
Review
Supplier to submit request Check fixture, Gage, and Test Equipment Approval Request form
Include:
1. C/ F Drawing
2. List of significant characteristic points
3. Cost expectations
4. Build and validation timing plan
Accepted
Not Accepted - Checking Fixture Change Request
Sign Design Approval Section of the Check fixture, Gage, and Test Equipment Approval Request form
Return original to supplier
BUILD
Check fixture, gage, or test equipment must by identified with
1. Part Number
2. Latest drawing revision and/or ECN number
3. Last date of certification
4. Re-certification date
USE
Review
Supplier to re-submit request Check fixture, Gage, and Test Equipment Approval Request form
Include:
1. Certification data
2. GRR study results for all significant characteristics
3. Maintenance and re-certification schedule
4. Instructions on the proper use of the gauge
5. Picture of the gauge
Accepted
Not Accepted
Sign Equipment Approval Section of the Check fixture, Gage, and Test Equipment Approval Request form
Return original to supplier

CHECK FIXTURE, GAGE, & TEST EQUIPMENT APPROVAL REQUEST

DESIGN APPROVAL

SUPPLIER

REQUEST:

SUPPLIER NAME: _____ CONTACT: _____ ☐ COPY OF DRAWING ATTACHED

DUNS CODE: _____ PHONE: _____

PART NUMBER(S): _____ FAX: _____

PART NAME(S): _____ MODEL: _____

EST. COST: _____ COMPLETION DATE: _____

DESIGN COMPANY: _____ GAGE REV. LEVEL: _____

	SUPPLIER QC		
	APPROVED	APPROVED	ORIG
TITLE			
SIGN & DATE	/ /	/ /	/ /

HTNA

RESULTS:

☐ PURCHASING/QC/QE DEPARTMENT APPROVES DESIGN(S) SUBMITTED
(THE MANUFACTURE OF THE GAGE / EQUIPMENT CAN BE INITIATED AT THIS TIME)

☐ PURCHASING/QC/QE DEPARTMENT DOES NOT APPROVE
THE CURRENT DESIGN DUE TO THE FOLLOWING REASONS:

_____

_____

_____

	HTNA PURCHASING/QC/QE			
	PURCHASING	CORP QE	PLANT QM	ORIG
TITLE				
SIGN & DATE	/ /	/ /	/ /	/ /

EQUIPMENT APPROVAL

SUPPLIER

REQUEST:

SUPPORT DOCUMENTS ATTACHED: CALIBRATION COMPANY: _____

☐ CALIBRATION CERTIFICATION DATA

☐ GRR STUDY ON △SC CHARACTERISTICS

☐ MAINTENANCE/RE-CERTIFICATION SCHEDULE

☐ GAGE USE INSTRUCTIONS

☐ PHOTO

	SUPPLIER QC		
	APPROVED	APPROVED	ORIG
TITLE			
SIGN & DATE	/ /	/ /	/ /

HTNA

RESULTS:

☐ PURCHASING/QC/QE DEPARTMENT APPROVES THE GAGE AS DESIGNED AND BUILT

☐ PURCHASING/QC/QE DEPARTMENT DOES NOT APPROVE THE GAGE
FOR THE FOLLOWING REASONS:

_____

_____

_____

_____

	HTNA PURCHASING/QC/QE			
	PURCHASING	CORP QE	PLANT QM	ORIG
TITLE				
SIGN & DATE	/ /	/ /	/ /	/ /

ROUTING: SUPPLIER (ORIGINAL) → HTNA QC/QE → HTNA PURCHASING

HTNA SQM HSF 2-1-1 Issue 3 Rev A

Design Changes:

HTNA Supplier Quality System Requirements reflect *ISO 9001:2015, IATF 16949:2016 Sec. 8.3.6 Design and development changes.*

HTNA Clarification

All design changes and modifications that occur prior to Design Validation approval are to be identified, documented, reviewed and approved by HTNA prior to implementation.

For any reason a design change or modification is required after Design Validation approval and before PPAP, the supplier shall be required to revalidate the design.

Design changes that occur after PPAP shall follow the HTNA PCR and Production Part Approval Process.

All changes that may affect the design of subcontracted (Tier 3 to HTNA) products are to meet the same requirements that are expected of HTNA Tier 2 suppliers. HTNA is to be made aware of these changes through the HTNA PCR process.

All changes affecting check fixtures or gages require a Checking Fixture Change Request to be submitted to HTNA Purchasing and the assigned HTNA Quality Engineer (See HTNA SQM HSF-2-1-2).

For HTNA specific parts *(See SQM Section 4-9 Production Part Approval Process)* the supplier is to review the impact on form, fit, function, performance, and/or durability with HTNA to ensure all aspects of the change will be properly evaluated.

The supplier must understand both the physical and cost that a design change has on HTNA and its customers.

CHECK FIXTURE CHANGE REQUEST

REQUESTING DEPARTMENT

DATE: _____

SUPPLIER NAME: _____

PART NUMBER(S): _____

PART NAME(S): _____ MODEL: _____

REASON FOR CHANGE:

- ❑ ECO NO _____
- ❑ INSPECTION STANDARDS CHANGE
- ❑ PART SUBMISSION VARIANT
- ❑ WORKABILITY
- ❑ REPAIR DUE TO: (ATTACH REASONING)
- ❑ OTHER _____

REQUESTER:

- ❑ HTNA PUR/QC/QE
- ❑ SUPPLIER (PLEASE INCLUDE CHECKING FIXTURE DRAWING)

PLEASE RESPOND BY: ___/___/___

CONTENT OF CHANGE (WITH SKETCH):

SUPPLIER

TEMPORARY QUALITY CONFIRMATION METHOD DURING CHANGE PERIOD:

COMPANY NAME TO PERFORM MODIFICATION: _____

TIMING FOR MODIFICATION: FROM: ___/___/___ TO: ___/___/___

COMPANY TO PERFORM CALIBRATION: _____

CALIBRATION / VERIFICATION DATE: ___/___/___

	SUPPLIER APPROVAL			
	APPROVED	APPROVED	CHECKED	ORIGINATOR
TITLE				
SIGN & DATE	/ /	/ /	/ /	/ /

FINAL PUR/QC/QE APPROVAL

TO: _____ ATTN: _____

REPLY TO REQUEST

- ❑ WE ACCEPT YOUR REQUEST
- ❑ WE ACCEPT YOUR REQUEST WITH SOME MODIFICATION
- ❑ WE CANNOT ACCEPT YOUR REQUEST

REASON:

	HTNA PUR/QC/QE			
	PURCHASING	CORP QE	PLANT QM	ORIGINATOR
TITLE				
SIGN & DATE	/ /	/ /	/ /	/ /

IF REQUESTER IS SUPPLIER: SUPPLIER → HTNA PUR/QC/QE → SUPPLIER

IF REQUESTER IS HTNA PUR/Q HTNA QC/QE → SUPPLIER → HTNA PR/QC/QE

HTNA SQM HSF 2-1-2 Issue 3 Rev A

Customer Prototype Support:

HTNA Supplier Quality System Requirements reflect *IATF 16949:2016 Sec. 8.3.4.3 Prototype program.*

HTNA Clarification

Whenever possible the supplier uses the same subcontractors, tooling, and processes that will be used in production. For those instances where the construction is being carried out at other sites the supplier is still responsible for all the technical support and required documentation contained within this Supplier Quality Manual (SQM).

Confidentiality:

HTNA Supplier Quality System Requirements reflect *IATF 16949:2016 Sec. 8.1.2 Confidentiality*

HTNA Clarification

The supplier shall not hint, elude, or state, to other than those of HTNA, the current design, development, and related product information of a new or current product without prior HTNA authorization.

2-2 SIGNIFICANT CHARACTERISTICS

PURPOSE

This section is to define the requirements for process capability studies of the significant characteristics that have been defined by HTNA and called out on the part drawing.

EXPLANATION

Significant characteristics (SC's) are the characteristics that affect the fit, function, or application of how they may relate to the surrounding parts. These dimensions are to be specifically identified on the Process Control Plan and are required to use documented statistical methods to assess the capability and control of the process. Dimensions that require a significant characteristic are always items that have given dimensions or functional outputs, items that are less tangible will require boundary samples to establish quality limits.

The supplier should use the AIAG supplement "Statistical Process Control" or other methods as a reference to conducting process capability studies. Parts that require specific Statistical Process Control will be identified in the RMIS with the symbol [Pc] or in the OEM inspection standard.

The control of process parameters shall reduce variation and ultimately produce better consistent parts. The supplier shall have systems in place to monitor machine conditions as well as part characteristics.

SUPPLIER RESPONSIBILITIES

The supplier must be able to show that the process has little variation and can produce quality products on a repeatable basis for those significant characteristics.

The significant characteristics [Pc] shall be determined and called out on all levels of inspection standard submissions. These control characteristics shall be negotiated between HTNA and the supplier for the final decision.

Significant characteristics [Pc] require PPK/CPK process capability studies to be submitted along with actual data during each level of part submission to HTNA.

2-3 CRITICAL/SPECIAL CHARACTERISTICS - FMVSS REGULATORY

PURPOSE

To clarify the supplier's responsibility to meet Critical Characteristics and (FMVSS) Federal Motor Vehicle Safety Standards.

EXPLANATION

The supplier is responsible for maintaining all data associated with the safety requirements for Critical Characteristics and FMVSS. The testing requirements and frequency of tests are to be called out in the Inspection Standard. The characteristics related to any government regulations are to be submitted using the FMVSS Regulation submission form (HSF 2-3 FMVSS Regulation Data Items). The results of the tests are to be included on all Part Sample Data Sheets Sheet *(see SQM Section 4-3 Part Sample Data Sheets & Part Submission Requirements)* as well as submitted along with the PPAP.

SUPPLIER RESPONSIBILITIES

It is the responsibility of the supplier to ensure that the supplied part/component meets all governmental regulations. The supplier must maintain these documents for the appropriate governmentally specified time and be able to provide this data to HTNA upon request.

All HTNA designed or designed controlled parts will identify any governmental regulations that are required. A note will be found on the drawing (and/or RMIS) calling out the Critical Characteristics and FMVSS requirement.

It is the responsibility of the supplier to help ensure that HTNA has identified all FMVSS regulations and should communicate their findings to HTNA Design/Engineering/Quality.

PPAP submission is to include a PSW and the section for governmental regulations shall be completed.

If for any reason at any time the component fails to meet the Critical Characteristics and/or FMVSS requirements, the supplier must immediately notify HTNA QC and begin the containment of the material. The supplier must be prepared to define the problem and provide the appropriate corrective /preventative actions to resolve the issue.

NOTE: Notification to HTNA does not remove the supplier from any legal obligations because of the noncompliance.

2-4 TOOLING PROGRESS REPORT

PURPOSE

To define the expectations of the supplier for submitting the Tooling Progress Report (TPR) when tooling is required.

EXPLANATION

The Tooling Progress Report is to provide a detailed plan relating to the status of all tooling to include mold/die, jigs/fixtures, check fixtures, and all other miscellaneous tooling that is required to ensure quality production parts. TPR should reflect the HTNA master schedule and should include all activities up to and including Production Validation/Run @ Rate.

SUPPLIER RESPONSIBILITIES

Tooling Progress Report (TPR):

The supplier is to submit a TPR per the requirement date of the HTNA Master Schedule. Trade sale suppliers will use the OEM schedule. The format can be of your choice if it includes all the elements and is approved by HTNA/OEM. The following documentation is to be included on the schedule and is described below:

Master Schedule – The HTNA Master Schedule is to be incorporated into the top portion of the TPR and should include part submission dates.

Supplier Schedule – The Supplier Master Schedule is to be incorporated into the top portion of the TPR and just below the HTNA Master Schedule. This schedule is to reflect and support the requirements of HTNA and its customers.

Supplier Validation Trials – All trials are to be incorporated and supported by the supplier and scheduled to meet the requirements of HTNA. (HTNA may require more production trials for testing than the required Design and Production Validation tests to help ensure quality and repeatability).

All production level parts are to be made using the following to validate process and quality:

Production level personnel, tools, dies, equipment, jigs, etc.

Sub-Supplier Control – The schedule should reflect all major components and indicate their status. The information should include such items as:

Prototype Tooling Build Status *(if applicable)*

Production Tooling Build Status

Run @ Rate

PPAP Approval

Management Review – The supplier should identify key dates on which the Team validates the status of the program vs. the requirements.

Submission Requirements:

The supplier is expected to submit an updated copy of the TPR for any major changes, delays, or as requested by HTNA.

The submission format may be by electronic media or hard copy.

The copy of TPR is to be submitted to the HTNA Program Manager, Program Engineer and purchasing contact.

If the supplier is unable to meet the requirements of the Master Schedule, they must negotiate with the HTNA Program Engineer, Program Manager and Purchasing.

The supplier is expected to notify HTNA immediately if any changes are expected to affect the schedule, delivery, and/or quality.

2-5 OFF TOOL TRIAL: DESIGN VALIDATION (DV) TRIAL BUILDS

PURPOSE

To define the methods by which the supplier reviews and approves the design level through DV trial build activity.

EXPLANATION

The Design Validation (DV) Trial Builds are methods by which both the supplier and HTNA can confirm the design and identify any potential areas of concern. The DV build timing will be dictated by HTNA and its customers, the supplier is to help support these builds. The DV build is to help HTNA determine if the final design of the component performs in the manner for which it was originally intended. HTNA will put the DV units through a series of tests that are better known as Design Validation Testing (DVT). DVT will provide the required feedback to HTNA design/engineering department so that they can make the required changes prior to the PV build.

SUPPLIER RESPONSIBILITIES

Design Validation (DV) Trial Builds:

The idea behind the DV build is to have the supplier produce prototype materials so that HTNA can confirm the original design intent. In many instances the parts submitted for DV will also be used by HTNA customers, so it is imperative that all standard Advanced Product Quality Planning (APQP) documents are completed and submitted to HTNA during each submission level requested. The following are the general requirements for documents required prior to DV Trial Builds:

Design Records- *2D/3D Data – Method: (RFQ) HTNA Purchasing & RD*

Engineering Change Order History Sheet - *Method: (RFQ) HTNA Purchasing & RD*

Bill of Materials (BOM) List *(if applicable) - Method: (RFQ) HTNA Purchasing & RD*

Design FMEA *(if applicable) - Method: (RFQ) HTNA Purchasing & RD*

Special and Critical Characteristics - Method: (RFQ) HTNA Purchasing & RD

Checking Fixture Design Approval Form *(if applicable) - Method: (RFQ) HTNA Purchasing, Quality & RD*

Preliminary Process Flow Sheets - *Method: (RFQ) HTNA Purchasing & RD*

Part Evaluation Plan - *Method:* (RMIS & APQP Schedule) *HTNA R&D, Quality and Engineering*

Raw Material Inspection Standards - *Method:* (RMIS) *HTNA R&D, Quality and Engineering*

Sample Data Sheet - *Method:* (APQP Schedule and PPAP) *HTNA Quality and Engineering*

SECTION 3: PROCESS DESIGN AND DEVELOPMENT

3-1 PLANT LAYOUT

PURPOSE

The supplier should have a document in place that adequately represents the facility to scale.

EXPLANATION

Suppliers are to generate a drawing of their facility that identifies the layout of the plant and all utility locations. The purpose of the plant layout is to define the confines of facilities and provide the necessary tools to properly locate equipment, tooling, and material storage. The facility layout will help to better determine material flow, employee ergonomics, future equipment placement, and continuous improvement activities.

SUPPLIER RESPONSIBILITIES

Generate a facility for drawing using a form of electronic media that can be easily manipulated to provide quick and easy changes. (i.e. – CATIA, Microsoft products, etc.)

The use of the facility drawing can be used for the following purposes:

Equipment and tooling layout

Utility locations

Material storage

Material flow

Fire escape routes

Employee ergonomics/standardized work

Future plant layouts

Additional uses of the facility drawing can be used to generate continuous improvement activities:

Better material flow/material handling

Space consolidation/reduction

Submit copy of facility layout and proposed material flow to HTNA purchasing as requested.

3-2 STANDARDIZED WORK COMBINATION TABLE

PURPOSE:

The Standardized Work Combination Table is used to define the actual amount of manual and machine work that can take place within the required TAKT time and without overlapping operator and machine requirements.

EXPLANATION

The Standardized Work Combination Table is a comprehensive sheet that is used to identify each actual step within the process, the handwork time for that step, the time for walking, and the machine time that is required. The Combination Table graphically depicts the time required to complete a single step. Each step is measured horizontally in time and placed one after the other until the whole process has been defined. The idea is to offset as much machine time by the combination of handwork and walking of the operator, this is accomplished by providing enough work for the operator during the time it takes the machine to cycle. The result should be that the operator returns to the machine at the exact moment that the cycle is finishing, no sooner and no later.

Workload Balance – The Standardized Work Combination Table is a tool to be used to help determine the actual workload per operator and attempt to make all operator workloads the same. A simple but effective method for judging workload is to create a board with each process side by side and the sum of each task within the process identified as blocks of time. These blocks of time add up to make the overall cycle time of each process and can be rearranged to balance the load of each operator.

Standardized Work Combination Tables are to be treated as controlled documents and thus require revision at any change.

SUPPLIER RESPONSIBILITIES

The supplier shall use the attached Standardized Work Combination Table to help better understand their process. The use of this form can help suppliers better identify potential bottlenecks in the process and/or identify where additional resources may be required.

This form should be completed prior to Production Validation (PV).

This document helps expedite the learning curve of new employees by specifically telling the operator what given points to be at throughout the process.

How to Complete a Standardized Work Combination Table

Fill in the department, group and operation number.

Fill in the revision date.

Fill in the quantity of units required per one shift.

Fill in the TAKT Time

Draw and label a red vertical line at the indicated TAKT time on the grid.

Fill in the work elements in proper sequence with the actual tasks being completed. Do not include walking as part of the time. These items should be phrased as action items.

Enter the hand work time for each work element and tally the total at the bottom. Draw a horizontal black line that is capped by vertical lines on either end, this will represent a unit of time.

Enter the machine time for each applicable machine element and tally the total at the bottom. Draw a horizontal dotted green line that is capped by vertical lines on either end; this will represent a unit of machine time.

Enter the walking time required between each working element and tally the total at the bottom. Draw a squiggly blue line to represent the walking from one step to the next, this will represent the walking time.

Graph the appropriate hand work, machine work, walking time, and waiting time.

Draw and label a blue vertical line at the indicated Cycle time (combination of total hand work, walking, and machine times) on the grid.

Number the work elements.

Fill in the "From" box at the top of the form with the title of the first work element that is required to be performed.

Fill in the "To" box at the top of the form with the title of the last work element that is required to be performed.

Sign the form.

3-3 PROCESS FAILURE MODE EFFECTS ANALYSIS (PFMEA)

PURPOSE

To explain the method for creating and submitting a Process Failure Mode Effects Analysis (PFMEA) based on VDA/AIAG FMEA 1st Edition Second Printing.

EXPLANATION

A PFMEA is a living document that is used to help identify potential failure modes that may arise during manufacturing and/or assembly of a product. A cross-functional team shall be created to study the process and identify possible failure modes that could potentially develop during each step in the process.

The PFMEA shall identify and match each step in the Process Control Plan and identify the potential failure modes. The risk for failure occurrence is determined by analyzing the frequency at which they

occur [O], their severity [S], and the likely hood of detection [D]. The failure mode is rated from 1 to 10 for occurrence, severity, and detection using the AIAG PFMEA tables. Once the [O], [D] and [S] values are determined they are used to look up the Action Priority [AP] level using the PFMEA table.

The Action Priority [AP] is used to help establish priorities when conducting continuous improvement activities. The [AP] is defined as High, Medium or Low Priority.

Priority High (H): Highest priority for review and action. The team needs to either identify an appropriate action to improve prevention and/or detection controls or justify and document because the current controls are adequate.

Priority Medium (M): Medium Priority for review and action. The team should identify appropriate actions to improve prevention and/or detection controls, or, at the discretion of the company, justify and document because the controls are adequate.

Priority Low (L): Low priority for review and action. The team could identify actions to improve prevention and detection controls.

After each improvement activity is implemented and the results verified, the PFMEA is to be updated, and the [AP] is to be reevaluated *(See SQM Form HSF 3-3 AIAG-VDA PFMEA Template).*

SUPPLIER RESPONSIBILITIES

Process Failure Mode and Effects Analysis (PFMEA):

HTNA Supplier Quality System Requirements reflect *IATF 16949:2016 Sec. 9.1.1.1 Monitoring, measurement, analysis and evaluation.*

HTNA Clarification

The supplier must submit a Process Failure Mode and Effects Analysis (PFMEA) to HTNA per the date specified on the Supplier Advanced Quality Planning Schedule (SAQPS) *(see SQM Section 1-5, Supplier Advanced Quality Planning Schedule)* and use the provided format or that which meets the requirements of *IATF 16949:2016*.

The supplier can reference the AIAG APQP, A-7 Process FMEA Checklist to help ensure all necessary requirements are met.

The supplier is required to re-submit a PFMEA for the following:

Each part submission level from prototype through production.

Engineering Change Notice (ECN) implemented.

Change to the process follow PCR requirements.

Changes in specifications follow PCR requirements.

Implemented corrective actions or continuous improvement activities that affect the process.

Each PPAP submission.

As requested by HTNA

The supplier is encouraged to use the VDA/AIAG supplemental Potential Failure Mode and Effects Analysis for the proper method for creating and maintaining a PFMEA.

3-4 PROCESS CONTROL PLANNING

PURPOSE

To define the expectations of the supplier's method for controlling the process.

EXPLANATION

The supplier is responsible for developing a quality system that provides for the identification and planning of the production, installation, and servicing processes that directly affect quality. These processes are to be carried out under appropriately controlled conditions.

QUALITY POLICY AND SUPPLIER RESPONSIBILITIES

Process Control:

HTNA Supplier Quality System Requirements reflect *IATF 16949:2016 Sec. 7.1.3.1 Plant, facility, and equipment planning.*

HTNA Clarification

As a rule, the supplier shall have the following minimum systems in place:

Written procedures that define the suppliers' Quality Management System (QMS) (at initial assessment).

Use of suitable production, installation, and servicing equipment and a clean environment to produce (at new program start).

A contingency plan shall exist explaining the course of action during emergency situations or machine failures (at the new program starts).

Compliance to standards, procedures, and quality systems (at initial assessment).

Control of product characteristics including special characteristics (at new program start).

A plan exists to identify, evaluate, and approve processes and equipment prior to production use including Run @ Rate (at new program start).

Quality standards shall be clearly understood and visible to the operator while performing the operation (i.e. – written standards, boundary samples, pictures, drawings, etc.) (at new program start).

Equipment/Tooling maintenance and repair shall be properly planned, performed, documented, and reviewed to ensure continuous process capability. Key components of machinery shall be made readily available to prevent excessive downtime and/or missed deliveries to HTNA/OEM (at new program start).

Process Monitoring and Operator Instructions:

HTNA Supplier Quality System Requirements reflect *IATF 16949:2016 Sec. 8.5.1.2 Standardized work - operator instructions and visual standards.*

HTNA Clarification

The supplier shall have documented process monitoring and operator instructions for all personnel who have responsibility for monitoring, controlling, and evaluating the process. These quality standards shall be clearly understood and available to the operator while performing the operation (i.e. – written standards, boundary samples, pictures, drawings, etc.). The supplier can use any form of documentation they believe conveys the appropriate control information to the operator; however, HTNA strongly believes that the addition of Operator Work Instruction Sheets *(see SQM Section 3-10 Operator Work Instruction Sheets)* can help dramatically improve quality and standardized work.

3-5 MISTAKE PROOFING (POKA-YOKE)

PURPOSE

To define the suppliers' ability to identify steps within the process that have the potential to produce nonconforming material and to put devices in place to prevent and monitor for recurrence.

EXPLANATION

Mistake Proofing (Poka-Yoke)

Poka-Yoke refers to the highly reliable devices or innovations that either detect abnormal situations before they occur at a production process or, once they do occur, will stop the machine or equipment, and thus prevent the production of defective products.

The idea behind mistake-proofing is to relieve some of the burden of the operators so that there is no need to double check previously inspected items. Poka-Yoke's can be implemented during the PFMEA, first run capability, and mass production stages as a continuous improvement (Kaizen) idea, however the sooner the Poka-Yoke can be identified in the development process the better. Remember the most effective systems are those that are simple, dependable, and affordable.

There are three main methods of Poka-Yoke's that can be used to control the process depending on the use, location, and/or cost. It is important to identify which method works best with the process and the systems that are already in place. The three different methods are as follows:

Prevention Detection Containment

The Poka-Yoke methods of prevention, detection, and containment can be further broken down into six separate methods to control them.

Listed below are the six methods of preventing defective material from being passed from one process step to the next.

Different size/staggered guide pins	Counters
Error detection and alarms	Sequence
Limit switches	Check list.

SUPPLIER RESPONSIBILITIES

Develop a system that allows employees to openly make suggestions to change that which may directly impact the method in which they perform their job (Kaizen). The system must be able to meet the following Poka-Yoke requirements:

Must prevent defects from getting by

The design must be based on actual processing conditions.

The devices should be economical.

The devices must be simple with long life and low maintenance.

Develop control mechanism that either prevents a mistake from being made or makes the mistake obvious immediately. One of the following Poka-Yoke Regulatory Functions must be in place:

Control Method: Halts operation until abnormality is corrected.

Warning Method: Alerts worker in the event of an abnormality

Develop a documented process to audit all the Poka-Yoke devices throughout the process. Identify known “no good” components and run them through the process to ensure that current Poka-Yoke systems are in place and are effective. Incorporate Poka-Yoke devices into a preventative maintenance schedule to evaluate wear or damage.

The Poka-Yoke device should provide at-the-source quality inspection with immediate feedback.

Must be able to eliminate the mass production of defective products and end-of-line quality inspection.

3-6 CONTROL PLAN

PURPOSE

To establish the development and submission requirements of a process control plan for HTNA that defines and controls the method of consistent production processes.

EXPLANATION

A process control plan is a chart compiled with processes and the systems that are used to control them. The process control plan is to be developed to aid in the manufacture of quality products according to

the requirements of HTNA or the OEM in the case of Trade sale components. This can be accomplished by using a structured approach to the design, selection, and implementation of value-added control methods. The process control plan is an important part of the overall quality system, it helps define and shape the quality processes that are required to produce quality products. Like most documents that control or monitor quality, this document is to be treated as living and thus shall be used to drive continuous improvement activities.

SUPPLIER RESPONSIBILITIES

Process Control:

HTNA Supplier Quality System Requirements reflect *ISO 9001:2015, IATF 16949:2016 Sec. 8.5.1 Control of production and service provision.*

HTNA Clarification

As a rule, the supplier at a minimum shall have systems in place that control, monitor, and evaluate the following:

Safety

Cleanliness (5S) – Plant Cleanliness and Order

Contingency Plan / Escalation

Records (i.e. – process, tooling, maintenance, etc.) Per the OEM record retention requirements.

Designation of Special Characteristics and their control

Tooling & Machines

Maintenance

Operator Work Instruction Sheets

Operator Training Matrix and Training Schedules

Process Control Plan:

HTNA Supplier Quality System Requirements match Control Plan first edition.

Suppliers shall use AIAG Control Plan book to develop the Process Control Plan.

The supplier should use the AIAG standard form or a format that closely resembles when submitting the control plan to HTNA *(see SQM Form HSF 3-6 Process Control Plan).*

A copy of the Process Control Plan (prototype or production) must be included with each submission.

The supplier shall have a process control plan for products that are intended for Production Validation (PV) using production equipment, tooling, or personnel. This document is a living document that can be changed up to the point of PPAP submission. **All changes made to the process after PPAP submission will require a Process Change Request (PCR) and a formal written response from HTNA.** ***(See SQM section 5-3 Process Change Request).***

If the supplier is unclear if the proposed change will require a PSW, they should consult with HTNA SQE/QE prior to any change.

The supplier must adequately identify all the revisions and the ability to explain the reasons for changes.

If the process for service parts differs from the production process, a separate process control plan must be created and identified. The supplier is not required to submit this document but must be able to produce it upon request.

The significant characteristics must be identified and controlled using statistical techniques. Per the RMIS. Raw Material Inspection Standard.

The control plan steps must match those of the PFMEA & Flow Diagram.

3-7 HANDLING, STORAGE, PACKAGING, PRESERVATION, AND DELIVERY

PURPOSE

The supplier shall have procedures in place for the handling, storage, packaging, preservation, and delivery of the product.

SCOPE

This applies to all suppliers of purchased production intent parts to HTNA.

EXPLANATION

The supplier is responsible for the handling, storage, packaging, preservation, delivery of product, and the steps it takes to meet those requirements.

SUPPLIER RESPONSIBILITIES

Handling:

HTNA Supplier Quality System Requirements *ISO 9001:2015, IATF 16949:2016 Sec. 8.5.4 Preservation.*

HTNA Clarification

The supplier shall have systems in place that define how material should be handled to prevent physical damage, and/or deterioration throughout the entire manufacturing process.

Storage:

HTNA Supplier Quality System Requirements *IATF 16949:2016 Sec. 8.5.4.1 Preservation.*

HTNA Clarification

The supplier shall have a designated storage area to prevent physical damage, deterioration, and/or unauthorized use pending the use or delivery of the product. Material is to be identified, and the inventory properly rotated to use the oldest material first, such as a FIFO (First in First Out) system.

Packaging:

HTNA Supplier Quality System Requirements reflect *IATF 16949:2016 Sec. 8.5.4.1 Preservation.*

HTNA Clarification

Suppliers will work with HTNA Purchasing to submit a packaging proposal during the quoting process. Trade sale suppliers will work with HTNA Purchasing, PC, and the OEM to develop the packaging. In-process and finished products shall be appropriately packaged to protect against damage. The packaging and its labeling shall meet HTNA/OEM requirements. HTNA specifies packaging which will meet applicable shipping laws, codes, and regulations.

Packing slips shall be attached to the carton exterior in shipping envelopes.

Each shipment shall include a packing list with the HTNA part number(s), quantity, date, purchase order number, number of boxes, HTNA name, address and gross weight as required. Shipment of product shipped under Engineering Change Notification (ECN), or process change request (PCR), approved deviation must be labeled as such. A note must be added to the exterior packaging notifying HTNA that the shipment contains the appropriate ECN, PCR, or Deviation Request and the HTNA contact name.

Preservation:

HTNA Supplier Quality System Requirements *IATF 16949:2016 Sec. 8.5.4.1 Preservation.*

HTNA Clarification

All material from the initial receipt to final production shall be preserved and segregated.

If segregation is not practical, the material or products shall be clearly identified throughout the various processes.

Each department shall be responsible for monitoring preservation and segregation to assure practices are maintained.

Delivery:

HTNA Supplier Quality System Requirements reflect *ISO 9001:2015 Sec. 8.5.5 Post-delivery activities.*

HTNA Clarification

Product, after final inspection and test, shall be protected against damage and deterioration from adverse conditions. Protection shall include delivery to destination.

“The supplier shall establish systems to support 100% on-time shipments to meet customer production and service requirements.”

Corrective actions shall be prepared and submitted to HTNA/OEM for all failures to meet delivery dates.

All material deliveries must meet the following compliance requirements:

On time Delivery

Agreed upon transportation used.

Correct packaging and labeling

The supplier's production scheduling activity shall be driven by HTNA daily delivery releases. Trade sale will follow the OEM forecast. If a daily release is not available, the 12-week forecast should be used. Any performance issues are documented by the Materials Group via a Delivery Trouble Report (DTR).

3-8 IDENTIFICATION AND TRACEABILITY

PURPOSE

To define the requirements for the identification and traceability of parts supplied to HTNA/OEM.

EXPLANATION

Identification:

This refers to the method in which the supplier can identify specific parts when a problem is identified. The identification method should be able to quickly provide all the information required to properly identify and relay the appropriate information. Such items include:

Label Identification (Part number, Date of manufacture, Lot number.)

Part Identification Material type, Regulation Marking per Drawing or Government Requirements

Cavity or Mold Number(s)

Traceability:

This refers to the method used to track an individual part through the supplier's entire process from raw material to shipping. Process parameters used to manufacture HTNA components should be traceable to the lot number with supporting inspection and testing documentation. This documentation must be accessible when asked for by HTNA.

SUPPLIER RESPONSIBILITIES

General:

HTNA Supplier Quality System Requirements reflect *ISO 9001:2015, IATF 16949:2016 Sec. 8.5.2 Identification and traceability.*

HTNA Clarification

Identification:

The supplier shall have a tracking system that identifies all raw materials as well as finished goods. This system of identification shall match the requirements of HTNA/OEM, the part drawing, and/or government regulations. In most cases HTNA at a minimum requires parts to be identified by tooling, material, and/or cavity numbers.

Special approval markings may be required by HTNA/OEM to be added to each assembly for such cases as production, evaluation, quality control, or approved deviation. Special approval markings are to be captured on the Standardized Work Instruction (SWI) and the control plan as applicable.

Traceability:

The supplier must ensure that documented systems are in place to control the traceability of all materials throughout the entire production process and after shipping.

Process parameters used to manufacture HTNA components should be traceable with supporting inspection and testing documentation. This documentation must be accessible when asked for by HTNA.

The supplier must ensure that documented systems are in place at all sub-suppliers to control the traceability of all materials throughout their entire production process.

The Supplier is responsible to verify the sub supplier traceability per the HTNA/OEM requirements.

3-9 RAW MATERIAL INSPECTION STANDARD (RMIS)

PURPOSE

To define the requirements for properly developing, reviewing, revising, and submitting the inspection standards used to properly validate and control material.

EXPLANATION

The inspection standard is a method used that defines the critical characteristics, criteria, inspection method, inspection instrument, and frequency by which the part should be routinely evaluated. Many critical or significant characteristics such as governmental requirements shall be incorporated into the Process Control Plan to ensure part conformance.

The Raw Material Inspection Standard (RMIS) is to be developed by the supplier during the design phase and in conjunction with the design and development of the check fixture *(if applicable)* and tooling. For those items which are directly supplied *(See SQM Section 6-1 Control of Customer-Supplied Product)* HTNA will provide inspection standards adequate to the quality requirements. Trade sale will work with HTNA/OEM for Inspection standard development. Inspection standards developed by HTNA will be

required to undergo the same continuous evaluations at each submittal prior to Start of Production (SOP).

These standards initially provide the method by which to evaluate the component and shall be reviewed during each pilot and production build. The results of the inspected parts are to be summarized on a Part Sample Data Sheet *(See SQM Section 4-3 Part Sample Data Sheet)* and attached to the Part Submission Warrant (PSW) along with sample parts for approval.

SUPPLIER RESPONSIBILITIES

The supplier is responsible for developing a standardized method for the inspection of material. The supplier is to use the format contained within this section or must negotiate with the responsible HTNA SQE/QE to determine other acceptable methods of documenting the inspection standard.

HTNA will issue a formal request to the supplier during the design phase requesting them to begin developing the Raw Material Inspection Standard (RMIS). The supplier is to complete this form and return it to HTNA to show acceptance. HTNA will maintain the original on file.

At a minimum the Raw Material Inspection Standard (RMIS) must define the following:

Datum	Material
Dimensions and tolerances	Appearance
Inspection instrument/gages	Function
Performance	Color

Weight

Special Inspection Requirements (governmental requirements, etc.)

Identification Method

The Raw Material Inspection Standard (RMIS)s draft should be submitted prior to off-tool trial. HTNA will review the draft and comment on any potential changes that may be required prior to the next submittal.

The final standard must identify the current revision of submission and be signed by all appropriate personnel on each sheet. All originals will be returned to the supplier, and a copy will be kept for HTNA records.

Each change that is required to the Raw Material Inspection Standard (RMIS) shall be negotiated between the supplier and the responsible HTNA QE.

At the issuance of an Engineering Change Notification (ECN) from HTNA, the supplier is to make the appropriate changes to the Raw Material Inspection Standard (RMIS) as well as other documents and methods of control that make up the quality system (i.e. – process control plan, sample data sheets, PFMEA, check fixtures, etc.). The supplier is responsible for keeping an accurate record of all implemented changes to the Raw Material Inspection Standard (RMIS) and why the revision was made.

HTNA reserves the right to request changes to the Raw Material Inspection Standard (RMIS) at any time based on the following:

A required change to meet the drawing specifications.

Changes based on the results of capability studies.

Engineering Change Notification (ECN)

Continuous improvement request to improve initial part quality.

HTNA must be notified and approve the implementation date of all revisions.

For any reason that an Inspection Standard requirement may differ from that of a controlled drawing, the more stringent of the two requirements shall apply. If either the drawing or the inspection standard cannot be met then the supplier and HTNA QC/QE must negotiate, with the HTNA team determining the final decision.

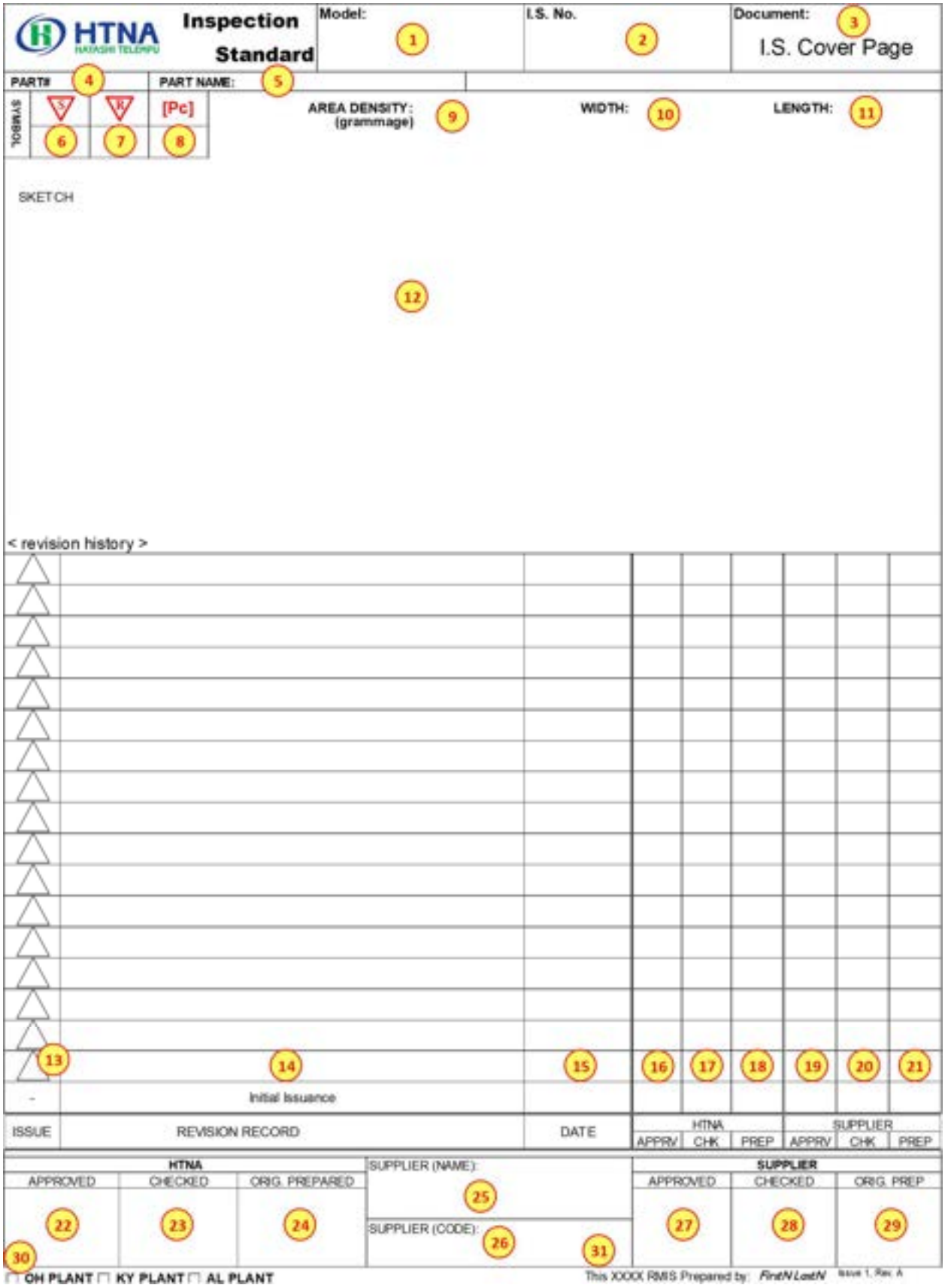
CAD data is the master to be used for items not called out on the drawing or RMIS.

The inspection frequencies that are called out on the inspection standard are to be only understood as minimum requirements. Suppliers must define all inspection requirements in their documented control plan. The supplier must take steps to ensure that nonconforming material is not shipped to HTNA.

The following charts and forms referenced on the following pages are to be used by the supplier to meet the requirements of this section.

PROCEDURE FOR WRITING A RAW MATERIAL INSPECTION STANDARD (RMIS)

The Raw Material Inspection Standard (RMIS) consists of two separate sections. The first section is the cover/title page which contains a picture/drawing of the part, defines the datums, identifies inspection locations, and denotes the level of the standard. The second section is that of the body which provides the methods, tools, and frequency by which to inspect. The following will explain the methods by which to complete a Raw Material Inspection Standard (RMIS).



HTNA HAYASHI TELEMPU **Inspection Standard**

Model: (1)	I.S. No. (2)	Document: (3)
		I.S. Cover Page

PART# (4) | PART NAME: (5)

SYMBOL			
	(6)	(7)	[Pc] (8)

AREA DENSITY: (grammage) (9) | WIDTH: (10) | LENGTH: (11)

SKETCH

(12)

< revision history >

	ISSUE (13)	REVISION RECORD (14)	DATE (15)	HTNA APPRV (16)	HTNA CHK (17)	HTNA PREP (18)	SUPPLIER APPRV (19)	SUPPLIER CHK (20)	SUPPLIER PREP (21)
-	-	Initial Issuance							

HTNA APPROVED (22)	HTNA CHECKED (23)	HTNA ORIG. PREPARED (24)	SUPPLIER (NAME): (25) / SUPPLIER (CODE): (26)	SUPPLIER APPROVED (27)	SUPPLIER CHECKED (28)	SUPPLIER ORIG. PREP (29)

(30) ☐ OH PLANT ☐ KY PLANT ☐ AL PLANT

This XXXX RMIS Prepared by: First\N Last\N Issue 1, Rev. A (31)

RMIS FORM INSTRUCTION

FORM NAME: I.S. Cover Page

USE: To be used as the inspection standard cover sheet (visible to the supplier).

Circle 1:	Enter the model code applicable for the part as referenced on the part drawing. (e.g., 051A, 2GA, etc.)
Circle 2:	Enter the Inspection Standard number that is assigned internally.
Circle 3:	Enter "I.S. Cover Page" in this box.
Circle 4:	Enter the part number. This should be the supplier stock number as assigned to this part.
Circle 5:	Enter the part name describing the part covered in the I/S.
Circle 6:	Enter the number of Delta-S (Safety) items that are contained within the I.S.
Circle 7:	Enter the number of Delta-R (Regulation) items that are contained within the I.S.
Circle 8:	Enter the number of [Pc] (designated control characteristic or capability) items that are contained within the I.S.
Circle 9:	Enter the grammage (area density) specification if applicable (gsm)
Circle 10:	Enter the width specification if applicable (mm)
Circle 11:	Enter the length specification if applicable (mm or m)
Circle 12:	Place a basic sketch of the part with this area. If part has a CF gauge then part datums sketches should be included.
Circle 13:	Enter the delta change number. This will capture all changes to the part. Use number and increment by 1. Use handwritten blue ink to update the original document.
Circle 14:	Description of the revision(s) being made. Use handwritten blue ink to update the original I/S.
Circle 15:	Enter the date the I/S was modified to reflect the change. Use handwritten blue ink to update the original document.
Circle 16:	The signed initials of the person approving the I/S original within HTNA. Use handwritten blue ink to update the original I/S.
Circle 17:	The signed initials of the person who checked the I/S original within HTNA. Use handwritten blue ink to update the original I/S.
Circle 18:	The signed initials of the person who prepared the I/S original within HTNA. Use handwritten blue ink to update the original I/S.
Circle 19:	The signed initials of the person who approved the I/S original within the supplier organization. Use handwritten blue ink to update the original document.
Circle 20:	The signed initials of the person who checked the I/S original within the supplier organization. Use handwritten blue ink to update the original document.
Circle 21:	The signed initials of the person who prepared the I/S original within the supplier organization. Use handwritten blue ink to update the original document.
Circle 22:	Signature of the person approving the I/S original within HTNA. Use handwritten blue ink.
Circle 23:	Signature of the person who checked the I/S original within HTNA. Use handwritten blue ink.
Circle 24:	Signature of the person who prepared the I/S original within HTNA. Use handwritten blue ink.
Circle 25:	Enter the name of the supplier who produces the part.
Circle 26:	Enter the supplier code of the supplier who produces the part.
Circle 27:	Signature of the person approving the I/S original within the supplier org. Use handwritten blue ink.
Circle 28:	Signature of the person who checked the I/S original within the supplier org. Use handwritten blue ink.
Circle 29:	Signature of the person who prepared the I/S original within the supplier org. Use handwritten blue ink.
Circle 30:	Check box that reflects the plant that the supplier is shipping to.
Circle 31:	Notation indicating who actually prepared the original document.

HTNA HAYASHI TELEMPU	Inspection Standard	Model: 999A	I.S. No. 999A-RM-KY-001	Document: I.S. Cover Page

PART# 10105667 PART NAME: CARPET FACE

SYMBOL	▽S	▽R	[Pc]
	1	1	4

AREA DENSITY: (grammage) 250 g/m² WIDTH: 1,820 mm LENGTH: 120 m

SKETCH

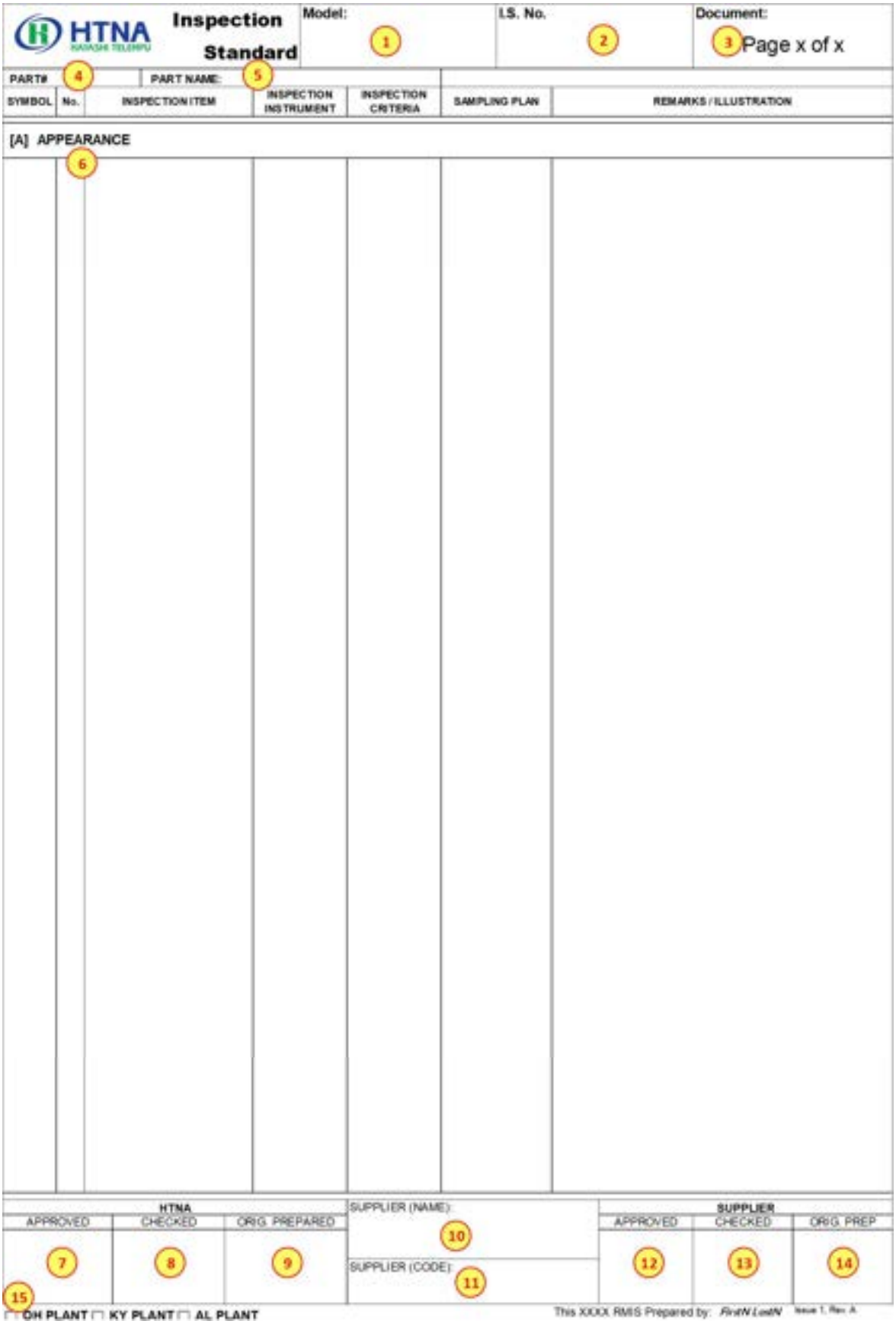
< revision history >

ISSUE	REVISION RECORD	DATE	HTNA APPRV	HTNA CHK	HTNA PREP	SUPPLIER APPRV	SUPPLIER CHK	SUPPLIER PREP
2	Changed roll width tolerance from ±12mm to -0/+25mm	11/4/2013	CDT	AMT	MKR	MW	ELF	HRG
1	Fixed typo on color number	7/29/2013	CDT	AMT	MKR	MW	ELF	HRG
-	Initial Issuance	5/26/2013	CDT	AMT	MKR	MW	ELF	HRG

HTNA APPROVED	HTNA CHECKED	HTNA ORG. PREPARED	SUPPLIER (NAME): XYZ Supplier	SUPPLIER APPROVED	SUPPLIER CHECKED	SUPPLIER ORG. PREP
FirstN LastN	FirstN LastN	FirstN LastN		FirstN LastN	FirstN LastN	FirstN LastN
5/30/2013	5/29/2013	5/26/2013	SUPPLIER (CODE): 50051234	5/26/2013	5/27/2013	5/26/2013

☐ OH PLANT ☑ KY PLANT ☐ AL PLANT

This 999A RMS Prepared by: John Doe Issue 1, Rev. A



HTNA HAYASHI TELEMPU **Inspection Standard**

Model: (1) | I.S. No. (2) | Document: (3) Page x of x

PART# (4) | PART NAME: (5)

SYMBOL	No.	INSPECTION ITEM	INSPECTION INSTRUMENT	INSPECTION CRITERIA	SAMPLING PLAN	REMARKS / ILLUSTRATION
[A] APPEARANCE (6)						

HTNA			SUPPLIER (NAME): (10)	SUPPLIER		
APPROVED	CHECKED	ORIG. PREPARED		APPROVED	CHECKED	ORIG. PREP
(7)	(8)	(9)	SUPPLIER (CODE): (11)	(12)	(13)	(14)

(15) ☐ OH PLANT ☐ KY PLANT ☐ AL PLANT

This XXXX RMS Prepared by: RnHW LeatN Issue 1, Rev. A

RMIS FORM INSTRUCTION

FORM NAME: **I.S. Body**

USE: **To be used for detailing the part requirements (visible to the supplier).**

Circle 1: Enter the model code applicable for the part as referenced on the part drawing. (e.g., 051A, 2GA, etc.)

Circle 2: Enter the Inspection Standard number that is assigned internally.

Circle 3: Enter the page number out of the number of pages. The cover sheet is page 1 and the first page of the body is page 2.

Circle 4: Enter the part number. This should be the supplier stock number as assigned to this part.

Circle 5: Enter the part name describing the part covered in the I/S.

Circle 6: The body of the I/S shall be divided into 3 sections:

[A]. Appearance - this section defines the appearance quality of the part. Aesthetic characteristics, color, and other visual control items (such as missing parts) are specified here.

Can be visual inspection for these items. If the check method requires an additional gage check if the initial visual check fails, the gage must be listed as an inspection instrument.

Symbol: Column reserved for Delta-S, Delta-R, [Pc] and Delta change number items.
No: Item number assigned to the applicable appearance attribute
Inspection Item: Should briefly describe the appearance characteristic to be controlled.
Inspection Instrument: Usually visual inspection for these items.
Inspection Criteria: Should define judgment for the acceptable limit of the inspection item. If a boundary sample is used to define the limits for an inspection item, it should be noted in this column as "per boundary sample".
Sampling Plan: The normal supplier sampling requirements for appearance items is 100%. Frequencies other than this should be determined based on the capability of the supplier to control this type of nonconformance.
Remarks/Illustrations: Should be used to add comments or illustration. For color, the appropriate Color Master Number should be referenced in this column.

[B]. Dimensions - this section defines the key dimensions that must be controlled on the part to assure the completed vehicle **fit** and **function**. The writer of the I/S will determine which part dimensions are to be included by reviewing the part drawing and the tolerances, and then compare the design intent. Some examples of key dimensions are:

1. Datum size and location
2. Design tolerance (geometric or those with a tolerance specified on the part drawing)
3. Process tolerance (those needed specifically for processing)
4. Dimensions of surfaces relating to mating parts for fit, function and appearance.

* The I/S cannot be used to change the Dimension or Tolerance that is called out on the drawing. It can, however, be used to change the process tolerance, appearance items, etc. as necessary to control part function.

Symbol: Column reserved for Delta-S, Delta-R, [Pc] and Delta change number items.
No: Item number assigned to the applicable dimensional attribute. Number should clearly correspond to a sketch showing the detailed measurement location for the dimension specified.
Inspection Item: Should briefly describe the dimension characteristic to be controlled.
Inspection Instrument: This can be identified as scale, gauge, check fixture, etc.
Inspection Criteria: Should define judgment for the acceptable limit/tolerance of the inspection item.
Sampling Plan: The normal supplier sampling requirements for dimensional items is 1st article, first piece at start-ups. Items marked [Pc] may require a higher frequency of checks and/or capability studies.
Remarks/Illustrations: Should be used to add comments or illustration. A close up sketch of the dimensional item.

[C]. Performance - this section defines any functional, reliability or material characteristic of the part.

Some examples of performance items include:

1. Movement and function of part mechanisms
2. Related functional durability testing
3. Part corrosion performance
4. Regulation conformance testing
5. Material specifications
6. Flammability testing
7. Heat shrinkage
8. Taber Abrasion
9. Rigidity
10. Tensile / Elongation
11. Tensile / Elongation after heat age
12. Rate of Change in Gage Length
13. Glass Fogging
14. Color Fastness
15. Peel strength
16. and more….

* The I/S cannot be used to change material / performance specification that is called out on the drawing. It can, however, be used to add additional items as necessary to control part function.

Symbol:

No: Item number assigned to the applicable performance/material attribute.

Inspection Item: as defined in the part drawing or specification sheet.

Inspection Instrument: Briefly describe the equipment to be used to confirm the material performance characteristic.

Inspection Criteria: Should define judgment for the acceptance for this inspection item.

Sampling Plan: Defines the frequency of submitting test results to HTNA (both initial and conformance testing).

Remarks/Illustrations: Should be used to add special comments or illustration to further explain the related material performance inspection item.

Circle 7:	Signature of the person approving the I/S original within HTNA. Use handwritten blue ink.
Circle 8:	Signature of the person who checked the I/S original within HTNA. Use handwritten blue ink.
Circle 9:	Signature of the person who prepared the I/S original within HTNA. Use handwritten blue ink.
Circle 10:	Enter the name of the supplier who produces the part.
Circle 11:	Enter the supplier code of the supplier who produces the part.
Circle 12:	Signature of the person approving the I/S original within the supplier org. Use handwritten blue ink.
Circle 13:	Signature of the person who checked the I/S original within the supplier org. Use handwritten blue ink.
Circle 14:	Signature of the person who prepared the I/S original within the supplier org. Use handwritten blue ink.
Circle 15:	Check box that reflects the plant that the supplier is shipping to.

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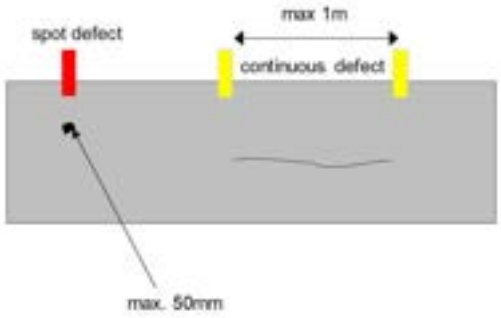
PART# 10105667 PART NAME: CARPET FACE

SYMBOL	No.	INSPECTION ITEM	INSPECTION INSTRUMENT	INSPECTION CRITERIA	SAMPLING PLAN	REMARKS / ILLUSTRATION
[A] APPEARANCE						
	1	Contamination	Visual	Allowed with Flag	Continuous	
	2	Dirt	Visual	Allowed with Flag	Continuous	
	3	Pile Distortion	Visual	Allowed with Flag	Continuous	
	4	Wrinkles	Visual	Allowed with Flag	Continuous	
	5	Color	Lab Equipment	Per Master ΔE + 1.0 to Master	Continuous Once per lot & As requested	Color Masters: Black (CRX54321) Grey (DRX46123) * Lot to Lot Variation cannot exceed ± 0.5 DE
	6	Torn	Visual	Allowed with Flag	Continuous	
	7	Foreign Fiber	Visual	Allowed with Flag	Continuous	
	8	Roll up Wrinkles	Visual	Allowed with Flag	Continuous	
	9	Needle Tracks	Visual	Allowed with Flag	Continuous	
	10	Metal	Metal Detector	Not Allowed	Continuous	
	11	Seams	Visual	Allowed with Flag	Continuous	
	12	Stop / Start marks	Visual	Allowed with Flag	Continuous	
	13	Thin spots	Visual	Allowed with Flag	Continuous	
	14	Crushed Core	Visual	Allowed with Flag	Continuous	
	15	Face Direction	Visual	Inside of Roll	Once per Roll	
	16	Nap Direction	Visual	Per Diagram	Once per Roll	
	15	Face Direction	Visual	Inside of Roll	Once per Roll	
	16	Nap Direction	Visual	Per Diagram	Once per Roll	
	17	Defect Marking Allowance	Visual	Each Defect Marking allotted 1.0 meter A max of 3 defects per roll	Once per Roll	* 2 yellow flags (start and stop) is equal to one defect

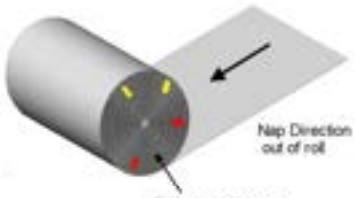


ex. Red Velcro for spot defect marking.

Use 4" Velcro Minimum 2" from edge

* Spot defect on carpet to be flagged with a red velcro

* Continuous defect on carpet is to be flagged with yellow velcro at beginning of defect and end of defect (max 1m)



HTNA APPROVED	HTNA CHECKED	HTNA ORIG. PREPARED	SUPPLIER (NAME): XYZ Supplier	SUPPLIER APPROVED	SUPPLIER CHECKED	SUPPLIER ORIG. PREP
FirstN LastN	FirstN LastN	FirstN LastN	SUPPLIER (CODE): 50051234	FirstN LastN	FirstN LastN	FirstN LastN
5/30/2013	5/29/2013	5/26/2013		5/28/2013	5/27/2013	5/26/2013

☐ OH PLANT ☑ KY PLANT ☐ AL PLANT

This 999A RMS Prepared by: John Doe Issue 1, Rev. A

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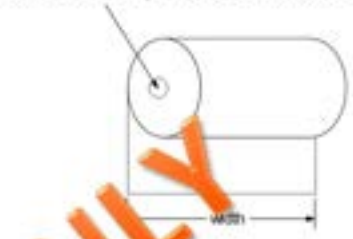
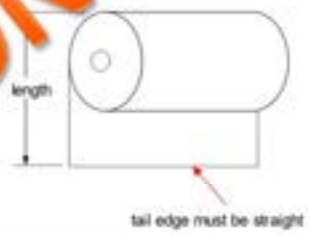
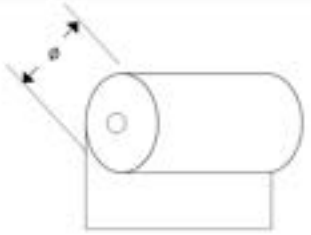
PART# 10105667 PART NAME: CARPET FACE

SYMBOL	No.	INSPECTION ITEM	INSPECTION INSTRUMENT	INSPECTION CRITERIA	SAMPLING PLAN	REMARKS / ILLUSTRATION
[B] DIMENSIONS						
[Pc] △7	1	Roll Width	Tape Measure	1,820mm - 0 mm 1,820mm + 25 mm	Once per roll after Heat Through	core 4" diameter heavy wall (must be flush or recessed up to 15mm 
[Pc]	2	Roll Length	Clock Gage	120 m - 0 m 120 m + 1 m * Length including Flags	Once per roll after Heat Through	
	3	Roll Diameter	Tape Measure	280 mm	Once per roll after Heat Through	
	4	Oscillation ("snaking")	Tape Measure	Target is zero Keep < 15mm	Continuous	
	5	Seam	Scale	Offset max 6 mm	Each Seam	
[Pc]	6	Area Density (grammage)	Lab Equipment	250 g/m² ± 10%	Once per roll after Heat Through	Polyethylene Terephthalate (Polyester) with 100% PET fiber
[Pc]	7	Thickness	Lab Equipment	3.50 mm ± 0.25	Once per roll after Heat Through	HIS- L-XXXXX standard * method 7.2

HTNA APPROVED	HTNA CHECKED	HTNA ORG. PREPARED	SUPPLIER (NAME): XYZ Supplier	SUPPLIER APPROVED	SUPPLIER CHECKED	SUPPLIER ORG. PREP
FirstN LastN	FirstN LastN	FirstN LastN	SUPPLIER (CODE): 50051234	FirstN LastN	FirstN LastN	FirstN LastN
5/30/2013	5/29/2013	5/26/2013		5/28/2013	5/27/2013	5/26/2013

☐ OH PLANT ☑ KY PLANT ☐ AL PLANT This 999A RMIS Prepared by: John Doe Issue 1, Rev. A

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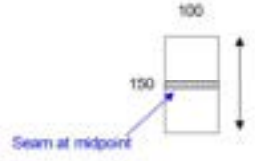
PART# 10105667 PART NAME: CARPET FACE

SYMBOL	No.	INSPECTION ITEM	INSPECTION INSTRUMENT	INSPECTION CRITERIA	SAMPLING PLAN	REMARKS / ILLUSTRATION
[C] PERFORMANCE						
▽	1	Flammability	Lab Equipment	< 60 mm / minute	initial PPAP & once per lot **submissions:** 2x per year (end of Jan) and (end of July)	reference TSM0500-G
	2	Tensile Strength (N/25.4mm)	Lab Equipment	MD 400 ± 100 AMD 450 ± 100	initial PPAP & once per lot **submissions:** 1x per year (end of July)	reference HIS-L-XXXXX
	3	Tear Strength (N)	Lab Equipment	MD 65 ± 20 AMD 65 ± 20	initial PPAP & once per lot **submissions:** 1x per year (end of July)	reference HIS-L-XXXXX
	4	Dimensional Change Rate After Heating (%)	Lab Equipment	MD ±2.5 AMD ±2.5	initial PPAP & once per lot **submissions:** 1x per year (end of July)	reference HIS-L-XXXXX Table 6
	5	Tensile Strength After Heating Elongation at 30% (N/25.4mm)	Lab Equipment	MD 150 ± 50 AMD 150 ± 50	initial PPAP & once per lot **submissions:** 1x per year (end of July)	reference HIS-L-XXXXX Table 9
	6	Rigidity, Glass Fogging, Smell, Color Fastness	Lab Equipment	Report Results	initial PPAP & as requested	reference HIS-L-XXXXX Table 10, 11.2
	7	Seam Tensile Strength (N/25.4 mm)	Lab Equipment	Must Exceed Material Tensile Performance	initial PPAP **submissions:** 1x per year (end of July)	reference HIS-L-XXXXX 

HTNA APPROVED	HTNA CHECKED	HTNA ORG. PREPARED	SUPPLIER (NAME): XYZ Supplier	SUPPLIER APPROVED	SUPPLIER CHECKED	SUPPLIER ORG. PREP
FirstN LastN	FirstN LastN	FirstN LastN	SUPPLIER (CODE): 50051234	FirstN LastN	FirstN LastN	FirstN LastN
5/30/2013	5/29/2013	5/26/2013		5/28/2013	5/27/2013	5/26/2013

☐ OH PLANT ☑ KY PLANT ☐ AL PLANT This 999A RMS Prepared by: John Doe Issue 1, Rev. A

3-10 OPERATOR WORK INSTRUCTIONS

PURPOSE

To define the expectations and provide the suppliers with the necessary tools for developing visual aids that shall be accessible to the employee during the manufacturing process.

EXPLANATION

Operator Work Instructions are defined as those items that are used by employees to help explain the standards for quality, assembly, processing, and inspection. These instructions are to be visual to the employee during the manufacturing process, easily legible (pictures are best), understood by all, and clearly define a "good" product.

Work that organizes human tasks and creates efficient production without any MUDA* is considered Standardized Work. Once the most efficient sequence has been determined, it is always repeated in the same manner time after time, operator after operator. In addition to promoting quality and efficiency, Standardized Work avoids wasted motion, effort, and machine damage. The most important aspect of Standardized Work is the fact that it will promote a safer work environment.

MUDA – Simply put Muda means waste; however, there are seven different types:

Manufacturing defects	Processing	Waiting
Over Production	Inventory	
Conveyance	Motion	

To develop consistent work from one operator to another it is important to develop what is known as Standardized Operator Work Instructions. These instructions are made up of three basic elements:

TAKT Time – Used to develop work instruction steps that make sure cycle time and capacity requirements are achieved.

Work Sequence – The step-by-step elements required to produce a part.

Special, Significant and Critical Characteristics- Regulatory and/or process/product critical characteristics and their control method(s).

SUPPLIER RESPONSIBILITIES

Operator Work Instructions:

Operator Work Instructions help to further define the actual process and can be used in several ways to effectively communicate the requirements of the process.

Operator Work Instructions are to be controlled documents and thus require revision at any change that affects them. The instructions are to be placed directly at the point of operation. Old versions must be removed and made unusable.

Significant, Critical and Special Characteristics shall be called out in the Work Instructions and shall use the symbols as defined on the 2D Drawing and/or RMIS.

The instruction sheets should include as many pictures as possible and denote “good” from “no good”.

Operator Work Instructions can be used to communicate any need that may be required for the operator to perform the task. The following are some examples that may require additional Operator Work Instructions:

Quality	Processing
Appearance	Inspection
Assembly	Detailed instructions

3-11 PRODUCTION VALIDATION

PURPOSE

To define the methods by which the supplier plans to submit parts for design and production level approvals.

EXPLANATION

Production Validation (PV) builds are methods by which both the supplier and HTNA can confirm and validate the processes. Trade sale will work with HTNA and the OEM directly.

PV build timing will be dictated by HTNA and its customers, the supplier is to help support these builds.

The Production Validation (PV) build is to determine if the supplier’s process can produce consistent product while meeting the demands of the specifications during an actual production run at the quoted production rate. The PV build must be performed using sub-supplier PPAP approved material and production level equipment and validate the process with a Run @ Rate study. HTNA will evaluate and confirm the results of the PV build by submitting the production-built parts to Production Validation Testing (PVT). The results of the PVT will be provided to the supplier. Additional tuning requests may be required to ensure proper fit, function, and workability.

HTNA strongly recommends to all suppliers that they perform additional production runs to eliminate the potential for unforeseen issues prior to the PV build.

The supplier is required to submit requests for approval using the standard Part Submission Warrant (PSW) form for both the Design Validation (DV) and the Production Validation (PV) level builds and all other agreed submission levels.

SUPPLIER RESPONSIBILITIES

Production Validation (PV):

The idea behind the PV build is to have the supplier be able to produce final products that meet the following requirements:

Run @ Rate *(See SQM Section 4-1 Run @ Rate)*

All components used by the supplier have been PPAP approved.

All parts are manufactured off production level tooling/equipment at both the supplier and subcontractor.

All parts are inspected using production level fixtures at both the supplier and subcontractor.

Properly trained production employees at both the supplier and subcontractor.

The intent of the PV build is to run the process as close as possible to the actual process without being in full production and determine if the process can produce parts that meet both capacity and capability requirements.

The PV is a required part of the Production Part Approval Process (PPAP) and the results must be submitted as part of the PPAP submission *(See SQM Section 4-9 Production Part Approval Process)*.

The supplier is to submit a Part Submission Warrant as part of the PPAP submission. HTNA may provide only provisional approval at this level until all production and quality requirements have been met *(See SQM Section 4-9 Production Part Approval Process)*.

The supplier shall develop an evaluation plan that is consistent with *SQM Section 4-2 Part Evaluation Plan.*

SECTION 4: PRODUCT AND PROCESS VERIFICATION

4-1 OFF PROCESS TRIAL: RUN @ RATE & PROCESS CAPABILITY

PURPOSE

This section is to define the procedure for conducting LVPT's and HVPT's (Low/High Volume Production Trials) including Run @ Rate and Process Capability verification.

EXPLANATION

The goal of the Run @ Rate study is to identify potential quality and/or productivity problems and put countermeasures in place to prevent these issues from further developing prior to the Start of Production (SOP). This study is to be completed during Production Validation (PV) and submitted as part of the PPAP. The results and timing of this study should be such that adequate time for improvement and confirmation of countermeasures is allotted.

SUPPLIER RESPONSIBILITIES

The supplier shall be responsible for completing the Run @ Rate study as per the supplier's timing plan. The study must be completed prior to PPAP submittal and allow enough time to react to potential problems that may arise. Trade sale will work with HTNA and the OEM directly.

In some cases, HTNA will request to be present during the Run @ Rate study, the supplier is to coordinate with HTNA Purchasing Development for the specific dates.

The supplier is to perform a Run @ Rate study to verify results, identify problems, and countermeasures.

If any issues with achieving Run @ Rate shall be reported to HTNA Purchasing immediately.

Manufacturing Process – Actual to Plan: The Run @ Rate study shall represent the mass production process. The production method must be the same as used during mass production, including the mass production line speed (Takt Time). The process is to flow exactly as called out in the Process Control Plan and follow each step in the correct order. The supplier is to perform the study using the following:

Production Tooling/Equipment/Jigs/Gages *(Each machine, production controls, die, mold cavity, etc. must be validated)*

Production Facilities

Production Level Material

Standardized work

Trained Production Personnel from all shifts that will be used for mass production

Manufacturing Capacity Results: The following is to be verified while the process is running:

The process meets the quoted capacity.

The tooling meets the quoted output and quality expectations.

Changeovers do not prevent the process from meeting the quoted capacity.

Scrap or rework levels do not prevent the process from meeting the quoted capacity.

NOTE: The supplier shall consider safety, workability, and ergonomic issues as issues that directly affect part quality and capacity.

Part Quality – Actual to Plan: The following shall be certified/approved and in place prior to the Run @ Rate study:

Check fixtures and Gages (GRR data available)

Inspection instructions / visual aids

Process Control Plan and statistical control techniques

Effective means for containment and corrective action

Part Quality Results: The following shall be verified while the process is running:

The process is continuously improved to meet the expectations of on-going quality.

The process is verified to be in control.

The Process Control Plan accurately captures all aspects of testing to ensure part quality.

Non-conformances are identified and corrected using a standard 8D/5WHY format and verified against the PFMEA for failure modes.

NOTE: Parts that pass all requirements of Run @ Rate are to be considered good, shippable parts and should be treated as such bearing no additional Engineering Change Orders (ECO's) or if additional tuning is required. These parts can be used for initial line fill requirements for HTNA. Parts that have been rejected are to be reviewed and approved by HTNA QE/QC before they can be included in the finished goods inventory. These parts shall be identified as Run @ Rate parts.

Sub-Supplier Requirements: The following must be certified/approved and in place prior to the Run @ Rate study:

A Run @ Rate or similar study was conducted at the sub-supplier level to verify quality and capacity.

Sub-supplier material used for supplier Run @ Rate is from verified Run @ Rate lot.

Systems have been established to verify all material prior to use.

Packaging & Handling: The following shall be certified/approved and in place prior to the Run @ Rate study:

Internal and external (shipping) packaging has been verified to ensure part quality and operator ergonomics.

The Supplier shall have a system developed to reduce the error for mixed stock.

If the supplier is unable to obtain the desired rates for the Run @ Rate study, they must notify HTNA Buyer, Program Manager, and Quality Engineer immediately and include a plan for achieving the target production levels.

Process Capability

Process capability studies as designated in the RMIS are to be conducted during Run @ Rate trials.

The significant characteristics [Pc] are to be used on an ongoing basis to generate long term (CPK) capability studies and drive continuous improvement activities. The results of these capability studies are to be made available to HTNA upon request.

Capability studies are affected by Engineering Change Notices (ECN's), Process Change Request (PCR), or changes to dimensional tolerances. Changes require additional capability studies for process verification.

The supplier is to follow the AIAG capability requirements for both PPK (1.67) and CPK (1.33)

4-2 PART EVALUATION PLAN

PURPOSE

To define the expectations of the supplier for identifying the testing and timing requirements for each level of part submission.

EXPLANATION

The Part Evaluation Plan is developed by the supplier to specify, organize, and schedule the appropriate resources to meet the part submission requirements designated by HTNA. The goal of this plan is to validate the conformance of the parts as compared to the drawing and inspection standards. The components are to be verified to a specified level prior to each part submission. Typically, full component testing will only be required for Design and Production Validation, but minimal testing requirements may be negotiated between HTNA QC and the supplier during other part submission levels. Trade sale will work with HTNA and the OEM directly.

SUPPLIER RESPONSIBILITIES

The supplier must develop a system to identify the necessary testing requirements, the resources involved, and the time required to meet each part submission level.

The following are typical methods used to validate components:

Material Certification	Color and finish *(if applicable)*
Dimensional	Weight
Visual/Appearance	Other
Performance (Reliability/Durability)	

The Plan should incorporate the following:

Drawing/Inspection Standard specifications

Test Location – In-house, different company facility, outside testing facility performing test (Test facilities must be compliant with *SQM Section 4-4 Inspection and Testing*.

Test size – quantity of parts required for testing out of total parts produced. (a minimum of 3 parts per process and cavities are required for testing at all levels unless otherwise negotiated between HTNA QC and the supplier or that which is determined by a defined test specification)

NOTE: Components that have been affected by an Engineering Change (ECI), supplier Part Submission Warrant, and/or quality improvements requests (QIR/PCR) require parts to be tested and verified to an agreed upon Part Evaluation Plan. However, cases where components can be verified by only testing the affected changed characteristic will need prior authorization from HTNA QC for confirmation of testing required.

The scheduled start and completion dates are to be noted along with the actual status of the testing.

A section shall exist that defines the results of the evaluation for each level of part submission.

The Part Submission Plan shall be submitted as defined by the supplier on the Supplier Advanced Quality Planning Schedule (SAQPS) and in accordance with the requirements of HTNA.

Along with the Part Submission Plan, all supporting data and the appropriately identified parts must accompany each part submission level. All data is to be incorporated onto a Part Sample Data Sheet *(see SQM Section 4-3 Part Sample Data Sheets & Part Submission Requirements)* that states the requirement and the actual results for each unit tested. The format and test requirements of the Part Sample Data Sheet must be approved by HTNA prior to submission. The results are to be summarized and clearly identifiable for each data point. Results are typically stated as:

meets requirement

meets requirement but needs improvement

does not meet the requirements

At the time of the part submittal, if any characteristic of a component that fails to meet the requirements of the drawing and inspection standard, the supplier will be required to provide corrective actions and appropriate timing for future part submissions.

All significant and process control characteristics, inspection requirements, and governmental regulations must be identified and verified on the Part Sample Data Sheet.

HTNA QC will review the Part Evaluation Plan with the supplier prior to testing to determine if all requirements of HTNA and their customers are covered.

4-3 PART SAMPLE DATA SHEETS & PART SUBMISSION REQUIREMENTS

PURPOSE

To define the procedure for evaluating and submitting parts.

SCOPE

This applies to all prototype and production sample parts.

EXPLANATION

The supplier is responsible for submitting parts to HTNA for the confirmation of part quality and supplier readiness as requested by HTNA. Trade sale will work with HTNA and the OEM directly.

This applies to all parts that are submitted to HTNA for review for the following circumstances:

Prototype builds *(as requested by HTNA)*

Design Validation Builds *(as requested by HTNA)*

Production Validation Builds *(as requested by HTNA)*

Run @ Rate *(as requested by HTNA)*

PPAP

Initial Mass Production Confirmation *(as requested by HTNA)*

Engineering Change Notification (ECN) *(as requested by HTNA)*

Any change to the supplier process that affects Man, Machine, Method, Material and/or Environment. Follow *SQM Section 5-3 Process Change Request).*

SUPPLIER RESPONSIBILITIES:

The supplier is responsible for manufacturing and evaluating parts in accordance with the Part Evaluation Plan *(See SQM Section 4-2 Part Evaluation Plan).* Each part submission must be produced from separate production runs to help identify process variations and attempt to establish capability. Parts are to be tested and validated for each multiple production line, cavity of a multiple cavity tool, and each multiple machines in which the tooling will be run.

NOTE: It is not acceptable for the supplier to suggest that similar machine types, sizes, and/or manufacturers produce the same level of quality parts.

The supplier is to generate a Part Evaluation Plan, Part Inspection Standard *(See SQM Section 3-9 Raw Material Inspection Standard)*, and the Part Sample Data Sheets as part of each submission level. The Part Sample Data Sheet is the actual work sheet for the Part Inspection Standard that all data is to be collected, evaluated, and judged by both the supplier and HTNA.

HTNA Quality advises minimum sample requirements.

The supplier must identify and record the data for all variable items for each of the following categories.

Dimension

Appearance

Performance

Material

Identification Method

The identified items should be identified as either variable data (hard dimensions) or attribute data (visual evaluation) per the inspection standard.

Provide actual data, capability results, and judgement to the results. The results are to be judged in the following manner:

○	=	Meets requirement
△	=	Meets requirement but requires additional tuning to nominal dimension
X	=	Does not meet requirement
⊗	=	Reworked to meet requirement

For all items that are△, ✕ and ⊗ judged items require a corrective action plan to be developed and implemented prior to the next submission.

The actual parts that are used to measure the results at the supplier are to be labeled per the production line, cavity, machine, and sample number and retained by the supplier. These Parts shall be available to HTNA upon request.

All parts that are submitted to HTNA must have a Part Sample Submission Cover Sheet with the results and countermeasures *(if applicable)* attached. When filling out the “Evaluation Summary” section it is important to understand that if the requirements are not met that there needs to be countermeasures in place to support those nonconformities and an action plan to resolve them. For items in which “No Requirement” has been identified it is important to state why that evaluation category has not been reviewed.

The following documents are required for all submission levels to HTNA: (this is to be known as the Sample Data Package)

Sample Data Package Contents

Part Sample Submission Cover Sheet

Part Sample Data Sheets

ECN Implementation Log

A copy of the Sample Data Package is to be included in the actual shipping package as well as originals to be sent to HTNA QE / SQE for review. If parts are requested the packaging must clearly identify that the parts are being submitted to a particular submission level as called out in the "Explanation" section at the beginning of this section.

HTNA will review the Sample Data Package and provide the necessary feedback prior to the next submission level.

All HTNA requests for measurements are to be submitted, regardless of program status or implementation, on the Part Sample Data Sheet that references the Part Inspection Standard unless otherwise negotiated with HTNA QE / SQE.

The supplier is to use all HTNA forms for the Sample Data Package unless otherwise specifically instructed by HTNA SQE.

Trade sales are to use OEM specific documentation through the portals.

4-4 INSPECTION & TESTING

PURPOSE

To establish and maintain the documented procedures used for inspection and testing of products to verify compliance.

EXPLANATION

The supplier is required to develop a system that adequately qualifies all parts for subsequent use during the receiving, in-process, and final inspection activities. Trade sales will work with HTNA to determine testing responsibilities.

SUPPLIER RESPONSIBILITIES

Receiving Inspection and Testing:

HTNA Supplier Quality System Requirements reflect *IATF 16949:2016 8.6.4 Verification and acceptance of conformity of externally provided products and services.*

HTNA Clarification

The supplier shall have systems in place that prevent the use of material until it has been inspected or otherwise verified as approved material. Verification of material shall be in accordance with the process control plan with a focus on the following:

Significant Characteristics

Process control characteristics [Pc]

Incoming material certifications from sub-suppliers.

History of nonconforming material

Risk Assessment is High

All inspected and approved material must be clearly identified and segregated. Material that is deemed nonconforming should be identified as such and segregated so that it cannot be used for production. The area containing the nonconforming material shall be accessible by a limited quantity of designated people and those approved to properly return/dispose of the material.

The supplier is required to have properly documented work instructions for each part requiring receiving inspection. The supplier is ultimately responsible for all material regardless of inspection levels and should have systems in place throughout the process to detect nonconforming material.

Received material must follow all requirements for proper First In, First Out (FIFO) material flow. This is true for all materials at all levels of inspection. However, if material is required for urgent production use, the supplier can expedite the material quickly through the process prior to verification if the material is properly identified and recorded to recall and replace the material in the event of a nonconformance. If a suspect or non-conforming product is shipped to HTNA the deviation request process must be followed.

In-process Inspection and Testing:

HTNA Supplier Quality System Requirements reflect *IATF 16949:2016 8.6.4 Verification and acceptance of conformity of externally provided products and services.*

HTNA Clarification

The inspection and testing of in-process products must meet the requirements of the process control plan. Material cannot pass to the next production process without all tests being completed, verified, and the material properly identified. Defects found at this level shall drive continuous improvement activities to prevent the continuation of nonconforming material.

Final Inspection and Testing:

HTNA (HTNA) Supplier Quality System Requirements reflect *IATF 16949:2016 8.6.4 Verification and acceptance of conformity of externally provided products and services.*

HTNA Clarification

Inspection or testing (i.e. – visual, functional, dimensional, etc.) on the final product shall be carried out in accordance with the Process Control Plan. No material shall be released to HTNA until all the associated activities have been completed and the data and documentation have been recorded and authorized. It is the responsibility of the supplier to ensure that the product performs and complies with the HTNA requirements. HTNA expects nothing less than 100% usable products from our suppliers and encourages our suppliers to implement internal controls and/or process improvements to help maintain those certain quality expectations.

To reduce potential slippage in the inspection processes, audits shall be performed to help control the systems. Audits of these systems shall be comprehensive and require follow-up corrective actions for those items that are in noncompliance. Audit frequency shall be adjusted based on failure occurrence and risk analysis. Audits shall be performed at all levels of inspection including "Dock Audits" which verify product, product quantity, packaging, and proper labeling.

Inspection and Test Records:

HTNA Supplier Quality System Requirements reflect *IATF 16949:2016 8.6.2 Layout inspection and functional testing.*

HTNA Clarification

The supplier shall establish and maintain a system for records that provides evidence that the product has been inspected and/or tested. These records must clearly show that the material has passed or failed the specific test as defined by the requirement in the control plan. Those items that fail, the proper use of the nonconforming material procedure applies. All records are to be specific and traceable to the exact level requested by HTNA. Although HTNA does not typically require inspection and/or test data from the sub-supplier on a regular basis, the supplier must have systems in place to trace the material back and be able to provide that information upon request.

Supplier Laboratory Requirements:

HTNA Supplier Quality System Requirements reflect *IATF 16949:2016 Sec. 7.1.5.3 Laboratory requirements.*

HTNA Clarification

Quality Requirements: The laboratory is required to follow the QMS System of the facility. The laboratory scope shall be defined. Customer testing standards shall be followed. Certification to *ISO/IEC 17025:1999* may be appropriate based on the type of testing.

Personnel: The personnel that ultimately have the responsibility for making the final decision with reference to testing and/or calibration must have the appropriate background and experience.

Product Identification and Testing: The laboratory shall have procedures in place for proper:

Receipt	Record Retention
Identification	Test Material Disposition
Handling	Calibration Equipment Retention
Protection	Provision of Test Equipment Protection Items

Laboratory Process Control: The laboratory shall have procedures in place that monitor, control, and record the environmental conditions that are required to properly test to meet the HTNA or customer requirements. A few environmental conditions which may directly influence the results as they pertain to HTNA are the biological sterility, control of Electrostatic Discharge (ESD), dust, electromagnetic interference, humidity, electrical supply, temperature, and sound and vibration levels.

Laboratory Testing and Calibration Methods: The laboratory shall use test and/or calibration methods that meet the needs of HTNA and are appropriate to the type of test and/or calibration the machine performs *(See SQM Section 4-5 Control of Inspection, Measuring, and Test Equipment).*

Laboratory Statistical Methods: Appropriate statistical methods shall be used to validate, monitor, and predict potential outcomes. This data must be accessible to HTNA upon request.

Accredited Laboratories:

HTNA Supplier Quality System Requirements reflect *IATF 16949:2016 Sec. 7.1.5.3.2 External laboratory.*

HTNA Clarification

A third-party testing and/or calibration laboratory must be nationally recognized by an accredited body and meet the requirements of *ISO/IEC 17025:1999* or national equivalent.

4-5 CONTROL OF INSPECTION, MEASURING, & TEST EQUIPMENT

PURPOSE

To establish and maintain the documented procedures used to control, calibrate, and maintain inspection, measuring, and test equipment.

EXPLANATION

The supplier shall develop procedures for the proper use and validation of inspection equipment.

SUPPLIER RESPONSIBILITIES

General:

HTNA Supplier Quality System Requirements reflect *ISO 9001:2015, IATF 16949:2016 Sec. 7.1.5 Monitoring and measuring resources.*

The supplier shall establish and maintain documented procedures to control, calibrate, and maintain inspection, measuring, and test equipment (including test software) used by the supplier to demonstrate the conformance of product to the specified requirements. Inspection, measuring and test equipment shall be used in a manner which ensures that the measurement uncertainty is known and is consistent with the required measurement capability.

Where test software or comparative references such as test hardware are used as suitable forms of inspection, they shall be checked to prove that they can verify the acceptability of product, prior to release for use during production, installation, or servicing, and shall be rechecked at prescribed intervals such as annual calibration. The supplier shall establish the extent and frequency of such checks and shall maintain records as evidence of control.

Where the availability of technical data pertaining to the inspection, measuring, and test equipment is a specified requirement, such data shall be made available, when required by HTNA, for verification that the inspection, measuring, and test equipment is functionally adequate.

Note: The term "measuring equipment" includes measurement devices.

Control Procedure:

HTNA Supplier Quality System Requirements reflect *ISO 9001:2015 Sec. 7.1.5.2 Measurement traceability.*

The supplier shall:

Determine the measurements to be made and the accuracy required, and select the appropriate inspection, measuring and test equipment that is capable of the necessary accuracy and precision.

Identify all inspection, measuring and test equipment that can affect product quality, and calibrate and adjust them at prescribed intervals, or prior to use, against certified equipment having a known valid relationship to internationally or nationally recognized standards. Where no such standards exist, the basis used for calibration shall be documented.

Define a calibration system appropriate to the process. Include details for identification, frequency, acceptance criteria and the action to be taken when results are unsatisfactory. Maintain calibration records for inspection, measuring and test equipment.

Assess and document the validity of previous inspection and test results when inspection, measuring or test equipment is found to be out of calibration. Inform HTNA if any defective product was shipped.

Ensure that the environmental conditions are suitable for the calibrations, inspections, measurements, and tests being carried out.

Ensure that the handling, preservation and storage of inspection, measuring and test equipment is such that accuracy and fitness for use is maintained.

Safeguard inspection, measuring and test facilities, including both test hardware and test software, from adjustments which would invalidate the calibration setting.

Inspection, Measuring, and Test Equipment Records:

HTNA Supplier Quality System Requirements reflect *IATF 16949:2016 Sec. 7.1.5.2.1 Calibration / verification records.*

Records of the calibration / verification activity on all gages, measuring, and test equipment, including employee-owned gages, shall include:

Revisions following engineering changes (if appropriate).

Any out of specification reading as received for calibration.

Statement of conformance to specification after calibration.

Notification to customers if suspect material has been shipped.

Records must be kept per OEM requirements (HTNA can provide upon request.)

Measuring System Analysis:

HTNA Supplier Quality System Requirements reflect *IATF 16949:2016 Sec. 7.1.5.1.1 Measurement system analysis.*

Appropriate statistical studies shall be conducted to analyze the variation present in the results of each type of measuring and test equipment system. This requirement shall apply to measurement systems referenced in the Process Control Plan *(See SQM Section 4-6 Measurement System Analysis)*. The analytical methods and acceptance criteria used should conform to those in the Measurement Systems Analysis reference manual (i.e. - bias, linearity, stability, repeatability, and reproducibility studies). Other analytical methods and acceptance criteria may be used if approved by HTNA.

NOTE: Measurements system analysis reporting is only required for items denoted as [PC] in the RMIS.

4-6 MEASUREMENT SYSTEMS ANALYSIS

PURPOSE

To explain the guidelines for creating and submitting procedures to assess the quality of a measurement system.

EXPLANATION

The measurement system is a “collection of operations, procedures, gages and other equipment, software, and personnel used to assign a number to the characteristic being measured; the complete process used to obtain measurements” (AIAG, Measurement System Analysis). The quality of the measurement system is determined by the statistical properties of the data produced. It is important that the supplier follow the current AIAG MSA standard.

SUPPLIER RESPONSIBILITIES

Measuring System Analysis (MSA):

HTNA Supplier Quality System Requirements reflect *IATF 16949:2016 Sec. 7.1.5.1.1 Measurement system analysis* and the AIAG, Measurement System Analysis reference manual.

HTNA Clarification

The supplier is responsible for identifying the methods by which to obtain the statistical data required to verify all the quality characteristics specified on the part drawing and/or Part Inspection Standard *(See SQM Section 3-9 Raw Material Inspection Standard)*.

If check fixtures have been specified by HTNA as a means of part verification, the supplier and HTNA Corporate QA will work with a cross functional team to determine the best method by which to design, inspect, and validate the gage.

A viable GRR shall meet the following requirements (the supplier is to use the long method for variable data and the short method for attribute data):

Parts must be off production level tooling, equipment, and off process.

Parts must be inspected using three separate operators.

Ten identified parts are to be measured per operator. Parts should cover the range of the dimension being measured.

At a minimum, all significant characteristics are to be measured with capability analysis as possible.

The supplier shall be responsible for the maintenance and calibration of all check fixtures, gages, and test equipment. There shall be a schedule in place to certify all inspection equipment and to include GRR studies. All certifications must be traceable to a national or international certifying body as applicable.

All test equipment must be identified using the following information:

Gage Number

Latest drawing revision and/or ECN number

Last date of certification

Next date of re-certification

NOTE: If the gage construction prevents the above information from being properly displayed on the actual gage itself, then at a minimum the gage is to have a tracking number that can reference the required information. Tag case by case.

The supplier shall have all check fixtures, gages, and other test equipment completed, validated, and provide evidence to HTNA, prior to PPAP submission case by case. The following data must be submitted at HTNA's request:

Certification data as applicable

GRR study results for all designated special characteristics

Maintenance and re-certification schedule

Instructions on the proper use of the gage

Picture of the gage

The supplier must keep all check fixtures, gages, and other test equipment in a safely controlled environment.

If the inspection equipment is damaged or out of calibration for any reason, the supplier shall contact HTNA Purchasing immediately. If this results in the shipment of nonconforming products, the supplier must immediately notify HTNA following the completion of *(See SQM Section 5-5 Control of Nonconforming Outputs)*. After such situations, the supplier is responsible for the repair and/or recalibration of the gage.

All personnel identified to use the inspection gages must be properly trained. Their training is to be documented and available to HTNA upon request *(See SQM Section 5-9 Training)*.

Check fixtures, gages, and other test equipment are <u>not</u> to be modified without the formal written consent of HTNA Purchasing. Prior to the supplier making a change they must first submit a PCR request. This form will allow suppliers to request changes for such items as:

Engineering Change Notifications (ECN) -Trade sale

Countermeasure response

Change in process.

Part Inspection Standard change

Repair

Fixture Workability

The supplier shall never undertake the disposal of any check gage without the formal written consent of HTNA.

MSA GRR Data Sheet

Rev.	Approved	Checked	Date
Orig.	J Olson	M. Sutton	5/5/2018
A	M. Sutton	A. Russell	3/29/2024

Date	
Supplier	
Measure Item	
Part Name	
Part Number	
Mfg. Site	
Gauge Name	
Gauge No.	

Upper Limit (USL)	
Lower Limit (LSL)	
Tolerance (Tol)	

Number of Samples	10
Number of Inspecto	3
Number of Repeat	3

This color denotes cells to be populated. Other cells cannot be edited.

Inspector	Sample	1	2	3	4	5	6	7	8	9	10	Average
Operator A	1st	0.29	-0.56	1.34	0.47	-0.80	0.02	0.59	-0.31	2.26	-1.36	0.194
	2nd	0.41	-0.68	1.17	0.50	-0.92	-0.11	0.75	-0.20	1.99	-1.25	0.166
	3rd	0.64	-0.58	1.27	0.64	-0.84	-0.21	0.66	-0.17	2.01	-1.31	0.211
	Average	0.45	-0.61	1.26	0.54	-0.85	-0.10	0.67	-0.23	2.09	-1.31	$\bar{X}_A$ = 0.190
	Range	0.35	0.12	0.17	0.17	0.12	0.23	0.16	0.14	0.27	0.11	$\bar{R}_A$ = 0.184
Operator B	1st	0.08	-0.47	1.19	0.01	-0.56	-0.20	0.47	-0.63	1.80	-1.68	0.001
	2nd	0.25	-1.22	0.94	1.03	-1.20	0.22	0.55	0.08	2.12	-1.62	0.115
	3rd	0.07	-0.68	1.34	0.20	-1.28	0.06	0.83	-0.34	2.19	-1.50	0.089
	Average	0.13	-0.79	1.16	0.41	-1.01	0.03	0.62	-0.30	2.04	-1.60	$\bar{X}_B$ = 0.068
	Range	0.18	0.75	0.40	1.02	0.72	0.42	0.36	0.71	0.39	0.18	$\bar{R}_B$ = 0.513
Operator C	1st	0.04	-1.38	0.88	0.14	-1.46	-0.29	0.02	-0.46	1.77	-1.49	-0.223
	2nd	-0.11	-1.13	1.09	0.20	-1.07	-0.67	0.01	-0.56	1.45	-1.77	-0.256
	3rd	-0.15	-0.96	0.67	0.11	-1.45	-0.49	0.21	-0.49	1.87	-2.16	-0.284
	Average	-0.07	-1.16	0.88	0.15	-1.33	-0.48	0.08	-0.50	1.70	-1.81	$\bar{X}_C$ = -0.254
	Range	0.19	0.42	0.42	0.09	0.39	0.38	0.20	0.10	0.42	0.67	$\bar{R}_C$ = 0.328
Average		0.17	-0.85	1.10	0.37	-1.06	-0.19	0.45	-0.34	1.94	-1.57	$\bar{\bar{X}}$ = 0.001
												$\bar{R}_p$ = 3.511
Aggregate Average		$(\bar{R}_a + \bar{R}_b + \bar{R}_c)/Number\ of\ Inspectors$										$\bar{\bar{R}}$ = 0.342
Aggregate Range		(Max $\bar{X}$ - (Min $\bar{X}$ =										$\bar{X}_{DIFF}$ = 0.445
Repeatability		$\bar{\bar{R}} \times K_1$ = = 0.342 x 0.5908 = 0.202										EV = 0.202
Reproducibility		$\sqrt{(\bar{X}_{DIFF} \times K_2)^2 - (EV^2/(Number\ of\ Samples \times Number\ of\ Repeat))}$ = = ((0.445 x 0.5231)^2 - (0.202^2/(10 x 3)))^1/2 = 0.230										AV = 0.230
Repeatability / Reproducibilit		$\sqrt{EV^2 + AV^2}$ = = ((0.202^2 + 0.230^2))^1/2 = 0.306										GRR = 0.306
Part Variation (PV)		$PV = R_p \times K_3$ = 3.511 x 0.3146 = 1.105										PV = 1.105
Total Variation (TV)		$TV = \sqrt{GRR^2 + PV^2}$ = 0 = 1.146										TV = 1.146
ndc (Number of Distinct Categories)		$ndc = 1.41\left(PV/GRR\right)$ = 1.41(1.105/0.306) = 5.094										ndc = 5.094
% GRR		$\%GRR = 100\,[GRR/TV]$ = 100(0.306/0.191) = 26.7										% GRR = 26.7%
												Judgment: Accept/Level Up

4-7 STATISTICAL TECHNIQUES

PURPOSE

To establish and maintain documented procedures to ensure that applications of statistical techniques have been correctly identified and implemented.

EXPLANATION

Suppliers are to establish and maintain a system for identifying the areas that require the application of statistical techniques. HTNA expects suppliers to use statistical methods (control plans) to predict and prevent quality issues from arising.

SUPPLIER RESPONSIBILITIES:

Statistical Techniques:

HTNA Supplier Quality System Requirements reflect *IATF 16949:2016 Sec. 9.1.1.2 Identification of statistical tools.*

HTNA Clarification

The supplier shall make use of statistical techniques to establish, control, verify, and improve process capability and product characteristics when possible.

The use of statistical tools shall be determined during the advanced quality planning stages and called out on the Process Control Plan.

Operators who are responsible for the control of statistical control documents are required to have training in the use and understanding of Statistical Process Controls (SPC).

SPC documents should be posted for operators to review and evaluate for continuous improvement activities.

SPC related to PC items on the RMIS must be submitted to HTNA with the PPAP upon request (capability studies).

HTNA may require additional statistical methods, other than what has been determined by the supplier, to maintain part quality.

4-8 BOUNDARY SAMPLES

PURPOSE

To establish methods used to develop, control, and maintain supplemental inspection standards for ongoing part quality.

EXPLANATION

The use of a boundary sample is to establish inspection criteria for characteristics that are based primarily on subjective methods. The boundary sample is used to communicate the agreed-upon acceptable limits to all personnel responsible for part quality at both the supplier and HTNA. Trade sale will work with HTNA and the OEM directly.

SUPPLIER RESPONSIBILITIES

Boundary samples must adequately define the problem and/or condition to be monitored. A picture or sketch should be included on the tag. The supplier is to use the boundary samples tag to communicate any requests for approval.

Boundary samples can be used when all other countermeasure attempts have been exhausted. These samples should be representative of the supplier's current process capability. Part capability is expected to improve through continuous improvement opportunities.

Boundary samples can be developed at any stage in the production process. (PV, PPAP, SOP, Ongoing Production)

The boundary sample should only identify the acceptable limit. Samples should not be created that identify the nonconformance (NG samples are occasionally supplied by HTNA to clarify an unacceptable condition).

HTNA and the supplier will agree on the correct amount of boundary samples required for all parties and processes required. The supplier should expect to provide a minimum of three sets of samples for HTNA QC for review and approval. HTNA QC will keep 1 set and return the remaining approved 2 sets to the supplier for 1 set to be used as a working sample and the final set to be secured in an area able to protect the unit in its original state.

HTNA QC and the supplier will negotiate the period in which the boundary samples will be effective. If the length of the approved boundary sample is less than that of the overall program, the supplier must ask for renewal or provide countermeasures that eliminate the need for the boundary sample prior to the expiration date.

HTNA and the supplier shall sign off on all boundary samples as evidence of the agreement.

HTNA
BOUNDARY SAMPLE TAG

CUSTOMER NAME
SUPPLIER NAME
SUPPLIER CODE
PARTS NAME
PARTS NUMBER
PROGRAM
DATE
NEW [ ] CHANGE [ ] RENEWAL [ ]
DESCRIPTION & SKETCH & PICTURE
SUPPORTING DOCUMENTATION SUBMITTED
VALID UNTIL
SOP:
EOP:
APPROVALS

CUSTOMER NAME
SUPPLIER NAME
SUPPLIER CODE
PARTS NAME
PARTS NUMBER
PROGRAM
DATE
NEW [ ] CHANGE [ ] RENEWAL [ ]
DESCRIPTION & SKETCH & PICTURE
SUPPORTING DOCUMENTATION SUBMITTED
VALID UNTIL
SOP:
EOP:
APPROVALS

ROUTING: SUPPLIER --> HTNA QC/QE --> SUPPLIER

NOTE: PLEASE AFFIX TO HEAVY CARD STOCK OR TAG WHEN ATTACHING TAG TO PART.

4-9 PRODUCTION PART APPROVAL PROCESS (PPAP)

PURPOSE

To define the methods by which the supplier is to submit Production Part Approval Process (PPAP) level parts and documentation.

EXPLANATION

The purpose of PPAP is to determine if the supplier completely understands all aspects of design and the specification requirements. The results of the PPAP should also help the supplier determine if the process has the potential to produce consistent products while meeting the demands of the specifications during an actual production run at the quoted production rate. Suppliers of HTNA specific parts, material compounds and process change-related materials are required to submit a PPAP to the level indicated by HTNA (see below). Trade sale will follow the OEM part approval (PA) process.

The supplier must follow the standard requirements for PPAP submission and not implement these changes until HTNA has issued formal written approval. A PPAP is to be submitted when HTNA issues a PPAP checklist. A PPAP may be required for any of the following situations:

New part or components (i.e. – a specific part, material, or a color/appearance change)

Tooling change/update

Correction of a discrepancy on a previously submitted part.

Product modified by an engineering change to design records, specifications, or materials

Any situations that are called out in Section I.3 of the AIAG Production Part Approval Process (PPAP) reference manual.

QUALITY POLICY AND SUPPLIER RESPONSIBILITIES

Production Part Approval Process (PPAP):

HTNA Supplier Quality System Requirements match *IATF 16949:2016 Sec. 8.3.4.4 Product approval process.*

HTNA Clarification

The supplier shall have systems in place that meet or exceed the requirements that have been stated in the AIAG Production Part Approval Process (PPAP) reference manual. Unless HTNA waives the requirements for PPAP submission all suppliers shall follow the following submission requirements.

All suppliers that manufacture custom materials specific to HTNA are to submit the PPAP to a Level 3 submission unless otherwise requested. In some cases, HTNA may wish to perform a Level 5 (validation at supplier location) to expedite the process.

Suppliers that produce items that are considered bulk items that are specific to HTNA will be required to submit to a level 3 PPAP unless otherwise negotiated with HTNA quality personnel.

Suppliers involved in process changes (PCR's) are usually requested to submit to a level 4 PPAP.

Products that HTNA feels are extremely critical to the overall performance of the final product may require the supplier to submit to Level 5 PPAP. HTNA identifies Level 5 as where the supplier submits all Level 3 documentation, other supporting data, and an HTNA presence may go on-site to approve the process. Other supporting data may contain but are not limited to:

Operator Work Instruction Sheets

Standardized Work Analysis/Sequence Sheets

List of Poka-Yoke (error proofing) Devices and their PM Audit Schedule

Preventative Maintenance Instructions and Schedule

Employee Training Matrix

The following documents are to be contained within the PPAP submission package and are as follows per the AIAG Production Part Approval Process (PPAP) reference manual:

Engineering Change Records

Engineering Approval

Process Flow Diagrams

Process FMEA

Dimensional Results

Records of Material/Performance Test Results

In Process Studies (minimum 30 per cavity)

Measurement System Analysis Studies

Qualified Laboratory Documentation

Process Control Plan

RMIS (raw material inspection standards – approved)

Part Submission Warrant

IMDS reference

Appearance Approval Report (if applicable)

Bulk Material Requirements Checklist (if applicable)

Run @ Rate Results

Sample Production Parts (as requested)

Master Samples

Checking Aids Identified and their Gage R&R Results Attached

HTNA Specific Requirements (if applicable)

Electronic submissions are preferred unless otherwise requested by HTNA purchasing or supplier quality. Submit per the RFQ directions.

While the timing of trial events will vary between Programs, Initial PPAP submissions are due approximately 4 months prior to SOP or by the due date provided.

Interim Approval / Final Approval:

The approval process may be split into two separate and distinct methods, Interim and final approval. HTNA understands that many suppliers have a great deal of capital expenditure invested but the suppliers must also understand that HTNA must meet the final tuning requirements of its customers. HTNA will work with each supplier on a case by case basis to determine the payment schedule.

Interim Approval is awarded to the supplier after all the PPAP and quality requirements of the SQM have been reviewed and approved by HTNA QE/QC. If HTNA rejects the request for Interim approval, HTNA will provide the reason, and the information required to obtain the approval.

In many cases, Interim approval is given for a specified time, usually SOP plus 90 days safe launch, to ensure the process consistently meets requirements.

Final Approval may be held until after the supplier has been given Interim approval and the supplier can prove that the process can consistently provide acceptable quality parts at production volumes. For HTNA to confirm that the supplier's process is under control, the supplier must submit the results of long-term capability studies for items designated as [Pc] on the RMIS. The requirements are as follows:

HTNA will sign, copy, and return the original Part Submission Warrant for confirmation of final approval.

If HTNA rejects the request for final approval, HTNA will provide the reason, and the information required to obtain the approval.

Any supplier changes requested after SOP and initial full approval by HTNA must be initiated by our Process Change Request, detailed in *Section 2-9-9 Process Change Request.*

Trade Sale (pass-thru) parts are those shipped directly from HTNA's supplier to our OEM. The PPAP/PA process is managed through HTNA corporate PC and the OEM. The notable difference is with final sample submission, which is done in communication and cooperation with HTNA corporate quality. These samples will require the following information, at a minimum:

SDS (sample data sheets) dimensional data for each part, clear indication of cavity number on each part with special tags for box marking depending on OEM facility.

All documentation is routed through HTNA Corporate PC and quality, not our OEM.

4-10 MAINTAINING PROCESS CONTROL

HTNA (HTNA) Supplier Quality System Requirements reflect *ISO 9001:2015, IATF 16949:2016 Sec. 8.5.1 Control of production and service provision.*

HTNA Clarification

The supplier shall have systems in place to maintain (or exceed) the process capability or performance which was initially established during the Production Part Approval Process (PPAP). Some of the documents that are required to help maintain the process include but are not limited to the following:

Process Control Plan

Process Failure Mode Effects Analysis (PFMEA)

Process Flow Diagram

Process Layout (Standardized Work Analysis Sheet)

Line Balancing (bottleneck)

Standardized Work Combination Table

SPC (Statistical Process Control)

Run @ Rate (Cycle time)

Maintenance Plan (Preventative, Predictive and Periodic Overhaul)

Modified Process Control Requirements:

HTNA Supplier Quality System Requirements reflect *IATF 16949:2016 Sec. 8.5.1.1 Control plan.*

HTNA Clarification

In some cases, the supplier may wish to adjust controls based on failure modes, kaizen, or new technologies. In these cases, the supplier's process control plan shall reflect the appropriate changes, and a PCR shall be submitted to HTNA for major control changes approval.

Verification of Job Setups:

HTNA Supplier Quality System Requirements reflect *IATF 16949:2016 Sec. 8.5.1.3 Verification of job set-ups.*

HTNA Clarification

At a minimum, verification is required whenever a setup is performed at:

Initial run setup	After any major maintenance activity.
Tooling/Material change	Significant time between production runs
Job change	HTNA request

Process Changes:

HTNA Supplier Quality System Requirements reflect *ISO 9001:2015, IATF 16949:2016 Sec. 8.5.6 Control of changes.*

HTNA Clarification

The supplier is encouraged to generate continuous improvement activities of which these activities may ultimately lead to a process change. All processes that require change must first have the approval of HTNA prior to implementation *(See SQM Section 5-3 Process Change Request).* Records of changes and their effective dates must be maintained for the life of the program and accessible to HTNA upon request (Retention based on OEM requirements).

SECTION 5: FEEDBACK ASSESSMENT AND CORRECTIVE ACTION

5-1 OPEN ISSUE SHEET

PURPOSE

This section is to be used by the supplier to aid in tracking open issues, their potential countermeasures, and status. This tool may also be referred to as a Problem Follow-up Sheet (PFS)

EXPLANATION

The Open Issue Sheet is a matrix that can be used in any application that requires the tracking of issues on a consistent basis. The matrix will ask for such key aspects as the item or failure mode, cause, intended action, responsibility, timing, results, and status.

QUALITY POLICY AND SUPPLIER RESPONSIBILITIES:

Suppliers are to establish and maintain a method for tracking open issues, their potential countermeasures, and status. This document is a living document and should be maintained for status as well as the Recovery Plan for past due items.

Suppliers are to use the Open Issue Sheet that has been agreed to between the supplier and the HTNA PC/Materials and QC/QE.

Problem follow-up sheets that are used to track open issues during the prototype and prestart of production (SOP) stages are to be submitted per HTNA request.

5-2 CONTINUOUS IMPROVEMENT

PURPOSE

The supplier should have a system in place that actively identifies areas that require improvement and makes the appropriate resources available to implement.

EXPLANATION

It is important for suppliers to understand continuous improvement (Kaizen) activities and how they benefit their organization. By implementing a continuous improvement or Kaizen program you empower the employees to make changes that can ultimately save time, money, work, and potentially reduce repetitive motion related injuries. It is important for the supplier to listen to the “voice of the people” and provide their employees with the tools they need to improve their work environment.

SUPPLIER RESPONSIBILITIES

Develop a system that allows employees to openly make suggestions to make changes that may directly impact on the method in which they perform their job.

The Kaizen program is to be a documented program with regularly scheduled reviews of suggestions.

All suggestions are to be generated on a formal document and filed.

The supplier should have a method for measuring the amount of return for the proposed or completed change.

The supplier shall monitor the effectiveness of the Kaizen system.

The continuous improvement or Kaizen program is to be an employee-based program that identifies potential areas of improvement and notifies upper management of a proposed change.

Many Kaizen suggestions may lead to improvements in:

Throughput

Cost savings

Ergonomics

Space reduction

Standard work.

Employee involvement

Safety

Suppliers should never accept that the current method for performing a given task is the best method. Suppliers should question their processes regardless of the amount of time they have been in place and should strive to continuously improve

5-3 PROCESS CHANGE REQUEST (PCR)

PURPOSE

The purpose of this document is to define the responsibilities of the supplier as they pertain to changes that affect the process (man, machine, method, and/or material).

SCOPE

This applies to all suppliers of purchased production level intent parts to HTNA.

EXPLANATION

The Process Change Request (PCR) procedure is a method used to communicate any changes to the overall process. The PCR helps both the supplier and HTNA identify, communicate, and control the changes proposed by the supplier.

A PCR is required for any of the following situations at the supplier or sub-supplier level (any tier):

Machine – Addition, replacement, or removal of machine, tooling, and/or test equipment from the PPAP approved process.

Material – New part or components (i.e. – sub-supplier, material, color/appearance, etc.)

Method – Changes in process flow, plant layout, plant location, and sub-supplier approved process, etc.

Any situations that are called out in Section I.3 of the AIAG Production Part Approval Process (PPAP) reference manual. *(See Section SQM 4-9 Production Part Approval Process and SQM 1-6 Sub-Supplier Quality Assurance).*

Trade sales will submit the PCR to HTNA and follow the implementation through the OEM portal.

SUPPLIER RESPONSIBILITIES

Supplier Activities There are four major stages that are required to implement a change. HTNA may waive any of the part submittals, but the supplier must maintain the data for each one of the identified stages and provide this information to HTNA upon request.

Plan and Approval – Submit the appropriate forms.

Initial Sample Inspection Approval – Submit first off tool parts to HTNA for review.

Mid-Size Trial Production Approval– Submit a significant number of parts for HTNA review

Mass Production Approval – No submission required. Send parts with current production but identify shipment with special labeling.

The procedure for each stage is as follows:

Plan Stage:

Develop timing plan – Allow typically 3-4 months from time of initial submission. This process may be expedited when HTNA Purchasing and Quality QE is made aware of the change prior to submission or in such cases where these changes are required almost immediately (i.e. – strikes, plant closures, etc.)

Contact HTNA purchasing and discuss process changes (affect price, form, fit, or function, etc.) HTNA Purchasing contacts are based in our Plymouth, Michigan facility.

Determine what impact the change will have on such items as:

The process	HTNA /OEM process
Inspection items/system	Manpower
Performance and reliability	Inventory
Sub-supplier	

Define the current process, the expectations of the new, and if there is any impact to the part characteristics.

Identify the expected date of implementation for the new process and what the main impact is on the overall part/process (improved quality, cost savings, increased capacity, etc.)

Submit the PCR Form to HTNA Purchasing contacts.

Attach all required documentation: (HTNA may request additional information as required) All PPAP documentation must be submitted per the PPAP checklist.

All appropriate key personnel are to review, sign, and submit the original Process Change Request to HTNA QE for review and approval.

For each trial submission HTNA will review the request for change and provide the supplier with the appropriate information for proceeding with the change. HTNA QE/QC and Purchasing will indicate to the supplier the following: (*HTNA goal is to respond within 10 business days to the PCR.)*

The correct PPAP submission level (*See Section SQM 4-9, Production Part Approval Process).*

If a process audit is required

If a meeting is required

If HTNA participation is required in the initial sample inspection process.

The additional testing requirements that may be required in addition to the ones previously identified in the Part Evaluation Plan

The appropriate level of evaluation at HTNA – HTNA may require different part submission levels to fully understand and capture the changes that are to be made and how they may impact the overall process and part quality. *(HTNA will circle the required submission levels and indicate the submission quantities required for that level)*

NOTE: One or all three levels may be required depending on the Type of Change.

The HTNA team will indicate if the PCR has been approved, not approved, or still requires additional information to complete the planned change. HTNA will have all appropriate personnel signs, date, and return the PCR to initiate the change. The supplier shall not proceed with any changes until the PCR has been approved, signed, and returned. If an urgent change is needed, approval can be expedited through appropriate communication with HTNA.

Approval Stage:

Once the PCR has been submitted and the Plan approved the supplier must submit the required number of parts, correlating data, and appropriate documents for each submission level. HTNA QC/QE will determine the correct submission level. There are 3 possible trial phases.

“A” - Initial Sample Submission

“B” - Mid-Size Production Trial

“C” - Mass Production

The supplier is to re-submit the original PCR to HTNA QC/QE prior to each approval stage and update the information contained within the Approval Stage section located at the bottom of the form. With each sample submission the PCR should be updated to include the following:

Sample submission level (Upper right-hand corner)

Supplier's current submission timing

The method in which the parts will be identified and segregated from current production material.

The supplier signs off for each approval stage.

HTNA will evaluate, confirm, and return the original PCR with each approval stage allowing the supplier to move on to the next approval stage. If the parts are rejected, HTNA and the supplier will have to review alternative methods and develop a new implementation plan.

The supplier must be able to assure HTNA that at no time will current production be interrupted during the implementation of the Process Change.

The following is a description of each submission level and their requirements:

Initial Sample Submission: (Approximately 2 months from implementation date)

Level 1 submission has been circled, and part quantities have been indicated. (Minimum submittal size n = 3 parts per cavity)

Parts are to be evaluated per the Part Evaluation Plan and the data documented and submitted per the Part Sample Data Sheet *(See Section SQM 4-3 Part Sample Data Sheets & Part Submission Requirements).*

Fill out the level 1 Initial Sample Submission section in the Approval Stage with the appropriate shipping time and method. (HTNA must have the updated PCR form 2 days prior to parts arrival)

Mid-Size Production Trial Submission:

Level 1 submission has been performed and HTNA has approved the supplier to proceed to a Mid-Size Production Trial. (Required as noted on the PCR.)

Level 2 submission has been circled, and part quantities have been indicated. Minimum submittal size n = 25 parts per cavity or 300 pcs, whichever is of greater quantity. HTNA will determine sample size. Adjust process based on Initial Sample data results and HTNA feedback.

Parts are to be evaluated, and the data documented per the Part Evaluation Plan and submitted per the Part Sample Data Sheet. *(See Section SQM 4-3 Part Sample Data Sheets & Part Submission Requirements)*

For any sub-suppler changes the supplier shall review the sub-supplier process at their facility as necessary for any changes that affect form, fit, and/or function.

Submit to HTNA SQE/QE designated PPAP submission level. HTNA may request parts.

Provide HTNA Production Control with the estimated volumes of current inventory and safety stock.

Fill out the level B Mid-Size Production Trial section in the Approval Stage with the appropriate shipping time and method. (HTNA must have the updated PCR form 2 days prior to parts arrival)

Mass Production: (At time of implementation)

Level A and/or level B submission has been performed and HTNA has approved proceeding to Mass Production. (Not required if HTNA did not request a level A and/or level B submission)

Level C submission has been circled, and part quantities have been indicated. (Submittal is based on production order quantities)

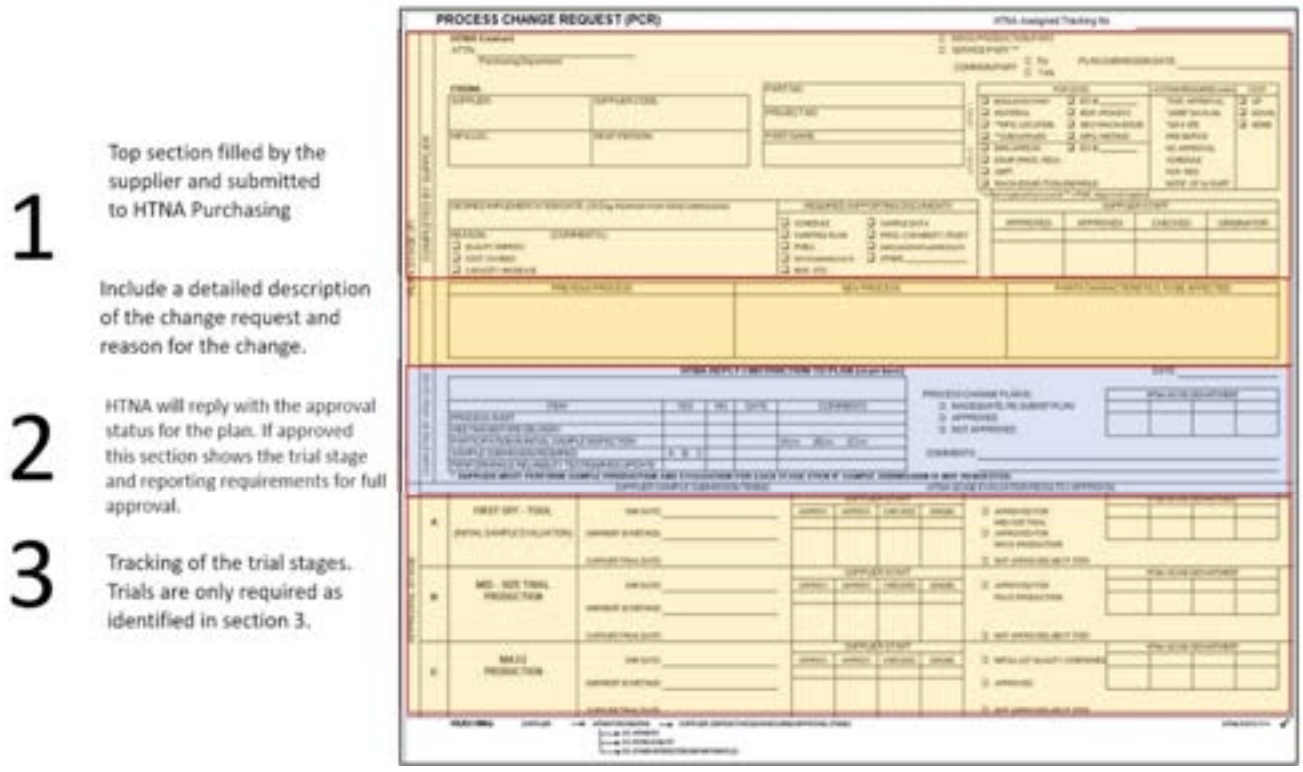
Shipment based on Initial Sample and Mid-Size Production Trial data and HTNA feedback.

Review with HTNA QC/QE and Production Control the ramp-up/build-out plan. Determine if the change is to be a running change or will require a defined affectivity date.

Submit HTNA QC/QE designated PPAP submission level with parts if not previously requested.

Fill out the level C Mass Production section in the Approval Stage with the appropriate shipping time and method. (HTNA must have updated PCR form 2 days prior to parts arrival)

PCR Form (Example)



***Trade sale** suppliers will follow the trial schedule of the OEM.

5-4 INSPECTION AND TEST STATUS

PURPOSE

To define the requirements for the procedures of identifying the inspection and test status of material and/or product throughout the production process.

EXPLANATION

The supplier shall have systems in place that define how the material status (i.e. - conforming or nonconforming) is identified for inspection and test purposes. The identification of the test status shall be maintained as defined in the Process Control Plan as well as any additional procedures or work sheets that are required for production, installation, and/or service of the product.

SUPPLIER RESPONSIBILITIES

Inspection and Test Traceability:

HTNA Supplier Quality System Requirements reflect *ISO 9001:2015, IATF 16949:2016 Sec. 8.5.2 Identification and traceability.*

HTNA Clarification

The supplier, at a minimum, shall have systems in place to accurately determine the status of the material prior to initial production runs and after each machine set-up, die change, or process change to assure conformance to the HTNA requirements. Material which is produced prior to any one of the before mentioned changes shall be subject to containment based on the failure mode. Any suspect material shall be segregated from subsequent production to ensure conformity and prevent potential mixing with nonconforming material.

The supplier should use parts, pictures, and/or drawings as limits/boundary samples and have them accessible to the operator to help ensure that the requirements of HTNA can be maintained effectively and efficiently.

Supplemental Verification:

HTNA Supplier Quality System Requirements reflect *ISO 9001:2015, IATF 16949:2016 Sec. 8.5.2 Identification and traceability.*

HTNA Clarification

All testing and inspection data shall be made available with traceability upon HTNA request and retained per OEM requirements.

5-5 CONTROL OF NONCONFORMING PRODUCT

PURPOSE NOTE:

To establish and maintain documented procedures to ensure that identified nonconforming/deviating material is identified, quarantined and prevented from being shipped to HTNA.

EXPLANATION

The supplier shall have systems that allow them to control and disposition nonconforming material. This system shall notify HTNA of any material that has shipped or is planned to ship and fails to meet the designated standards set forth by the 3D data, drawing(s), Raw Material Inspection Standards, Boundary/Limit Samples, and/or Process Control Plan. If the supplier suspects any nonconforming material has been sent to HTNA, the supplier shall immediately notify HTNA using the Notice of Nonconforming Product / Deviation Request form. The completed form must be submitted to all affected Hayashi Quality contacts who in turn will forward to all necessary parties.

Suppliers must remember that they are expected and required to submit quality parts that do not deviate from the PPAP sample parts. Once the process has been validated it must never change unless approved by HTNA through the PCR process. Regardless of the size of a change, HTNA must be made aware of the change to validate the effectiveness; otherwise HTNA may be forced to reject the parts if they fail to perform to the historical standard. It is the primary responsibility of the supplier to resolve the issue. HTNA QC/QE will assist the supplier and provide them with the tools to resolve and prevent this issue from recurring. HTNA will return all non-conforming products back to supplier upon receipt of an RMA (Returned Material Authorization). The Supplier must submit RMA within (48 hours) of notification of the claim in accordance with the HTNA QPR Procedure.

When the supplier identifies a potential process or product deviation situation due to “force majeure “such as flooding or smoke damage, etc. the supplier shall inform HTNA Purchasing immediately.

Note: The above situations may not result in HTNA issuing a claim and may not affect the Supplier Monthly Performance Rating if the supplier properly notifies HTNA of the problem and takes the necessary steps to prevent the product from reaching the production line and/or installed units.

Review and Disposition of Nonconforming Product:

HTNA Supplier Quality System Requirements reflect *IATF 16949:2016 Sec. 8.7.1.7 Nonconforming product disposition.*

HTNA Clarification

The procedures should clearly define the responsibilities and authority of the personnel that record and disposition of the nonconforming material. Nonconforming material shall be reviewed as mandated in the Process Control Plan and as specified in the procedures. Material that has been identified as nonconforming or suspect shall conform to one of the following dispositions:

Material reviewed and no problem was found.

Reworked to meet the specified requirements.

Rejected and returned to sub-supplier for evaluation.

Scrapped.

HTNA allows rework if the product meets all specifications. All rework methods shall be approved by HTNA and documented including training records for the associates performing the rework.

All material that is reworked must be re-inspected following the standardized procedure for inspection that is documented on the Process Control Plan. The supplier shall have a system to track, analyze, and reduce the amount of nonconforming material throughout all levels of production from receiving to shipping. Defective material reports are to be made accessible to HTNA upon request.

Control of Reworked Product:

HTNA Supplier Quality System Requirements reflect *IATF 16949:2016 Sec. 8.7.1.4 Control of reworked product.*

HTNA Clarification

The procedures must be clearly defined and accessible by the appropriate personnel in their work areas.

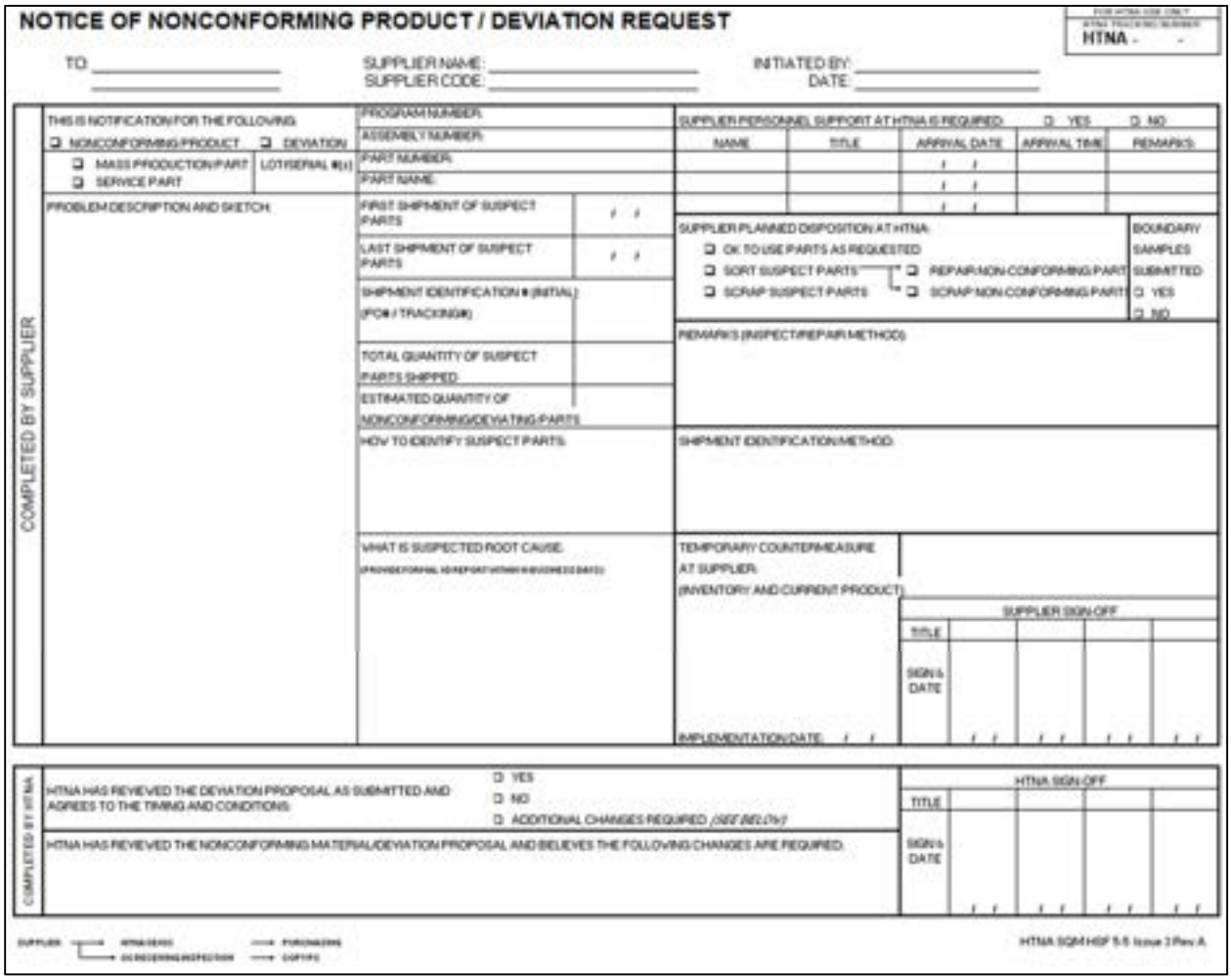
The reworked parts shall meet all drawing and RMIS requirements.

Reworked products shall be clearly identified and traceable throughout the entire supplier process. Reworked material traceability shall be established in such a way that they are accessible to HTNA during problem solving.

Notice of Nonconforming Deviation Request:

HTNA Supplier Quality System Requirements reflect *IATF 16949:2016 Sec. 8.7.1.6 Customer Notification.*

Based on the type of change HTNA shall obtain a customer concession as required by the OEM SQM requirements. HTNA shall maintain a record of the expiration date or quantity authorized. HTNA shall also ensure compliance with the original or superseding specifications and requirements when the authorization expires. Material shipped on an authorization shall be properly identified on each shipping container.



NOTICE OF NONCONFORMING PRODUCT / DEVIATION REQUEST

HTNA -

TO: _____ SUPPLIER NAME: _____ INITIATED BY: _____
SUPPLIER CODE: _____ DATE: _____

COMPLETED BY SUPPLIER

THIS IS NOTIFICATION FOR THE FOLLOWING:
☐ NONCONFORMING PRODUCT ☐ DEVIATION
☐ MASS PRODUCTION PART LOT/SERIAL #(s)
☐ SERVICE PART

PROGRAM NUMBER:
ASSEMBLY NUMBER:
PART NUMBER:
PART NAME:

PROBLEM DESCRIPTION AND SKETCH:

FIRST SHIPMENT OF SUSPECT PARTS / /
LAST SHIPMENT OF SUSPECT PARTS / /
SHIPMENT IDENTIFICATION # (INITIAL) (PO# / TRACKING#)
TOTAL QUANTITY OF SUSPECT PARTS SHIPPED
ESTIMATED QUANTITY OF NONCONFORMING/DEVIATING PARTS
HOW TO IDENTIFY SUSPECT PARTS:

WHAT IS SUSPECTED ROOT CAUSE:
(PROVIDE FORMAL 8D REPORT WITHIN 10 BUSINESS DAYS)

SUPPLIER PERSONNEL SUPPORT AT HTNA IS REQUIRED: ☐ YES ☐ NO

NAME	TITLE	ARRIVAL DATE	ARRIVAL TIME	REMARKS
		/ /		
		/ /		

SUPPLIER PLANNED DISPOSITION AT HTNA:
☐ OK TO USE PARTS AS REQUESTED
☐ SORT SUSPECT PARTS ☐ REPAIR NON-CONFORMING PART
☐ SCRAP SUSPECT PARTS ☐ SCRAP NON-CONFORMING PART

BOUNDARY SAMPLES SUBMITTED ☐ YES ☐ NO

REMARKS (INSPECT/REPAIR METHOD):

SHIPMENT IDENTIFICATION METHOD:

TEMPORARY COUNTERMEASURE AT SUPPLIER (INVENTORY AND CURRENT PRODUCT):

IMPLEMENTATION DATE: / /

SUPPLIER SIGN OFF

TITLE				
SIGN & DATE	/ /	/ /	/ /	/ /

COMPLETED BY HTNA

HTNA HAS REVIEWED THE DEVIATION PROPOSAL AS SUBMITTED AND AGREES TO THE TIMING AND CONDITIONS:
☐ YES ☐ NO ☐ ADDITIONAL CHANGES REQUIRED (SEE BELOW)

HTNA HAS REVIEWED THE NONCONFORMING MATERIAL/DEVIATION PROPOSAL AND BELIEVES THE FOLLOWING CHANGES ARE REQUIRED:

HTNA SIGN OFF

TITLE				
SIGN & DATE	/ /	/ /	/ /	/ /

SUPPLIER → HTNA REVIEW → PURCHASING
→ INCOMING INSPECTION → STORES

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5-6 QUALITY PROBLEM REPORT (QPR) - CORRECTIVE AND PREVENTATIVE ACTION

PURPOSE

To establish and maintain documented procedures for internal and external corrective and preventative actions.

SCOPE

This applies to all suppliers of purchased parts to HTNA, specifically recipients of Quality Problem Reports.

EXPLANATION

The supplier shall have systems in place that will investigate, correct and prevent identified nonconforming issues from recurring.

SUPPLIER RESPONSIBILITIES

General:

HTNA Supplier Quality System Requirements reflect *ISO 9001:2015, IATF 16949:2016 Sec. 10.2 Nonconformity and corrective action.*

HTNA Clarification

Nonconforming material can either be caused or detected internally (supplier or sub-suppliers) or externally (HTNA) but both should use the same or similar methods for containment and resolving the problem. The internal nonconformities identified by the supplier and caused by the external sub-suppliers shall require that the sub-supplier generate a corrective or preventative action report that is acceptable to the requirements of the supplier. These problems shall be documented to establish a history of potential problems and used to track supplier performance and problem resolution.

Corrective Action & Preventative Action:

HTNA Supplier Quality System Requirements reflect *ISO 9001:2015, IATF 16949:2016 Sec. 10.2 Nonconformity and corrective action.*

HTNA Clarification

Corrective Action and Preventative Action uses the following information to help detect, analyze, and eliminate the potential causes of nonconformities. The effectiveness shall be reviewed daily, weekly, and/or monthly based on risks in reducing the overall number of nonconformities seen internally by the supplier and/or at HTNA. Internal supplier findings are to be used to generate internal corrective actions and drive continuous improvement activities

Items that are externally identified by HTNA and reported back to the supplier will cause the supplier to complete the following tasks by due dates provided by HTNA:

Contain any suspect material and inform HTNA of any additional suspect shipment.

HTNA Corrective/Preventative Action Report – 8D Format if requested.

Implementation of action items called out in the report.

Audit of implemented action items.

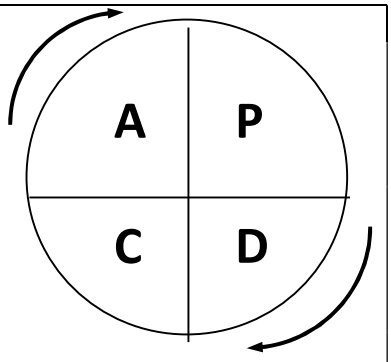
Potential expedited material replacement

Plan-Do-Check-Action:

To properly implement corrective action, one first must understand Deming's circle of Plan-Do-Check-Action (PDCA). Deming's PDCA circle is important to understand since it dictates the method by which to properly resolve any issue until completely closed.

Like most tools it is important to identify and document the problem and follow the proper steps to ensure total resolution. As each step in the process is completed, each section of the pie should be shaded in to show status of the problem. For convenience, a listing of all issues should be summarized into an Open Issue Sheet *(See SQM Section 5-1 Open Issue Sheet).* The following is a brief example of the method for performing a PDCA.

	TASK	METHOD
Plan-	-Identify Top 3 defects in scrap cost -Determine Top 3 failure modes	-Capability Studies -Evaluate data
Do-	-Kaizen - continuous improvement -Brainstorm -Fishbone Diagram	-Should enhance productivity and/or quality -Train Employees
Check-	-Evaluate the data on the implemented changes	
Action-	-Confirm improvement -Prepare countermeasure as required	-Develop Standardized Work -Update Poka-Yoke list -Repeat PDCA as required



Deming's Circle

HTNA Corrective/Preventative Action Report – 8D Format:

The preferred method of documenting corrective action is by using the 8-Steps provided in this section. For all HTNA identified supplier nonconformities, HTNA will issue its own Corrective/Preventative Action Report that is to be filled out and returned.

THE 8D METHOD IS

A systematic problem-solving process with a sequence of events to be followed when an issue is found and a reporting format to show progress in resolving the root cause(s).

1. Use of Team Approach

The team shall be a cross-functional group with the product/process knowledge, time, skills, and authority to implement corrective action.

2. Define and Describe the Problem

It should be updated as new information becomes available.

All relevant data is to be collected and organized that fully describes the problem.

The problem description should answer who, what, where, when, how, and how big the problem is.

3. Develop Interim Containment Plan; Implement and Verify Interim Actions

Are actions taken to isolate the effects of a problem from HTNA?

Ensure timely communication is established for any potential outflows.

Containment actions should be “temporary” and used only until a permanent fix can be made.

1st step in the 8D process.

4. Identify and Verify Root Causes and Escape Points (5 Whys)

Before listing suspected root causes, the team will need to update the Problem Description using any new pieces of information that they may have learned about the problem.

Identify all potential causes that could explain why the problem occurred. Isolate and verify the root cause by testing each potential cause against the problem description and test data. Root cause shall be determined for why made and why shipped.

Use established analytical tools such as 5 Why’s to determine actual root cause.

The 5 Why’s is an additional tool to be used to identify root causes. The basic philosophy behind the 5 Why’s is to ask “Why” continuously 5 times until the root cause is determined. Each Why is related to the previous Why and helps to define the true systematic root cause.

5. Choose and Verify Permanent Corrections for the Problem/Nonconformity

Before making the final choice, the team will need to ensure the Permanent Corrective Action(s) will resolve the problem for the customer and not create any unwanted side effects.

Monitoring of corrective action activity shall be tracked using a tool such as, PDCA (Deming’s Plan Do Check Act).

If significant change is required to the process, then a Process Change Request (PCR) must be submitted.

6. Implement and Validate Corrective Actions

Monitor permanent corrective action effectiveness for 90 days from implementation. Data showing effectiveness to be made available upon request.

7. Take Preventative Measures

Implement corrective actions for similar systems, practices, and procedures to prevent recurrence for similar products and processes (Yokoten - Read Across).

8. Approval - Congratulate Team

This step is to recognize the team’s collective efforts in solving the problem and show appreciation for individual contributions.

Implementation of Action Items Called Out in the Report:

It is imperative that the actions called out on the action report be implemented and evaluated in accordance with the planned timing. Failure to perform these tasks in a timely manner could potentially cause continuous production of nonconforming material which could force HTNA to shut down and miss deliveries. HTNA expects a formal documented containment plan within (24 hrs.) of supplier notification and a corrective/preventative 8D plan within (10) working days unless another due date is indicated on the QPR.

Containment Plan: A plan that defines the containment actions used to prevent suspect material that is at HTNA, in transit, or at the suppliers from being used. Corrective/Preventative 8D plans: Details the proposed permanent corrective actions that are to be implemented. Prior to containment activities being removed and permanent countermeasures being implemented, HTNA must be made aware of the proposed date of change and the packaging identification methods.

Trade sales will follow the OEM process with HTNA verification.

Audit of Implemented Action Items:

To ensure HTNA that the action items identified in the corrective action report have been implemented, HTNA strongly suggests that the corrective/preventative action items be added to the process audit and routinely verified for compliance. HTNA may wish to review all implemented corrective/preventative action items to ensure implementation, compliance, and assess future risk. The supplier shall evaluate the action item for effectiveness (suggest 30-60-90-day review).

Reimbursement of All HTNA Time and Materials:

HTNA expects all materials to be of the highest quality and free of defects. The supplier is responsible for all the time and materials that are associated with the nonconformance of its product. Any defect that directly affects HTNA production will be immediately identified, quarantined, and the supplier notified for immediate disposition requirements. Each supplier identified incident that requires HTNA to generate a corrective action report or the monthly accumulation of defects will be automatically debited an administrative fee at the HTNA current production rate. For material that is nonconforming and was used inadvertently in subsequent processes, HTNA will debit the supplier back the original cost of the material plus the additional time, labor, and components that were used up to the point the nonconformance was identified. If a supplier identified nonconformance forces HTNA or any of its customers to shut down, those costs will be passed back to the supplier.

Potential Expedited Material Replacement:

If a supplier identified nonconformance forces HTNA into a potential shutdown condition, the supplier is responsible for expediting all material at their expense to meet the new HTNA/supplier agreed upon delivery time.

5-7 FIELD RETURNS / WARRANTY

PURPOSE:

To define the supplier's responsibility to analyze returned field units and thus generate improvements to the process/product to eliminate future recurrences.

EXPLANATION

HTNA receives units back from our customers that have failed either at their assembly facility or in the field. It is the responsibility of HTNA to review these parts and determine the root cause. In some cases, HTNA may determine that a failure is linked to a specific nonconformance and may require the help of a particular supplier to help resolve the issue. The supplier is to provide the appropriate resources to help aid in the resolution of the issue.

Trade sale will follow the OEM Portal. If warranty parts are returned to the Trade Sale supplier, HTNA QE shall be notified.

5-8 INTERNAL QUALITY AUDITS

PURPOSE

The supplier shall have a documented process in place within their Quality System for the planning and execution of internal audits for verification and compliance with quality-related activities and requirements.

EXPLANATION

Suppliers are to establish and maintain an internal auditing system that plans, executes, and evaluates all issues relating to quality on an on-going basis. Audits are to be performed by personnel other than those who have direct responsibility for the activity being audited. The goal of the internal audit is to validate all compliance and generate continuous improvement activities.

SUPPLIER RESPONSIBILITIES

Internal Quality Audits and Internal Audit Schedules:

HTNA Supplier Quality System Requirements reflect *ISO 9001:2015, IATF 16949:2016 Sec. 9.2 Internal audit.*

HTNA Clarification

A team composed of knowledgeable key personnel with a Team Leader *(Lead Auditor)* shall be constructed to conduct the audit.

Suppliers are to perform scheduled internal audits at their own established intervals; however, HTNA suggests that audits be performed at a minimum annually. The two (2) audit types that shall be performed are Product and System (Process) audits per IATF 16949:2016 and/or ISO 9001:2015.

The supplier can choose any format or checklist on which to audit but at a minimum the Control Plan and PFMEA shall be evaluated for process compliance.

The personnel responsible for the area being audited shall be made aware of the results so that corrective action activities will be generated.

The supplier's upper management shall be notified of the results.

An Open Issues/Problem Follow-up sheet *(See SQM Section 5-1 Open Issue Sheet)* is to be generated by the lead auditor to track and verify the implementation and effectiveness of the corrective action.

Internal Audits shall apply to all shifts.

When noncompliance is found internally or externally, audit frequencies shall be reviewed and increased as necessary until the noncompliance is under control.

5-9 TRAINING

PURPOSE

The supplier shall have documented procedures for identifying and providing training for all personnel performing activities that affect quality.

EXPLANATION

Suppliers shall establish and maintain a training matrix or document that identifies all the key quality points throughout the process and the personnel involved. A matrix or document shall be created which correlates personnel to the areas that require training and shows current training status. A plan should exist that promotes continuous education and cross-training of employees.

SUPPLIER RESPONSIBILITIES

Training and Training Effectiveness:

HTNA Supplier Quality System Requirements reflect *ISO 9001:2015, IATF 16949:2016 Sec. 7.2 Competence.*

HTNA Clarification

At a minimum the following training requirements shall be identified:

Standardized Work Manufacturing Processes/Steps *(Matched to the Process Control Plan)*

Product Quality Requirements

Quality Documentation

Environmental Concerns

Health and Safety Awareness

Internal/External qualified experienced personnel only are to be used as trainers.

HTNA strongly encourages the use of cross training personnel to reduce fatigue, repetitive motion injuries, and increase alertness/quality.

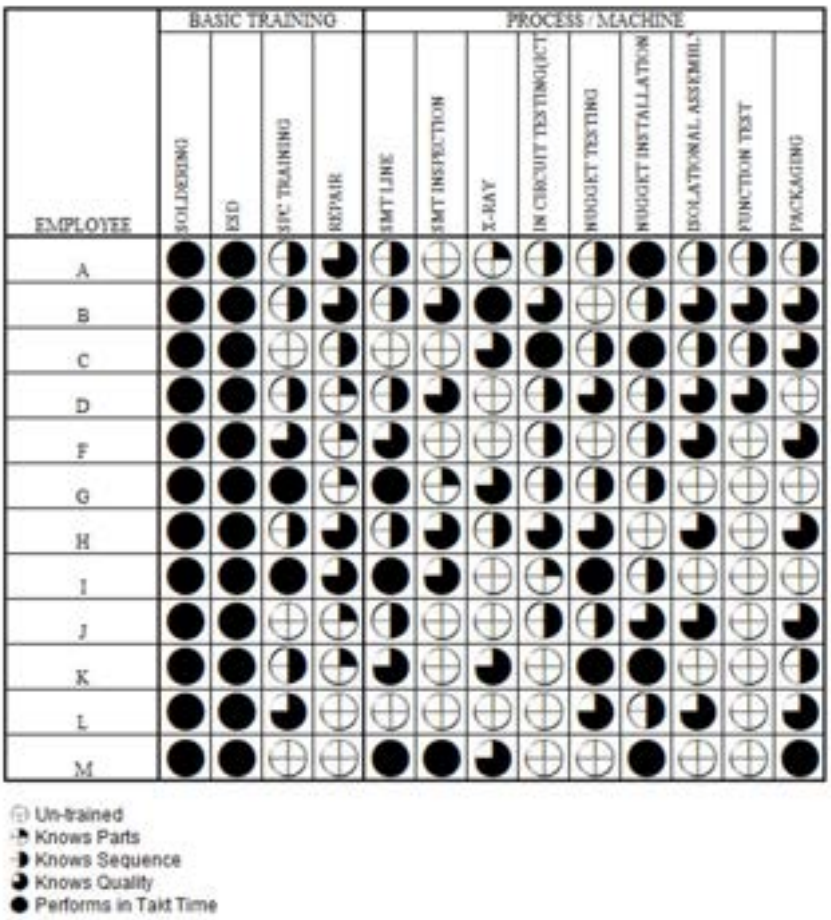
A matrix or document of training requirements, personnel, and status shall be available or posted for all to see.

Training effectiveness is to be reviewed and documented on a periodic frequency based on risk.

The supplier is encouraged to continuously train their personnel through on-the-job training, educational classes, and/or outside workshops. A training plan shall exist outlining the required actions.

For new programs all training should exist in parallel to the timing and submission requirements that are expected during a new production launch with the expectation of fully trained operators by the Start of Production (SOP).

OPERATOR TRAINING MATRIX



5-10 CHARGEBACK OF WIP SCRAP

PURPOSE

To properly communicate HTNA's method for recovering processing costs for supplier-caused WIP (work-in-process) scrap.

EXPLANATION

HTNA's supplier scorecard system *(see SQM Section 5-11 Supplier Quality Performance)* is primarily focused on monitoring the quality of raw materials supplied directly to HTNA, not WIP. Chargeable defects are typically established at the time of PPAP, through our RMIS (Raw Material Inspection Standard) documentation.

QUALITY POLICY AND SUPPLIER RESPONSIBILITIES

Maintain RMIS agreement and understand/accept basis for chargebacks/debits.

WIP DEFINITION

WIP scrap assigned to supplier is any defect (flagged or otherwise) that is found during processing at HTNA. A primary example is our back coating process for both face goods and SA layer material. There are also instances of sheet material in which defects become visible only after molding.

HTNA PHILOSOPHY

Supplier-caused processing scrap from roll goods is recognized as unavoidable, HTNA believes it is best to develop standards for such allowances with each applicable supplier. The back charge process is a direct debit to a supplier's existing open invoice. This process provides a clean reimbursement to HTNA of costs absorbed for defective WIP scrap, without issuing a QPR and without the added administration fees associated with QPR.

5-11 SUPPLIER QUALITY PERFORMANCE

PURPOSE

To measure and evaluate the performance and capability of suppliers based on standard criteria and expectations.

SCOPE

This applies to all suppliers of purchased parts and materials to HTNA.

EXPLANATION

HTNA'S goal is to work in conjunction with its suppliers to ensure world class performance while maintaining a competitive cost. To measure these goals, HTNA has developed a performance rating

system that will fairly and effectively measure the performance of each target supplier based on the following categories: Quality conformance to requirements, quick response (containment), and on-time and effective corrective action. Our Supplier Rating System, including Quality Problem Reports (QPR's), recognizes solid and good performance. It is also detailed enough to assign severity indexes, quantity indexes, and penalties for late corrective actions, broken containment, etc. Monthly reports are sent out by email each month and will be referred to as the Supplier Quality Scorecard. The Supplier Quality Scorecard shall be reviewed by the supplier and used to generate continuous improvement activities.

SUPPLIER RESPONSIBILITIES

Monitoring the performance of the supplier and sub suppliers.

HTNA Supplier Quality System Requirements match *ISO 9001:2015 Sec. 8.4.3 Information for external providers.*

SUPPLIER QUALITY RATING SYSTEM

Quality Rating – Raw Materials and Cross-dock

The goal of each supplier is to achieve and maintain 0 quality index score.

Nonconforming material is any material that does not conform to the specifications or meet the expectations of HTNA and its purchase agreement and/or Raw Material Inspection Standard (RMIS). Material that is either reworked or rejected (HTNA, customer, or field returns) will make up the total nonconformance value and tallied against the total quantity of parts received for the month to determine the supplier index scores and related chargeback costs. Nonconforming material that determines supplier performance may be gathered from any/all the following areas:

Receiving / Inspection

In-Process

Customer and Cross-dock Claims

When large quantities of material are determined to be nonconforming the quantities will be temporarily documented until the supplier or HTNA can effectively sort or return the material. If the supplier is unable to help with sorting the material (i.e. providing immediate containment), HTNA may choose to sort the material and charge the supplier for the time and material involved.

For raw materials and cross-dock items, HTNA will issue the QPR, with available scrap quantities and details, to the supplier requesting proper disposition and account payable adjustments. HTNA reserves the right to send nonconforming material back to the supplier without prior authorization if HTNA feels that the nonconformance is of either significant value, quantity, or is time dependent. Otherwise, if the supplier has not issued a form of return material authorization (RMA) within 48 hours of QPR issuance, HTNA reserves the right to dispose of the material. The RMA process can be used for root cause investigation. Deviations that lead to the potential shutdown of HTNA or its customers will ultimately be charged back and reflected in the Scorecard. QPR's are sent via email. A sample QPR is as follows:

HTNA

1 QPR_ M

2 Part No: 1013235A (Ins Floor LH VWave 2HX)

QPR_ M - [ ] Site 2 - HTNA OH **CLOSED**

Discrepancy: 3
Thickness: out of spec causing parts to delam

Scrap Code Category:
1006_Incorrect Thickness | Dimensional

Initiator: [ ]

Record Created: 1/5/2017

Close Date: 1/26/2017

4 **Severity Index:** 5

5 **Qty Index:** 2

6 **CA Index:** 10

Module: Supplier CAR

Group: QPR

Sub Group: OEM

Division:
Quality

Assigned To (Record Owner):
Brenda Browning

Supplier: [ ]

Mfg Entity:
RM

Rank:
M

DETAILS

Note:
1013235 parts were found to be out of spec. on thickness.

Relation:
Individual

Hayashi Responsible:
HTNA OH

Product Flow:
RM Supplier → HTNA OH

Scrap Code Sub-Acct:
990 | Other Supplier

Part Unit:
EA

WIP Reject Unit:

WIP Reject Item No:

Canceled: No

PermCA Due:

Date Canceled:

PermCA Approve:

WIP Qty Check: 0

Part Qty Check: 150

WIP Qty Rework: 0

Part Qty Rework: 0

WIP Qty Reject: 0

Part Qty Reject: 20

MATERIAL LOT

RMA No: (not assigned)

Material Disposition **Material Disposed:** Yes

Lot Information: Lot# 198010 carton 20 parts

7 CONTAINMENT - ROOT CAUSE

Supplier Sort Results and Temporary CA:

Root Cause 5Y (Why Made? Why Shipped?):

QPR_ M - 170001 CLOSED

CORRECTIVE ACTION

Permanent Corrective Actions Taken: PermCA Submit:

8 SUPPLIER TASKS

ID	Est Due Date	Assigned To	Status	Closed	T: Task C: Comments	Completed By	Completion Date
167	2017-01-17	-Supplier-Responsible	Complete	Yes	T: Please sort all 1013235 parts for out of spec thickness. Please complete a containment. After you have contained all the material please certify the material before shipping to HTNA. Certifying the material will need to be with some type of colored label or sticker showing it has been certified. C: No Containment information was provided.	Jeff Smith	2017-01-23

9 QPR FEES

Count	Unit	Cost ($)	Classification	C: Category S: SubCategory	Comments
100	$	100.00	Failure External	C: Supplier QPR S: Admin Fee	
	Total Cost: 100.00				

FILE ATTACHMENTS

ID	File Name	Description
1004	Copy of Complaints and measures (QPR_-170001) .xlsx	5Y Submission
968	20170105_105718_resized.jpg	Bad material
969	001.JPG	Label information
970	002.JPG	bad part

APPROVALS

State	Sequence	Approver	Assigned on	Current	Responded on	Comments

Quality Problem Report

Code

1 QPR Number and Level (Severity Index, see table below)

2 Part Number and Description

3 Problem Found and verified

4 Severity Index, see table below

5 Quantity Index, see table below

6 CA Index = corrective action timeliness (see table below)

7 Containment (expected within 24 hours), root cause, corrective action. This is the portion of the QPR where HTNA personnel summarize supplier responses.

8 Special supplier tasks to ensure HTNA has quality product (containment is always expected)

9 Associated Fees (will be debited by HTNA – see table below)

Current discretionary QPR Penalty scores are reflected in the table below (all rates, penalties, indices subject to change). Cross Dock (termed "XDK") products are those which are simply relabeled at HTNA, then shipped directly to our customers. A heightened level of scrutiny and control is expected by suppliers who provide Cross Dock parts; the higher penalties and associated fees for issues involving XDK products reflect this expectation:

Supplier QPR Reference Table

	RM	XDK
Product Flow Type	RM Supplier → HTNA → OEM RM Supplier → HTNA → HTNA → OEM	XDK Supplier → HTNA → OEM
Admin Fee	(1x) $100 per occur.	(1x) $200 per occur.
Recurring Fee	(2x) $250 per occur.	(2x) $500 per occur.
	(3x +) $500 per occur.	(3x +) $500 per occur.
Downtime at an HTNA facility	($45) * (# hours) * (# oper.)	($45) * (# hours) * (# oper.)
Sort at an HTNA facility by HTNA employees	($35) * (# hours) * (# people)	($35) * (# hours) * (# people)
Downtime at an End Customer OEM	QPR fee based on OEM charges	QPR fee based on OEM charges
Sort at an End Custr OEM by OEM employees	QPR fee based on OEM charges	QPR fee based on OEM charges
Cost of Parts Rejected at an HTNA facility	charged by Accounting EOM debit memo	charged by Accounting EOM debit memo
Cost of Parts Rejected at an End Customer OEM	QPR fee based on OEM charges	QPR fee based on OEM charges
Parts Return Cost from reject at an HTNA facility	supplier responsible for direct shipping	supplier responsible for direct shipping
Parts Return Cost from reject at End Cust OEM	QPR fee based on OEM charges	QPR fee based on OEM charges
3rd Party Sort at an HTNA facility	supplier responsible for direct billing	supplier responsible for direct billing
3rd Party Sort at an End Customer OEM	QPR fee based on 3rd Party invoices	QPR fee based on 3rd Party invoices
H-Severity Index	10 pts. per occur.	12 pts. per occur.
M-Severity Index	5 pts. per occur.	5 pts. per occur.
L-Severity Index	1 pt. per occur.	1 pt. per occur.
a-Severity Index	0 pts. per occur.	0 pts. per occur.
b-Severity Index	2 pts. per occur.	4 pts. per occur.
* Late CA Index	5 pts. per occur.	5 pts. per occur.
* * Qty Index	0 pts. (qty = 0)	0 pts. (qty = 0)
	2 pts. (1 to 99)	2 pts. (1 to 99)
	5 pts. (100-599)	5 pts. (100-599)
	8 pts. (600 to 1099)	8 pts. (600 to 1099)
	10 pts. (1100 +)	10 pts. (1100 +)

* add 5 the first day that CA is late. Add 5 each subsequent week CA is late
* * calculated by number of reworked + number of rejected at an HTNA facility and/or End Customer OEM
[H] Rank - Critical Issue (Safety, Line Stop) - or - 3rd Party Sort - or - 5P/A3 Presentation - or - End Customer
[M] Rank - Corrective Action Submission Required (Certified Parts Mandatory)
[L] Rank - No Corrective Action Submission Required (Certified Parts Mandatory, CA Should Be Done Internally at
[a] Rank - Child Record (Dependent). Due to an Additional WIP/RM/XDK item number.
[b] Rank - Child Record (Dependent) due to Broken Containment

Supplier

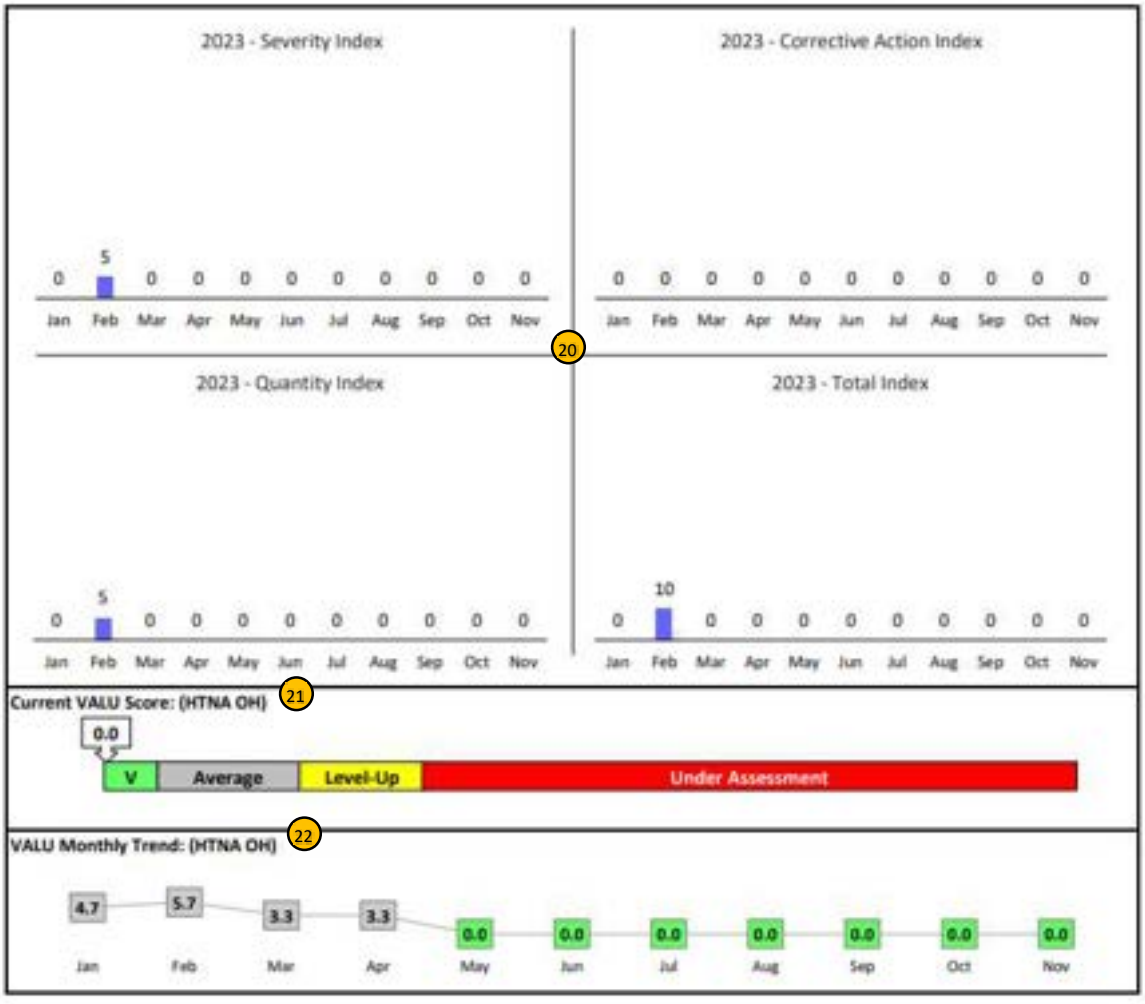
SUPPLIER QUALITY SCORECARD

SUPPLIER: (2)
CODE:
PLANT: (3)

HAYASHI PLANT: HTNA OH
SITE: 2
SITE CODE: 17LEB1OH

MONTH: November (7) YEAR: 2023

	(9) H	(10) M	(11) L	(12) a	(13) b	(14) Late CA	(15) Qty	(16) Quality *Performance* Index		(17)	(18)	(19)
	count	count	count	count	count	count	sum	Severity		CA	Qty	Total
Jan	0	0	0	0	0	0	0	0		0	0	0
Feb	0	1	0	0	0	0	104	5		0	5	10
Mar	0	0	0	0	0	0	0	0		0	0	0
Apr	0	0	0	0	0	0	0	0		0	0	0
May	0	0	0	0	0	0	0	0		0	0	0
Jun	0	0	0	0	0	0	0	0		0	0	0
Jul	0	0	0	0	0	0	0	0		0	0	0
Aug	0	0	0	0	0	0	0	0		0	0	0
Sep	0	0	0	0	0	0	0	0		0	0	0
Oct	0	0	0	0	0	0	0	0		0	0	0
Nov	0	0	0	0	0	0	0	0		0	0	0
Dec												
YTD	0	1	0	0	0	0	104	5		0	5	10



Quality Performance Report

Code	
1	Supplier Name
2	Supplier Assigned Code
3	Supplier Manufacturing Location
4	HTNA Manufacturing Location
5	HTNA System Site Number
6	HTNA System Site Code
7	The latest month included in scorecard Data
8	The year included in scorecard data
9	The number of H-Rank QPRs that were issued in each month
10	The number of M-Rank QPRs that were issued in each month
11	The number of L-Rank QPRs that were issued in each month
12	The number of a-Rank QPRs that were issued in each month
13	The number of b-Rank QPRs that were issued in each month
14	The number of QPRs that had Late Corrective actions (based upon the month they were due)
15	Total quantity of effected parts (rework + scrap +end customer) for all QPRs issued in each month
16	Total Severity index points for all QPRs issued in each month
17	Total Late Corrective Action Index points for all QPRs (based upon the month they were due
18	Total Quantity Index points for all QPRs issued each month
19	Total Index points (Total Severity Index + Total CA Index + Total Qty Index) for all QPRs issued in each month
20	Charts are categorized by each Index Points Category by month
21	Current VALU rating of supplier. VALU is the average of Total Index points for the last 3 months
22	Current VALU monthly trend.

Understanding VALU

The term VALU is the following acronym:

V very good results or "valuable"

A average results

L level-up, results require action by supplier management to immediately level-up

U under assessment. HTNA may conduct a supplier assessment and develop action items.

VALU is different than TOTAL INDEX. The Total Index is calculated on a monthly basis using the following: Total Index = Severity Index + CA Index + Qty Index

The VALU rating is used to analyze the supplier's performance over a rolling 3 month average.

The VALU is calculated using the following equation:

VALU = The sum of Total Index of the last 3 months divide by 3

Example:

	Severity	CA	Qty	Total
January	10	5	8	23
February	5	0	5	10
March	0	0	0	0
April	5	5	2	12
May	5	0	2	7

With this example, the current VALU for May would be 6.3 ([0+12+7] (divide by 3)

The VALU rating for the previous month (April) would have been 7.3 ([10+0+12] (divide by 3)

The following scale will be used:

V ≤ 2.9 (Green)	A 3.0 to 10.9 (Gray)	L 11.0 to 17.9 (Yellow)	U ≥ 18.0 (Red)

HTNA expects its suppliers to continuously strive to improve their overall performance. Any supplier falling into the "level up" and "under assessment" categories will be expected to take appropriate corrective action to bring their performance up to acceptable levels. "Under Assessment" rankings will require additional improvement plans, at a minimum and possible "no quote" status. If you are a supplier with consistent V-level scores, HTNA commends you for your efforts as a world class supplier. If there are any questions concerning your scores, please contact the HTNA Quality Department or the Supplier Quality Engineer directly.

Quality Rating – Trade sale partners (ship direct to OEM under Hayashi label)

The goal of each supplier is to achieve and maintain 0 quality index score.

For Trade sale parts, the indication of any quality issue or concern comes through the customer, either via email or customer portal access.

As HTNA Corporate Quality must enter responses from our Trade sale partners regarding containment, short-term countermeasures and long-term countermeasures, timely, accurate responses are essential. Please refer to the references below:

Trade sale response on the OEM portal.

Scorecard Criteria per OEM.

Delivery Rating The *goal of each supplier is to achieve and maintain 100% on-time, accurate shipments.*

An order is defined as being the summation of all components delivered from one supplier source, on one delivered truck, and for one order. Each order will be inspected for the following:

Incorrect or missing documentation

Incorrect shipping quantities (over or under)

Mixed components

Incorrect components

Missed delivery windows (late, early (more than 3 days), missed)

Unauthorized shipments

Mislabel

If a shipping carrier is believed to be responsible for an order being discrepant an investigation will be launched to determine the actual cause of the problem. HTNA, the courier, and the supplier will work together to develop countermeasures to prevent future problems from recurring. Any order that is found to be discrepant due to the responsibility of the supplier will receive a form requiring immediate preventative and corrective action.

Advanced Notice of Problems:

Any problem that could potentially affect quality and/or delivery and what the supplier is aware of should be communicated to HTNA immediately. Suppliers will not have their scorecards affected for those instances where steps were taken to notify HTNA. However, each problem HTNA experiences and believes the supplier was or should have been reasonably aware will be taken into consideration for scoring purposes.

Explanation for lack of advanced notification

Immediate action plan completed with timing

Containment and preventative countermeasure plan

Cost reimbursement for HTNA and potentially customers – chargebacks/debits

Response to Problems:

Suppliers are responsible for responding to the HTNA corrective action requests. A containment plan is required within 24 hours followed by the final corrective/permanent countermeasure plan within 7 days, unless otherwise noted on the QPR. 100% sorting required for all stock, at both HTNA and supplier site(s). All actions must be in writing (email is preferred) and acceptable to HTNA. The Scorecard impact is detailed in Section 1, Quality Rating.

Problem Resolution: Percentages used instead at all HTNA Plant. Quality/delivery

Countermeasures that have been called out in both the containment and corrective/permanent countermeasure plans are to be structured in the 8D or 5P format *(see SQM Section 5-6 Corrective and Preventative Action)* and submitted as follow-up to the original problems. Supporting documentation and photos are strongly encouraged.

Trade Sale

Trade sale partners will work with HTNA and follow the OEM requirements for Customer Claims.

SECTION 6: General Requirements

6-1 PLANT CLEANLINESS & ORDER

PURPOSE

The supplier shall have a process in place to keep the facility clean, organized, and maintain a well-lit work area.

EXPLANATION

A clean, organized, and well-lit work area provides employees with a good work environment and allows items to be identified and retrieved quickly. When items are not in their proper location it is easy to identify that they are missing and where they should go. A clean workplace is a safe workplace.

SUPPLIER RESPONSIBILITIES

The facility work areas shall be clean and free of any debris that could potentially cause harm to employees and/or visitors. This includes but is not limited to oil, water, and process waste. If these issues are persistent, a method shall be established to maintain control and a plan generated to eliminate them. Machines should be kept in good repairs to reduce potential failures, downtime, potential safety hazards and fire prevention.

Implement Safe practices and 5S throughout all areas of the facility including office areas alike. 5S does not just represent the tasks required to have a clean facility, it represents a philosophy that is disciplined and caring. The following are the five requirements behind the 5S philosophy:

Safety

Seiri – Sort (Eliminate Waste-Muda)

Seiton – Straighten (Set in Order)

Seiso – Shine (Cleaning)

Seiketsu – Standardize (Maintain)

Shitsuke – Sustain (Discipline)

Provide employees with the proper tools to maintain a good 5S. HTNA requires establishing a standardized method for cleaning.

The facility shall be lit well enough to identify potential defect modes. The lighting used must be appropriate for the process being performed.

6-2 CONTROL OF QUALITY RECORDS AND DOCUMENT RETENTION

PURPOSE

The supplier shall have procedures in place for controlling records and documentation retention.

EXPLANATION

Suppliers are to establish and maintain a system that properly collects, stores, and dispositions SQM records. The document control system shall be understood by all personnel who have access to and/or control of quality documents.

SUPPLIER RESPONSIBILITIES

Control of Quality Records & Record Retention:

HTNA Supplier Quality System Requirements reflect *ISO 9001:2015, IATF 16949:2016 Sec. 7.5.3 Control of documented information.*

HTNA Clarification

All quality records, customer purchase orders/amendments, and documentation regarding customer tooling require an easily retrievable method for storing and retaining documents.

Quality records shall be maintained to measure the conformance to quality requirements and the effectiveness of the Quality System. Pertinent quality records from subcontractors (including suppliers) shall be an element of these records.

The storage area must be adequate to prevent damage, deterioration, and loss from occurring. All quality related documents are to be maintained per OEM requirements.

Records can be kept and maintained in the form of any type of media, such as hard copy or electronic.

All production-related problems, trends, and countermeasures in the manufacturing cycle shall be measured and summarized in reports. Records shall be kept for defective components and assembly processes to highlight problem areas and trends.

Records of internal quality system audits and management reviews shall be retained per OEM requirements.

HTNA requirements do not supersede any governmental requirements.

Quality records for HTNA products shall be available upon request from HTNA.

Document Retention:

HTNA requires suppliers to maintain the following SQM related documents for the minimum duration based on OEM requirements:

Document Type	Retention Period	How to Dispose
Mazda Related	12 Years	Delete/Shred as applicable
Honda Related	25 years after discontinuation order	Delete/Shred as applicable
Toyota Related	25 years	Delete/Shred as applicable

NOTE: OEM requirements as of 2024. HTNA will inform suppliers of any changes to the OEM requirements.

6-3 HTNA SECURITY & SAFETY REQUIREMENTS

PURPOSE

The purpose of this section is to define the security and safety expectations while visiting HTNA.

EXPLANATION

It is important to understand the security and safety requirements of HTNA; many items are technologically advanced and highly proprietary and thus contribute to the success of our organization. All information and advanced methods of production are not to be shared with anyone other than employees of HTNA. Suppliers and their contracted service workers must abide by HTNA visitor's safety policies and procedures.

QUALITY POLICY AND SUPPLIER RESPONSIBILITIES

The supplier must first request HTNA's approval to schedule a visit.

Suppliers and their service workers are to be always escorted by an HTNA employee.

Suppliers are not allowed to remove any material from the HTNA facility without first receiving the written / verbal permission of HTNA.

All information and knowledge that is gained at HTNA is not to be shared with any other customers or suppliers without the prior consent of HTNA.

Suppliers are not allowed to take pictures within any HTNA facility. If pictures are required, the supplier must first receive written permission from HTNA applicable Plant Manager.

Suppliers must follow HTNA safety procedures, plant rules and regulations.

6-4 SUPPLIER'S USE OF PERSONNEL AT HTNA

PURPOSE

The purpose of this section is to define the expectations of supplier service workers (i.e., 3rd party sorting companies) while at the HTNA facility.

EXPLANATION

The use of service workers at HTNA must meet the expectations for training, corrective action, and be able to communicate all issues and their resolutions back to the supplier.

SUPPLIER RESPONSIBILITIES

The use of service workers must first be approved by HTNA.

Service workers are to be organized by the supplier, or an approved contracted inspection service as agreed upon with HTNA.

HTNA and the Supplier will define the method by which to review and/or rework in conjunction with the findings.

The supplier takes full responsibility for the service workers' safety and quality of work.

The worker is expected to communicate all nonconformities to their organization and provide their findings to HTNA.

ACKNOWLEDGEMENTS

PURPOSE

The purpose of this section is to acknowledge those companies which have provided established methods, systems, and direction for HTNA to compile this Supplier Quality Manual (SQM).

ACKNOWLEDGEMENTS

HTNA would like to formally acknowledge the efforts of all the companies and their personnel that helped in developing their internal quality systems and requirements and have thus been chosen for the development of this Supplier Quality Manual.

International Organization of Standard (ISO)

Automotive Industry Action Group (AIAG)

Verband der Automobilindustrie (VDA)

International Automotive Task Force (IATF)

Hayashi Telempu Corporation (HTC)

Toyota – Honda - Mazda

BLANK FORMS

PURPOSE

To provide suppliers with the forms required for documented communication with HTNA.

SUPPORTING FORM	FORM #/SECTION
Supplier Quality Representative	HSF 1-3
Supplier Advanced Quality Planning Schedule	HSF 1-5
Checking Fixture Approval Request	HSF 2-1-1
Checking Fixture Change Request	HSF 2-1-2
FMVSS Regulation Data Items	HSF 2-3
Tooling Progress Report	HSF 2-4
Standardized Work Combination Table	HSF 3-2
AIAG-VDA PFMEA Format	HSF 3-3
Process Control Plan	HSF 3-6
RMIS Template	HSF 3-9
PPAP Checklist and PSW incl TRS	HSF 4-1-1
Run @ Rate	HSF 4-1-2
Part Evaluation Plan	HSF 4-2
Part Sample Data Sheet	HSF 4-3
GRR Data Sheet	HSF 4-6
Boundary Sample Tag	HSF 4-8
Open Issue Sheet	HSF 5-1
Process Change Request (PCR) Form	HSF 5-3
Notice of Nonconforming Product & Deviation Request	HSF 5-5
8D Problem Solving Format	HSF 5-6
Supplier Assessment Form	HSF 5-7

REVISION RECORD

REVISION	DATE	REMARKS
Issue 1	2007	INITIAL ISSUE
Issue 2	1/1/2021	INITIAL ISSUE
“A”	1/1/2021	Released
“B”	7/28/2021	2-2-4, submission due changed
“C”	1/1/2024	See Change document
Issue 3	8/1/2025	Rev. A